The following reports are made available to CABA members through the CABA Research Library.

(IS-2014-200) On Intelligent Home Offices – A Model and Potential Impacts
The idea of “teleworking” or “telecommuting” or “working from home” is not new. The practice is still not very popular because most organizations lack a policy for “telecommuting.” There are two schools of thought fighting against each other related to the implementation of this practice in a broad sense. The main theme of this CABA White Paper suggests that technology is available to let employees, whose work is information-based, work at home for three or four days a week. While many employees are provided with cell and smart phones to be accessible while they work from anywhere when away from their desks, what is lacking is a cultural acceptance and clearly defined guidelines for telecommuting as part of business activities.

(IS-2014-199) Sustainability in the Age of Big Data
This report was completed September 2014, by The Wharton School, University of Pennsylvania. This report outlines the characteristics of big data and describes what it means for sustainability. The report discusses how utilities and energy companies are generating large amounts of data and how this can be used to optimize business performance and reduce impacts to the environment, citing that 1.1 gigatons of greenhouse gases could be eliminated each year. The report continues on to highlight that there are many challenges still to solve with big data such as privacy concerns.

This paper describes the different forms of financing energy efficiency projects. The paper indicates that energy efficiency installations will double to $9.5 billion per year by 2025. It mentions that due to a lack of understanding and access to financing that there is much opportunity missed within the market. Based upon an industry survey, the paper outlines the current market and then proceeds to describe the various financing options available for energy efficiency projects.

(IS-2014-197) Adaptive Optics: Technologies and Global Markets
This report from bcc Research, published June 2014, takes a 10-year look at the global market growth potential for adaptive optics (AO) systems. The report will also present findings on the technology and commercial drivers for the deployment of AO systems in applied scientific research, military, medical, industrial and consumer markets.
(IS-2014-196) THE ARRIS 2014 CONSUMER ENTERTAINMENT INDEX
This report from Arris, published May 2014, examines consumer demands in entertainment. The report is broken down into four sections including: "Broadcast TV is here to stay", "Consumers engage in binge-viewing", "New opportunities for multiscreen merchandising", and "Storage challenges".

(IS-2014-195) Disruption Becomes Evolution: Creating the Value-Based Utility
This report from CMG, published June 2014, examines the numerous changes that are currently pressuring the utility industry. It analyzes how change has disrupted the standard practices in other industries, and how this can be applied to the utility industry.

(IS-2014-194) San Diego improving Downtown District with LED street lighting with wireless controls
This report from GE Lighting, published February 2014, examines the current state of San Diego’s downtown street lights. The city implemented GE’s LightGrid technology and replaced their old street lights with new wireless LED lights. The new lights are expected to save the city "upwards of $254,000 annually" and reduce the environmental impact of the city’s street lights.

(IS-2014-193) Smart Cities Readiness Guide
This report from the Smart Cities Council, published in 2013, provides insight into the future of the smart city, as well as general goals for smart city planners and best practice guidelines. The purpose of the report is to provide an understanding of how a city can prepare for the future and eventually transform into a ‘smart city’.

(IS-2014-192) Synapse Wireless Drives Internet of Things Innovation
This report from Harbor Research, examines a new wireless sensor networking platform and data management from Synapse Wireless. The Synapse Wireless SNAP platform provides a unified development framework and platform for smart sensing combined with software development tools.

(IS-2014-191) Breaking Down Federal Investments in Clean Energy
This report from ITIF, published March 2013, assembles a series of articles first published on Energy Trends Insider, featuring data captured in the Energy Innovation Tracker (a database of federal investments in energy innovation at the project level). The Energy Innovation Tracker was developed to inform the clean energy policy debate by defining federal investments in clean energy innovation by technology, innovation phase, and investment type.
(IS-2014-190) The five behaviors that accelerate value from digital investments 6th Annual Digital IQ Survey
This report from PWC, published March 2014, examines the company's sixth annual Digital IQ survey. The survey looked to answer the following: "how do we use digital technology to improve products and services, create new ones, or change our business models?". PWC outlines five behaviors that make a difference in enabling a business to realize sustained value from digital technology.

(IS-2014-189) The Energy Savings Potential of Smart Manufacturing
The report by the American Council for an Energy-Efficient Economy presents a comprehensive overview of energy savings in smart manufacturing, particularly on how additional energy efficiency made possible through the use of ICT in the industrial (or manufacturing) sector. Brief case studies are also provided to show the related features and benefits.

(IS-2014-188) Sensors, Sensors Everywhere
This article from IHS provides an overview of sensors and their applications, particularly in smartphones, smart watches, cars, and very briefly homes.

(IS-2014-187) Introduction to IP in Commercial Buildings
The paper by IPSO Alliance presents a very brief overview of business or IT systems, building management systems (BMS), and specialty systems in commercial buildings. Then it discusses their convergence and integration using an IP (Internet Protocol) based approach.

(IS-2014-186) 2013 Moving Forward: Findings and Recommendations from the Consultative Council
This report from the National Institute of Building Sciences highlights the industry's annual priorities and offers recommendations for action. The reports focuses on several key areas including: the building workforce; guidance on the use of non-potable water; understanding the energy/water nexus; supporting the existing state and local building regulatory infrastructure; developing the business case for private sector investment in hazard mitigation.

(IS-2014-185) Financing AERS: Innovation & Commercial Investments
This report from the Consortium for Building Energy Innovation (CBei) summarizes the 2013 panel discussion on financing energy efficiency. The platform consisted of four panelists that focused primarily on two topics: the proliferation of energy benchmarking ordinances, and existing financial tools. Panel experts also shared their views on the future of the commercial building market's future trajectory.
(IS-2014-184) EEB Codes: Performance-Based Codes
This report from the Consortium for Building Energy Innovation (CBei) explores performance (or outcome) based building codes, which set standards based on “buildings’ actual energy use, rather than on compliance with stipulated technology or design features.” This feature would allow building owners flexibility in trying out new energy conservation measures; however, most state building codes are not currently performance based.

(IS-2014-183) Simulation Platform
This report from the Consortium for Building Energy Innovation (CBei) explains their Simulation Platform, which was created to “circumvent much of the need for a technical background when undertaking basic building energy simulations so a relative layperson can begin to tinker with building energy design”. The simulation platform is essentially a suite of web simulation tools, which process models on a remote server given a set of user inputs.

(IS-2014-182) Review of Company Demographics, Sales Focus and Technology
This report from examines active US based interconnected Voice over Internet Protocol (iVoIP) Service Providers. It covers topics such as: what services are bundled with VoIP technology, what technology is used to serve which target customers, and demographic data points on the Companies that make up this unique sub-set of VoIP Service Providers. The data presented was collected “directly and indirectly from a sample size of 48.3% of all actively licensed FCC iVoIP Service Providers as of June 11, 2013 (472 out of 977).”

This report from the European Commission (within the 7th Framework Programme) summarizes the presentations and discussions held during the 4th Vocabulary Camp (VoCamp) on “Integrating multiple domains and scales”, which was organized by the SEMANCO project. The VoCamps series is an initiative of the European Commission, and is an informal event where experts meet to deliver “lightweight vocabularies and corresponding ontologies.” The purpose of this VoCamp was to discuss the “application of ontologies to integrate data from various domains and scales to improve the energy efficiency in urban areas.”

(IS-2014-180) Turning the Page: Reimagining the National Labs in the 21st Century Innovation Economy
This report focuses on the Department of Energy’s National Labs, which have been a cornerstone of high-impact, federally funded research and development. The report proposes a more flexible lab-management model that strengthens the labs’ ability to address national needs and produce a consistent flow of innovative ideas and technologies. The fundamental idea is to build policy reforms that re-envision the lab system. The purpose of this report is to put forth a set of recommendations that will bring greater efficiency and effectiveness to the DOE lab system, produce more relevant research, and increasingly allow that research to be pulled into the private sector.
(IS-2014-179) Broadband Technology Opportunities Program Evaluation Study
This report from ASR Analytics reviews the Broadband Technology Opportunities Program (BTOP). “BTOP projects support increased broadband access and adoption, provide broadband training and support through community organizations, and stimulate the demand for broadband.” This study uses Impact Analysis for Planning (IMPLAN), an input-output model that is widely used in the study of economic impacts, to estimate the direct, indirect, and induced impacts of BTOP. “Economic input-output models, like IMPLAN, are the primary tools to measure the total economic impact of a policy or event.”

This report from the National Institute of Building Sciences presents “a view of what the task force sees as the future of the building industry.” Their research was based largely short essays provided by industry experts about “the nature of their role, profession, or industry as it will be in 8-10 years.” They used this to create a “vision of how a construction project may be built in the future”, using the example of a six-story children’s medical care facility built in 2021.

(IS-2014-177) Towards a Wiser Use of Intelligence
The article, published by California Institute for Energy and Environment, University of California, makes a case for using open software architecture (as opposed to proprietary, closed systems) for building management systems. A layered model is introduced (similar to Open Systems Interconnect model, on which the Internet connectivity is based) and its benefits are discussed. Actual examples of implementation in the field (UC Berkeley campus) are described.

(IS-2014-176) Big Data Analytics (Can CSPs handle the complexity?)
The article, by Dan Baker at the Technology Research Institute, describes the use and the inherent value of using “Big Data” analytics for communications service providers business.

(IS-2014-175) Refit Solutions LED Tube Lighting
Options for retrofitting existing LFL light fixtures with replacement LED tubes. Three types of tubes are briefly discussed (existing ballast and integrated driver (direct replacement, Type A); integrated driver, no ballast (Type B, not recommended); and remote (external) driver (Type C).
(IS-2014-174) Dutch Energy Savings Monitor for the Smart Meter
This report from Rijksdienst voor Ondernemend Nederland discusses the savings in households that were given a smart meter and indirect feedback via a bi-monthly energy report. It also discusses the potential savings for alternative direct and indirect feedback interventions for the smart meter and the prospects for market development.

(IS-2014-173) Unlocking Your Business Value: Leveraging Java on Devices
This report from Beecham Research argues the growth of the Internet of Things opens up all types of service driven opportunities, delivering increased efficiencies and better customer value. Business value will come from using the large amounts of resulting data and acting on it quickly to create new services. Java is required to achieve this vision because it provides local device intelligence, portability and flexibility, all within a secure environment.

This paper from the U.S. Energy Information Administration (EIA) models the average values of levelized costs for generating technologies entering service in 2019. The levelized cost of electricity (LCOE) is used as a measure to compare the competitiveness of each of each technology. Technologies include coal, gas, nuclear, geothermal, biomass, wind, solar, and hydro.

(IS-2014-171) Green Quadrant Building Energy Management Software
This report from Verdantix evaluates and compares building energy management software applications from 14 vendors. It uses the Green Quadrant methodology which includes data from live product demonstrations, questionnaires and interviews with customers. It can be used to understand the criteria that is important when selecting a software application and rates each of the vendor's offerings against this criteria. A business should consider its energy-related objectives when determining the importance of each criteria.

(IS-2014-170) Urban Mobility in the Smart City Age
This report, sponsored by Schneider Electric, examines the effect of infrastructure capacity constraints on urban mobility and provides new ideas and solutions that better manage both current and future requirements. Linking the physical infrastructure with a digital platform through application program interfaces enables the urban environment to better meet the mobility needs of businesses and individual users. Examples of smart mobility products and services, including cost benefit analysis, are provided. The report includes overall market opportunities along with a data chain for urban sustainable mobility.
(IS-2014-169) Intelligent Design using Solar Climatic Vision
This extensive analysis, co-authored by Technische Universität Berlin and BHRC Road, Housing and Urban Development Center Tehran, provides a thorough review of the solar impact on architecture and urban design. The report contains numerous diagrams for different cities around the world including sun paths, solar radiation and temperature models. The role of an intelligent design for the building skin is described and analyzed in terms of finding a good relation between outside and inside as well as direct and indirect collection of solar energy on different building surfaces. The optimization of solar surfaces, including size, arrangement, orientation and transparency is discussed. This thorough report provides a solid technical foundation for those interested in this area.

This white paper, sponsored by Siemens, provides an overview of building commissioning and the importance of planning in achieving energy savings. An overview of a five phased approach is provided, and includes options for partial implementation when a fulsome strategy may not have been approved. This white paper provides a good background on commissioning as part of a comprehensive energy strategy.

(IS-2014-167) Energy Efficiency Ratings – Benchmarks that Drive Excellence in Building Design and Operations
This reference paper, sponsored by Building IQ, provides an overview of the energy efficiency ratings used in benchmarking building design and operation. Various rating systems including LEED, Energy Star, NABERS, and Green Star are discussed, along with specific examples of how Building IQ’s services can be used to both benchmark and improve energy efficiency performance. While this paper is specific to Building IQ’s services, it does provide a background with examples on how the management of a building, as it interacts with the power grid, can be monitored intelligently in real time to improve its operational efficiency.

(IS-2014-166) The Digital Tipping Point
This global survey of 850 C-Suite Executives, sponsored by McKinsey & Company, illustrates the increasing recognition of the importance of digital initiatives. One-third of survey participants expect digital to drive 15% of future revenue in the next three years. Customer engagement and digital product innovation are examples cited as strategic opportunities for future growth. Less than 40% of companies have accountability measures in place and only 7% understand the exact value at stake from digital. As indicated in the survey, digital will increasingly play a more important strategic role for organizations.
(IS-2014-165) The Evolution of Communications for Demand Response
This paper, presented by Comverge, describes the evolution of communication platforms for demand response, including paging, AMI, ZigBee Gateway, WI-FI and Cellular. The pros and cons of each platform are discussed, including relative costs, including the likely future direction of the market. A handy comparison table referencing the key functions of each platform and a relative total cost of ownership comparison table are both provided. This paper summarized the overall business considerations for the various communication technologies.

(IS-2014-164) Intelligent Efficiency: Improving Measures and Investment Analysis Framework
This paper demonstrates a method of evaluating investment for 58 building intelligence measures using simple payback and the net present value of each measure. The white paper also applies this methodology to a reference building.

Research findings suggest that residential electricity use feedback can be an effective tool in encouraging conservation. This white paper provides a synthesis of research relating to household electricity consumption feedback, both past and ongoing. This report also proposes an economic framework that can provide a basis for further empirical research.

(IS-2014-162) Work Smarter: 5 Reasons You Need a Lighting Assessment for Your Office Space
GE recommends Professional Assessment to determine the "right" lighting technologies and design for the smart office space. There are 5 justifications to do so: (1) Energy and Cost Savings; (2) Stricter Efficiency Standards; (3) Good lighting makes great impression; (4) Maintenance costs; (5) Continuous efficiency improvements.

(IS-2014-161) IDC Workbook on Investing in an IoT Solution
IDC report offers guideline for analysis of IoT investment strategies: (1) Plan for the number and intensity of initial solution deployment activities; (2) Demand for a connectivity management platform; (3) The investment (fixed and variable) and IT support for the applications and data analytics required to generate value of an IoT deployment. IDC defines IoT as a network that connects devices, or "things," and always includes autonomous provisioning, management, and monitoring. The IoT components include devices (or endpoints) that will be connected, the connectivity, the platforms to manage the endpoints and applications, and the analytics capability required to manage the data and turn it into something meaningful for decision makers to act on or review.
(IS-2014-160) Cool Policies for Cool Cities
This report, provided by the American Council for Energy-Efficient Economy, provides a background on how 26 cities in North America are implementing practices and policies to address the "urban heat island" effect, which can amount to temperature difference of 15 – 20°F. Heat waves and natural disasters are motivating cities to implement heat-mitigation strategies through both voluntary and mandatory practices. Cities are setting UHI-related goals and several of these programs are discussed. References to each municipal program, including costs and benefits, are provided. Two case examples are provided along with a number of recommendations including the establishment of strategies and goals, policy implementation, motivating engagement, and the role of government.

(IS-2014-159) Successful Practices in Combined Gas & Electric Utility Energy Efficiency Programs
This report by the American Council for an Energy-Efficient Economy provides a number of case studies of programs that successfully leverage the benefits of combined natural gas and electric energy efficiency programs for residential, commercial and industrial customers. The report provides four category groupings of institutional arrangements with some unique issues and challenges as well as approaches to overcoming barriers associated with combined programs. In depth profiles of 16 programs, including costs and benefits, across these categories is also provided. The benefits of third party administration, joint program design, consistency of service, and regulatory support contribute to program success and overall customer satisfaction. Dual fuel energy efficiency programs are an important opportunity for additional energy savings.

(IS-2014-158) M2M Communication Platforms
This discussion paper, provided by CH2M HILL and Qualcomm, provides a review of the various machine-to-machine (M2M) communication platform options for intelligent water monitoring systems. The pros and cons of six different wired and wireless platform options are discussed. A brief overview on retrofitting existing assets, integrating multiple technologies with cellular and sensor combinations, and future industry trends is also provided.

(IS-2014-157) Smart Grid Data Communication: Accelerating Results in Spain
This paper, by DNV GL, reviews the Spanish market's Smart Meter roll-out, outlines the involvement that the SG DataCom Lab had with the project, and gives their view on the future of Smart Metering. Spanish utility companies formed the "Spanish Utility Consortium", which was responsible for ensuring that the companies were using the same specifications and communication protocols. As of now, 7 million smart meters have been installed, and clients are eager to upgrade their traditional meters to smart
meters to take advantage of newly possible contract schemes that take into account the hourly market price of
electricity rather than constant pricing schemes. DNV GL was involved with defining the framework for
conformance testing and interoperability testing requirements. The SG DataCom Lab was the lab used for testing
by the Spanish Utilities Consortium and the PRIME Alliance. The lab now consists of six testing stations that
cover the end-to-end testing requirements of the Spanish Smart Meter Project.

(IS-2014-156) Effective Planning for Fire/Life Safety Upgrades
This white paper, published by Siemens, reports the findings of a survey asking questions to a wide variety of
companies on the topic of fire and life safety systems. The survey found that phased modernization was more
common than wholesale upgrading of the systems. The phased approach allowed companies to budget their
money, keep up to date with upgrades and have shorter construction/installation times to allow business
continuity and smaller disruptions to the normal operations of the company. The survey found that finding funding
for upgrades was the hardest challenge for companies. A phased upgrade approach was much more feasible for
most companies because they could budget over many years rather than spend an enormous amount of money
replacing the whole system at once. Guidelines are given for when a facility should choose to use wholesale
replacement, and when they should use the phased approach, along with some planning guidelines. The paper
then outlines some of the problems with aging fire/life safety systems. As they age, the systems may no longer be
up to date with the ever-changing fire and life safety code, the system itself may issue more false or nuisance
alarms, and people may not recognize the alarms or be able to hear the safety voice messages. New systems are
audio engineered so as to reach every possible location in the building with the necessary safety information. The
older systems may require more frequent repairs, and replacement parts may be difficult to come across.

(IS-2014-155) Case Study Report Round 2: Foundation for California Community Colleges
The Foundation for California Community Colleges (FCCC), established in 1998, is a nonprofit organization
providing technology-related access and training in California. The National Telecommunications and Information
Administration awarded FCCC a grant to implement the California Connects Sustainable Broadband Adoption
(SBA) grant. The goal of California Connects is to induce broadband adoption through two sustainable broadband
adoption programs that emphasize acquiring digital literacy skills through the community college system.

(IS-2014-154) Case Study Report Round 2: Florida Agricultural and Mechanical University
The Florida Agricultural and Mechanical University focuses on innovative teaching, research, and public service
programs, enhanced by informational and instructional technology and distance learning. The National
Telecommunications and Information Administration awarded the University a grant to implement the Center for
Public Computing and Workforce Development (CPCWD) project. The goal of this project was to establish a new
PCC and provide workforce training focused on industry certifications, education, and virtual learning services to student and nonstudent populations.

(IS-2014-153) Case Study Report Round 2: Connect Arkansas
Connect Arkansas is a private, nonprofit organization under the umbrella of the Arkansas Capital Corporation Group (ACCG), an affiliation of eight organizations. The Arkansas Capital Corporation, ACCG’s primary entity, specializes in providing financing to Arkansas businesses. Through several initiatives, the principal goal of ACCG is to promote economic growth in Arkansas. They are responsible for the Expanding Broadband Use in Arkansas Through Education (EBAE) project. The goals of the project are to ensure that Arkansas is competitive in the new economy, improve healthcare, and increase the use of technology.

(IS-2014-152) Case Study Report Round 2: Technology For All, Inc.
Technology For All, Inc. (TFA) is a nonprofit organization headquartered in Houston, Texas that uses technology to create opportunities for low-income and other vulnerable populations. TFA worked with its partners to create a service model for PCCs designed to facilitate a user experience to make everyone, particularly those who had not adopted broadband, comfortable with using computers and the Internet. The project focused on providing the technological, organizational, and human resources to support upgrading existing PCCs, build PCCs in new locations, and provide mobile labs.

(IS-2014-151) Case Study Report Round 2: Michigan State University Evidence Based Computer Centers II
This case study is one of fifteen performed by ASR Analytics, LLC (ASR), on a sample of eight PCC and seven Sustainable Broadband Adoption (SBA) grants. It is part of a larger mixed-methods evaluation of the social and economic impacts of the BTOP program. On August 1, 2010, the National Telecommunications and Information Administration (NTIA) awarded MSU a Broadband Technology Opportunities Program (BTOP) Public Computer Center (PCC) grant for $6,056,819 to implement the Evidence Based Computer Center II project. The project established or improved PCCs in colleges, public libraries, public housing developments, tribal community centers, and other community support organizations across the state.

(IS-2014-150) Broadband Technology Opportunities Program Evaluation Study
This case study is one of fifteen performed by ASR Analytics, LLC (ASR) on a sample of eight PCC and seven Sustainable Broadband Adoption (SBA) grants. It is part of a larger mixed-methods evaluation of the social and economic impacts of BTOP. The purpose of this case study is to: identify how the grantee maximized the impact of the BTOP investment; identify successful techniques, tools, materials, and strategies used to implement the
project; identify any best practices, and gather evidence from third parties, such as consumers and anchor institutions, as to the impact of the project in the community

(IS-2014-149) Rooftop Unit Fault Detection and Diagnostics Field Results
This report, which was written for New Buildings Institute and was funded by Sempra Utilities, explains the application of EZENICS’ automated fault detection and diagnostics (AFDD) approach on packaged RTUs. This includes control settings and equipment performance. The report’s secondary objective is to discuss how OG and AFDD analytics provide a foundation for enhanced Demand Management opportunities.

(IS-2014-148) Improving Performance with Integrated Smart Buildings
This white paper, provided by Siemens Building Technologies, provides an overview on how to implement an integrated Building Automated System (BAS). Topics include: what makes a smart building; smart building strategies being used by specific buildings; benefits of integration; how existing buildings are using integration to become smarter; and, challenges to creating smart buildings. This paper provides a good overview of how companies better manage their energy costs utilizing a BAS.

(IS-2014-147) Integrated Building Optimization
This white paper, provided by Siemens Building Technologies, illustrates how an integrated strategy can improve energy management for large commercial buildings. Energy consumption represents 32% of a building’s lifecycle cost, and can be better managed through the convergence of energy procurement, conservation and sustainability initiatives. Demand for Building Energy Management Systems is projected to grow 15.3% annually. A five phased conservation and sustainability model is proposed. Supported by data analytics, energy savings of 20% - 30% have been achieved with two year paybacks. A typical business scenario is reviewed, along with a discussion on how this scenario can be modified to support a more holistic approach.

(IS-2014-146) The Consumer Study: From Marketing to Mattering
This consumer marketing study, prepared by Accenture, surveyed 30,000 consumers from 20 countries to better understand their views on sustainability. CEOs in general see sustainability as critical to the success of their business, although many are frustrated with the lack of a quantifiable return for their efforts. Consumers expect more from companies in this area. This study points to a number of major issues hampering the credibility that sustainable, responsible practices should offer to forward-thinking companies. Three fundamental imperatives are provided that will help businesses leverage sustainability to create market performance advantages.
(IS-2014-145) Enterprise Plug-n-Play Diagnostics and Optimization for Smart Buildings
The report provides information on low-cost, non-invasive, plug-n-play diagnostics and optimization technologies for energy efficient HVAC that could be adopted immediately. The approach leverages cloud computing, automated continuous remote monitoring system, and innovative concept from automobile industry using “virtual sensors” to compensate for lack of onsite physical sensors.

(IS-2014-144) The Promise and Potential of Comprehensive Commercial Building Retrofit Programs
This is a report on the overall building system energy efficiency retrofit and operation focusing on the interaction of interrelated system i.e. lighting, HVAC, Control, etc. where changes in one system often affect the energy use in the others. The report identified key success factor parameters for the comprehensive and effective whole building energy efficiency sustainable program.

(IS-2014-143) The Business Case for Green Building
This thorough report, prepared for the World Green Building Council, reviews the costs and benefits for developers, investors and occupants. Using peer-reviewed evidence as the standard for analysis, the study’s findings represent a summation of the most recent and relevant research. The following six areas were reviewed: design and construction costs; asset value; operating costs; workplace productivity; risk mitigation; and, scaling up from green buildings to green cities. Case studies and examples are provided, illustrating the economic value for green building.

(IS-2014-142) Under cloud cover: How leaders are accelerating competitive differentiation
This report by the IBM Center for Applied Insights gives an overview of their findings on how organizations are using cloud computing. They found that pacesetters (who have already deployed cloud on a large scale and are gaining competitive advantage over their rivals through cloud) are earning, on average, higher revenue and gross profit than their competition. With the improved market responsiveness of cloud, these pacesetters are able to rapidly respond to changes in markets and customer needs, and expand into new markets. There are descriptions of how large companies such as Target, TP Vision and Colleagues in Care, are using cloud technologies to improve their business strategies.

This white paper focuses on three main areas in regards to the utility industry: the future of electricity sales and viable sales models, the range of options proposed by others on the future role of utilities and how these options affect energy efficiency.
(IS-2014-140) Work Smarter: Five Reasons You Need a Lighting Assessment for Your Office Space
This white paper focuses on the importance of a professional lighting assessment, which can examine an office’s current system and identify other lighting technologies that are smarter. The five main reasons for a lighting assessment are highlighted and explained.

(IS-2014-139) Toward Zero Net Energy (ZNE) Super High-Rise Commercial Buildings
This CABA White Paper examines the driving force for zero net energy buildings, along with examining various definitions and technologies. The paper then presents a concept for a feasible net-zero solution applied to a building cluster consisting of an office building and homes.

This report examines a Dell Software commissioned CERR global survey of midmarket executives. Focused exclusively on midmarket organizations, the survey indicates that big data projects have made a significant shift from their enterprise roots, and have become a critical decision-making factor for midmarket companies across the globe. Survey findings also show midmarket organizations today overwhelmingly believe in the potential of big data projects to help them solve tangible business problems, and they are backing up that belief with action.

(IS-2014-137) EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks
The EU has found that broadband deployment will provide socio-economic benefits, and they have made it a priority. This report from the Journal of the European Union provides guidelines for the application of state aid rules in relation to the rapid deployment of broadband networks.

(IS-2014-136) Designing and Using a Tape-as-NAS Data Archive
This report from HP describes a reference architecture for a scalable long-term data storage environment they call Tape as NAS, centered on the QStar Archive Manager and the HP StoreEver tape libraries with LTO tape technology. This architecture provides the availability and accessibility of NAS, but with the low operating cost and long retention times that are characteristic of tape systems. The paper then steps through some choices the designer can make to optimize for different workflows, scales, and redundancy requirements. Several advanced configuration topics are included. The paper concludes with an example of the components required to build out a Tape as NAS environment at three different scales. This paper is intended as a guide for IT architects and managers who want to deploy an archival system with the cost and reliability benefits of tape while the production workflows and applications retain access to the data via file system interfaces.
(IS-2014-135) Net Zero and Living Building Challenge Financial Study
The purpose of this report is to first investigate costs, benefits and approaches necessary to improve building performance in the district of Columbia from LEED Platinum to zero energy, zero water and living building status; secondly, to advise district government on policy drivers related to deep green buildings and to analyze the opportunities for the district to offer incentives to advance most rapidly toward zero energy, zero water and living buildings.

(IS-2014-134) Ruston Optimizes Smart Grid by Integrating AMI, MDMS, PrePay and Distribution Automation
This case study from the city of Ruston, Louisiana examines the city’s smart grid program. In 2009, the City of Ruston was awarded a Smart Grid Investment Grant (SGIG), which greatly supported the funding requirements of Ruston’s Smart Grid program. The goal of the Program was to move the City towards full interoperability between its various electric systems through improvements to metering, customer systems, and distribution components.

(IS-2014-133) Assessing the Use and Value of Energy Monitors in Great Britain
This report from vaasaETT investigates research that may tells us about the value of IHDs, their role within the context of alternative consumption feedback channels, the key drivers of successful use of IHDs, and where they might lead in the near future. Ultimately, this report looks to answer whether the benefits for consumers will outweigh the costs and help consumers save energy and money.

(IS-2014-132) Drilling for Innovation: Funding Clean Energy R&D with Oil and Gas Revenue
This report from ITIF examines the current issue of funding clean energy research in the US. ITIF claims the US needs to put money into research and development for clean energy in order to lower the cost; however, federal investments in clean energy innovation have remained stagnant since the Stimulus expired. ITIF proposes “Congress can reconcile these challenges by generating new revenue from oil and gas drilling by opening new lands in exchange for raising drilling fees on federal leases.”

(IS-2014-131) Change is in the Air: How States Can Harness Energy Efficiency to Strengthen the Economy and Reduce Pollution
This report from the American Council for an Energy-Efficient Economy establishes that Energy Efficiency does work but States must coordinate building as well as consumer product codes that adapt to modernization of both the demand and supply side. On the demand side, the paper is based solely on new constructions however it lacks detail regarding replacement of older, non-efficient electric equipment such as home appliances, and older homes; it assumes that efficiency is synonymous with mortgages for new constructions. On the supply side, it
hangs on to the Laissez-Faire ideal in the short term for the States that have yet to develop Energy-efficiency based building and product codes. This would give States time to modernize. There are barely any mentions of Renewable Energy sources. It focuses solely on existing infrastructure.

(IS-2014-130) The Path to Disruption – Innovative Technologies and the Electrical Distribution Industry
This report looks at several technologies and how they may play a significant role now and in the future. Based on a 2013 National Association of Electrical Distributors member survey, the following areas were review: customized lighting, energy storage, electric vehicles, gesture controlled devices, additive manufacturing, low cost advanced robotics and autonomous vehicles. Each section provides projected economic impact, key applications and opportunities & challenges. This brief overview is designed to generate discussion about the market and business impact of these technologies.

This report, compiled by the ACEEE, analyzes the world’s 16 largest economies and rates the cost effectiveness of the respective energy efficiency for each. Policy and performance metrics were used to how efficiently these economies used energy. Policy metrics include a variety of efficiency standards and energy savings targets, while performance metrics are a measure of energy use and provide quantifiable results. Covering buildings, industry, transportation and national efforts, ranked results place Germany on top, China 4th, Canada 9th and the United States 13th. There is room for improvement within the four sectors for all countries. This report provides an interesting analysis of energy efficiency as an opportunity to improve economic competitiveness.

(IS-2014-128) Cloud Services Level Agreement Standardization Guidelines Provider: Cloud Select Industry Group
The Cloud Services Level Agreement: Standardization Guidelines provide an ideal reference to working best practices for the cloud service market. Topics of discussion include: Defining Principles for a Cloud Computing Standard; Establishing Terminology defining a Cloud Service Level Agreement; An Overview of Service Level Objectives; Defining the Security Services Providers Objectives and Responsibilities; Data management; and Data Security Service Level Objectives. This whitepaper investigates standardization models more applicable to the regional and/or national level rather than the international level.
(IS-2014-127) Application Intelligence & Connected Devices: Harnessing The Value
This white paper focuses on identifying the results of a research study on the Internet of Things (IoT) and use of machine-to-machine (M2M) technology. The study identifies new trends in the market for connected devices, with a particular focus on application intelligence. This white paper also discusses the coming changes and impact of these changes in this market.

(IS-2014-126) Addressing Security Concerns for Connected Devices in the Internet of Things Era
This white paper focuses on analyzing the results of a research study on the Internet of Things (IoT) and machine-to-machine (M2M) market. The study identifies security concerns and methods for the IoT era. It also outlines the best practices in securing devices, data and identity and outlines the impact and cost for device manufacturers.

(IS-2014-125) Continuous Efficiency Improvement
Consortium for Building Energy Innovation (CBEI) Research Digest on the topic of "Continuous Efficiency Improvement". Commercial building energy efficiency performance tends to decrease as the building component aged and use over the time. CBEI's revitalization process is based on Continuous Efficiency Improvement (CEI) cycle; it extends the building's lifecycle and be more energy efficient over time.

(IS-2014-124) Intelligent Buildings & Enterprise
Navitas Venture Capital's paper explores the trend in Intelligent Buildings & Enterprise, opportunities, challenges and key market drivers; it presents readers with insights into common characteristics of best-in-class startup.

(IS-2014-123) The power of cloud, Driving business model innovation
This executive report by the IBM Institute for Business Value is an overview cloud technology and of the three ways businesses use cloud to impact company and industry value chains, and customer value propositions. Businesses can use cloud for optimizing, innovating and disrupting. The optimizers make incremental improvements and increase efficiency by using cloud. The innovators use cloud to improve customer value, leading to new revenue streams or to change in their role within the industry. Disruptors use cloud to create new value propositions, including creating new customer needs and wants. Recommendations of how to best reap the potential rewards of the cloud-enabled business model are made: share the responsibility for cloud strategy governance; seek internal and external ways to maximize the value of cloud adoption; and decide to be an optimizer, innovator, or disruptor.
(IS-2014-122) Understanding the Impact and Value of Enterprise Asset Management
This paper from IBM discusses the importance of enterprise asset management for asset intensive industries. It focuses on physical, technical, and human assets for multiple industries and highlights the benefits of IBM’s offering Maximo and how it can address the enterprise asset management needs of a large company.

(IS-2014-121) Customer Experience Index
This survey from Forrester ranks customers’ experiences for 175 large US brands across 14 industries. Benchmarks are provided along with high/low scores as well as a relative ranking. In general, companies and industries showed a strong pattern of upward movement. The overall number of “poor” and “very poor” brands declined dramatically versus the 2013 survey. While the survey does not include the energy industry, the report is interesting for organizations wishing to understand the methodology for brand benchmarking and setting goals for optimizing customer experience.

(IS-2014-120) Energy Efficiency Resource Standards
This comprehensive report from the American Council for an Energy-Efficient Economy reviews programs for Energy Efficiency Resource Standards that are in 26 U.S. states. These programs set goals for annual or cumulative energy savings (ranging from about 1% to nearly 30% per annum by 2020). The effectiveness and limitations of these programs are surveyed and discussed. The focus is on electricity, but some gas programs are included. States with EERS polices are generally on track to meet or exceed long-term savings targets. If these states continue to meet targets, combined annual electricity savings will be equivalent to 6.2% of overall U.S. electricity sales in 2020. Case studies are included.

The State of Competition in Canada’s Telecommunication Industry critically accesses the current policies enacted to enhance competition within the Telecoms. This whitepaper clearly challenges the current regulatory systems set out by government and the CRCT to mandate competitive actively in the Telecommunications Industry. Not only are these mandates deemed uncompetitive, they also are harmful to profitability and enhancing innovative technology. Chapter 1 investigates the actual performance of telecoms in Canada, and the soundness of rhetoric disseminated from the political arena. Chapter 2 evaluates the failed policies enacted by government to promote competition. Emphasis is placed on the spectrum auctions and tower sharing agreements. Chapter 3 focuses exclusively on the failures of mandatory network sharing. Case examples include US and European models in comparison to the Canada’s current regulatory framework. Chapter 4 discusses alternatives to the status quo by recommending policies that liberalize the telecommunication industry. Recommendations include removal of all
restrictions on foreign investment, devising a spectrum transfer policy, the incorporation of technology through a dynamic model, and adopting a “light touch” regulatory system.

(IS-2014-118) The Logic Chain to an Effective Global Clean Energy Policy
This report presents a logic chain of nine steps for addressing global climate change through innovation. It works through a step-by-step series of assumptions that link the globally serious climate challenge with the need for an aggressive clean energy innovation policy strategy.

(IS-2014-117) Guide to Green Colleges
This guide from the Center for Green Schools examines 332 colleges and universities that have demonstrated a notable commitment to sustainability. In this report they take both a quantitative and qualitative look at a school’s sustainability efforts in areas we’ve identified as most important to students: 1) whether students have a campus quality of life that is both healthy and sustainable; 2) how well a school is preparing students for employment in the green economy; and 3) how environmentally responsible a school’s policies are. They invited 2,000 schools to take our survey in order to come up with the 332 profiled here.

(IS-2014-116) Clean Energy Trends 2013
This report from CleanEnergy examines trends in the clean energy industry from 2013. They claim that 2012 was a difficult year for clean energy and that 2013 has continued many of the same themes. In the U.S., conservative organizations and politicians continue to attack pro-clean energy policies at both the state and federal level. In Europe, ongoing economic struggles continue to slow demand for a host of clean technologies. Even in China, where economic growth and clean-tech commitments seem to carry on unimpeded, the country’s overleveraged solar manufacturers are being forced to crawl back to the government for even larger safety nets.

(IS-2014-115) 2013 U.S. CLEAN TECH LEADERSHIP INDEX
This U.S. Clean Tech leadership index report contains findings from the 2013 editions of Clean Edge’s State and Metro Indexes, which track activity in the U.S. based on a diverse set of underlying industry indicators at state and metro levels. The objective of the Leadership Index is to serve as a tool for regional comparative research, a source for aggregated industry data, and a jumping-off point for deep, data-driven analysis of the U.S. clean-energy market.
(IS-2014-114) U.S. Homeowners on Clean Energy: A National Survey
SolarCity and Clean Edge commissioned a survey of U.S. homeowners by polling firm Zogby Analytics. This study focused on U.S. homeowners and their choices and attitudes towards a wide range of clean-energy technologies. Respondents were randomly selected to answer questions about renewables, energy efficiency, clean transportation, energy storage, and other related topics. The purpose of the survey was to learn what homeowners know and think about clean-energy products and services, electric utilities, third-party energy service providers, and consumer choice.

(IS-2014-113) Clean Energy Trends 2014
This report from CleanEnergy examines the trends in clean energy for 2014. They claim that as the clean energy industry continues to mature and makes its presence felt among fossil-fuel energy sources, it faces a host of new challenges and opportunities. Among these are a transition away from early-stage venture capital investments to corporate and later-stage project financing sources; the shift away from nuclear power in Germany, Japan, California, and elsewhere; and pushback from some utilities and regulators who perceive distributed generation as a significant threat to long-established business models.

(IS-2014-112) KEUS electricity sales report March 2014
This report from CoBank Knowledge Exchange examines the current trends in US electricity sales. They claim that U.S. total electricity demand has “decoupled” from the pace of overall economic activity. Empirical data suggest that the growth in electricity sales began to decouple at least partially from real GDP growth after 2010. This represents a significant departure from historic norms, where real GDP and electricity sales seemed to expand and contract almost in lockstep. They believe that “Electric utilities will probably see more change over the next 10 years than they did over the previous 100 years.”

(IS-2014-111) Electric Utility Efficiency Programs Increase Spending, Save
This news release establishes that the sector is working towards meeting energy efficiency. The study which is mentioned in the news release is also very indicative of the industry’s efforts and shows substantial growth and adaptation in the US market in meeting targets on both supply and demand sides.

(IS-2014-110) How the EEB Hub is Engineering Smarter Buildings
The EEB Hub reports on the Intelligent buildings providing optimal controls and automated diagnostic systems to enable energy savings, reliable system performances, and improved occupant comfort.
(IS-2014-109) Improving Indoor Quality Can Save Energy
Carnegie Mellon's CBPD and US-GSA are collaborating on the WorkPlace 20-20 project to investigate the relationship of physical environment and building attributes to occupant performance and organization effectiveness. The report on 3-Pronged approach includes: (1) National Environmental Assessment Toolkit (NEAT) measurement on key Indoor Environmental Quality: Thermal, Air, Visual, and Acoustic; (2) Occupant surveys; and (3) Building system observation.

(IS-2014-108) How OBIX is Expanding into Residential & Internet of Things Applications
The whitepaper provides a historical context for OBIX (Open Building Information Exchange) and then focuses on its latest standards developments, particularly as it relates to Smart Home and Internet of Things applications.

(IS-2014-107) Multiscreen Video - The New Imperative
Today, a large percentage of consumers conduct a variety of activities on multiple devices while watching linear and on-demand TV programs. This whitepaper discusses new trends and strategies relating to Multiscreen Video Experiences.

(IS-2014-106) Energy-Efficient Lighting Explained
This report from RealEnergyWriters.com and The Daily Energy Report is intended to help commercial enterprises understand their lighting options, including the benefits, costs and savings offered through the installation of high-efficiency lighting. They describe the big-picture landscape and today’s political controversies surrounding light bulbs, so that companies can understand the excitement swirling around lighting. They also describe the various kinds of lighting and lighting controls and their pluses and minuses. In addition, they provide audio interviews with leaders in the field about energy efficient lighting and how to best take advantage of the different options. And finally, they feature some of the valuable government incentives now available that can help reduce the cost of a lighting project.

This report summary highlights key findings and recommendations from the co-chairs of the Bipartisan Policy Center’s (BPC) Electric Grid Cyber-security Initiative. It covers four topic areas: standards and best practices, information sharing, response to a cyber-attack and paying for cyber-security.
(IS-2014-104) D1.1 Annex : Energy and Technical Characterization, Operational Scenarios of European Airports as Open Spaces
This report from Cascade explains an online survey for airport energy management teams that was conducted between March, 1st and May, 21st 2012. The survey consisted of 35 multiple choice questions and blank text boxes where additional information could be captured. Airports energy managers were asked to respond and enter data on their energy supply structures and consumptions, operational procedures, ICT systems for energy and building managements, certification strategies and energy efficiency planning. The survey addressed energy issues for buildings and external areas and did not consider energy questions for air- and landside transportation. Over 40 European airports were invited to take part to the survey. 14 airports, including six major European airports with over 10 Mio passengers yearly, answered the survey.

(IS-2014-103) Framework for Improving Critical Infrastructure Cybersecurity
On February 2, 2013, the President issued Executive Order 13636, Improving Critical Infrastructure Cybersecurity, which established that it is the Policy of the United States to enhance the security and resilience of the Nation’s critical infrastructure and to maintain a cyber environment that encourages efficiency, innovation, and economic prosperity while promoting safety, security, business confidentiality, privacy, and civil liberties. The resulting Framework, created through collaboration between government and the private sector, uses a common language to address and manage cyber-security risk in a cost-effective way based on business needs without placing additional regulatory requirements on businesses. The Framework focuses on using business drivers to guide cyber-security activities and considering cyber-security risks as part of the organization’s risk management processes.

(IS-2014-102) All Clouds are Not Created Equal: A Logical Approach to Cloud Adoption in Your Company
Frost & Sullivan's executive briefing paper discusses various "cloud" models (ie. IaaS, PaaS, SaaS, etc), assess their suitability to solve IT challenges, and provide recommendations on what to look for in a cloud service provider.

(IS-2014-101) Total Economic Impact of Managed Mobility for BYOD
This is a Forrester Consulting research report on the framework to evaluate the potential financial impact of mobile enterprise services for a BYOD (Bring Your Own Device) program. Forrester's methodology is based on four fundamental elements: (1) Costs, (2) Benefits to entire organization, (3) Flexibility, and (4) Risk.
(IS-2014-100) Engaging Small to Mid-Size Lenders in the Market for Energy Efficiency Investment: Lessons Learned From the ACEEE Small Lender Energy Efficient Convening (SLEEC)
This white paper captures key findings from the ACEEE Small Lender Energy Efficient Convening and places them within the context of current research and experience. It goes on to make recommendations to entities within the energy efficiency community to help increase small to mid-size lender activity in the market for energy efficiency financing.

(IS-2014-99) New IT Energy Efficiency Incentives: Opportunities Hiding in Plain Sight
This white paper is a collection of articles exposing the issue of IT “scotoma” or blind spots. These articles discuss the ways energy is being wasted and how energy incentives are being overlooked in the IT industry.

(IS-2014-98) The Convergence of IT Security and Physical Access Control
This white paper looks at the challenges, deployment options and results associated with a converged IT and physical access control system. It also describes the value of a seamless user experience when using cloud-based applications and services.

(IS-2014-97) Integrated Lighting Controls
This white paper from Siemens explains the benefits of integrated lighting control with other building management systems. Lighting systems have been self-contained closed systems. By interconnecting lighting with other building automation system, building performance and energy efficiency can be increased. This paper notes some of the practical issues of gathering data from an increased number of points, such as using a common naming method, the same command set, and compatible communication protocols. Integrated lighting can be programmed to adjust to time-of-use electric rates through the control of dimming levels. An integrated lighting system can participate in demand response and can impact the heat load on the building air-conditioning system.

(IS-2014-96) Select the right solution for environmental and energy management
IBM paper addresses environmental and energy management tactics for organization to implement today and continuous improvements. IBM suggests solution in 5 key areas: (1) Energy data capture and analysis; (2) Facilities operation and maintenance; (3) Portfolio and project management; (4) Facilities space management; and (5) Management system architecture. The technology roadmap that provides greater instrumentation at all levels to help identify which facilities to target, and one that delivers the critical capabilities successfully used to achieve environmental and energy reduction goals while helping to effectively manage facilities operations, maintenance and capital projects.
(IS-2014-95) Connect your life: Wi-Fi and the Internet of Everything
The economic potential of the Internet of Everything (IoE) is boundless, presenting a vast range of opportunities across virtually all sectors of the economy. Wi-Fi Alliance promote Wi-Fi as the preferred communication enabler for IoE. This paper reviews consumer market data about readiness to adopt IoE devices and applications; the next generations Wi-Fi technology to address advanced usages and help unlock the full potential of the IoE.

(IS-2014-94) Essential Elements of Data Center Facility Operations
This is a Schneider Electric's Data Center Science Center whitepaper. The paper describes unique management principles and provides a comprehensive, high-level overview of the necessary program elements for operating a mission critical facility efficiently and reliably throughout its life-cycle. It is a balanced critical facility management program and mindset with twelve essential program elements, while providing practical tips and advice throughout.

(IS-2014-93) The Changing Face of Smart Buildings - The Op-Ex Advantage
The case study is written by Jones Lang LaSalle (JLL), a financial and professional services firm specializing in commercial real estate services and investment management - A Smart building management system implementation at Corporate Middle-East headquarters with the investment payback less than 2 years. The technology advances coupled with reduction in ICT devices cost enable sustainable op-ex savings while improving the quality of the workspace for the occupiers. The system leverages cloud computing, secure VPN, real-time central monitoring & alerts, convergence of building & IT system, M2M interaction, energy management, combining data analytics with intelligent facility management.

(IS-2014-92) ICT for Energy Efficient Airports - Systematic approach for developing measurement-based facility specific operational guidelines
This report by SENSUS MI contains CASCADE consortium framework of Fault Detection and Diagnosis (FDD); it provides best practice Operation & Maintenance guidelines based on pilot projects at the Italia's Milano Malpensa and Roma Fiumicino Airport. A Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of Building Automation/Management System (BAS/BMS) are presented to assess BAS capability to be integrated in the CASCADE solution. Then, the minimal data sets of common building energy systems are defined to validate FDD approach, Performance Indicators calculation and results of the measurements for both airports are presented.
This is a joint publication by District of Columbia (DC) Department of Environment and Green Building Advisory Council. The 2012 annual report summarizes green building efforts including Green Construction Code development and Green Building Fund grant program. DC has some unique land and building characteristics that provide challenges as well as opportunities due to large number of historically-protected public space, federal land ownership and predominantly federal government and foreign government high profile tenants. The District continues to lead the nation with the highest LEED certified projects on per capita basis for any large cities in N. America.

(IS-2014-90) The Executive Guide to Unlocking the Full Value of Your Meter Data
This book by Elster is composed of 8 different chapters that cover the new issues faced by the utilities industry today. Together, the chapters aim to guide and inform on the topic of the smart grid. The different chapters explore the ideas of: leveraging meter data for better business practice, choosing the right smart meter, the future of advanced metering infrastructure, 3D interoperability of the smart grid infrastructure, security of the smart grid, changing and revolutionizing data analytics to unlock its full value, managed services to reduce risk of smart grid investment, and finally, envisioning the future of the smart grid.

(IS-2014-89) NIST Roadmap for Improving Critical Infrastructure Cybersecurity
The National Institute of Standards and Technology has put together a Roadmap for Improving Critical Infrastructure Cybersecurity. This paper is a companion to their previous paper titled ‘The Framework for Improving Critical Infrastructure Cybersecurity’. It discusses the ways in which owners of critical infrastructure can best protect information and assets from cyber attacks. The Framework is continually evolving and changing to keep up with the best current practices. Some high-priority areas for development, alignment and collaboration are outlined. Development of authentication mechanisms is the first high-priority area discussed. Next, automated indicator sharing needs to be standardized between communities and organizations in order to effectively make use of shared data and the indicators. Leveraging of conformity assessment is discussed. The lack of skilled cybersecurity workers will continue to be an issue and the NIST has recommendations of what can be done in the future to expand the workforce. Challenges that must be overcome in order for data analytics to unlock their full potential are outlined and some solutions proposed. The proposed framework should comply with the already existing Federal Agency Cybersecurity programs. NIST will continue to work on an international scale to ensure efficient global operations by communicating with the international community about the cybersecurity Framework. Supply chain risk management is outlined and discussed. Finally, technical privacy standards are discussed.
(IS-2014-88) Magic Quadrant for Advanced Analytics
This report by Gartner presents an evaluation of 16 leading providers of advanced analytics platforms that can be used to build solutions, including advanced data analytics solutions for intelligent buildings and smart homes. Each provider is evaluated with its strengths and weaknesses (cautions).

(IS-2014-87) CASCADE Methodology for Energy Efficient Airports
This is one of several reports resulted from an European Seventh Framework project titled ICT for Energy Efficient Airports (with CASCADE as its project acronym) (http://www.cascade-eu.org/). The report describes the development of the CASCADE methodology which focuses on the integration of advanced data driven Fault Detection and Diagnosis (FDD) tools for ISO 50001 standard compliant energy management systems / subsystems. The proposed methodology and related framework are developed specifically for airport facilities, but can also be applied to other similar facilities and buildings.

(IS-2014-86) The Ultimate Guide to AMI: Best practices, lessons learned and future directions in electric power
This eBook from Smart Grid News contains a collection of advanced metering infrastructure (AMI) best practices written by leading industry professionals on this topic. The articles outline important issues like what questions to ask before you buy a smart meter, how to get the most value from your meter and the future of AMI communications.

This report provides an introduction to smart metering and its benefit to consumers. It also gives an overview of the steps that the Government and the energy industry are taking to prepare for the roll-out of smart meters in 2015. This report reflects the significant developments in the smart metering programme since December 2012.

(IS-2014-84) Building Sustainability through Building Automation
High level review of benefits of implementing building automation for building sustainability. Four categories are discussed: Higher energy efficiency, Lower operating and maintenance costs, Better indoor air quality and Greater occupant comfort and productivity.

(IS-2014-83) Data Centre projects: Project Management
Overview of methodology for managing Data centre upgrade or construction projects.
(IS-2014-82) Converging the optical core to IP
Building a common network infrastructure that's constructed with a mix of Ethernet, IP/MPLS, and DWDM may be an ultimate goal for traditional and competitive service providers, but the reality is that there are various ways to get there. At the heart of this concept is the emergence of the Packet Optical Transport System (P-OTS). While definitions vary, P-OTS is a transport solution that supports a mix of DWDM, SONET/ SDH, Optical Transport Network (OTN), and Ethernet switching capabilities. Various aspect of converging multiple transport protocols on a single optical network are discussed, including technical issues and ways to address them.

(IS-2014-81) Smart Grid & Renewables: a guide for effective deployment
This report is intended as a pragmatic user’s guide on how to make optimal use of smart grid technologies for the integration of renewables into the grid. It outlines the systemic approach that is required to address both the technical and non-technical issues associated with the implementation of smart grids for renewables. The report also provides a detailed review of smart grid technologies for renewables, including their costs, technical status, applicability and market maturity for various uses. This overview shows that a range of enhanced smart grid technologies is already available to improve grid performance and enable higher penetration levels of renewable energy. Furthermore, the use of smart grids is cost effective when installing new grids or upgrading old ones. Examples of cost-effective smart grid technologies include "smart meters", which can measure and track the output of a rooftop photovoltaic (PV) system and send that data back to the utility operating the grid, and "smart transformers" that will automatically notify.

(IS-2014-80) PV in MENA: Turning Policy into Projects
This guide examines desalination, financing, module performance and the latest policy updates in PV in MENA. It has been produced in conjunction with MENASOL, the 6th Annual Middle East and North Africa Solar Conference and Exhibition, taking place on 6-7 May in Dubai, 2014 where developers and solar companies will find out how to create an unbeatable proposal based on the winning combination of market insight and robust desert plant design.

This latest report examines how the military is leveraging private-sector expertise and resources at home to deploy clean and efficient energy in service of economic, environmental, and national security interests. The report’s research is derived from publicly available information, close collaboration with DOD officials and experts, site visits to installations across the United States, and a partnership with Navigant Research, a leading market research firm that analyzes global clean energy technology markets. The research in this report details how
defense leaders have initiated wide-ranging steps to harness advanced technologies to conserve energy, enable on-site production from renewable sources, and save taxpayers millions of dollars at these DOD facilities in the United States.

(IS-2014-78) Administration of the Smart Grid, Smart City Program
This report examines the $100 million Smart Grid, Smart City demonstration program, which was established to implement or trial a range of new technologies in a challenging environment. These challenges included technological issues, consumer resistance to smart metering technologies, regulatory reform in the electricity sector, and responsibility for the program being transferred across four departments between 2009 and 2013. While a number of staff transferred with the program, changes in administrative responsibility occurred at key stages of the program’s implementation (such as the approval of the successful grant applicant) and resulted in changed oversight arrangements and administrative policies and procedures. The changes also made it more difficult to manage program knowledge, including the creation and retention of program records.

(IS-2014-77) The Business Value of BIM for Construction in Major Global Markets
This report analyzes new survey data collected exclusively from construction companies that use BIM in nine of the world’s top construction markets to improve productivity, efficiency, quality, safety and their own competitiveness. This study builds upon McGraw Hill Construction’s investigation of BIM in individual markets, including North America, Europe and South Korea, to demonstrate larger trends globally through data from contractors in 10 countries: Australia, Brazil, Canada, France, Germany, Japan, New Zealand, South Korea, the UK and the US.

(IS-2014-76) The State of Green Building: Results from the 2014 Green Home Builders and Remodelers Survey
This report provides the results from the 2014 Green Home Builders and Remodeler Survey. The survey was first conducted in 2006 with NAHB and repeated in 2008, 2012 and 2014. It consisted of 117 Builder and Remodeler Respondents: 52 builders only working on new projects, 38 remodelers, 27 doing both new and remodeling work. It found that while currently at 23%, the green share of new single-family home construction is expected to continue to grow. Number of remodeling firms doing largely green work is expected to double in the next 5 years. Green is becoming more embedded into codes and regulations, driving green growth.
McGraw Hill Construction Green Residential Market Sizing and Key Findings From New Market Research Study on the State of Green Homes

The findings on the green homes and remodeling marketplace, as well as other results from this national survey of U.S. home builders and remodelers, will be published in Spring 2014 by McGrawHill Construction in partnership with the National Association of Home Builders (NAHB). This will be the fourth SmartMarket Report in the series, starting in 2006, that focuses on the green home building market. The report will also include additional data being gathered by McGraw Hill Construction on multifamily builders for insights on green building in the entire housing marketplace. This was an online study conducted from December 2013 through January 2014. It had a total of 117 respondents of which 52 were exclusively new single family home builders, 38 were only home remodelers and 27 were both building new homes and doing home remodeling projects. This level of response represents a 95% confidence interval with a margin of error of +/- 9%. This use of a sample to represent a true population is based on the firm foundations of statistics.

New and Retrofit Green Schools

Since McGraw-Hill Construction’s Education Green Building SmartMarket Report was published in 2007, schools have been demonstrably on the vanguard of green building. The green school market is thriving because both the K–12 and higher education sector report seeing strong financial benefits combined with positive impacts on student health and well being. The research results demonstrate that schools are making significant green investments and that most expect strong benefits in return. However, a significant percentage is also unsure about the benefits they are accruing, presenting an opportunity for increasing the market with better, more consistent tools for measuring.

Business Benefits Driving New and Retrofit Market Opportunities in Over 60 Countries

This study assesses the attitude and trends in green building expanding on McGraw-Hill Construction’s 2008 Global Green Building SmartMarket Report study. For this study, green building is defined as a construction project that is either certified under any recognized global green rating system or built to qualify for certification. The average share of green work reported in 2012 by respondents is 38%.

The Impact of School Buildings on Student Health and Performance: A Call for Research

This brief not only discusses the influence a school facility can have on student occupants, but also closes with the important role stakeholders need to take to advance, identify and require research into the connection between school buildings and student health and learning. From translating research into actionable advice to engaging students in research projects, they can mobilize advocates to speed up the research process and the dissemination of research findings. They can get feedback to practitioners and school leaders who need it and
increase funding for the improvement of school buildings. At the end of the document is a set of resources to help readers learn more and increase involvement with the work outlined in this brief. These resources provide more in-depth information about ongoing research efforts and identify some organizations to work with when conducting research or discussing work in this area.

(IS-2014-71) Disruptive technologies: Advances that will transform life, business, and the global economy
In this report, the McKinsey Global Institute (MGI) assesses the potential reach and scope, as well as the potential economic impact and disruption, of major rapidly advancing technology areas. Through extensive research, they sort through the noise to identify 12 technology areas with the potential for massive impact on how people live and work, and on industries and economies. They also attempt to quantify the potential economic impact of each technology across a set of promising applications in 2025.

Pacific Controls, a Dubai-based software company, recently installed a smart building management system in Cisco’s Middle East headquarters. The system manages the building from remote servers, using software that constantly generates algorithms that indicate if building temperature, cooling and energy use are straying from benchmarks. The database is in Amsterdam and the proxy server is in Bahrain. This global system delivers speed and security, but, for many observers, its most important feature is its investment payback—which was realized in less than two years. Smart building technology, while requiring some capital expenditure (cap-ex), is helping to reduce operational expenditures (op-ex) on the other side of the ledger. The resulting savings, according to two major corporate energy management studies done last year by The Economist Intelligence Unit (EIU) and Deloitte, have become increasingly essential to remaining financially competitive in the global marketplace.

(IS-2014-69) The Integrated Grid
This paper is the first phase in a larger Electric Power Research Institute (EPRI) project aimed at charting the transformation to the Integrated Grid. Also under consideration will be new business practices based on technologies, systems, and the potential for customers to become more active participants in the power system. Such information can support prudent, cost-effective investment in grid modernization, and the integration of DER to enable energy efficiency, more responsive demand, and the management of variable generation such as wind and solar.
Accenture Technology Vision 2014
This year’s report from Accenture represents the latest iteration of Accenture’s Technology Vision, which declares, “every business is a digital business.” In last year’s report, they laid out the imperative for every business to reimagine itself in this digital world, and they charted the increasing appetite of leading enterprises for exploring the opportunities that emerging technologies provide. This year’s Technology Vision report highlights six emerging themes that reflect the shifts being seen now among the digital power brokers of tomorrow: large enterprises such as Tesco, GE, and Disney that recognize, as they leverage their scale to redefine digital in their industries, that big is the next big thing. Collectively, these themes represent the newest expression of Accenture’s stance that “every business is a digital business.”

What Happens When we Un-Plug? Exploring the consumer and market implications of viable, off-grid energy supply
The research paper highlights that the National Energy Market is in a state of profound transition, from a centrally planned and controlled market, to one where local generation, storage and local control of power is commonplace. How far this transition goes, and how quickly, are the only questions, which remain unanswered. The research paper suggests the transition may be quick and dramatic – a shift to cost-effective stand-alone power solutions appears highly plausible by 2020, in a wide range of market segments. The research paper is an addition to public discourse on the transition our energy market is experiencing. It examines various scenarios, using energy and economic modeling, where new and existing communities own and operate their own power supply infrastructure.

Austin Energy: A real-life advanced distribution management system
This report examines the move from distribution management systems (DMS) to advanced distribution management systems (ADMS). It discusses two issues that concern almost every utility: 1) bandwidth and latency (can our communications network handle the data flow and do so fast enough) and network modeling (can we get an accurate picture of our power network).

Pyramid Research Predictions 2014
This report from Pyramid research provides predictions for mobile communications trends for 2014. Although unexpected events can always happen, they anticipate that 2014 will be a year of transformation, increased competition and innovation in the industry, particularly around mobile broadband and media.
(IS-2014-64) Lean Construction Leveraging Collaboration and Advanced Practices to Increase Project Efficiency
Recently, Mcgraw Hill Construction has explored many ways in which the industry has addressed questions of inefficiency. Their series of BIM reports demonstrate, among other findings, that the collaborative approach BIM can help foster has strong impacts on productivity and profitability. Similarly the 2011 Prefabrication and Modularization and Mitigation of Risk in Construction SmartMarket Reports reveal approaches that improve the process of construction, improving the bottom-line of projects. This report builds upon those findings by demonstrating that taking a Lean approach, including the use of BIM and prefabrication, makes firms more competitive and yields strong business benefits.

(IS-2014-63) Energy @ Home Data Model
This document describes a data model that represents the functionalities covered by the Energy@home use cases, integrated in the ZigBee Home Automation 1.2 standard, but represented in an abstract way, independent on the underlying communication technology. The definition of this data model was inspired by the ZigBee SEP2 specification: on the basis of a gap analysis approach, Energy@home identified missed functionalities and attributes and submitted to ZigBee Alliance all these modifications in the form of a set of two kind of documents: New Function Sets collection, described in SEP2-style, presented in the first paragraph of “Data model” chapter; Change Control Boards (CCB) comments that, for completeness, are reported in the Annex 1 of this document.

(IS-2014-62) Smart Grid Threat Landscape and Good Practice Guide
This report from Enisa elaborates on cyber security issues with regards to smart grid information infrastructure. This document provides tools to assess risk exposure of smart grid assets and will show what others have done in this respect. It elaborates on the threats smart grid components are exposed to and on the security controls to reduce threat exposure. But the assessment on the living object can be done only by the asset owner, just because asset owners master the complexity of infrastructures and the interdependencies among various assets. This task cannot be done as a generic exercise or it would have low value. Concluding, one should note that the use of these tools will depend on the capabilities of the expert users. In cyber-security preparedness, however, much depends on the capabilities of the adversary, which are not always known and certain.

The following report relies on a survey conducted in October 2012 along with practitioner and consultant interviews. Together they provide a briefing on the degrees to which leading companies are obtaining greater business effectiveness and value through leading-edge, cloud-driven collaboration.
(IS-2014-60) Pathways to Commercial Success: Technologies and Products Supported by the Fuel Cell Technologies Office
The purpose of the project described in this report is to identify and document the commercial and emerging (projected to be commercialized within the next 3 to 5 years) hydrogen and fuel cell technologies and products that resulted from Department of Energy support through the Fuel Cell Technologies Office (FCTO) in the Office of Energy Efficiency and Renewable Energy (EERE). Pacific Northwest National Laboratory (PNNL) undertook two efforts simultaneously to accomplish this project. The first effort was a patent search and analysis to identify patents related to hydrogen and fuel cells that are associated with FCTO-funded projects (or projects conducted by DOE-EERE predecessor programs) and to ascertain the patents’ current status, as well as any commercial products that may have used the technology documented in the patent. The second effort was a series of interviews with current and past FCTO personnel, a review of relevant program annual reports, and an examination of grants made under the Small Business Innovation Research and Small Business Technology Transfer Programs that are related to hydrogen and fuel cells. This report documents the methodology and results of this study, including the specific patents as well as commercial and emerging technologies that resulted from FCTO funding.

This report from the US Department of Energy examines the market trends in fuel cell technologies for 2012. 2012 was an important and pivotal year for the fuel cell industry. Sales and shipments generally were up, markets continued to develop, new strategic alliances were formed, and policies and supporting programs continued to be implemented that tend to favor the industry.

(IS-2014-58) Fuel Cells in America 2013
This report is the fourth in a series. In 2010, Fuel Cells 2000 published “State of the States: Fuel Cells in America,” with follow-up reports in 2011 and 2012. This report focuses on all that has happened since, plus a look at how international investments and collaborations are helping to generate jobs and business growth within the U.S.

This report profiles a select group of nationally recognizable companies and corporations that have purchased or deployed fuel cells since our last report (November 2012) through December 2013. These businesses are taking advantage of a fuel cell’s unique benefits, especially for material handling and providing clean, reliable power to their data centers, stores, administrative offices and headquarters.

On-bill financing refers to a financial product that is serviced by, or in partnership with, a utility company for energy efficiency improvements in a building and is repaid by the building owner on their monthly utility bill. This report outlines the advantages and challenges of on-bill financing and highlights current on-bill financing programs in the industry.

(IS-2014-55) The State of Telework in the U.S.

This 27-page report, sponsored by Citrix Online & New Ways of Working, identifies the Work-at-Home definition, demographics, benefits, challenges, trends, and what these workers actually do there. It intentionally ignores the self-employed to focus instead on those who telecommute or ‘workshift.’ The objective is to help craft business and government policy.

(IS-2014-54) Valuing the Invaluable: 2011 Update

This important 28-page report, based on 2009 data about the estimated $450 billion/year economic cost of unpaid family caregiving, is also available on the AARP website. That $450B amount is higher than estimates of the Congressional Budget Office but looks at all adults caretakers, not just those age 65+. A good AARP comparison of the two reports is at http://blog.aarp.org/2013/07/19/just-how-valuable-is-family-caregiving/. Where AARP’s report is entirely narrative, the GBO report has many great charts, but I suggest using both reports together.

(IS-2014-53) Wireless Personal Area Networking

This $1,500 report by Harbor Research examines the technologies, standards, applications, players and anticipated market growth for short-range wireless networks including analysis of the competitive landscape as well as the conflicts between and amongst the many proposed standards in this WPAN segment of the Internet of Things (IoT). Covered in the report are Bluetooth (IEEE 802.15.1), Zigbee Low Rate WPAN (802.15.4), Smart Utility Networks (802.15.4G), Body Area Networks (802.15.6), and Z-Wave.


This slide from the New Buildings Institute reviews program trends (regulatory and voluntary), performance, cost and technology for buildings deep energy savings in several U.S. states. These programs set goals for annual or cumulative energy savings by reducing energy, water and transportation impacts by 50% by the year 2030. The effectiveness and limitations of these programs are surveyed and discussed. 50% savings on energy is realistic and proven. Case studies are included.
(IS-2014-51) Establishing a Data Collection Methodology, Common Metrics and the Lighting Energy Code Comparison for Lighting Control Systems Research
This paper from the New Buildings Institute reviews two commercial office lighting controls research field studies – one through the Office of the Future Consortium (OTF) and another funded by the Northwest Energy Efficiency Alliance (NEEA). This paper characterizes a method framework, applied to office spaces, and is offered as a methodology and metrics combination concept to be leveraged by working groups in a position to educate and influence the lighting research milieu. Additional NBI work with the California PIER program also provided some insights for the research metrics and key performance indicators for lighting controls research. These studies were commissioned because utilities are facing higher mandates to save through energy efficiency.

(IS-2014-50) Schneider Electric Dutch Headquarters
Over the past decade, Schneider has seen “monumental growth” in their size as well as in their product line as a result of multiple strategic acquisitions culminating in one of the largest solutions provider of energy management, automation and control solutions in the world. To accommodate the expansion in The Netherlands, a new 6,000 square meter head office that would unite the multiple companies under one roof. Schneider Electric’s new Dutch head office is a thoroughly modern and excellent example of the opportunities available for saving energy in buildings. The building, with its A+ energy label, originally featured a design classified by the BREEAM-NL (Building Research Establishment Environmental Assessment Method) certificate as ‘Very Good’. The building then received the BREEAM-NL Excellent certificate as a result of the many measures adopted once construction had commenced.

(IS-2014-49) Descriptive, predictive, prescriptive: Transforming asset and facilities management with analytics
Data analytics represents an opportunity for real estate, facilities and asset managers to transform their operations. But many organizations have yet to adopt the analytics approach. Many, in fact, still rely on manual tools such as spreadsheets for creating reports on their assets—and on intuitive management from individuals to draw conclusions from data and act to improve operations. For organizations that want greater insight into their real estate, facilities and enterprise asset performance, along with a better way to use information for improvement, knowing how to utilize data more effectively in decision making can present a challenge. This white paper describes a key first step in adopting an analytics approach: understanding the different types of analytics—descriptive, predictive and prescriptive—the management role each can play and the value each can deliver.
(IS-2014-48) 2014 Getting to Zero Status Update
This 2014 Getting to Zero Status Update presents the findings on ZNE and ultra-low2 energy buildings and districts across North America and builds on the Getting to Zero 2012 Status Update work by New Buildings Institute (NBI). The 2014 Getting to Zero Status Update is based on extensive research by NBI as well as input from many of the key organizations, states and design firms that are leading the ZNE market. This executive summary provides highlights of our findings. The lists of all buildings that were studied appear in the full report.

This project examines the approaches that states are taking regarding the use of net vs. gross savings in the evaluation of their ratepayer-funded energy efficiency programs. The purpose of this report is not to resolve the methodological issues relating to estimating net savings. It will not attempt to assess and make recommendations regarding specific evaluation methods. There are other entities that have addressed and are addressing that task, e.g., the Department of Energy/National Renewable Energy Laboratory (DOE/NREL) Uniform Methods Project. Rather, the purpose of this project is to examine and document what states are doing in actual practice regarding the issue of net savings. What is in fact being done by states in terms of the use of net savings in making regulatory decisions? What issues are being discussed? What precedents are being set and what lessons are being learned that can help inform decisions by other states?

(IS-2014-46) 2013 Building Energy Efficiency Standards
The initial PIER FDD project goal was to develop and submit an FDD prescriptive measure to Title 24. At the same time, a parallel project with a similar goal was initiated by the utilities Codes and Standards Enhancement (CASE) program. The PIER and CASE research teams joined forces to fully collaborate all the way through the Title 24 measure development process. Based on final negotiations carried out through a working group of the Western HVAC Performance Alliance (WHPA) Subcommittee on In-field/Onboard FDD consisting of PIER project personnel, HVAC manufacturer representatives, California engineering consultants, an FDD tool developer, and utility representatives, mandatory measure was submitted and subsequently approved by the CEC in May 2012. Field compliance acceptance test requirements are in development along with workforce education and training materials, and an HVAC manufacturer option to pre-certify with the CEC to meet compliance objectives, entire equipment lines with the required FDD capabilities.

Fault detection and diagnostics (FDD) was introduced in the 1970s for nuclear, industrial, aerospace and military applications, but over the past 15 years has been increasingly applied in HVAC. FDD in air-cooled unitary air-
conditioning systems, including residential-type split systems and rooftop units (RTU) that are typically used in small commercial buildings, is of particular interest because these systems are so widely deployed and because they often have lower-quality installation and maintenance than larger and more complex systems, hence more undiscovered faults. Several FDD tools are currently available for unitary air-conditioning systems. When a homeowner, facilities manager, utility program manager or regulatory body is considering which tool to use (if any) a key question they must ask is: how well does each tool work? But no system currently exists for evaluating the performance of FDD tools applied to unitary air-conditioners, or for evaluating the performance of FDD tools in other industries. This problem is particularly pressing for California because the Title 24 Building Energy Code includes diagnostics-based installation procedures, and because utility programs have provided incentives for diagnostics-based maintenance programs. The objective of the current project is to address the need to know how well FDD tools work by developing a methodology for evaluating FDD protocols, and software that can conduct the evaluation methodology.

The goal of this research is to identify the minimum requirements for FDD, including communications options for RTUs that enable cost-effective energy/demand savings. To do this, the research team undertook a comprehensive review of available products, services, and facility management behaviors related to heating, ventilation, and air conditioning (HVAC) operations/maintenance to identify and prioritize the faults that can be detected by a set of currently (or shortly) available diagnostic tools, and to evaluate the available tools. This work is the foundation for defining the minimum FDD requirements that were proposed, vetted with stakeholders, modified, and ultimately adopted into the 2013 Title 24 California Standards.

(IS-2014-43) NBI Factsheet
This report from NBI provides a brief overview of the company. New Buildings Institute (NBI) is a nonprofit organization working to improve the energy performance of commercial buildings. As a technical resource for governments, utilities, energy efficiency advocates and the building industry, NBI acts as a carrier of ideas between these groups and works collaboratively to put the best innovations for advanced buildings into action. They assess technologies, promote design approaches and help guide policies and programs that will significantly improve the energy efficiency of commercial buildings.
(IS-2014-42) Filling the Gaps on Whole Building Design Guidance
This poster from ACEEE examines the current gap between expertise of the design community and the available design techniques and technologies (that can make buildings 50% more energy efficient).

(IS-2014-41) Bringing Outcome-Based Code Compliance to the IgCC
This paper describes how the concept went from speculation to model code language, moving through a national summit on outcome-based codes in Washington DC, a series of (often conflicting) code proposals, broken and re-established collaborations, and national outreach before becoming a proposal backed by an unusual consortium of national organizations. Even though the proposal ultimately failed, the whole IgCC process holds many lessons and this paper explores what the process revealed about the realities of addressing actual energy outcomes in code and some realities of the codes landscape.

(IS-2014-40) Ace Hardware LED High-Bay Lighting and Controls Project
This project was intended to test the integration of Light Emitting Diode (LED) lighting technology in combination with an aggressive lighting controls strategy to realize the deepest energy savings possible within a warehouse space. The study compared the energy consumption of a baseline metal halide (MH) lighting system with that of a LED retrofit lighting system and the integration of a variety of lighting controls establishing energy savings produced by each option. The study was conducted in a discreet 44,800 square foot warehouse space within a much larger warehouse facility. This study found that the simple payback for this retrofit project, while using the full host of controls available was 3.6 years, and resulted in a predicted 93% reduction in the yearly energy consumption in the space.

The primary objective of this project is to demonstrate the application of air source heat pumps (ASHP) at a commercial facility under field operating conditions. Secondary objectives include estimating the possible energy savings when installing emerging technology and projecting the energy savings across the eight climate zones (CZ) within Southern California Edison’s (SCE’s) service territory as well as validating manufacturer performance claims.

(IS-2014-38) Demand Control Ventilation with Centralized Air Quality Sensors
The main focus of this project was to document the energy savings at one particular college laboratory facility where this system was installed. The calculation strategy included a pre- and post-retrofit weather bin analysis of supply fans, exhaust fans, chilled water usage, and heating hot water usage. This report serves as a case study
of the effectiveness of a demand control ventilation system with centralized air quality sensors. At the host site, the existing system and this DCV system will be monitored under real building conditions and in compliance with applicable HVAC codes, standards, and recommendations.

(IS-2014-37) Fluorescent Dimming Ballast Study Report
The goal of this study from SMUD was to understand full range dimming ballast performance for a comprehensive list of ballasts that best represent the market. These findings are presented as a tool that can be used to shape future energy efficiency programs through understanding of common continuous dimming ballast performance behavior. This report explores the issue of performance anomalies through a comprehensive dimming ballast research study in order to identify typical ballast performance characteristics for products that are compatible with 4 ft T8 fluorescent lamps. This report is written to provide all relevant information while preserving manufacturer anonymity. It should be noted that the data presented in this report are self-reported by the manufacturing companies and have not been independently tested.

(IS-2014-36) Innovations Across the Grid
Through its Volt/VAR optimization (VVO) implementation during the "gridSMART" Demonstration Project, AEP Ohio’s goal was to achieve energy efficiency by improved control and monitoring of the voltage level on 17 distribution circuits, ultimately reducing customer energy consumption. With VVO, customers experienced reduced energy consumption while maintaining the same level of comfort and service. Optimizing the voltage supplied reduced the amount of capacity and energy required on the AEP Ohio system, yielding an average energy reduction benefit of two to three percent across the 17 circuits.

(IS-2014-35) Trends to 2050
This report is an update and extension of the previous trend scenarios for development of energy systems taking account of transport and GHG emissions developments, such as the “European energy and transport - Trends to 2030” published in 2003 and its 2005, 2007 and 2009 updates1. The purpose of this publication is to present the new “EU Reference scenario 2013” (“Reference scenario” later in the text). This Reference scenario was finalized in July 2013. It focuses even more than previous ones on the energy, transport and climate dimensions of EU developments and the various interactions among policies, including now also specific sections on emission trends not related to energy.

This paper summarizes the research done by the Department of Psychiatry and Behavioral Science, Upstate Medical University, State University of New York, Syracuse, New York, USA; and the Indoor Environment Department, Lawrence Berkeley National Laboratory, Berkeley, California, USA. 22 test subjects were put through a series of 9 different decision-making tests under different concentrations of CO2 levels: 600ppm, 1000ppm and 2500ppm. The data showed that there was a clear relationship between the scores in the tests and the CO2 levels for 7 of the 9 tests. Specifically, the performance of the subjects at 2500ppm was significantly reduced compared with the subjects at 600ppm. If the findings can be replicated, this would have implications on the standards that dictate the ventilation rates in buildings and other indoor environments. There is a current interest in reduce ventilation rates to cut costs but this could lead to higher CO2 levels and potentially adversely affect decision-making performance. The findings may be economically important and reductions in outdoor air supply per person in buildings to cut costs may be limited. Confirmation of the research is still necessary.

(IS-2014-33) The elephant in the living room: how our appliances and gadgets are trampling the green dream

This report from the Energy Saving Trust (UK) is promoting the idea of reducing electricity emissions from domestic appliances. Meeting the UK's 2020 target of 34% emissions reduction will take progress and some dramatic cuts to household energy consumption. The elephant in the room is referring to the fact that we are buying more energy-efficient products, but we are not acknowledging that the amount of energy we use in our homes is increasing. The progress is here reported on the recommendations Energy Saving Trust made in 2006 in a report (The rise of the machines) warning of the effect of increasing energy consumption and carbon emissions. Further recommendations are made about what retailers and consumers can do to reduce emissions. Many different statistics and predictions on domestic energy consumption are given including: lighting, refrigeration, cooking, washing, consumer electronics and home computing from the past, present and future. Based on current trends and predictions, the goal of 34% emissions reduction will not be met, but there will still be a decrease in emissions.
The objective of the AAL JP (Ambient Assisted Living Joint Programme) is to enhance the quality of life of older people and strengthen the industrial base in Europe through the use of Information and Communication Technologies (ICT). The most important activity of the AAL Joint Programme is the regular publication of calls for proposals for research, development and innovation projects in the field of ICT for Active and Healthy Ageing. The programme co-funds projects within the user-driven-innovation paradigms between minimum three partners from AAL JP Partner States. The organization also supports project activities and organizes the annual Forum to showcase all solutions to the European audience.

This report joins the ongoing conversation about how best to construct cost-effective behavior programs that deliver appreciable energy savings. As the first comparative analysis of utility-run behavior programs, it lays the groundwork for further program development by developing a classification scheme, or taxonomy, that sorts programs into discrete categories. Practitioners, evaluators, and regulators will be able to use this taxonomy as they implement and assess strategies and develop policies for utility-run behavior programs. It concludes with a number of further recommendations besides the suggestion that managers stack behavioral strategies for maximum impact.

Navigant Research has prepared this white paper to provide current and interested stakeholders in the smart utilities market, including technology companies, service providers, utilities, investors, and policymakers, with an overview of 10 key trends that will affect the smart utilities market during 2014 and beyond. Navigant Research segments the smart utilities market into five key application areas: transmission upgrades, substation automation, distribution automation, information and operations technology, and smart metering. The major objective of this white paper is to provide an understanding of some of the key market developments and movements that are likely to occur during 2014 and beyond.

This paper presents an overview of the case for the application of 380 Vdc as a vehicle for optimization and simplification of the critical electrical system in the modern data center. Specifically, this paper presents currently available architectures consistent with ANSI/BICSI 002-2011 and the EMerge Alliance Data/Telecom Center Standard Version 1.0. Additional EMerge Alliance white papers will explore the specific elements including economics, reliability, safety and efficiency.
(IS-2014-28) Wearables, 'Phablets' Command Consumer Interest
This report from Aaron Baar analyzes the emergence of wearable smart technology. According to Accenture’s new Digital Consumer Tech survey, more than half of consumers (52%) worldwide are interested in buying a wearable technology device such as a fitness monitor or Internet-connected headwear. The wearable technology market for some time has been tagged as an area ripe for growth in the coming year. But the Accenture survey demonstrates just how widespread the consumer interest is.

New Buildings Institute, Northwest Energy Codes Group, Institute for Market Transformation and Southwest Energy Efficiency Project have identified seven key issues to ensure that the 2015 IECC improves energy efficiency, is easier to apply, and makes compliance and enforcement more straightforward. The votes recommended within the report on these seven issues will provide the most technically sound 2015 IECC to achieve these objectives.

(IS-2014-26) Enlighted Technical Proof of Concept Study
This report represents the findings on research on the Enlighted lighting control system. New Buildings Institute (NBI) conducted the work on behalf of the Northwest Energy Efficiency Alliance (NEEA) from May 2011 to December 2012. The technical Proof of Concept study aimed to validate manufacturer claims for costs, ease of installation, end user satisfaction and energy savings. Researchers investigated three sites in the Pacific Northwest.

(IS-2014-25) Indirect-Direct Evaporative Rooftop Unit Field Test Final Report
This report focuses on a third-generation five-ton commercial building evaporative cooling product previously tested through a Northwest Energy Efficiency Alliance (NEEA) and New Buildings Institute (NBI) field research project. The second-generation unit was configured as an evaporative (indirect-direct evaporative cooling/IDEC), direct expansion (DX) hybrid. While this earlier version aptly demonstrated the effectiveness of the evaporative cooling section, the unit was bulky and not as efficient as hoped-for. The third-generation unit was intended to be a minimum-cost and higher-efficiency configuration that takes the well-demonstrated performance of the IDEC evaporative section and attaches it to an existing DX rooftop unit (RTU).

(IS-2014-24) Evidence-based Design and Operations Pier Program
This report presents the results of the Evidence-based Design and Operations Research Program led by New Buildings Institute from 2008-2013. The Program included four technical projects for commercial buildings. The objective of the first project was to develop feedback tools for designers, operators/owners and tenants as aides
to reduce building energy use. These tools feature new and unique data analysis capabilities. The other projects included: field measurement to quantify and estimate potential plug load energy savings, validating computer simulation for skylight systems evaluation, and developing a method and software to evaluate rooftop heating and cooling units fault detection and diagnostic protocols.

(IS-2014-23) Commercial Plug Load Energy Use Policy
The purpose of this paper is to examine the issues related to the energy use category in commercial buildings commonly referred to as Plug Loads. It is prepared as part of the New Buildings Institute (NBI) California Energy Commission Public Interest Energy Research (PIER) program on Evidence-based Design and Operations. Plug loads are frequently characterized as comprising energy consumption that arises from the use of devices connected to electrical receptacles (things that plug into the wall outlets). Plug loads are an increasing use of energy in buildings, especially when considered as a percentage of total energy consumption. As building systems such as lighting and HVAC have become more efficient, and the envelope has become more thermally effective, plug load devices have grown in type and magnitude, even though individual devices may have become more efficient. This is believed to be one of the main reasons that, although major building systems such as lighting and HVAC have become much more efficient, building energy use intensity has not decreased over the three most recent decades of CBECs1 surveys (1983-2003).

(IS-2014-22) Rooftop Units Fault Detection and Diagnostics
This Program Report (Final Report) summarizes the findings for Rooftop Unit Fault Detection and Diagnostics project within the Evidence-based Design and Operation research program (Program) led by New Buildings Institute (NBI) and its subcontractors for the California Energy Commission’s Public Interest Energy Research (PIER) program. The research period was October 2008 and March 2013 and included studies on a methodology for evaluating the effectiveness of Fault Detection and Diagnostic protocols that identify and measure operational faults in rooftop heating, ventilation and air conditioning equipment.

(IS-2014-21) High Performance Buildings Measured Performance and Key Performance Indicators
This Project Report (Final Report) summarizes the findings for the Plug Load Savings Assessment project within the Evidence-based Design and Operation research program (Program) led by New Buildings Institute (NBI) and its subcontractors for the California Energy Commission’s Public Interest Energy Research (PIER) program. The research period was October 2008 through March 2013 and included studies on plug load energy use and savings strategies.
Plug Load Savings Assessment
This Project Report (Final Report) summarizes the findings for the Plug Load Savings Assessment project within the Evidence-based Design and Operation research program (Program) led by New Buildings Institute (NBI) and its subcontractors for the California Energy Commission's Public Interest Energy Research (PIER) program. Plug loads (miscellaneous electric devices that plug into wall outlets) are one of the largest and fastest growing electric end uses in commercial buildings in the United States. In California, plug loads on average account for 13% of total electricity consumption in commercial buildings and 23% in offices specifically. The objective of the Plug Load Savings Assessment research project was to characterize the electricity consumption of office equipment plug load devices and identify opportunities for energy savings.

NBI Annual Report FY 2012
This report from NBI highlights the company's accomplishments since its beginning over 15 years ago. "New Buildings Institute (NBI) is a nonprofit organization dedicated to improving the energy performance of commercial buildings. As a technical resource for governments, utilities, energy efficiency advocates and the building industry, NBI facilitates the transfer of ideas between these groups and collaborates to put the best innovations for advanced buildings into action."

Methodology for Reporting Commercial Office Plug Load Energy Use
NBI has conducted research on the energy use characteristics of plug loads in office spaces and other commercial buildings to provide a greater level of information to those seeking methods and programs for reducing plug loads. In analyzing the data NBI used a standardized set of metrics. The intention is that by utilizing a consistent analysis method the body of data on plug load usage and the impact of measures might be greatly expanded. Further, sufficient data at the office-aggregated level might be collected to use in a benchmarking approach to provide a target for offices to achieve as part of a LEED-type rating system. As described in this guide, the outcome of NBI's research provides building designers, real estate personnel and utilities with two fundamental ways for expressing energy use characteristics for commercial plug loads: (1) Plug Load Equipment Power Density (EPD) and Schedule and (2) Plug Load Summary Metrics. Each of these is described in general below: Using data from past projects, this guide includes preliminary ranges for high, median, and low calculations of the metrics and EPD and Schedule. Lastly, the guide includes a summary of references for metering and monitoring equipment and project management.

Acceptance Testing of Fiber Optic Cable Using an OTDR
This article (which is based on the "Acceptance Testing" chapter from The Light Brigade's OTDR Theory and Operation DVD) reviews how to perform an acceptance test and how to place OTDR markers manually for
accurate results. However, most users will rely on the OTDR's automatic measurement functions, which quickly display length, losses, and reflection values for the fiber span. In the case of an acceptance test, the key points to document are the total length of the fiber, the total loss of the fiber in dB, and the loss of the span for each test wavelength in dB per kilometer.

(IS-2014-16) An Introduction to Fiber Optic Connectors
This article (which was edited from the first chapter of The Light Brigade’s Fiber Optic Connectors DVD) reviews fiber optic connectors. In all fiber optic systems, it is necessary to join two fibers together with low signal attenuation while maintaining low reflection levels depending upon the type of system used. Fiber optic connectors are used to the mechanical and optical means for cross-connecting fibers and linking to fiber optic transmission equipment.

(IS-2014-15) Introduction to Fiber Optic Safety
This introductory article addresses one of the basics safety concerns that fiber optic professionals can be exposed to, the power of lasers. Most fiber optic systems today use laser transmitters and the optical signals carried by the fibers can also pose eye hazards to the unwary. Even short distance multimode systems, which in the past used LEDs, have now migrated to low cost Vertical Cavity Surface Emitting Laser sources. For this reason, all cables must be handled as if they are carrying a laser signal unless it has been verified by an optical instrument that no laser energy exists. Today, most optical signals are laser based; with low power and low speed LEDs now used only in the simplest and shortest links. Fiber systems that use LEDs emit non-coherent energy at wavelengths longer than 700 nanometers at power levels considerably less than laser diodes. Since the potential risk of eye injury is determined by the output characteristics of the optical fiber system including power, coherence-time, wavelength and beam divergence, it is less for an LED than a laser. However, for the purpose of uniformity, all control measures commensurate with a specific hazard level apply to laser diode and LED systems.

(IS-2014-14) Smart Grid Consumer Survey
In order to better understand consumer interest and attitudes related to a select group of smart grid concepts, Navigant Research conducted a web-based survey of 1,084 consumers in the United States. The survey was executed in the fall of 2013 using a nationally representative and demographically balanced sample. The key findings of the survey are summarized in this report. More specifically, the Smart Grid Consumer Survey analyzes the dynamics of consumer demand, favorability, and attitudes toward several key smart grid product and service categories: smart grids and smart meters, smart thermostats, HEM bundles, and DR.
(IS-2014-13) Improving Critical Infrastructure Cybersecurity Executive Order 13636
The national and economic security of the United States depends on the reliable functioning of critical infrastructure. To strengthen the resilience of this infrastructure, President Obama issued Executive Order 13636 (EO), “Improving Critical Infrastructure Cybersecurity” on February 12, 2013. This Executive Order calls for the development of a voluntary Cybersecurity Framework (“Framework”) that provides a “prioritized, flexible, repeatable, performance-based, and cost-effective approach” for assisting organizations responsible for critical infrastructure services to manage cybersecurity risk. The Framework, developed in collaboration with industry, provides guidance to an organization on managing cybersecurity risk. A key objective of the Framework is to encourage organizations to consider cybersecurity risk as a priority similar to financial, safety, and operational risk while factoring in larger systemic risks inherent to critical infrastructure.

(IS-2014-12) Grid Energy Storage
This report from the U.S. Department of Energy examines grid energy storage. Section 2.0 of this report describes the present state of energy storage in the US, as well as international projects that could serve as a near-term template for US investment and growth. Section 3.0 describes the present state of technology for energy storage, including the applications and opportunities for each technology type. Section 4.0 discusses the barriers and challenges to widespread adoption of grid-storage techniques, as well as other concerns that will need to be addressed. Sections 5.0 and 6.0 highlight ideas on how to promote and advance energy storage over the next three to five years, ranging from promoting basic research to promoting and analyzing present and future grid-storage markets. Section 7.0 discusses goals related to technology developments while section 8.0 discusses goals related to analysis. Finally section 9.0 addresses standardization and DOE’s ongoing activities.

(IS-2014-11) Making the Business Case for Energy Efficiency: Case Studies of Supportive Utility Regulation
This report from the ACEEE examines supportive utility regulation. They examined a selected group of utilities that provide relatively large-scale customer energy efficiency programs in states with decoupling and/or shareholder incentives in place. Generally such policies are part of a much larger set of policies that address energy efficiency. The experiences they examined reveal the importance of comprehensive policies addressing customer energy efficiency programs, including policies that address utility financial barriers. Their research focused on (1) financial and program impacts and (2) organizational and managerial impacts. An ideal regulatory framework addresses all three financial barriers faced by utilities.
(IS-2014-10) Best Practices for Creating Your Smart Grid Network Model
This paper from Schneider Electric discusses best practices for ensuring complete, correct, and current data for a Smart Grid network model. A real-time model of their distribution network enables utilities to implement Smart Grid strategies such as managing demand and integrating renewable energy sources. They build this model in an Advanced Distribution Management System (ADMS) based on accurate and up-to-date information of the distribution network infrastructure. Yet, a recent survey shows that less than 5% of utilities are confident about the quality of the network data.

(IS-2014-09) The future utility as an “energy concierge”
With utilities puzzling over their future business model, one potential approach to gaining some insights is to ask their future customers what they envisage. DEFG gathered together a diverse group of students at New York University (NYU) to develop their 2020 vision of the future utility customer experience. The winning Vision 2020 centered on a story depicting a young couple with different needs and expectations as they navigated buying a new home that featured a number of new technologies and applications that both managed energy and were environmentally friendly. The utility served as a partner and was proactive in assisting the young couple with their decision-making, even providing an “energy concierge” to the couple.

(IS-2014-08) Cloud Computing 101
This report from American Express provides a brief introduction to cloud computing. In all, new technologies such as cloud computing involve legitimate worries about putting valuable company information into the hands of others. Yet the recent advances in the field of cloud computing now offer small businesses a myriad of opportunities to save time, resources and money, all while keeping important data more secure. While many SBOs are still nervous about digital tools, particularly those involving data storage and information management, the reality is that cloud computing can make running a small business faster, easier and more manageable.

(IS-2014-07) How Can We Make Our Cities Smarter
This report from IBM examines smarter cities. Smarter Cities create and encourage innovation through systems enabled by technology such as open data, analytics, cloud computing, pervasive devices and social media. These stimulate growth and social mobility, sustainably and resiliently, in a city’s economy and communities.

(IS-2014-06) Integrated Design – Advanced Energy Retrofit Roadmaps
This report from EEB Hub examines advanced energy retrofit roadmaps. An Advanced Energy Retrofit is a building and systems based renovation of an existing structure focused on the energy savings potential of proposed retrofit activities. Modifications and improvements to building envelopes and mechanical systems can
achieve 50% energy reductions, saving the owner significant operating costs throughout the life of the building. Completing an Advanced Energy Retrofit (AER) is facilitated by a set of four Integrated Design Roadmaps developed by the Energy Efficient Buildings Hub (EEB Hub) with the goal of guiding building owners, their professionals and consultants in achieving high levels of energy efficiency. Each Roadmap discusses the recommended protocols and activities with the potential to achieve 50% energy savings.

(IS-2014-05) 2G, 3G, 4G... OMG! What G is Right for M2M?
This report from Aeris provides information on how to decide which cellular date speed to choose. If you have chosen cellular for your M2M application, then the next step is to select the cellular radio and wireless data service that is right for your application. In general, if you have a smart phone and use your device for sending and receiving data, then we can all agree that more is better: the faster speeds and greater bandwidth provided by 4G LTE is the best choice. When considering M2M deployments, however, this does necessarily not apply.

(IS-2014-04) Why MVNOs and Carriers Aren’t Right for Your M2M Application
This report from Aeris examines M2M applications and MVNOs. Based on your business requirements, you must consider different technologies (wired, WiFi, cellular, etc.) and if you determine that cellular is right for your company, then there are many more options to consider. You must first know that there are three distinct types of companies that can connect your cellular M2M devices: mobile/cellular carriers, MVNOs and Aeris. To select the provider that is best for you, you must first know the facts. We understand that cellular M2M is complex and confusing – in the following pages, we hope to clarify the situation.

(IS-2014-03) Key Performance Indicators to analyze and improve management of information flow in the BIM design process
This paper presents a set of key performance indicators that can be used to analyze and improve the flow of information that occurs during the BIM design process. These measures aim to provide an indicator of the process efficiency of the design process as represented by a proposed BIM Integrated Management Model. Indicators are associated with each of the loops within the design process and are described in detail along with the formulas and some examples.

(IS-2014-02) BACnet and EnOcean enable Energy Efficient Buildings
Overview of BACnet and EnOcean integration, including case studies and examples of real life applications; specific device is described (including specification).
(IS-2014-01) EnOcean Technology and LEED
This document is intended to serve as a roadmap to LEED for the EnOcean technology supplier, providing the following foundational elements: overview of LEED, including recent developments and trends; application of EnOcean technology to LEED 2009; application concepts and considerations; and project profiles highlighting EnOcean technology's contribution to sustainability and LEED certification.

(IS-2013-353) Friend or Foe – energy service companies and the electric distribution industry
This study was intended to describe the energy service company (ESCO) industry and identify best practices for distributor-ESCO relationships, including how you can best negotiate relationships with the different types of ESCOs. The findings of this research establish that the ESCO industry is large and growing. Further, it identifies opportunities to secure more energy efficiency retrofit work through either partnerships with ESCOs or by working independently, though both approaches carry risk and must be carefully assessed. This report identifies specific recommendations to help them assess that risk and secure positive and profitable working relationships with ESCOs.

(IS-2013-352) Trends in Mobile Research
This study from Confirmit examines recent trends in mobile research. They claim that the ‘mobile voice’ provides a key component to many “Voice of the Customer” programs. Its immediacy and accuracy augment other feedback channels - such as Web, telephone and paper – and enable consumer-focused businesses to build a clear picture of the experiences they offer at every stage of the customer lifecycle. By reporting on all these channels in a single view, you can react tactically to resolve issues and build your reputation, while driving strategic decision making that will support growth in the long term.

(IS-2013-351) Answers to energy efficiency challenges in buildings
This policy paper from the DTES Generalitat of Catalonia and the Mediterranean highlights the importance of the improvement of the Energy Efficiency (EE) in the existing buildings in the Mediterranean. It considers both energy efficiency policies and territorial cooperation, trying to pave the way for an empowerment of them as central topics at the next programming period operational programs. It also aims to reinforce the linkage between territorial cooperation initiatives on energy efficiency, public policies and access to new sources of funding.

(IS-2013-350) Clean Conventional Fuel — Oil and Gas SD Business Case
This Investment Report is one of a series of reports released by Sustainable Development Technology Canada (SDTC) as part of the SD Business Case. This report focuses on upstream oil and gas, which, for the purposes of the Investment Report, addresses the following technical or business divisions within that segment of the industry:
Conventional Oil Production; Heavy Oil Extraction & Upgrading; Oil Sands In-situ and Surface Mining, Extraction, Upgrading; and Sweet and Sour Gas Production and Processing

(IS-2013-349) LATIN AMERICAN SMART GRID TECHNOLOGY OUTLOOK REPORT, 2013 - 2018
The purpose of this report is to zero-in on major smart grid investment areas among Latin American utilities from 2013 to 2018. Further, the report identifies smart grid deployment drivers and concerns among utilities in the region.

This report from ON World examines wireless sensor networks, which they believe will be responsible for the majority of the growth in intelligent building systems over the next decade. In 2017, global WSN revenues from buildings under 50,000 square feet will reach $1.3 billion. ON World’s report is based on phone interviews, and online surveys with over 250 individuals.

(IS-2013-347) Renewable Electricity Generation SD Business Case
This Investment Report is the first in a series of such reports that will be released by Sustainable Development Technology Canada as part of The SD Business Case. Building from the overall base of the Power Generation economic sector, this report focuses primarily on the Renewable Electricity Generation area. Within this area, the report examines four primary technology groups or sub-sectors.

(IS-2013-346) Building Design
This report examines the design of the CIRS and all of its features. Features include: Energy Systems; Rainwater System; Wastewater Reuse System; Landscape & Site; Living Roof & Living Wall; Lighting; Ventilation. They also include a “lessons learned” section, which includes several insightful lessons that may be applied to other buildings as well.

(IS-2013-345) Value of the Grid to DG Customers
This paper describes how a DG customer (or a micro grid) that is connected to the host utility’s distribution system 24/7 utilizes grid services on a continuous, ongoing basis. The point is to recognize the value of these grid services and to develop a methodology for the DG customer to pay for using the services. The utility’s cost of providing grid services consists of at least four components – the typical fixed costs associated with: (i) transmission, (ii) distribution, (iii) generation capacity, and (iv) the costs of ancillary and balancing services that the grid provides throughout the day for the DG customer.
(IS-2013-344) Designing a High Performance Building
This report examines the planning process of a new building. The paper presents insights gained by interviewing a number of individuals about smart construction, net-zero buildings (which produce as much energy as they consume), and high performance buildings (HPBs). A focus on efficiency in the built space is critical, since buildings consume nearly 40% of U.S. energy consumption, and a huge amount of that (over 50%) is wasted. It focuses on the Parkland Hospital, using it as an example of the kind of approach necessary to create a high performance building, keeping both resource efficiency AND tenant use in mind.

(IS-2013-343) Green Retail and Hospitality: Capitalizing on the Growth in Green Building Investments
This report from McGraw-Hill examines green building in the retail and hotel sectors. The results of this seminal study on green building in the retail and hospitality sectors, reveals that green building has indeed taken hold in these sectors and is expected to grow significantly in the next two years. These sectors have lagged behind other markets, such as office and education, due to innate challenges like strong ventilation requirements, transient occupants, long hours of operation and franchise ownership models. However, the benefits provided by green and the brand advantages offered by sustainability efforts are supporting an increasingly strong green market in these sectors.

(IS-2013-342) Smart Systems Manifesto
This report from Harbor Research examines “the internet of things”. For quite a few years now, Harbor Research has focused most of its research and consulting on what they call “Smart Systems”—the convergence of pervasive or embedded computing with the packet switching “network of networks” called the Internet. These days, many people refer to this phenomenon as “the Internet of Things.”

(IS-2013-341) K-12 SCHOOL COMMUNICATIONS REPORT CARD
Motorola’s 2013 study offers a valuable snapshot of the current state of communications in school districts across the country. Conducted in May and June, responses were gathered from a wide cross-section of K-12 schools and educational professionals in 43 states. Participants were rather evenly divided among different-sized districts, resulting in a good mix of U.S. schools. Almost 45 percent of respondents were school administrators. Other participants included information technology (IT) and telecommunications, operations and maintenance, teachers and administrative staff, transportation and facilities directors, and safety and security management.
(IS-2013-340) HIF to LED White Paper
This report examines the change from HIF lighting to LED lighting in large buildings. Intelligent LED lighting systems leverage the power and flexibility of LEDs as an illumination source and take a more sophisticated, network-based approach to lighting. They eliminate the shortcomings of HIFs and offer facility managers the opportunity to approach lighting as a strategic asset — all without performance issues, lengthy warm-up times, and ongoing maintenance (re-lamping/re-ballasting) chores.

(IS-2013-339) The Rise Of Holistic Enterprise Mobile Engagement
In May 2013, OpenMarket commissioned Forrester Consulting to evaluate the current state of mobile engagement at large enterprises. To get the best picture of how companies are adapting to the mobile shift, Forrester developed a survey that asked business leaders about their mobile efforts. Conducting an in-depth survey with 167 mobile channel decision-makers, Forrester found that these enterprises regard the mobile channel as one of their most important communication channels.

(IS-2013-338) Smart Grid Vision and Roadmap for India
The India smart grid task force was established as an interdisciplinary group to explore how India can develop and deploy smart grid capabilities. The "smart grid vision and roadmap" offers a series of time-framed, specific, target-driven measures, with which to enable the development and deployment of an Indian smart grid model.

(IS-2013-337) NBIMS Real Property Position Paper
This report examines where BIM fits into the overall real property supply chain. According to the author, interoperable data exchange standards have significant value. Given the size and net worth of the industry and its impact on the economy, it would seem prudent for public-private partnerships to drastically increase their participation and financial support. Upon receiving additional funds and resources, standards development organizations need to streamline their processes, making standards development easier for participants to understand and dramatically reduce their time to market.

(IS-2013-336) Big Data - extracting value from your digital landfills
The survey was taken using a web-based tool by 403 individual members of the AIIM community between March 30th, and April 25th, 2012. Invitations to take the survey were sent via e-mail to a selection of the 65,000 AIIM community members. In this report they record how users see the potential benefits of big data analytics. They
explore some of the more practical and popular applications, and they also look at the issues that are holding users back, including skills shortages, product immaturity and implementation uncertainties.

(IS-2013-335) Case Study: Pacific Gas & Electric Company (PG&E) SmartRate
The National Action Plan on Demand Response (NAPDR), published by the Federal Energy Regulatory Commission in June 2010, called for the development of case studies that would illustrate "lessons learned." The Association for Demand Response and Smart Grid (ADS) produced this, the third case study in a series. The NAPDR called for the development and dissemination of case studies as an action to support demand response practitioners and policymakers. Consumers and the general public are not the intended audience of this paper.

(IS-2013-334) Oracle’s Internet of Things Platform: The M2M Platform for a Connected World
This white paper from Oracle answers the following: why M2M/Internet of Things is a pressing initiative for your company; how M2M/Internet of Things affects enterprises and what challenges and opportunities it creates; how Oracle’s Internet of Things platform can help enterprises harness the power of M2M.

(IS-2013-333) PUBLIC INTEREST ENERGY RESEARCH (PIER) PROGRAM
This report describes New Buildings Institute’s (NBI) investigation of metered key performance indicators (KPI) for commercial building energy use. These are indicators that can be observed or benchmarked using more detailed system-level meter data beyond whole-building energy data. This report summarizes the installation of additional system metering downstream of the whole-building meters to investigate what KPIs can be observed and benchmarked, what they indicate, and how energy performance reviews can be enhanced while still using only limited additional metering. The findings show that calculated system-level KPIs can reveal superior or inferior performance of certain aspects of design, operations and occupant behaviors.

(IS-2013-332) Electricity In Canada
This paper illustrates the necessity of continued investment in electricity generation, transmission and distribution systems to ensure long-term economic growth and competitiveness as well as the need to define the ground rules for energy trade, including electricity, within Canada.
(IS-2013-331) Local Energy Efficiency Policy Calculator

The ACEEE Local Energy Efficiency Policy Calculator, or LEEP-C is intended for use by local policymakers and stakeholders interested in advancing the adoption of energy efficiency in their communities. Currently the tool is capable of analyzing the impacts of a total of seven different policy types from two economic sectors—existing public buildings and existing residential buildings. Based on existing research on the costs and savings from specific policies and user inputs regarding local energy and economic characteristics and level of investment, LEEP-C is able to calculate estimated impacts of specific policy choices on energy savings, cost savings, pollution, jobs, and other outcomes over a time period set by the user. Additionally, the tool allows users to interactively explore the absolute and relative impact of different policies. Finally, the tool allows for the weighting of different policy options based on user inputs regarding community priorities to find those policies that best fit with community goals.

(IS-2013-330) The Challenges of a Mature Netflix

The data in this report is drawn from TDG’s new report, The Maturation of Netflix, which analyzes historical trends and forecasts US Netflix streaming use from 2012 to 2022 and uses 2012 annual US TV viewing as a basis for comparison. Additionally, the report compares US Netflix streaming subscription counts from 2008 to Q2-13 with those of leading premium TV networks HBO, Showtime, and Starz, as well as TV operator video-on-demand from 2009 to 2012. It also recommends competitive strategies for TV incumbent networks and operators, as well as native OTT firms. This report presents an overview of this new report, including the historical analysis and discusses a few of the drivers and inhibitors that will dictate Netflix’s maturation.

(IS-2013-329) Key findings from The Global State of Information Security Survey 2014

The Global State of Information Security Survey 2014 aims to measure and interpret how global organizations implement practices to combat today’s highly skilled adversaries. This year’s survey indicates that executives are elevating the importance of security. They are heeding the need to fund enhanced security activities and believe that they have substantially improved technology safeguards, processes, and strategies.

(IS-2013-328) Delivering Next Generation Shopping Experience

This report from ZigBee Alliance examines their retail services. ZigBee Retail Services benefits both the retailer and the customer with enhanced services through automation of many retailer operations and customer touch points. Retailers benefit from using new technology that helps increase productivity, encourage customer engagement, increase quality of service and revenues, reduce spillage and spoilage, save on energy costs and
reduce the number of devices needed to perform daily operations.

(IS-2013-327) Connecting Battery-Free Devices
This report from ZigBee Alliance examines wireless sensor technology. An advantage of wireless solutions is, of course, the elimination of wires and the ability to create extensive flexible networks. To meet this need, the ZigBee Alliance has developed a family of standards that provides an efficient and robust wireless networking technology for sensor networks.

(IS-2013-326) PayPal study finds consumers okay with biometrics
Apple's newest iPhone may have spurred some debate over whether it's a good idea to unlock your phone with your fingerprint, but a new study from PayPal finds that a majority of Americans are comfortable with the idea of using their biometric information instead of the pesky passwords that are currently the norm. The survey, sponsored by PayPal and the National Cyber Security Alliance, found that 53 percent of those surveyed are "comfortable" replacing passwords with fingerprints, 45 percent would opt for a retinal scan, and 41 percent are comfortable with photo identification. This survey was conducted using an opt-in online panel, and its results cannot be projected to the overall U.S. public.

(IS-2013-325) How to Build Sustainable and Resilient Environments In an Increasingly Urbanized World
This white paper provides a framework for understanding the definitions, market indicators, key metrics and value propositions smart cities hold for numerous industries. The emergence of smart cities as the receptacle for ideas, thoughts, policies and strategies about the future of the world's cities is an important milestone because it comes amid rapid innovation, convergence and a redefinition of what it means to live and work in an urban environment in the 21st century.

(IS-2013-324) LNG FOR HIGH HORSEPOWER APPLICATIONS IN CANADA
This report from FC business intelligence examines North America's energy transformation; not only is the region shifting from a net importer to a net exporter of natural gas but across all industrial applications, the need to reduce costs and cut emissions has never been more acute. A number of financial and strategic investors are moving to take advantage: particularly by building LNG liquefaction facilities either for domestic sale or export overseas. The challenge for those who want to be a part of the natural gas revolution is to get the strategy right in terms of planning, investment and logistics. This means comprehending to a highly detailed level where the strongest opportunities are and how they are likely to develop, in order to support the analysis behind the large-scale capital commitment necessary for projects.
(IS-2013-323) Moving from Connected Buildings to Smart Buildings
This report from building IQ examines the switch from connected building to smart buildings. They claim that technology is fundamentally redefining the opportunities around smart buildings. Decisions on how best to optimize today's building operations are becoming so complex, so conflicting and so continuous that advanced algorithms must play a role. But with complexity, comes opportunity. When transitioning from a connected building to a smart building, any solution must provide facility operators with timely, accurate and consistent information through as few separate systems as possible. As complex as it can be, it is always best to start simple and learn by listening.

(IS-2013-322) The M2M adoption barometer 2013
Circle Research commissioned specialist B2B research firm Circle Research to canvass the opinions of IT and business managers, directors and C-level executives that are involved in setting M2M strategy for their organization. The result is a report with a broad industry and global coverage that gives a unique perspective on M2M. We hope that its combination of deep-dive research and expert commentary will enable you to benchmark where you are.

In Forrester's 38-criteria evaluation of the cloud strategies of online collaboration software vendors, they identified eight significant collaboration services providers — Box, Cisco Systems, Citrix Online, Google, IBM, Microsoft, salesforce.com, and Yammer — in the category and researched, analyzed, and scored them. This report details our findings about how well each vendor fulfills our criteria for constructing an online collaboration service and where they stand in relation to each other.

(IS-2013-320) ASIA-PACIFIC, MID-YEAR RENEWABLES UPDATE
This report from Bloomberg New Energy Finance provides key financial trends in Asia-Pacific's renewable energy market for 2013 and onwards.

(IS-2013-319) Di-BOSS: a real case of Smart Building
This paper aims to define the SelexES smart buildings solution as a holistic system that encompass all the physical components of the building, providing to the user a simple and optimized tool to manage a building efficiently through continuous re-commissioning hence driving energy saving.
**Bullish on digital: McKinsey Global Survey results**
This online survey was in the field from April 2 to April 12, 2013, and garnered responses from 850 C-level executives representing the full range of industries, regions, and company sizes; 8.6 percent of these executives have a specific technology focus. In the 2012 survey, they asked about three digital-business trends: big data and advanced analytics, digital marketing and social-media tools, and flexible delivery platforms.

**ENERGY EFFICIENCY PERFORMANCE STANDARDS: The Cornerstone of Consumer-Friendly Energy Policy**
This paper reviews the conceptual and empirical analysis of the efficiency gap literature of the past decade and weaves the discrete pieces of empirical evidence and the broad conceptual frameworks into a comprehensive explanation of the efficiency gap. Part I discusses the major conceptualization offered by academics, thinks tanks, private sector firms and government agencies and ties them to four dozen empirical studies completed in the past decade. It then evaluates estimates of costs and benefits of policies to enhance energy efficiency. It concludes with a discussion of the studies that show that performance standards are an economically attractive and effective approach to closing the efficiency gap. Part II of the paper places the efficiency gap analysis in the context of two broader frameworks that add important depth to the understanding of the efficiency gap. The central themes in the diffusion of innovation literature and the climate change literature reinforce the conclusions drawn from the efficiency gap literature.

**Data Line Transient Protection**
This white paper explains how electrical transients (surges) are created, how they can have devastating effects on electrical equipment, and how surge suppression devices work to help protect against them. A layered approach to surge suppression is the ideal method, reducing external and other large surges first and then attenuating them further internally before passing the energy to sensitive electronic equipment. Data line surge suppression is necessary to seal sensitive equipment against data corruption, to prevent damage over low voltage data lines, and to prevent any open paths for transient surges to enter.

**HOUSING FOR OLDER CANADIANS: The Definitive Guide to the Over-55 Market**
This volume provides an overview of the general characteristics of seniors in Canada, and to some extent by province. It provides a broad overview of the seniors market in Canada, using the most recent statistics available but housing providers will need to do their own research on specific communities to fully understand the markets in which they operate.
This volume provides information on market factors to consider and analyze when contemplating a new housing development targeted to older Canadians. It has been written for developers, project sponsors and other industry stakeholders, and offers tools, techniques and approaches to help answer the questions noted above. The volume begins with a brief overview of the seniors’ market in Canada using the current and historical data available through Statistics Canada and other sources. Possible housing options are identified and described as an essential first step in deciding on a particular project concept. Next is a section on defining a target market as well as a description of some of the ways by which the housing market for older Canadians can be segmented. The following sections outline the steps involved in completing a project feasibility assessment, including market analysis, site selection, competitive analysis and financial feasibility analysis. With this information, housing providers should be able to determine if their project concept is likely to meet with market acceptance.

This volume contains detailed information on planning and developing a housing project targeted to older Canadians. It has been written for developers, housing sponsors and other industry stakeholders, and offers tools, techniques and best practices to help answer the questions above. The volume begins with an overview of the development process and a definition of the project sponsor. Part 2 covers the construction phase, and this section lists the activities required to build the project. The volume concludes with a description of the tasks that must be finalized by the builder before the project can be considered complete and turned over to the project sponsor or property manager.

This volume provides guidance on the ways in which developers and sponsors of seniors’ housing can accommodate the changing needs of people 55 and over through appropriate design of dwellings and communities. Examples of best practices will be described in terms of how good and environmentally sustainable housing and community design have led to successful housing developments serving the needs of older Canadians.

(IS-2013-311) Site Selection for Mission Critical Facilities
In this paper guidelines are established for selecting a new site or assessing an existing one. When selecting a new site or evaluating an existing site, there are many risks and benefits that must be considered in order to optimize availability and reduce cost. Geographic and regional, local and site-related, and building risks need to be understood and mitigated to lessen the downtime effects on your business. Meanwhile, site selection can offer financial benefits when a data center considers climate, electricity rates, and incentives.
(IS-2013-310) High Performance VAV Systems
This article discusses several design and control strategies that can significantly reduce energy use in multiple-zone VAV systems. Although none of these strategies are new (in fact, several are required by energy standards or codes), implementation of them in buildings seems to be surprisingly infrequent. In this age of striving for higher levels of energy performance, these ought to be standard practice for every VAV system.

(IS-2013-309) A TCO model assessing the cost benefits of Wi-Fi and cellular small-cell joint deployments
In this paper, they look at the benefits and cost savings that carrier Wi-Fi, with its lower per-bit cost, brings to mobile operators at a time when they need to increase capacity in order to keep up with growing demand from subscribers. They present the results from a TCO model that compares the per-bit costs of Wi-Fi and small-cell deployments in which combinations of Wi-Fi, 3G and 4G are considered. They show that carrier Wi-Fi is conducive to lower per-bit costs than cellular, and that a combination of interfaces (Wi-Fi, 3G and 4G) further increases the cost savings.

(IS-2013-308) A futureproof approach to expanded Wi-Fi public access
This paper presents the advantages that carrier Wi-Fi brings to fixed and mobile operators as they build their own Wi-Fi infrastructure or leverage the capacity of Wi-Fi networks managed by partnering operators. It discusses the market drivers that will accelerate carrier Wi-Fi deployments and access over the coming years, and highlights the standards and technology that make Wi-Fi an essential access technology in mobile and fixed networks, as well as the role that Passpoint and Wi-Fi CERTIFIED ac have in spearheading and accelerating adoption of carrier Wi-Fi. The paper concludes with an overview of the evolving role of carrier Wi-Fi as operators try to manage the growth of wireless data usage cost-effectively, and the multiple business models enabled by carrier Wi-Fi.

(IS-2013-307) GSM vs. CDMA: Technical Comparison of M2M Technologies
Aeris provides network and data analytics services for Machine-to-Machine ("M2M") and Internet of Things ("IoT") applications using multiple cellular technologies for our customers. These are the 2G1 and 3G GSM and CDMA family of cellular technologies—the predecessors to the 4G cellular technologies, called LTE, currently in deployment. This whitepaper compares the GSM and CDMA technology families.

This report from EnOcean Alliance examines their energy management solutions in a hotel setting. Energy management solutions that utilize self-powered, wireless EnOcean based technology allow hotels to monitor, manage and control a hotel's energy consumption. Taking control of, and optimizing operational systems, can result in energy savings of between 20 and 50 percent. In addition to the energy savings through wireless
technology, EnOcean enabled solutions don’t require extensive renovations, in fact these solutions can be installed in about the same amount of time a hotel room takes to clean. Wireless, self-powered energy management solutions are both flexible and scalable and can be implemented as either stand-alone, in room applications or as a complete turnkey solution that utilizes a secure software platform.

(IS-2013-305) Wireless Lighting Controls: A Total Cost Analysis
This report from EnOcean Alliance examines wireless lighting solutions. Although there is little difference between the energy savings capabilities of wired versus wireless solutions, there are difference associated with the costs of their installation. In new construction scenarios, wired building control and automation strategies are more likely to be the cost effective choice. That is primarily due to the ability of installers to run wire while construction is taking place. Since wired controls are, on average, less expensive than wireless technology, especially energy harvesting wireless controls, they tend to be much more cost effective when it comes to new construction. When it comes to building retrofits, which are by far the more popular energy efficiency strategies for buildings today, wireless technology has been proven to be more cost effective as compared to wired solutions. The ease of installation and no new wire requirement of wireless technology makes it a cost effective solution for retrofits of nearly all types of buildings.

(IS-2013-304) Wireless Control of Architectural and Theatrical Lighting via DMX-512
DMX-512 is the most predominant theatrical lighting control protocol used in many theatrical and architectural lighting control devices worldwide. Historically wireless methods of interfacing with DMX-512 have been complex and costly, but with the use of EnOcean based radios and energy harvesting technologies, a simple and effective control method has been implemented.

(IS-2013-303) LonMark International and EnOcean Alliance team-up for optimal network topologies in building automation
When it comes to choosing a facility’s backbone for carrying building automation information, wired LON® bus systems have become the norm. However, wireless systems have been growing in popularity since the arrival of energy-autonomous and service free wireless components based on EnOcean technology. This collective assessment of major criteria relevant for the market indicates that neither of the two transmission media comes out alone on top in a building-automation scenario. For an optimal solution, it takes both; each implemented where it is better than the other. These criteria are looked at below.
**(IS-2013-302) New avenues in KNX building automation by integrating self-powered wireless sensors**

Interaction between self-powered EnOcean sensors and a KNX solution unites the enhanced flexibility of wireless with the high performance of a bus. The result is a single consistent system of wireless, twisted pair and – if desired – IP (Ethernet) too. Expansion with KNXnet/IP means that the data of wireless sensors can also be used in very large-scale installations, and will present them on the Internet too.

**(IS-2013-301) Smart Grid Consumer Survey**

In order to better understand consumer interest and attitudes related to a select group of smart grid concepts, Navigant Research conducted a web-based survey of 1,084 consumers in the United States. The survey was executed in the fall of 2013 using a nationally representative and demographically balanced sample. The key findings of the survey are summarized in this report. More specifically, the Smart Grid Consumer Survey analyzes the dynamics of consumer demand, favorability, and attitudes toward several key smart grid product and service categories: smart grids and smart meters, smart thermostats, HEM bundles, and DR.

**(IS-2013-300) The state of the Internet**

This quarter’s report includes data gathered from across the Akamai Intelligent Platform in the second quarter of 2013 about attack traffic, broadband adoption, and mobile connectivity, as well as trends seen in this data over time. In addition, this edition of the report includes insight into attacks for which a group known as the Syrian Electronic Army has claimed responsibility, the states of IPv4 exhaustion and IPv6 adoption, Internet disruptions that occurred during the quarter and observations from Akamai partner Ericsson on data and voice traffic growth on mobile networks.

**(IS-2013-299) Road Map for Smart Grid Implementation in Israel**

The Israeli Smart Energy Association (ISEA) took upon itself to prepare a comprehensive document analyzing all aspects of the Enhanced Smart Meter deployment: Technology, Engineering, Regulation, Legal, Marketing, Economic (CBA), and role of the local industry. This document analyzes the Smart Grid in an objective manner from the point of view of the national economy.

**(IS-2013-298) Oceania Report 4th Quarter 2013**

The Oceania Report, covering Australia and New Zealand, provides a half-yearly snapshot of construction market conditions and price movements in Australia and New Zealand, via commentaries and analysis from RLB directors in each location. The Oceania Report is a member of a suite of reports produced by RLB. Currently,
suite comprises the Caribbean, European, Gulf States, Hong Kong and China, Oceania, Singapore, USA and Vietnam reports, as well as the International Report, which is a global overview document.

(IS-2013-297) Making the Business Case for Energy Efficiency: Case Studies of Supportive Utility Regulation
In this report the ACEEE examines a selected group of utilities that provide relatively large-scale customer energy efficiency programs in states with decoupling and/or shareholder incentives in place. Generally such policies are part of a much larger set of policies that address energy efficiency. The experiences they examined reveal the importance of comprehensive policies addressing customer energy efficiency programs, including policies that address utility financial barriers. Their research focused on (1) financial and program impacts and (2) organizational and managerial impacts. They were especially interested in looking at how regulatory changes addressing financial barriers have affected corporate priorities and decision making regarding customer energy efficiency programs.

(IS-2013-296) Using IBM Maximo Asset Management to manage all asset classes in hospitals and healthcare organizations
This white paper shows how IBM Maximo Asset Management is a solution that can help organizations stay competitive and responsive to business drivers such as utilizing assets more effectively, taking steps to minimize risk, and better managing regulatory compliance efforts.

(IS-2013-295) European Electricity Grid Initiative Implementation Plan
This document describes the Implementation Plan for the period 2014-2016 of the Research and Innovation (R&I) Roadmap 2013-2022 prepared by the European Electricity Grid Initiative (EEGI). The Implementation Plan 2014-2016 results from parallel analyses of: the on-going R&I activities performed at European level by transmission and distribution system operators (the work already launched, and sometimes completed, in line with the priorities set within the previous EEGI R&I Roadmap 2010-2018 approved in June 2010); the upgrading of the EEGI Roadmap which has led to the already mentioned new version (2013-2022) approved by the EEGI in February 2013; the upgraded priorities which have emerged for network operators as of early 2013, in order to remain compliant with European energy policies and orientations, which include the 2050 de carbonization targets of the European electricity system.

(IS-2013-294) Assessing Storage Value in Electricity Markets
The present document is the result of the analysis of more than 200 publications on the subject of the economics of electricity storage, which are currently in the focus of research, by academics, utilities, potential investors as
well as policy makers. It aims at presenting the “state of the art” regarding research on the economics of electricity storage. Three particular aspects are given attention to: the methodologies used, the profitability results obtained and the impact of regulation on storage economics.

(IS-2013-293) Imagine 2050
This report from Veolia attempts to spark discussion on what the future (in particular the future of buildings and energy) might look like. “By 2050 it is estimated that 70% of the world’s population will live in cities. It’s a prospect that today we cannot even imagine. That’s why we need to start the debate now. To help you visualize what it might be like we have joined forces with the London School of Economics (LSE) to create our own ‘tale of two cities’ based on collaborative and individual approaches. “This report from Veolia attempts to spark discussion on what the future (in particular the future of buildings and energy) might look like. “By 2050 it is estimated that 70% of the world’s population will live in cities. It’s a prospect that today we cannot even imagine. That’s why we need to start the debate now. To help you visualize what it might be like we have joined forces with the London School of Economics (LSE) to create our own ‘tale of two cities’ based on collaborative and individual approaches.”

(IS-2013-292) Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings
This report recommends 10 best practices for designing and implementing effective multifamily programs and includes examples from leading programs. The results from these programs provide a snapshot of the possibilities for energy savings and reaching new customers.

(IS-2013-291) Demand Control Ventilation Benefits for Your Building
This white paper form KMC examines demand control ventilation (DMV). Energy efficiency is no more important than the health and well-being of the building’s occupants. Vital to employee health and productivity is good IAQ (Indoor Air Quality), of which proper ventilation is key. However, proper ventilation and energy efficiency are at odds with each other. A building that was an insulated, sealed, air-tight box would be very energy efficient, but would eventually suffocate its occupants. Finding solutions for an economical, sustainable, optimal balance between these two conflicting priorities is the goal of Demand Control Ventilation

(IS-2013-290) How to Achieve LEED Points by Installing VRF HVAC Systems
This white paper from Mitsubishi Electric describes the major benefits of VRF systems and how to garner LEED points by applying these systems. The systems, which can simultaneously cool some zones while heating others, have many benefits. For LEED certification, VRF systems can contribute a great number of points in the Energy & Atmosphere (EA) and Indoor Environmental Quality (IEQ) categories in the following LEED ratings: new
Construction and Major Renovations; Core and Shell Development; Existing Buildings; Schools (new and renovation); and Retail (new and renovation).

(IS-2013-289) Integrated workplace management – build a business case for IWMS software
This report from IBM discusses what a business case is and the tools and strategies for developing a business case and gaining approval. It also provides principles and guidelines for helping take your business proposition and derive the benefits outlined in your value proposition.

This paper addresses the various types of M&V plans typically used for evaluating lighting systems, the benefits provided from these plans, along with the implementation of an M&V system. Measurement and Verification (sometimes referred to as M&V) is the process used to track the performance of a piece of equipment, a system, or an entire facility. M&V plans have become an essential component of many LEED® projects as well as many federal, state and local public energy projects. M&V is used to assure that projected savings occur, to identify opportunities that might impact greater efficiency, and as a means for quantifying and reporting emission reductions.

This paper presents an overview of the principles of personnel identification and describes the basic elements and procedures used in security systems. As new technologies such as biometric identification and remote management of security data become more widely available, traditional card-and-gaurd security is being supplanted by security systems that can provide positive identification and tracking of human activity in and around the data center. Before investing in equipment, IT managers must carefully evaluate their specific security needs and determine the most appropriate and cost-effective security measures for their facility.

(IS-2013-286) Meeting of the Minds 2013
This report from Urban Age Institute provides an overview of their annual “Meeting of the Minds” for 2013.

(IS-2013-285) A Quantitative Comparison of High Efficiency AC vs. DC Power Distribution for Data Centers
This paper presents a detailed quantitative efficiency comparison between the most efficient DC and AC power distribution methods, including an analysis of the effects of power distribution efficiency on the cooling power requirement and on total electrical consumption. The latest high efficiency AC and DC power distribution architectures are shown to have virtually the same efficiency, suggesting that a move to a DC-based architecture is unwarranted on the basis of efficiency.
(IS-2013-284) Are you Listening to Your CMMS
This report from Eagle Technology, Inc., a developer of computerized maintenance management solutions (CMMS) and enterprise asset management (EAM) for the worldwide facility market, examines the importance of listening to your CMMS. They claim that: “CMMS reports and KPI (Key Performance Indicator) functions allow you to turn data into valuable information for improved strategic decision-making and planning across all organizational levels. Tracking rising repair trends for equipment can help anticipate asset “end of life” and build asset replacement costs into strategic maintenance budget planning.”

(IS-2013-283) How Data Center Infrastructure Management Software Improves Planning and Cuts Operational Costs
This paper demonstrates, through a series of examples, how data center infrastructure management (DCIM) software tools can simplify operational processes, cut costs, and speed up information delivery.

(IS-2013-282) OPC UA Security
This report from MatrikonOPC provides an overview of the OPC UA security, and addresses concerns that users may have. The OPC UA specifications, profiles and certification process provide users strong security foundations that incorporate the use of encryption for confidentiality and signatures for source authentication and integrity. This allows asset owners to secure OPC UA client / server communication using the protocol itself rather than add-on security.

(IS-2013-281) Monetization of the Connected Home Landmark Research Executive Summary
The Continental Automated Buildings Association, through its Connected Home Council, undertook a collaborative research study entitled “Monetization of Connected Homes.” The purpose of the landmark study was to improve understanding of consumer attitudes towards home automation, to explore business models currently in use by select industry participants and importantly, to identify areas of potential for maximizing profit.

The core objective of the “Life Cycle Costing of Intelligent Buildings” research report is to identify what needs to be done, and by whom, to make life cycle costing a mainstream criteria for building system evaluation in North America. Life cycle costs analysis calculates the cost of a building system over its entire life span. The process allows commercial property owners and operators to analyze the long-term impact of construction processes and infrastructure costs on forecasted operational costs throughout the expected life of a building. CABA’s research project identifies the barriers to adopting life cycle costing and determines what issues need to be rectified in order to make life cycle cost processes more understandable.
(IS-2013-279) Life Cycle Costing of Intelligent Buildings Landmark Research Presentation
The core objective of the “Life Cycle Costing of Intelligent Buildings” research report is to identify what needs to be done, and by whom, to make life cycle costing a mainstream criteria for building system evaluation in North America. Life cycle costs analysis calculates the cost of a building system over its entire life span. The process allows commercial property owners and operators to analyze the long-term impact of construction processes and infrastructure costs on forecasted operational costs throughout the expected life of a building. CABA’s research project identifies the barriers to adopting life cycle costing and determines what issues need to be rectified in order to make life cycle cost processes more understandable.

(IS-2013-278) EVIDENCE-BASED DESIGN AND OPERATIONS PIER PROGRAM
This report presents the results of the Evidence-based Design and Operations Research Program led by New Buildings Institute from 2008-2013. The Program included four technical projects for commercial buildings. The objective of the first project was to develop feedback tools for designers, operators/owners and tenants as aides to reduce building energy use. These tools feature new and unique data analysis capabilities. The other projects included: field measurement to quantify and estimate potential plug load energy savings, validating computer simulation for skylight systems evaluation, and developing a method and software to evaluate rooftop heating and cooling units fault detection and diagnostic protocols.

(IS-2013-277) Key Performance Indicators and Analysis for Commercial Buildings with System Level Data
This report describes New Buildings Institute’s (NBI) investigation of metered performance indicators (KPIs) for commercial building energy use. This report summarizes the installation of additional system level metering downstream of whole building meters to investigate what KPIs can be observed and benchmarked, what they indicate, and how energy performance reviews can be enhanced while still using only limited additional metering. The findings show that calculated system level KPIs can provide an orderly way to better define superior or inferior performance of certain aspects of design, operations or occupant behaviors.

(IS-2013-276) Getting to Zero 2012 Status Update
In this first status report on Zero Energy Commercial Buildings, New Buildings Institute (NBI) gathered information to determine characteristics, costs, and features of Zero Energy Buildings (ZEBs) recently constructed in the United States. ZEBs (also called Net Zero or Zero Net Energy Buildings) have garnered attention over the last few years as a focus of some voluntary programs and public policy, most notably on the Pacific coast. Buildings constructed related to these efforts (the Living Building Challenge, for example) are just beginning to emerge.
(IS-2013-275) Title 24-2013 Language and Explanation of the Mandatory HVAC FDD Requirement
This is Appendix A-5 of the NBI PIER Final Report. The initial PIER FDD project goal was to develop and submit an FDD prescriptive measure to Title 24. At the same time, a parallel project with a similar goal was initiated by the utilities Codes and Standards Enhancement (CASE) program. The PIER and CASE research teams joined forces to fully collaborate all the way through the Title 24 measure development process.

(IS-2013-274) Methodology for Reporting Commercial Plug Load
NBI has conducted research on the energy use characteristics of plug loads in office spaces and other commercial buildings to provide a greater level of information to those seeking methods and programs for reducing plug loads. As described in this guide, the outcome of NBI’s research provides building designers, real estate personnel and utilities with two fundamental ways for expressing energy use characteristics for commercial plug loads: (1) Plug Load Equipment Power Density (EPD) and Schedule and (2) Plug Load Summary Metrics. Using data from past projects, this guide includes preliminary ranges for high, median, and low calculations of the metrics and EPD and Schedule. Lastly, the guide includes a summary of references for metering and monitoring equipment and project management.

This paper presents a set of 15 best practices for owners, designers, and construction teams to reach high-performance goals while maintaining a competitive budget. They are based on the recent experiences of the owner and design-build team for the RSF, which show that achieving this outcome requires each key integrated team member to understand their opportunities to control capital costs.

(IS-2013-272) Introduction to U.S. Policies to Improve Industrial Efficiency
This report summarizes many of the major efforts, but also includes summaries of less high profile efforts. This study was written with two audiences in mind. First, it was commissioned by the Energy Foundation China Sustainable Energy Program so that Chinese policymakers and energy efficiency practitioners can learn more about U.S. energy efficiency programs and policies, allowing them to learn from what the U.S. has been and is doing, helping to inform discussions about appropriate programs and policies for China. Second, it is designed to serve as an "Industrial Energy Efficiency Policy 101" introduction for Americans who are new to the energy efficiency field and could benefit from a quick tutorial on many of the major programs.
**The Growth of 100G Optical Fiber**
This report from cisco examines the evolution to 100G transport networks. According to cisco “the evolution to 100G transport networks is underway and gathering momentum. The need for greater bandwidth is not a novelty for today’s telecommunications operators, although the rate at which demand is accelerating is challenging to manage. With 100G solutions, however, the real difference seems to be the demand, not just for throughput, but for demonstrably superior performance that will allow operators to offer services that are truly differentiated on quality of experience. Operators clearly believe this will be something for which their enterprise and cloud customers will pay, and are therefore prepared to pay for it themselves.”

**Plug Load Best Practices Guide**
This report from nbi examines plug loads and how to maximize energy efficiency. They claim that “one of the most significant steps you can take to reduce your office plug loads is to better manage your computer server rooms.” It then provides 5 steps to managing plug load energy use in offices.

**Sensitivity Analysis**
The goal of this study is to compare the magnitude of energy impact that modifications to design, operation and tenant behavior characteristics have on total building energy use. The DOE/NREL mid-size office prototype1 was used as a representative building type for this analysis. A set of 28 distinct building features was identified representing physical and operational characteristics of buildings that affect total building energy use. For each characteristic, a range of performance values was identified representing poor, baseline and good practice with respect to building energy performance. The impact on total building energy use was evaluated as each variable was modified from low to high performance individually, while all other characteristics were kept at the baseline performance level. Results of this analysis demonstrate that building operating strategies and tenant behavior represent significant impacts on building energy use.

**Rooftop HVAC Fault Detection and Diagnostics: Technology and Market Review Energy and Demand Savings Estimates**
In this report from nbi they identify nine different potential approaches to prioritizing FDD tools, depending on the type of data collected (air side, refrigerant side, or electrical) and the type of model used for comparison with measurements (first principles, qualitative, history). They also identify the specific criteria that must be met to have a measure that is appropriate for inclusion in Title 24. These criteria include significant energy savings, cost effectiveness, prevalence of the fault being detected, probability that the fault will be fixed, reliability of detection, deployability, and other maintenance benefits.
(IS-2013-267) Building for our future
Buildings for Our Future first explores the mitigation potential from buildings in China, European Union, India and the United States and provides an overview of the analysis of the array of policy options used to improve the energy performance of buildings in these regions. The key issues that influence the way forward are then presented. Finally, the report provides instruction for drawing up roadmaps for the design and implementation of a Deep Path aiming to realize the building sector’s significant mitigation potential.

(IS-2013-266) IBM Smart Cloud Home
This report from IBM provides recommendations for the future of the connected home. IBM has proposed a new way to look at connected home services; one that leverages a cloud-based platform. The delivery and management of services are consolidated over a common IP connection to the consumer’s home. Integration of services, because it takes place in the cloud, avoids the complexity that results when consumers are expected to integrate smart home components at the residence.

(IS-2013-265) Back-Office Automation is key to Broadband Profits
This report from ETI examines how the “ETI Triad” helped when Frontier Communications purchased Verizon assets in several states, and it found that integrating them was a challenge. In 2010, Frontier Communications acquired from Verizon nearly 200,000 customers, 8,000 new staff members and a complex array of legacy Verizon billing and back-office systems. To minimize its costs, Frontier agreed to lease the Verizon systems for only a short time. Its challenge was, in the time allotted, to successfully take full control of billing, provisioning and monitoring these customers with as little disruption as possible to the customers, their services or Frontier’s cash flow. This was a steep mountain to climb in a very short time. With help from ETI Software Solutions, Frontier accomplished this task within the allotted time and under budget.

(IS-2013-264) Financing for Multi-Tenant Building Efficiency: Why This Market Is Underserved and What Can Be Done to Reach It
The purpose of this report is to provide an in-depth look at the barriers and potential solutions to energy efficiency investment in commercial leased space markets including office and some discussion of multifamily subsectors in the United States. They then provide a description of the commercial real estate market in the United States, detailing different types of owner/manager/tenant models and their particular barriers to providing attractive energy efficiency financing within the underserved subsectors. Next, they examine the role of traditional financing and explore how energy efficiency-specific financing mechanisms that have been growing in popularity such as
ESCO financing, performance contracting, PACE, and on-bill financing address or fail to address the barriers described. It concludes with a brief discussion on driving demand of efficiency projects.

(IS-2013-263) Outsourced Smart Grid Services: A Smart Approach for AMI and Beyond
This report from Landis+Gyr examines the outsourcing of smart grid services and begs the question: could your utility improve efficiency and performance with third-party services? They claim that often, the day-to-day management of AMI systems is as challenging as their implementation, and instead of hiring and training new staff, many utilities are considering the value of outsourced services.

(IS-2013-262) 2013 Cyber Security Study
This report provides the 2013 cyber security study results. Forty-seven percent of surveyed organizations have suffered a cyber-attack in the past year. The report looks into how prepared organizations truly are against cyber attacks, as well as the impact of such an attack, and provides some preventative measures.

(IS-2013-261) Transportation — Industrial Freight Transportation
This SD Business Case focuses on the environmental, economic and social impacts of the Canadian industrial freight transportation sector. It addresses the potential introduction of sustainable technology and infrastructure to counter the negative impacts associated with energy consumption such as greenhouse gas (GHG) and criteria air contaminant (CAC) emissions, as well as impacts related to soil and water quality.

(IS-2013-260) Saving Water and Energy Together: Helping Utilities Build Better Programs
Although there are examples of collaboration going back to the early 1990s, experience with jointly run water and energy efficiency programs has been relatively limited. However, there are several program areas where collaboration can be mutually beneficial and should be more fully implemented. The program types profiled here are good recent examples in the residential, commercial, industrial, agricultural, and municipal (water/wastewater) sectors, all with several promising models for joint water and energy utility-run programs.

(IS-2013-259) HOUSING FOR OLDER CANADIANS: The Definitive Guide to the Over-55 Market
This final volume in the series reviews the principles for providing services and amenities within housing developments, as well as the range of options for partnering with public- or private-sector providers that specialize in the management and/or delivery of services to older Canadians. This volume will therefore be of particular interest to developers and project sponsors who are focusing specifically on the market segments where services and amenities have a major bearing on the decision to move into a retirement community or nursing home.
(IS-2013-258) Cost of Connectivity 2013 Data Release
Last year, the New America Foundation’s Open Technology Institute published The Cost of Connectivity, a first-of-its-kind study of the cost of consumer broadband services in 22 cities around the world.\(^1\) The results showed that, in comparison to their international peers, Americans in major cities such as New York, Los Angeles, and Washington, DC are paying higher prices for slower Internet service. While the plans and prices have been updated in the intervening year, the 2013 data shows little progress, reflecting remarkably similar trends to what we observed in 2012. The new data underscores the extent to which U.S. cities lag behind cities around the world, further emphasizing the need for policy reform.

(IS-2013-257) Renewable Biofuels
This report presents the “Biofuels Investment Report”, which is one in a series on the current state of sustainable development and future investment priorities in Canada. This report is the result of collaboration from a wide range of stakeholders. It is based on reports, studies, and research findings by various industry associations and government initiatives.

(IS-2013-256) Renewable Fuels - Hydrogen
This report presents the “Hydrogen Production and Purification Investment Report”, which is one in a series on the current state of sustainable development and future investment priorities in Canada. This report is the result of collaboration from a wide range of stakeholders. It is based on reports, studies, and research findings by various industry associations and government initiatives.

(IS-2013-255) EcoEfficiency – Buildings
This SD Business Case report focuses on impacts of resource utilization in the operation of commercial/institutional buildings in Canada. It examines building characteristics (location, size and operations) and identifies the direct and enabling technologies that can help create more sustainable buildings in both the existing and future building stock.

(IS-2013-254) Resilience and Cyber Security of Technology in the Built Environment
The purpose of this technical briefing is to inform professionals involved in the development and operation of intelligent or smart buildings about the resilience and cyber security issues that arise from a convergence of the technical infrastructure and computer-based systems as those systems become interconnected with the global network that comprises cyberspace. This document is not intended to address the physical hardening of buildings to protect against specific physical threats such as earthquakes, weather or blast. The document examines
different sources of threats across the building life cycle from initial concept through to decommissioning. It considers potential threat agents that could cause or contribute to a cyber security incident and identifies some of the measures that may be appropriate to reduce the risks.

(IS-2013-253) Harbor Glassbeam Final October 2013
This report from Glassbeam examines how machine communications and the "Internet of Things" are combining to create new modes of asset awareness, intelligence, support and decision-making. In its simplest form, the Internet of Things is a concept in which inputs—from machines, sensors, people, video streams, maps and more—is digitized and placed onto networks. These inputs are integrated into Smart Systems that connect people, processes, and knowledge to enable collective awareness, efficiencies and better decision making.

On the basis of these national plans, the European Commission is required to publish a report on the progress of Member States, by December 2012 and every three years thereafter (Article 9(5)). This first report is largely based on the information contained in the national plans for NZEBs (nearly zero energy buildings) submitted by 8 Member States (BE, DK, CY, FI, LT, NL, SE and UK) as of the end of November 2012. In the meantime, six other Member States (BG, DE, FR, HU, IE and SK) have sent in their plans but these have not been taken into account in the analysis. In addition, for the Member States that did not provide an official national plan, information on their progress was drawn from their second National Energy Efficiency Action Plans (NEEAPs), where such information was available.

(IS-2013-251) The Forrester Wave: File Sync And Share Platforms, Q3 2013
In Forrester’s 26-criteria evaluation of file sync and share vendors, we identified, researched, analyzed, and scored products from the 16 most significant solution providers in this market. They scored factors like mobile support, security, links to systems of record, organizational commitment, market experience, and deployment architecture to give you the decision tools to create the right shortlist for your particular environment and scenarios. This report and accompanying spreadsheet detail our findings about how well each vendor scores based on our criteria and where they stand in relation to each other.

(IS-2013-250) Crossing the Sustainability Chasm
A 2010 study by Gartner, in collaboration with TRIRIGA, Inc. (acquired by IBM in April 2011), surveyed 130 professionals responsible for the planning and implementation of sustainability initiatives at large corporations and public sector organizations. IBM completed a thorough analysis of these survey results and found that while most
large organizations measure energy and environmental performance, barely a third have "crossed the sustainability chasm" and actually achieved their sustainability objectives.

**(IS-2013-249) Results-Based Regulation: A Modern Approach to Modernize the Grid**
The goal of this paper is to advance conversations on the design of forward-looking regulatory models that can meet today’s challenges. It examines the benefits of modernizing the power grid, the development and limitations of cost of service regulation, the incentives provided by alternative approaches to regulation, and how a results-driven regulatory model could support the transition to an efficient, reliable, and sustainable power system.

**(IS-2013-248) REDEX Case Study 2013**
This report from OSCRE examines their “Portfolio Management Reporting Standard”, which may revolutionize analytics for real Estate investment in the Netherlands. The property, lease and financial data collected by CBRE Global Investors is derived from their property managers. Before the implementation of the REDEX platform, CBRE Global Investors’ asset management process consisted of compiling information from the monthly reports submitted to them by their property managers.

**(IS-2013-247) New Needs, New Models: How growth and innovation are changing the way Asia Pacific organizations acquire technology**
This report examines two key trends that are converging to change the way Asia Pacific organizations approach information and communications technology (ICT) procurement. To understand how these trends are impacting technology procurement, in 2012 Cisco Capital commissioned Forrester Consulting, an independent global research and advisory firm, to conduct a survey of 330 key decision makers at organizations in Australia, China and India. The published results of this survey, ‘Financing in the Current Macro Economic Environment’, are the source for all charts in this industry insight paper. In addition to the research findings, this industry insight paper provides recommendations for taking a more strategic approach to ICT acquisition and for choosing the right financing provider.

**(IS-2013-246) The role of micro CHP in a smart energy world**
The report goes on to set out a commercialization roadmap for mCHP. It highlights the potential of individual and clustered mCHP as a heating solution in new or existing buildings, where it can integrate with legacy heating systems. It also elaborates on the potential of the technology as a grid support mechanism to cope with capacity constraints and short-term spikes in demand and meet the electrical requirements of other new technologies which require electricity such as electric vehicles and heat pumps. The report concludes by proposing elements for a support plan to capture the diverse advantages of the technology for the energy system.
(IS-2013-245) 380 Vdc Architectures for the Modern Data Center
This paper presents an overview of the case for the application of 380 Vdc as a vehicle for optimization and simplification of the critical electrical system in the modern data center. Specifically, this paper presents currently available architectures consistent with ANSI/BICSI 002-2011 and the EMerge Alliance Data/Telecom Center Standard Version 1.0.

In Forrester’s 38-criteria evaluation of the cloud strategies of online collaboration software vendors, they identified eight significant collaboration services providers — Box, Cisco Systems, Citrix Online, Google, IBM, Microsoft, salesforce.com, and Yammer — in the category and researched, analyzed, and scored them. This report details our findings about how well each vendor fulfills our criteria for constructing an online collaboration service and where they stand in relation to each other.

(IS-2013-243) Engineering a Smarter Grid
This report from Texas Instruments examines the smart grid, and proposes several possible improvements. Their solutions include: Smart Electricity Meters; Smart Gas, Water and Heat Meters; Smart Buildings and IoT; Communication

(IS-2013-242) The Impact of Cloud on IT Consumption Models
This report from Intel examines the impact of cloud on IT consumption models. Their respondents foresee both growing influence of LOBs as well as a leadership role for IT. They also anticipate a greater focus on metrics such as return on investment, and, ultimately, on improved business outcomes.

The intent of this report is to identify strategic, actionable opportunities for Mississippi to consider to expand and perpetuate its energy efficiency efforts for the benefit of all Mississippians. Their analysis estimates the potential for a suite of policies and programs to capture untapped energy efficiency resources that exist in Mississippi in order to spur economic development in the state. This report responds to two primary needs: the identification by Governor Phil Bryant in his energy plan of the need for a statewide energy efficiency assessment, and secondly to offer strategic guidance and insights to the MPSC, utilities, and other key stakeholders during the continued development and implementation of the new energy efficiency rules.
Delivering the internal electricity market and making the most of public intervention
This Communication assesses the main features of public interventions to correct market failures. It shows how they can be designed or respectively adapted in order to increase their effectiveness. The Communication presents the principles and direction of changes for discussion, in which in the Commission's view, the design of public interventions should further develop. Although the focus of the Communication is on public interventions in electricity sector the principles established might be applied as well in other energy sectors e.g. in transport and heating.

Smart Grid Economic and Environmental Benefits
This review aims to help these stakeholders determine what U.S. consumers can realistically expect to receive relative to Smart Grid investment for their money based on demonstrated experience. It has been specifically developed to help stakeholders understand: exactly how Smart Grid capabilities create value relative to a traditional grid; the size of the various benefits (economic, reliability, environmental, and customer choice) as supported by available research; the key drivers of these benefits; the costs typically incurred to create those benefits, expressed “per customer” whenever possible.

Smart Grid – 2013 Global Impact Report
This report presents the first global view into the impact of smart grid. This report aims to help utilities benchmark their existing and planned smart grid projects and learn from the best practices used by leading utilities around the world. The report focuses on five pillars or goals based around delivering returns against some of the biggest challenges faced by smart grids.

Methodology for Reporting Commercial Office Plug Load Energy Use
This guide provides building designers, real estate personnel and utilities with two fundamental ways for expressing energy use characteristics for commercial plug loads: (1) Plug Load Equipment Power Density (EPD) and Schedule and (2) Plug Load Summary Metrics. Using data from past projects, this guide includes preliminary ranges for high, median, and low calculations of the metrics and EPD and Schedule. Lastly, the guide includes a summary of references for metering and monitoring equipment and project management.

Electric Vehicle Consumer Survey
In order to better understand consumer attitudes toward BEVs (battery electric vehicles) and PHEVs (plug-in hybrid electric vehicles), Navigant Research conducted a web-based survey of 1,084 consumers in the United States. The survey was executed in the fall of 2013 using a nationally representative and demographically balanced sample. The key findings of this survey are summarized in this report.
(IS-2013-235) Case Study: Analyzing Plug Loads
In this report, PECI and NBI study the plug loads in PECI’s headquarters, which occupy three floors of a LEED® Platinum office building in Portland, Oregon. They developed an inventory of their plug load equipment and analyzed equipment-level data to examine what was contributing to high overnight energy use.

This report from Lawrence Berkeley National Laboratory projects the costs and benefits of spending on energy efficiency programs (excluding load management) through 2025. Spending is expected to double from 2010 levels and to be distributed throughout the United States. Now such programs are more concentrated in the Northeast and West. These projections are based on current government and utilities policies. State-by-state programs for electricity and gas are reviewed.

(IS-2013-233) Can you image the urban building of the future?
This report from Foresight predicts features of intelligent buildings expected by 2050. Such buildings will adapt in real-time to the environment and to the occupants. The technology will be based on the Internet of Things. Such buildings may generate electricity with solar cells, produce bio-fuels for transportation, and include food production. Building materials are manufactured onsite.

This report from the American Council for an Energy-Efficient Economy describes the progress in the United States toward energy efficiency. As of 2012 the U.S. ranked ninth among the 12 largest economies in energy efficiency. The U.S. ranked low in mandatory energy efficiency standards, combined heat and power, energy intensity of freight transport, use of public transit. The report concludes that more aggressive policies and programs are needed.

(IS-2013-231) Plug Load Savings Assessment: Part of the Evidence-based Design and Operations PIER Program
This report from the New Buildings Institute prepared for the California Energy Commission examines electricity consumption by office equipment and opportunities for savings. This is part of a study about why some new buildings are performing below expected efficiency levels. Office equipment consumes 13% of building energy and 23% of office energy. Solutions are recommended such as power management, smart power strips that
reduce standby power, reminders to users about saving energy, and future purchases of equipment that is more energy efficient. Savings of 19-40% for office equipment are projected.

(IS-2013-230) A Search for Deep Energy Savings
This report from New Buildings Institute, Northwest Energy Efficiency Alliance, and Preservation Green Lab explores techniques used in retrofitting buildings to achieve energy savings of more than 30%. 50 of 500 buildings studied achieved this level of savings; nine buildings achieved more than 50% savings. All of these buildings use high efficiency lighting and most integrate day lighting. Integrated design, multiple measures, and monitoring are more important than any specific technology.

(IS-2013-229) Net Zero by 2030: Where do we stand with the policies, programs and projects necessary to achieve this goal?
This report from the New Buildings Institute examines characteristics of zero-energy buildings. These are buildings that consume no more energy than they generate over a span of a year. A study in 2012 found 21 such buildings with another 39 under construction. These buildings were in warm and cold climates in the U.S. Features of many of these buildings include the use of day lighting, occupancy-based controls, high-efficiency lighting, and a high-performance building envelope. The extra costs for achieving zero-energy were 3-18% above the baseline cost of the building. Proposals are included for encouraging more such buildings.

(IS-2013-228) Appliance Standards: Compared Predicted and Observed Prices
This report from the American Council for an Energy-Efficient Economy examines the impact of energy-efficiency regulations on the cost of appliances. Before rules are issued, the U.S. Department of Energy estimates the cost impact. This study found those estimates are up to 90% too high. In some cases, prices decreased. The report recommends that the Department of Energy reassess the method for assessing the impact of energy-efficiency regulations on appliance prices.

(IS-2013-227) Smart Home in a Box: A Large Scale Smart Home Deployment
This report introduces a research project at the Washington State University on smart houses. The project is called Smart House in a Box. The goal is to examine a home automation system appropriate for mass-market deployment. A trial involving 120 homes is described. The sensor and controller components were packaged in a large box that could be carried to each house for installation in under three hours. Data are being gathered from these installations.
(IS-2013-226) Where Will Value Be Created In The Internet of Things & People?
This report from Harbor Research examines business opportunities in networked sensors and smart devices. Profits from infrastructure components that support an Internet of Things are likely to decline. Profit opportunities are likely to grow in data management, analytics, and intelligence activities. Vendors serving niche markets with networked equipment are at risk.

(IS-2013-225) Energy Transparency in the Multifamily Housing Sector
This report from the Institute for Market Transformation proposes guidelines for measuring and disclosing building performance data for multifamily housing to improve programs for energy efficiency. Rules for disclosure are in effect in the European Union, China, Australia, two U.S. states (California and Washington), and a few U.S. cities. The potential benefits are unknown since such building data have not been available. Simple-to-understand disclosures are recommended for consumers. Improvements in energy efficiency may make multifamily residential housing more affordable.

(IS-2013-224) Analytics for Achievement
This report from IBM examines the growing rate of students around the world falling below the proficiency level. IBM claims that measuring and monitoring performance and understanding the factors at play in student achievement can help educators create the right conditions and design the most effective interventions for student success. They propose that "creating a roadmap to analytics is the first step in becoming a data-driven education organization. Analytics can help educators understand how their students are performing, why, and how to get better. Teachers can make the most of the time they have with students, and organizations can fine-tune methods to build on success. Students can fulfill their potential and make a meaningful contribution in their field of choice."

This analysis from the ACEEE evaluates the energy efficiency provisions in both the Shaheen-Portman and INCAAA bills, and finds that these bills, individually and combined, can reduce energy use, save consumers money, and support a significantly larger number of jobs than would be sustained without the energy efficiency improvements. This report discusses the national level impacts from these bills and describes the methodology used to estimate these impacts. The cumulative discounted net consumer savings (benefits minus costs) over the 2012–2030 period are estimated to be $59 billion for Shaheen-Portman, $11 billion for INCAAA, and $71 billion total. The benefit-cost ratio for the combined provisions is approximately 3:1. These two bills represent important pieces of energy efficiency legislation. However, policymakers should recognize that these bills are only an initial down-payment on needed policy steps to maximize use of cost-effective energy efficiency resources to benefit the U.S. economy.
(IS-2013-222) Harmonization of Pump Schemas with the ISO 15926 Reference Data Library
This document completes the deliverable for Tasks 1, 2, and 3 defined under the AEX/ISO 15926 Harmonization initiative as part of the Engineering Equipment Life-Cycle Application Tools (EELCAT) project. The objective of this initiative is to provide exploratory analysis of the work required to harmonize three technical activities: ISO 15926, AEX cfiXML, and the Hydraulic Institute’s EDE 50.7 standard. Each of these activities endeavors to facilitate efficient exchange of capital facility and engineering data in electronic format. However, they approach and solve these issues in different manners.

(IS-2013-221) BREEAM: ‘THE HARSH REALITY’
This paper proposes to review the BREEAM process in reality, looking at 3 live case studies from BREEAM Healthcare, Bespoke and Offices Assessment Types. The paper is written by a BRE Accredited Professional, who has experience in BREEAM assessments both as a designer and as an assessor, at grass roots level. The paper will discuss opportunities when utilizing BREEAM, and discuss whether it really does improve the building, or if credits are targeted purely as a cost effective box–ticking exercise. It may be that the harsh realities of the construction industry mean corners are cut and the refinement of BREEAM is lost on site. This paper therefore proposes to examine the benefits, the negatives, and the realities of using BREEAM on the three aforementioned sites, from an independent perspective.

(IS-2013-220) Enabling a mobile workforce with IBM Cognos solutions
This brief from IBM describes how Cognos software addresses the challenges of the mobile workforce by providing BI to the growing community of mobile users. According to IBM, Cognos solutions for the mobile workforce were designed for users who need to interact with, analyze and share Cognos Business Intelligence content wherever they are. With these solutions, IT can take advantage of authoring skill sets and eliminate duplicate efforts to support the mobile workforce, ensuring that the right information gets to the right people on the go and that corporate information on the device is secure.

(IS-2013-219) Building Operator Scoping Study
The Building Operator Scoping Study examined the current labour market of building operators in the commercial and institutional sectors with the goals of defining the occupation and identifying mechanisms to assist building operators in adapting to the requirements of a sustainably built and operated environment. The research identified a number of challenges and gaps within the building operator profession which should be addressed in order to build a strong, qualified and valued workforce for the future. These challenges include a lack of consistent definitions, professional qualifications and standards, as well as gaps in training and education, and human
resource practices. Addressing these challenges will enhance the value of building operators by preparing them to operate high performing buildings in the present and future.

(IS-2013-218) E2BA has launched the validation phase for its new research and innovation roadmap towards Horizon 2020
This report from ECTP and E2B announces that after the public consultation open from July to early October, the final version of the Energy-efficient Buildings PPP roadmap beyond 2013 is now available for final validation. It also provides a link to the final document.

(IS-2013-217) Tracking The Sun V
The report from Berkeley labs describes installed price trends for residential and commercial PV systems, and another set of trends for utility-scale PV. In all cases, installed prices are identified in terms of real 2011 dollars per installed watt (DC-STC), prior to receipt of any direct financial incentives or tax credits.

(IS-2013-216) Mobile Payment: Stepping Into Uncharted Territory
This report from Parks Associates examines the current state of mobile payment. They analyze near- and long-term growth prospects of the multiple markets covered by the mobile payments umbrella.

(IS-2013-215) Trends in gaming: free-to-play, social and mobile games
This report from Parks Associates examines video games, focusing on mobile phones and free-to-play. Parks Associates' study Online Gaming and Digital Distribution found that an astounding number of people in the U.S. play some kind of videogame on a regular basis. 135 MILLION PEOPLE play at least one hour of games per month (compared to 56 million in 2008).

(IS-2013-214) Public Procurement and the Private Supply of Green Buildings
This report from Timothy Simcoe and Michael W. Toffel measures the impact of municipal policies requiring governments to construct green buildings on private-sector adoption of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) standard. Using matching methods, panel data, and instrumental variables, they found that government procurement rules produce spillover effects that stimulate both private-sector adoption of the LEED standard and supplier investments in green building expertise. Their findings suggest that government procurement policies can accelerate the diffusion of new environmental standards that require coordinated complementary investments by various types of private adopters.
This white paper from Pike Research outlines key opportunities and challenges afforded by the evolving smart grid landscape and competing DER control approaches – including the digital energy network. It also presents Pike Research’s market capacity and revenue forecasts for micro grids, DR, and VPPs.

(IS-2013-212) An Operating System for the Home
This report from Microsoft Research examines their HomeOS platform. Network devices for the home such as remotely controllable locks, lights, thermostats, cameras, and motion sensors are now readily available and inexpensive. In theory, this enables scenarios like remotely monitoring cameras from a smartphone or customizing climate control based on occupancy patterns. HomeOS presents network devices as peripherals with abstract interfaces, enables cross-device tasks via applications written against these interfaces, and gives users a management interface designed for the home environment.

(IS-2013-211) A technological roadmap for low carbon
This report presents the ideas generated by the Equinox Summit: Energy 2030 participants and contribute their findings to the evolving, global conversation. They claim that it will take many decades to develop more sustainable ways of meeting growing energy demand all around the world. But as Summit organizers and participants appreciate, the historical track record of scientific and technological achievements in advancing civilization provides us with the strong motivation to look ahead and leverage science-first thinking in our approach to a lower carbon, electrified future.

(IS-2013-210) Friend or Foe – energy service companies and the electric distribution industry
This study was intended to describe the energy service company (ESCO) industry and identify best practices for distributor-ESCO relationships, including how you can best negotiate relationships with the different types of ESCOs. The findings of this research establish that the ESCO industry is large and growing. Further, it identifies opportunities to secure more energy efficiency retrofit work through either partnerships with ESCOs or by working independently, though both approaches carry risk and must be carefully assessed. This report identifies specific recommendations to help them assess that risk and secure positive and profitable working relationships with ESCOs.

(IS-2013-209) Trends in Mobile Research
This study from Confirmit examines recent trends in mobile research. They claim that the ‘mobile voice’ provides a key component to many “Voice of the Customer” programs. Its immediacy and accuracy augment other feedback channels - such as Web, telephone and paper – and enable consumer-focused businesses to build a clear picture
of the experiences they offer at every stage of the customer lifecycle. By reporting on all these channels in a single view, you can react tactically to resolve issues and build your reputation, while driving strategic decision making that will support growth in the long term.

(IS-2013-208) Answers to Energy Efficiency Challenges in Buildings
This policy paper from the DTES Generalitat of Catalonia and the Mediterranean highlights the importance of the improvement of the Energy Efficiency (EE) in the existing buildings in the Mediterranean. It considers both energy efficiency policies and territorial cooperation, trying to pave the way for an empowerment of them as central topics at the next programming period operational programs. It also aims to reinforce the linkage between territorial cooperation initiatives on energy efficiency, public policies and access to new sources of funding.

(IS-2013-207) Economic Impacts of Advanced Energy
This analysis provides a comprehensive quantification of advanced energy today. However, the result must be viewed as a conservative assessment, for though this may be the most comprehensive study available to date, it is not necessarily complete. Identified sub segments or product categories that have not been independently studied by Pike Research or Navigant Consulting are not included, leading the size of some segments, such as the Industry segment, to be significantly understated. The market revenue for most sub segments is based on the total installed cost of the technology. However, some sub segments only measure vendor revenue from equipment sales, while others exclude revenue from multiyear projects still in development. Operations and maintenance revenue is likewise not included, nor are refurbishments. In addition, a few identified sub segments may have significant economic impact, but are not easily measured as distinct markets and are considered here only qualitatively. Finally, the economic impact in the United States includes only the domestic content provided into the U.S. advanced energy markets, not the positive impacts associated with U.S. exports into similar global markets. The opportunity remains for additional studies to complete and expand this assessment of advanced energy.

(IS-2013-206) HomePlug AV White Paper
In this paper, an overview of HomePlug AV has been presented. An overview of the architecture and some details of each of the functional blocks have been presented. In order to get complete details and access the specification, any company may join the HomePlug Alliance.

(IS-2013-205) HomePlug AV2 Technology
This report from HomePlug examines their AV2. According to HomePlug, “HomePlug AV2 provides a major step forward in high-bandwidth capabilities and interoperability for cost-effective “no new wires” networking that
supports HD / 3D video and other bandwidth-hungry applications by leveraging existing power line wiring throughout the whole home. HomePlug AV2 maintains full interoperability with HomePlug Alliance's other connected home technologies (HomePlug AV & HomePlug Green PHY) in order to facilitate a simple migration to next generation HomePlug Certified products. This is a key benefit as HomePlug Certified products are already found in millions of consumers' homes and widely available worldwide from service providers and retail stores.”

The report includes legislative and regulatory background for every state where an EERS policy has been in place for over two years and examines the progress these states have made achieving their goals. Tracking actual energy savings and comparing these results with the required targets, the analysis develops a comprehensive portrait of the performance of twenty states, noting important trends influencing the outcomes thus far. The report finds that states' performance meeting energy savings targets is driven by issues such as the clarity and appropriateness of the regulatory framework, the length of time allowed for program administrators to ramp-up programs, and the overall commitment of all parties to invest the proper resources to meet targets.

This report focuses on one mechanism for attempting to address this problem, a "lost revenue adjustment mechanism" (LRAM). Their focus is to provide information about LRAMs and catalog recent experience with this policy tool. They review these experiences and discuss the pros and cons associated with this approach.

(IS-2013-202) RATING THE ENVIRONMENTAL IMPACTS OF MOTOR VEHICLES: ACEEE’S GREEN BOOK METHODOLOGY, 2011 EDITION
This report covers the data issues, key assumptions, and analysis methods used to develop the vehicle ratings for ACEEE's Green Book®. It summarizes the application of the methodology to the 2011 model year (MY), highlighting results for major classes and technology types, and identifies research needs for updating and refining the methodology.

This report reflects conversations with over 50 individual CHP developers, supporters, state energy officials, public service commission employees, and managers of utility and public benefit efficiency programs. The second half of the report profiles individual states, highlighting the unique CHP environments of each. A key finding of this research is that, while there are some unique regulatory barriers in each state, CHP suffers generally from its high upfront cost, inexpensive and widely available electricity, and a lack of prioritization by regulators in all capacities.
(IS-2013-200) Network Registrar Data Backup and Recovery Strategies
This document from Cisco provides an overview of Network Registrar databases used for: DHCP lease storage; DNS authoritative data; CCM configuration management. This document presents different backup and recovery strategies for each type of data, based on operational considerations.

This report examines state efforts and experiences with financial incentives for encouraging investor-owned utilities (IOUs) to provide effective energy efficiency programs for their customers. Two fundamental impediments to improving efficiency in the IOU sector include the existence of: 1) A disincentive to using energy efficiency programs to reduce customer energy consumption because utility revenues will also be reduced. 2) A lack of incentive to spend money on programs to improve customer energy efficiency as compared to making investments in new utility facilities and equipment.

(IS-2013-198) IBM System x Hyper-V Private Cloud Solution
This report from IBM examines their "IBM® System x® Private Cloud offering (PCO)". PCO combines high-quality servers and networking hardware with the robust tools and software to create an innovative, comprehensive, usable cloud-computing offering. Microsoft software Hyper-V™ Cloud Fast Track provides the latest in virtualization and cloud management software and Brocade Top-of-Rack switches and adapters complete the datacenter connectivity.

(IS-2013-197) Evaluating MPLS security and compliance
This report from Bell examines Multi-Protocol Label Switching. In response to growing bandwidth demands in their corporate networks, many companies are evaluating the merits of a Multi-Protocol Label Switching (MPLS) network. While MPLS services offer a powerful solution for managing the network traffic of new unified communications applications like video conferencing, they also raise important security and compliance considerations for organizations because a third-party service provider now has control over some network security functions.

(IS-2013-196) Texas Gap Analysis
The purpose of the Texas Gap Analysis Report is twofold: 1) document and analyze the strengths and weaknesses of the state’s existing energy code adoption and implementation infrastructure and policies; 2) recommend potential actions state agencies, local jurisdictions, and other stakeholders can take to achieve 100 %
compliance with the model energy codes. The report is organized into four sections: Introduction, Adoption, Implementation, and Conclusion.

(IS-2013-195) APPLIANCE AND EQUIPMENT EFFICIENCY STANDARDS: A MONEYMAKER AND JOB CREATOR
This study estimates net employment and wage impacts of U.S appliance, equipment, and lighting efficiency standards. These standards are a key part of the United States' energy policy, and their contributions to energy and economic savings for consumers and the broader economy is well-documented in previous studies by the American Council for an Energy-Efficient Economy (ACEEE), the U.S. Department of Energy (DOE), and the Lawrence Berkeley National Laboratory (LNBL). But the macroeconomic impacts, like employment and wages, have only been examined for individual standards, and not comprehensively. In this analysis, ACEEE and the Appliance Standards Awareness Project (ASAP) have estimated the number of jobs created in the United States as a result of the standards already in place as of December 2010, most of the standards revisions DOE is now working on and will complete by 2013, and the consensus standards in pending legislation.

(IS-2013-194) ON-BILL FINANCING FOR ENERGY EFFICIENCY IMPROVEMENTS: A REVIEW OF CURRENT PROGRAM CHALLENGES, OPPORTUNITIES, AND BEST PRACTICES
Despite the benefits of energy efficiency investments, high upfront costs continue to be a significant barrier to leveraging retrofits to achieve potential monetary and energy savings across the building sector. On-bill financing is a financial mechanism that is in many ways uniquely positioned to reduce first-cost barriers in several building markets, some of which have traditionally been underserved by energy efficiency finance. On-bill financing generally refers to a financial product that is serviced by, or in partnership with, a utility company for energy efficiency improvements in a building, and repaid by the building owner on his or her monthly utility bill. Programs can be tailored to the industrial, commercial, and residential sectors.

(IS-2013-193) Appliance Standards Awareness Project
This report from ASAP examines the updated efficiency standards for refrigerators and freezers issued by the DOE. They present several key questions (and their answers) about the new standards, which will take effect in the fall of 2014.

(IS-2013-192) Connected education: Four strategies for transforming education in a connected world
This report from Dell examines connected education and presents what they deem the “four building blocks of educational success”. The four items are as follows: Increase access to global resources with a robust
infrastructure; Develop 21st century college and career readiness; Foster strong professional development and support professional learning communities; Ensure effective use of data and accountability.

(IS-2013-191) Draft Environmental Impact Statement
The National Highway Traffic Safety Administration (NHTSA) prepared this Environmental Impact Statement (EIS) to analyze and disclose the potential environmental impacts of the proposed model year (MY) 2017–2025 Corporate Average Fuel Economy (CAFE) Standards for passenger cars and light trucks (the Proposed Action). This document was prepared pursuant to Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) implementing regulations, U.S. Department of Transportation (DOT) Order 5610.1C, and NHTSA regulations.

(IS-2013-190) Requirements Recognition for Achieving Specification Automation
The research initiative entitled “Requirements Recognition for Achieving Specification Automation” was led by Carnegie Mellon University (CMU) and The Engineering Essentials Company (TEEC) as part of the Fiatech Specification Automation Project. It was initiated in order to improve the current manual specification-related processes and workflows by providing computerized assistance via semantically enriched specifications. Their approach will enable the authors of specifications to mark up specification texts and identify structural and semantic entities that are machine-interpretable, and can be used to improve current workflows.

(IS-2013-189) Guide to broadband investment
This document sets out best practice examples in planning an investment of public funds in broadband projects. The guidance provided is targeted at all Managing Authorities1 in the European Union (EU). The guide has been prepared by Analysys Mason on behalf of the European Commission (EC), and details the issues associated with investment planning and procurement that must be considered by any Managing Authority that is aiming to implement an EU-funded broadband project.

(IS-2013-188) Energy Conservation Standards for Residential Furnaces
The Energy Policy and Conservation Act of 1975 (EPCA), as amended, prescribes energy conservation standards for various consumer products and certain commercial and industrial equipment, including residential furnaces and residential central air conditioners and heat pumps. EPCA also requires the U.S. Department of Energy (DOE) to determine whether more-stringent, amended standards for these products would be technologically feasible and economically justified, and would save a significant amount of energy. In this direct final rule, DOE adopts amended energy conservation standards for residential furnaces and for residential central air conditioners
and heat pumps. If DOE receives adverse comment and determines that such comment may provide a reasonable basis for withdrawing the direct final rule, this final rule will be withdrawn, and DOE will proceed with the proposed rule.

The 2011 ACEEE review of emerging building sector focuses on water heating technologies. The methods used in this study are adapted from Chapter 3 of Sachs and others. In this study, they have expanded their treatment of technologies from one-page synopses to brief essays that introduce the technologies. The reported metrics remain the same, but they place less emphasis on likelihood of success and priority than in earlier studies across broader ranges of technologies. This change should help program administrators and other interested parties estimate both current and projected costs, while assuming conservative estimates of market penetration and product and installation costs.

This report investigates consumers’ vehicle purchase decisions under the 2009 Consumer Assistance to Recycle and Save (CARS) program, which offered financial incentives for the scrapping of older, inefficient cars and light trucks and their replacement with new, more fuel-efficient vehicles. The research focuses on the question of whether the program led consumers to purchase vehicles more fuel-efficient than those they otherwise would have bought.

(IS-2013-185) Energy Savings Potential and Strategies
This report analyzes the opportunity presented to the Cincinnati region by the Greater Cincinnati Energy Alliance, a local nonprofit organization committed to improving energy efficiency in existing buildings, through its grant work under the Department of Energy Better Buildings Neighborhood Program. The mission of the Energy Alliance is “to facilitate investment in energy efficiency for homeowners, nonprofit organizations, and commercial building owners through outreach and education, project management, and financing solutions” (Energy Alliance 2011). Energy efficiency is important for the regional economy as a whole, but the immediate focus of the Energy Alliance, and this report, is on single-family residential and nonprofit buildings. The four counties currently served by the Energy Alliance are Hamilton in Ohio plus Boone, Kenton, and Campbell in Kentucky. As a result we restrict our analysis in this report to these four counties.

(IS-2013-184) Intelligent solutions for the integration of technical services in a hospital
This report from Honeywell examines energy use in hospitals and how it may be reduced. Hospitals have a high demand for energy - but therefore likewise harbor enormous potential to optimize processes and save energy.
The significant costs associated with energy, installation, and maintenance can be dramatically reduced through the use of intelligent, integrated building management systems for such applications as heating, ventilation, air conditioning, and lighting.

(IS-2013-183) Emerging developments in Enterprise Information Management
This paper reveals a number of ways in which IM is expanding and deepening to the advantage of enterprises. As these newly emerging trends mature into effective business disciplines and best practices, PwC’s Technology Consulting specialists will integrate them with current methodologies, working with clients to achieve even stronger business performance.

(IS-2013-182) Strategies for Smart Services – White Paper
This report form Harbor Research examines smart services. All companies considering machine-to-machine (M2M) or connected device adoption agree that the future of their businesses will be shaped by new, significant revenue opportunities emerging from the availability of the information provided by these newly connected devices. This world of smart, connected devices is becoming the enabling platform for smart services. They refer to smart service as an “information circle”. Inside this “information circle,” a whole world of new, attractive, and more profitable services will take shape. Because those next-generation services cannot be offered without device information, and because even traditional service relationships will be made vastly more efficient inside the information circle, channel partners can no longer cut an OEM out of the services action.

(IS-2013-181) Creative Partnerships Are Key To M2M Market Development For Wireless Carriers
This white paper is about a fundamentally different approach to M2M alliances. Pacific Controls is pioneering the convergence of information and communication technology (ICT) in M2M applications to improve efficiencies, reduce costs and improve business performance for customers. The company is working with wireless carriers today to form partnerships to provide M2M solutions. For the cellular network operator, these new solutions are a critical service line extension to offset saturation in their handset businesses: they expand the scope of value the carrier can provide to customers.

(IS-2013-180) UPnP TECHNOLOGIES FOR THE SMART GRID-ENABLED HOME
This report from UNPN forum provides a brief overview of the company, which has “hundreds of millions of new UPnP-based products shipping each year”. The UPnP Device Architecture is an open networking platform that leverages existing and widely deployed Internet protocols like TCP/IP, HTTP, and UDP.
(IS-2013-179) ENERGY EFFICIENCY: ACCELERATING THE AGENDA
This study from the World Economic Forum seeks to accelerate the agenda and identify the barriers holding implementation of energy efficient measures. The Forum has worked closely with the Mexican Government in 2010 ahead of the United Nations Conference of Parties (COP16) in Cancun in December 2010 to give due attention to energy efficiency and hopes to continue this cooperation with the Mexican and other governments, including South Africa throughout 2011 and ahead of COP17 in South Africa at the end of 2011, to monitor progress and demonstrate early results.

(IS-2013-178) Leveraging New Mobility Technology in the Field
This report from Stay In Front examines the mobile technology market. They provide several points on how to build a sustainable mobile CRM strategy. They also provide several questions to ask your CRM vendor in order to match strategic imperatives with specific features and functionality.

(IS-2013-177) UPNP TECHNOLOGIES FOR THE SMART GRID-ENABLED HOME
This report from UNPN forum provides a brief overview of the company, which has “hundreds of millions of new UPnP-based products shipping each year”. The UPnP Device Architecture is an open networking platform that leverages existing and widely deployed Internet protocols like TCP/IP, HTTP, and UDP.

(IS-2013-176) UPNP DEVICE MANAGEMENT — SIMPLIFY THE ADMINISTRATION OF YOUR DEVICES
This report from UNPN forum provides a detailed overview of the company. Universal Plug and Play is a set of networking protocols proposed by the UPnP Forum. It intends to easily connect computers and other devices into a network ‘hub’ from which to access data, transport media and offer network connectivity under the command of any connected control device. UPnP device control protocols (DCP) are built upon open, Internet-based communication standards and can therefore be implemented on any operating system. It works with any type of physical networking media that supports IP, wired or wireless, and offers a multitude of options. UPnP devices are “plug-and-play” in that when connected to a network they automatically announce their network address and supported device and services types, enabling clients that recognize those types to immediately begin using the device.

(IS-2013-175) OSRAM SYLVANIA – Commercial Lighting Survey
This survey from Osram Sylvania provides insight into the minds of business consumers about lighting options. The 15-minute telephone survey collected information from 252 “purchasing and facilities decision makers” and 100 “Lighting designers and specifiers”. They found that many have evaluated new lighting options recently and
are most focused on costs, maintenance, energy use, and task-suitability when making lighting decisions. Although initial cost is an important consideration, most say they prefer systems that will save over their lifetimes, even if initial costs are higher. Familiarity with LED lighting is high, but shallow, despite almost three quarters reporting they are using or planning to use LEDs. Experiences with LEDs are largely positive. Low maintenance, reduced costs and energy-efficiency are the major draws of LEDs, but the high initial cost is still a significant barrier for many.

(IS-2013-174) Regional Green Building Case Study: Year Two Report
The Regional Green Building Case Study, also referred to as the Illinois LEED Study or the Study in this report, is a multiyear project to collect and analyze post-occupancy data from Leadership in Energy and Environmental Design (LEED) certified projects in Illinois. It is among the first of such studies to have a regional focus and to provide ongoing analysis to participants on a wide variety of metrics. The Study’s second year, detailed in this report, builds on a successful dialogue between the participants and the research team established during the project’s first year and doubled the number of projects to 51, including 19 projects from the first year.

(IS-2013-173) Resource Adequacy and the Cost of Reliability
This report from DEFG examines resource adequacy and looks to provides solutions for the future. Resource adequacy refers to the ability of the bulk power electric system to provide sufficient electricity to satisfy consumer demand. To achieve resource adequacy and system reliability, the electric network must be managed and operated in a coordinated manner, with as much certainty as possible for stakeholders. They believe it is crucial to recognize that the traditional system of planning for resource adequacy has resulted in historically high levels of system reliability, but relatively little focus on reliability from the consumer perspective. The recent advances in smart grid and market-driven information flows may, in the future, fully engage consumers in the market. This should result over time in a closer match between the marginal value of reliability and the marginal cost of electric production and delivery.

(IS-2013-172) Resource Adequacy Implications of Forthcoming EPA Air Quality Regulations
This report from the U.S. Department of Energy presents the results of an independent assessment by the U.S. Department of Energy (DOE) of the adequacy of U.S. electric generation resources under air pollution regulations being finalized by the U.S. Environmental Protection Agency (EPA). This report does not estimate the economic impacts of EPA regulations, nor does it provide detailed reliability assessments that planning authorities and other stakeholders will need to conduct to ensure deliverability of power and grid reliability during implementation of EPA rules.
Multi Protocol Label Switching (MPLS) is a mature packet technology that is already widely deployed and plays an important role in service providers’ packet-based networks to deliver a diverse, rich set of services and applications. Section 1 of this paper introduces the key market drivers for extending MPLS. Section 2 describes the MPLS extensions needed to support the transport profile (MPLS-TP), addressing transport requirements jointly provided by the IETF and ITU-T. The relationship with existing mechanisms is explained. Section 3 shows how unified MPLS technology can be applied in Broadband Multi-Service Architectures and introduces some considerations regarding the choice between static and dynamic provisioning and management. Section 4 presents the opportunities that the extended technology can bring to mobile backhauling, a key application now supported by broadband networks.

This paper targets vendors and service providers that are in various stages of planning for mobile backhaul for LTE. MPLS is a mature technology that unifies various types of backhaul traffic and offers several migration choices to service providers, enabling them to follow the course that best suits their needs and operating environment. The Broadband Forum, through its MPLS in Mobile Backhaul Initiative (MMBI), aims to define reference architectures and technical specifications for mobile backhaul deployments in collaboration with vendors and service providers. The initiative motivates vendors to offer products and services on a commonly agreed framework and enables service providers to offer new services with reduced risk and improved time to market.

This report from McKinsey Global Institution examines the rise in productivity in our society and the associated increase in use of resources. Their analysis shows that there are resource productivity improvements available that would meet nearly 30 percent of demand for resources in 2030. Successful implementation of these productivity opportunities could more than offset the expected increase in land demand over the next 20 years in our base case.

This report from Juniper Networks examines mobile security. It focuses on the recent advancements in mobile security and sheds light on the areas that need improvement. It should be noted that the primary sponsor of this report, Juniper Networks, sells mobile security options.
(IS-2013-167) Summary of Findings Smart Grid Consumer Collaborative Consumer Pulse Research Program–Wave 1
This summary from SmartGrid consumer collaborative is based on the initial wave of SGCC’s Consumer Pulse Research Program, with survey fieldwork completed August 15 to September 6, 2011. The Consumer Pulse research program is designed to provide knowledge of what consumers want and need from Smart Grid, and how to communicate with them about it. This initial study establishes baseline measures of awareness, favorability, persuasiveness of key positive messages, and interest in smart grid/meter-enabled programs. The data have also been used to create an in-depth segmentation analysis that shows how smart grid reactions and preferences differ among five different types of consumers.

(IS-2013-166) Quality of service: Maintaining the connection
This report from RCR Wireless examines cellular service in the US. It focuses on connection issues (dropped calls, etc.) across the country and how it has been affected by the transitions from 2G to 3G, and finally, to 4G. It also includes insights from Gary Fankhauser, a network tester.

(IS-2013-165) Magic Quadrant for PC Configuration Life Cycle Management Tools
This report from Gartner examines the PC configuration life cycle management. They found that while PC configuration life cycle management (PCCLM) market is mature, there is not a huge difference in the core functionality of most PCCLM products. Buyers are increasingly driven by factors relating to ease of use and lower total cost of ownership, rather than comprehensive functionality. The vendors in this market are lacking in some key areas, most significantly non-Windows device management, management of desktop virtualization technologies and software-as-a-service (SaaS) delivery models.

(IS-2013-164) Opportunity Calling: The Future of Mobile Communications – Take Two
This report from Oracle surveyed more than 3,000 mobile phone users around the world to examine: changes in global mobile phone use and perceptions of mobile devices; interest in new mobile technologies, such as purchasing capabilities and location-based services; expectations for service providers in the new mobile frontier.

TR-200 outlines an Ethernet-based access system in the context of the existing Broadband Forum Technical Reports. TR-200 focuses on access systems comprising EPON OLT and ONU components. It builds on the architectural/topological models of the Ethernet-based aggregation network and deployment scenarios defined in earlier Broadband Forum Technical Reports, and in doing so it describes how to design and deploy EPON access nodes as well as hybrid access nodes that support combinations of EPON and DSL.
(IS-2013-162) MR-229: Leveraging Standards for Next Generation Wholesale Access MR-229 describes the Broadband Forum Technical Reports that are applicable across the areas of service requirements, broadband architecture and control and management. In addition relevant work in progress within the Broadband Forum is highlighted. This paper discusses the drivers for the deployment of these technologies and the open access principles often adopted to support the widespread of utility of these next generation access networks. This paper provides a blueprint for wholesale and retail service providers, as well as for regulators and other industry bodies, to determine the relevant standards work that is available for next generation broadband access networks operating in an open access environment.

(IS-2013-161) GREEN BUILDING MARKET AND IMPACT REPORT 2011
This report from GreenBiz examines LEED certified green buildings. They found that LEED green building certification continued to grow its share of the US and world markets during 2011. Unlike last year, where the certification picture was the good news amid the otherwise dreadful performance of LEED, 2011 registrations resumed fairly spectacular growth — over 40 percent — compared with 2010, while certified floor area remained disappointingly flat.

This report from the USDOE provides resources for state and local policy makers in the US with respect to energy codes. This guide is intended to provide key information to policy makers on energy codes and to offer guidance on how policy makers can support the creation of statewide energy efficiency goals and standards. Policy makers should set an example by using codes in state-owned and -funded buildings, providing guidance on enforcement strategies, and helping educate and train building professionals and code officials. These strategies will provide local governments with the reinforcement they need to adopt and enforce building energy codes.

(IS-2013-159) Comparison of Standard 90.1-07 and the 2009 IECC with Respect to Commercial Buildings
The U.S. Department of Energy’s (DOE’s) Building Energy Codes Program (BECP) has been asked by some states and energy code stakeholders to address the comparability of the 2009 International Energy Conservation Code® (IECC) as applied to commercial buildings and ANSI/ASHRAE/IESNA1 Standard 90.1-2007 (hereinafter referred to as Standard 90.1-07). An assessment of comparability will help states respond to and implement conditions specified in the State Energy Program (SEP) Formula Grants American Recovery and Reinvestment Act Funding Opportunity, Number DE-FOA-0000052, and eliminate the need for the states individually or collectively to perform comparative studies of the 2009 IECC and Standard 90.1-07.
(IS-2013-158) Building Technologies Program – Air Leakage Guide
This guide is a resource for understanding the new air leakage requirements in the 2012 IECC and suggestions on how these new measures can be met. It also provides information from Building America’s Air Sealing Guide, Best Practices and case studies on homes that are currently meeting the provisions. The 2012 IECC and a few International Residential Code (IRC) requirements are referenced throughout the guide.

(IS-2013-157) INTEGRATION OF AN INFRARED-BASED MONITORING SYSTEM WITH AN EIIP (ENERGY INFORMATION INTEGRATION PLATFORM) FOR INNOVATIVE EFFICIENT INDOOR ENVIRONMENT CONTROL
In this paper the integration of energy and comfort information, in input and output to the innovative IR-based monitoring device, within the IntUBE EIIP (Energy Information Integration Platform) is developed and described. The obtained results demonstrate that the IR monitoring system can in real-time exchange data from the EIIP through SPARQL queries, such as other sensor data (e.g. humidity) necessary to compute accurate comfort parameter as the PMV. The system allows users to measure actual building performance and to present the data to the occupant/manager in order to improve room control, maintenance and thermal comfort for the building occupants.

(IS-2013-156) Accenture Technology Vision 2011
This report from Accenture provides the 2011 version of their “technology vision” report. The 2011 Accenture Technology Vision report explains what trends will have the greatest impact on performance in the future. They believe discontinuous change is at the foundation of these trends. Three threads run through the report: things will be distributed; things will be decoupled; things will be analyzed.

(IS-2013-155) Utility-Scale Smart Meter Deployments, Plans & Proposals
This report from the Edison Foundation provides an overview on the current deployment of smart meters in the US. It mostly comprises of a table that summarizes current smart meter installations, as well as planned deployments and proposals, by investor-owned utilities, large public power utilities, and some rural electric cooperatives. IEE estimates that approximately 65 million smart meters will be deployed by 2015, representing 54% of U.S. households. As of September 2011, 27 million smart meters have been installed.

(IS-2013-154) Low Income Consumer Issues and Voluntary Prepaid Energy Offerings: Perspectives from Three Industry Thought Leaders
This report from DEFG examines the issues facing low-income consumers with regard to prepaid energy offerings. Consumer advocates argue that prepaid energy invites low-income customers to make tough choices,
potentially opting to disconnect electric service to keep money available for other. Part of the 2011 Working Group efforts included commissioning essays authored by three industry thought leaders representing divergent perspectives on low-income specific issues presented by a voluntary utility prepaid energy offering. Each author drafted an essay consisting of introductory paragraphs framing their point of view, responses to a set of ten questions prepared by DEF, and a conclusion. The objective is to present different points of views around prepay issues specific to low-income customers to facilitate discussion and a consensus-building process where differences may be narrowed and recommendations introduced.

(IS-2013-153) Annual Baseline Assessment of Choice in Canada and the United States
The ABACCUS scores and rankings are based on market design issues that are driven by the topics covered by the ABACCUS methodology: 1) retail market status, 2) wholesale market competition, 3) default (standard or basic) service design, and 4) facilitation of the choice of retailer. The comprehensive assessment methodology was developed over several years through a collaborative effort among retail energy suppliers and representatives from state regulatory commissions. The ABACCUS methodology applies data related to market structure and performance to score each state or province, which results scores and a ranking set forth in the following sections of this document. This report also presents background information on electric markets and the objectives of electricity restructuring.

(IS-2013-152) Measuring LTE Modulation Quality Over-The-Air with a Handheld Instrument
This application note presents a method of measuring modulation quality—making the measurement over-the-air with a handheld instrument. This method is based on the fact that control channels do not use spatial multiplexing or beam forming because they have to operate over the entire cell, including at the cell edges. Over-the-air measurements of LTE modulation quality are not intended to replace direct-connect measurements because direct-connect measurements are more accurate and comprehensive. However, over-the-air measurements are much faster and more convenient so they provide a valuable tool to help meet the challenge of delivering seamless LTE service.

(IS-2013-151) Chilean wireless market set for continued growth
This report from RCR Wireless examines Chile’s wireless market. They claim that the country has great potential for wireless companies, as the market is quickly growing. Chile is currently running on 3G and at the time of the report has yet to schedule auctions for the 4G spectrums. However, many companies are still waiting for their investment in 3G to pay off.
This report from Oracle examines advanced distributions management (ADM). The utility industry has rallied behind the Smart Grid as a way to make valuable infrastructure improvements, increase customer options, and improve efficiency. The Smart Grid will require not only new hardware like smart meters and sensors but also major new software functions that can maximize hardware and business process performance. ADM is the emerging umbrella term for the set of advanced functions that will turn today's distribution grid into the Smart Grid of tomorrow. By analyzing the massive amounts of new data generated by Smart Grid hardware and by making that analysis available across the utility enterprise, ADM speeds cost recovery for Smart Grid investments, delays the need to construct new central generation, and provides a flexible grid-management platform that can accommodate emerging demands.

(IS-2013-149) Strategic Metering – White Paper
This report from Oracle examines smart metering. Advanced Metering Infrastructure (Smart Metering) helps utilities respond to a variety of emerging customer and community needs. Utilities that permit metering or billing departments to control Smart Metering design almost invariably discover that initial investments fail to provide optimal return on investment. In fact, without strategic executive leadership and involvement of all departments, utilities embarking on Smart Metering risk near-term revenue loss, less-than-optimal service delivery, and long-term excessive IT costs that customers and communities may not tolerate.

(IS-2013-148) State of Technology 2011
This report from EPRI examines advancements in the energy industry from 2011. It looks briefly into nuclear power, power delivery and utilization, and the effects on the environment. A main focus of the report is the interaction between older and newer technologies and how they will overlap or replace one another.

(IS-2013-147) FOLLOW THE LEADERS: IMPROVING LARGE CUSTOMER SELF-DIRECT PROGRAMS
This report from the American Council for an Energy-Efficient Economy is based on first-person conversations conducted with over 50 individuals closely acquainted with today's opt-out and self-direct programs. Interviewees included administrators of today's self-direct programs, state regulators, energy efficiency advocates, industrial energy users and officials from other state agencies affiliated with a self-direct or opt-out program's administration. The report discusses the self-direct programs in place today and the policy goals we ought to have embedded within our self-direct programs. It discusses the unique opportunities presented by self-direct programs and the leading self-direct programs in place today. The report also discusses the challenges presented by opt-out programs and poorly structured self-direct programs, and concludes with recommendations of how ideal self-direct programs might be structured.
(IS-2013-146) Closing the Convergence Gap
This report from Zanthus provides studies on consumer trends within the home control and video technologies markets. They claim the key to success in these markets is to make it easier for shoppers to experience the contagious excitement of those who have already taken the plunge. That means fostering a groundswell of genuine word-of-mouth exchanges between would-be buyers and experienced users, who can most effectively communicate the high-level emotional benefits. The task at hand, then, is to effectively engage the right people, who will then naturally deliver this compelling message—that they are happier, more relaxed and more in control than ever before, and they will never go back to the way things used to be.

This report from the ACEEE focuses on one mechanism for attempting to address this problem, a “lost revenue adjustment mechanism” (LRAM). The focus is to provide information about LRAMs and catalog recent experience with this policy tool. They review these experiences and discuss the pros and cons associated with this approach.

(IS-2013-144) A Guide to Creating Effective Green Building Programs for Energy Efficient and Sustainable Communities
This guide from the US Department of Energy is designed to help state and local governments design and implement successful “beyond code” programs for new commercial and residential buildings. The goal is to help states and localities establish voluntary or mandatory programs that go well beyond traditional minimum code requirements for new buildings. The guide addresses keys to successful adoption and implementation and discusses the primary areas that are typically included in beyond code or green building programs, including energy efficiency materials and resource conservation, water efficiency, indoor environmental quality, and site development and land use. Detailed descriptions and analysis of actual programs are discussed, including lessons learned and best practices. States and localities can use the information on local programs, national codes and standards, and the model energy efficiency criteria for residential and commercial buildings to find the best approach for their jurisdiction to develop and implement an effective beyond code program.

(IS-2013-143) Comparison of Standard 90.1-2010 and the 2012 IECC with Respect to Commercial Buildings
The U.S. Department of Energy’s (DOE’s) Building Energy Codes Program (BECP) has been asked by some states and energy code stakeholders to address the comparability of the 2012 International Energy Conservation Code® (2012 IECC) as applied to commercial buildings and ANSI/ASHRAE/IESNA1 Standard 90.1-2010 (hereinafter referred to as Standard 90.1-10). An assessment of comparability will help states respond to and
implement conditions specified in the State Energy Program (SEP) Formula Grants American Recovery and Reinvestment Act Funding Opportunity, Number DE-FOA-0000052, and eliminate the need for the states individually or collectively to perform comparative studies of the 2012 IECC and Standard 90.1-10.

(IS-2013-142) Attitudes on Data Protection and Electronic Identity in the European Union
This report from the European Commission presents the results of the largest survey ever conducted regarding citizen’s behaviors and attitudes concerning identity management, data protection and privacy. It represents the attitudes and behaviors of Europeans on this subject.

(IS-2013-141) Stakeholder’s Workshop – Enel Viewpoint
This report from Enel provides an overview of the company. This includes: company structure, shareholders, network division, the role of smart grids, and current project (street and building lighting and EV recharging).

(IS-2013-140) Interoperability White Paper
This report from the Technology Strategy Board provides an overview of their Dallas program and interoperability. Interoperability is where different application functions are able to use shared information in a consistent way. Providing for Interoperability provides for the plug and play services that are desired by the service provider and by the user living independently. Interoperability should lead to improved ease of use, easier installation, better human factor capability, greater choice, international economies of scale and market development, and hence lower unit costs, but above all improved outcomes for users. Interoperability is about information provision (not data). It can facilitate integrated services, but services may need to be re-designed, requiring organisational change.

(IS-2013-139) Lifetime Digital Homes – New Homes
This discussion document aims to support commissioners and designers identify infrastructure options that will deliver integrated assisted living (telecare, telehealth and environmental control) services in new domestic buildings. While any assisted living function or service may be provided by a stand-alone system, the benefit of an integrated system is that devices and systems can synchronize their operation, deliver greater overall functionality than the sum of the parts, provide greater robustness, and offer potential ‘plug and play’ flexibility, at lower cost and greater efficiency. This document sets out the advantages and disadvantages of each option in relation to a set of performance criteria that seeks to balance quality of service against cost of installation and maintenance.
(IS-2013-138) Supplement to the Draft
This supplement will allow the BLM (U.S. Department of the Interior Bureau of Land Management) its preferred alternative to emphasize its commitment to the concept of solar energy zones (SEZs). While the BLM's preferred alternative emphasizes the use and creation of SEZs for utility-scale solar energy development, it also includes a proposed process that will accommodate responsible development outside of SEZs. As described in DOE’s (U.S. Department of Energy) proposed action in the Draft Solar PEIS, DOE would develop and adopt programmatic environmental guidance which would be used by DOE to further integrate environmental considerations into its analysis and selection of proposed solar projects. Release of this Supplement allows the public an opportunity to evaluate the modified and new components of the proposed program and provide input that will assist the BLM and DOE in their decision-making process. On the basis of input received on the Draft Solar PEIS and this Supplement, the lead agencies will prepare a Final Solar PEIS and Record(s) of Decision (ROD).

(IS-2013-137) HOW TO PLAN EUROPE’S ENERGY FUTURE
At the third in a series of high-level academic policy debates on the energy R&D challenge, The Energy Difference, key ideas and recommendations have emerged on how to plan a sustainable and cost-effective energy future for Europe. A systems approach to energy innovation is proposed, in order to help guide decision-making by determining the most cost-effective combination of future technologies.

(IS-2013-136) 4G Revisited: The continued evolution of wireless mobility
This white paper from i-pass examines the two leading 4G technologies and the current status of deployed 4G networks. It continues with advice on managing long-term 4G costs. The paper concludes with a discussion of next steps and their position.

(IS-2013-135) Summary of Findings Smart Grid Consumer Collaborative Consumer Pulse Research Program–Wave 1
This summary is based on the initial wave of SGCC’s “Consumer Pulse Research Program”, with survey fieldwork completed August 15 to September 6, 2011. The Consumer Pulse research program is designed to provide knowledge of what consumers want and need from Smart Grid, and how to communicate with them about it. This initial study establishes baseline measures of awareness, favorability, persuasiveness of key positive messages, and interest in smart grid/meter-enabled programs. The data have also been used to create an in-depth segmentation analysis that shows how smart grid reactions and preferences differ among five different types of consumers. One additional wave of Consumer Pulse survey research is planned during the remainder of 2011, with further waves in 2012.
(IS-2013-134) Top Trends in the Global Communications Industry
This report from Pyramid Research examines trends in the global communications industry. They expect the global telecommunications services market to grow at a more modest 4% in 2012 as a result of the rising volatility and uncertainty facing the global economy. They expect total service revenue to reach US$1.7trn, 2.4% of global GDP, in 2012. Mobile broadband, enabled by the proliferation of high-speed mobile computing devices including smartphones and tablets, will be one of the largest growth areas in 2012, particularly as the price of these computing devices comes down, enabling further penetration in emerging markets.

(IS-2013-133) Energy Efficiency White Paper
This report from NRGExpert examines global energy intensity. Energy intensity and its’ change is often used as a measure of energy efficiency in the broadest sense as this includes structural and behavioral changes, an example of a structural change is changing weather. It is measured as a ratio of energy consumption to a measure of demand, e.g. energy consumption per unit of GDP, as mentioned above.

(IS-2013-132) Influences on the Low Carbon Car Market from 2020-2030
This report from element energy investigates the factors influencing the total costs of ownership for a wide variety of powertrains in three vehicle size classes, and analyses to what extent low carbon vehicles will close the current cost premium over conventional cars. The first part of this report is designed to provide the “LowCVP” (The LowCVP wishes to investigate how technology and policy factors influence the TCO (true cost of ownership), and hence the relative attractiveness of various vehicle types.) with robust data on the range of TCOs for different powertrains, vehicle segments and years. The second part of this report uses a scenario based approach to analyze specific sensitivities and input assumptions.

This report from In-Stat examines their Distributed Antenna System (DAS), as they believe it will be able to bridge several key areas in cellular coverage. A DAS is a way of routing radio frequency (RF) signals through fiber or copper cabling from a single base station to multiple antennas located throughout a building (or in outdoor DAS, through antenna nodes). For the end-user, in-building signal quality improves. The improved proximity of in-building antennas propagates better signal attenuation coming in through walls. “Rpower” coming from individual antennas is less than what would come from an indoor or onsite micro-cell or macro-cell base station. And finally, DAS installations can be camouflaged into the form factor of roofs or walls.
(IS-2013-130) MARKET INSIGHTS: JANUARY-JUNE 2011 - GfK findings for IFA: Consumer Electronics Unlimited
This report from GfK provides global market insights for electronics and appliances. They found that even though the market environment is currently challenging, a number of innovative growth segments exist. Overall, GfK retail and technology is expecting a perceptible recovery for the industry during the second half of the ongoing year. They also expect positive growth of the overall IT market in the single-digit range in Europe, both for this year and next. GfK also claims that the market for major domestic appliances is continuing to develop positively worldwide.

(IS-2013-129) European Union Clean Energy Policy
This white paper looks at the potential development of smart energy and smart transportation within the current EU-27 through the current basket of policies aimed at moving the European Union to a low carbon economy. The 27 member states of the EU have committed to the following goals: 20% of energy consumption from renewable energy, a 20% decrease in GHG emissions, and a 20% increase in energy efficiency – all by 2020. Since this agreement was put in place a further round of more aggressive targets for 2050 in the areas of transport, energy efficiency, and energy production have been developed.

(IS-2013-128) Challenges Facing Combined Heat and Power Today
This report from the American Council for an Energy-Efficient Economy reflects conversations with over 50 individual CHP developers, supporters, state energy officials, public service commission employees, and managers of utility and public benefit efficiency programs. A key finding of this research is that, while there are some unique regulatory barriers in each state, CHP suffers generally from its high upfront cost, inexpensive and widely available electricity, and a lack of prioritization by regulators in all capacities. This report concludes with suggestions for how CHP stakeholders could further the development of the CHP market in the U.S. and individual states, building on existing successes.

(IS-2013-127) The All-IP Revolution and the Changing Services Mix
This report from Vision2Mobile examines what they describe as a “fundamental drive to IP in carrier networks” and the effort to drive scalability and bandwidth through converged platforms that ensure operators have an optimal cost of delivery for new services. They believe that by collapsing multiple heterogeneous services onto this architecture, operators achieve the ability to be flexible in service innovation, can mash up lines of business, and leverage third party content and apps, in order to drive top-line revenue.
This report from Echelon and SAIC provides a presentation on their smart grid architecture. It is composed of an ANSI meter, their system software, data concentrators, and an edge control node. This presentation provides a brief overview of the smart grid, the need for reliability, and the products each company offers.

(IS-2013-125) THE TEXAS SOLAR PV MARKET: A Competitive Analysis
The Texas Solar PV Market: A Competitive Analysis aims to provide insight about solar PV energy in Texas, including market share, overall investments, R&D, job creation, policy landscape, and other key measures. Data and analysis contained in the report compares solar activity in Texas against five other leading solar PV states, and is built on research and analysis contained in Clean Edge’s U.S. Clean Energy Leadership Index. A private Clean Edge client commissioned the report.

(IS-2013-124) Oregon's Clean Energy Economy
This report, sponsored by the Portland Development Commission and Business Oregon, evaluates Oregon’s standing in the U.S. clean-energy economy. The report leverages data from Clean Edge’s 2011 State Clean Energy Leadership Index, a subscription-based research service that provides a unique perspective of U.S. clean-energy activity by aggregating and analyzing industry datasets from a variety of public, private, and Clean Edge sources. The index produces annual comprehensive performance scores and rankings for all 50 U.S. states based on activity in three key clean-energy categories: technology, policy, and capital.

(IS-2013-123) DELIVERING LONDON'S ENERGY FUTURE: EXECUTIVE SUMMARY
This report from the mayor of London examines the Mayor’s Climate Change Mitigation and Energy strategy. It is one of eight environmental strategies setting out the action the Mayor is taking, and encouraging others to take, to green London, retrofit London, and provide cleaner air for London. This strategy focuses on reducing CO2 emissions to mitigate climate change, securing a low carbon energy supply for London, and moving London to a thriving low carbon capital. It forms a central part of the Mayor’s goal of retrofitting London. The Mayor’s activity to achieve this is well underway. His programs are already making real cuts in CO2 emissions, improving quality of life for Londoners, and creating economic opportunities for the capital.

This paper from the ACEEE examines regulatory changes that could help create a new business model for utilities. This new business model aligns utility financial objectives with meeting energy resource needs through a balanced, lowest cost portfolio of both supply and demand options. Such options include reducing energy use through improved customer energy efficiency.
Enabling the next wave of telecom growth in India
This report from the FICCI and Ernst & Young examines India’s growing economy and the opportunities present in the telecom industry. In 1999 the government recognized the need to overhaul its policy framework and issued the NTP 1999, which has played a key role in shaping the sector. India has reached the goals set in NTP 1999 far ahead of time, with the market evolving into the world’s second largest in terms of subscribers. Presently, there are more than 700 million subscribers in India, and the overall ‘teledensity’ has reached more than 60%. With plenty of strong potential value remaining, the sector requires much attention and a robust policy framework to address the challenges that exist in the present scenario as well as help to capture the opportunities that the sector holds for the country. The key recommendations for advancing the sector to the next level of growth focus on financial inclusion, m-commerce, convergence, security concerns and consumer affordability.

DRAFT STANDARD CAN/CSA-F280 Determining the Required Capacity of Residential Space Heating and Cooling Appliances
This report from the Canadian Standards Association provides a draft of the standards for the required capacity of residential space heating and cooling appliances. This Standard provides contractors, equipment manufacturers, building officials, and others involved in residential construction with updated calculation methods for determining the output capacity of all types of applicable residential space heating and cooling appliances to maintain specified indoor environmental conditions in Canadian homes. *Note: this is a public review draft and not the final copy, changes may have been made since this version

Standards and Codes for Electric Drive Vehicles
This report from the American National Standards Institute provides an overview of their workshop held in April 2011. The workshop explored what codes, standards, and conformity assessment programs are needed to facilitate the large-scale deployment of light-, medium-, and heavy-duty on-road electric drive vehicles (EDVs), meaning vehicles that are recharged via connection to the electrical grid. The workshop format included presentations and panel discussions on day one focused on U.S. based standards activities (infrastructure and vehicle), international and regional standards activities, and code, conformance and training issues. Day two focused on gaps identification via breakout group discussions on the vehicle, associated infrastructure and related support services.

comScore Overview of BRIC Internet markets
This report from comscore provides a breakdown of the size and composition of the worldwide internet population. They also include a breakdown of the most popular online video sites for Russia, China, India, and Brazil.
(IS-2013-117) Cleantech on the rise: Generational opportunities for 21st-century businesses
This white paper from Grant Thornton concentrates years of the firm’s professional experience on four areas they believe cleantech companies must excel at if they are to succeed in the sector: the ramifications of global governmental policies; global operational and funding opportunities; corporate management and talent; and the need to stay focused.

(IS-2013-116) comScore Data Passport
This report from comScore provides an overview of digital content consumption worldwide. It includes information such as mobile retail behaviors, number of online video consumers globally, and information on some of the largest digital companies (Facebook, Apple, Google, etc.) for marketing purposes.

(IS-2013-115) Eco-Cities — A Global Survey 2011
In 2009, the International Eco-Cities Initiative published its first global survey, covering some 79 initiatives. Building on this, the present study includes the results of the second, extended global survey. As with the first survey, its primary aim is to identify and document the scale and diversity of current eco-city initiatives from an international perspective.

(IS-2013-114) NATIONAL ACTION PLAN - COMMUNICATIONS UMBRELLA
This action guide is intended as such a reference to be used on an as-needed basis. It seeks to help communications specialists and program managers at utilities, consumer advocacy groups, public service commissions, technology companies and service programs, consultants, and trade groups involved in co-creating a sustainable energy future with consumers. The guide includes fundamental processes recommended as part of every communications and energy literacy program

This report from Alcatel-Lucent provides an overview of their broadcast message center that can be used for the FCC’s commercial mobile alert system. The Alcatel-Lucent Broadcast Message Center (BMC) offers a reliable and cost-effective solution for broadcasting timely emergency alert messages issued by government agencies. The solution satisfies Federal Communications Commission (FCC) standards, using today’s most efficient technology to deliver emergency alerts to mobile users in targeted geographic areas.
(IS-2013-112) EPA’s National Building Competition – 2011 competition wrap up report
In May 2011, EPA launched the ENERGY STAR National Building Competition: Battle of the Buildings. In its second year, the "Biggest Loser"-style competition featured teams from 245 buildings across the country in a head-to-head battle to save energy and reduce greenhouse gas emissions that contribute to climate change.

(IS-2013-111) Duke Energy: Developing the communications platform to enable a more intelligent electric grid
This report from Duke Energy examines their digital grid communications architecture; smarter power grids that will help increase the use of renewable capacity. Duke Energy’s communication architecture vision is based on utilizing a communications node to transmit, locally aggregate and manage the deluge of data that results from implementing a digital grid. The communications node will manage the data of various applications locally or will route data back to a centralized location or to other nodes on the distribution grid that may be in a key location for further analysis and action. All three options enable Duke Energy to apply and manage various energy management applications individually or in concert with others, providing the capability for optimization and management based upon a particular situation in any given area.

(IS-2013-110) Verification Analysis of the National Broadband Map: spotlight on Arizona
In February of this year, the National Telecommunications and Information Administration (NTIA) released the first National Broadband Map. As a part of this evolving need for accurate broadband data and information, we created Broadband Scout in 2009. Unlike the NTIA map which was generated primarily as the result of collecting coverage data and advertised speeds directly from the carriers, Scout was created by looking at over a half a billion consumer internet transactions that link the consumer’s physical address to their internet provider through their Internet Protocol (IP) address.

This white paper spells out how telco service providers can provide competitive triple-play service bundles to consumers, with or without new all-fiber build. In particular, the paper explores the major technical, operational, and financial challenges of IP service fulfillment for triple-play packages. It also suggests the operational support system (OSS) best practices that service providers can adopt to tackle the major back-office and provisioning challenges for triple-play fulfillment.
Assessing the environmental, social and economic impact of Intelligent X on future cities and communities – White Paper

This white paper examines the economic, social, and environmental issues surrounding sustainability programs used to drive an agenda around economic growth and job creation in an environmentally sustainable manner. IdC believes a Services delivery platform is needed to build a services ecosystem that can scale, be easily modified and is conducive to the needs of the software and end-user device developers. Smart planning and collaboration between the public and private sector will set the stage for much success in creating connected communities to achieve economic, social and environmental sustainability.

Manitoba Hydro Place

This report from CTBUH examines the Manitoba Hydro Place. The Manitoba Hydro Place is internationally held as a model of excellence in sustainability through its natural passive systems which create dramatic efficiencies in energy use and human comfort. It sets a precedent for the seamless integration of architectural excellence and climate-responsive, energy-efficient and sustainable design while enhancing and improving the quality and comfort of the human experience and the civility of urban life.

Demand Response White Paper: Integrated Intelligent Lighting Controls

This report from Kiwi Power examines the demand response on integrated intelligent lighting controls and their ability to increase efficiency and reduce costs. Demand response is a means by which demand on an electrical distribution network can be dynamically managed to meet movements in supply. Integrated intelligent lighting controls provide the opportunity for dimming based demand response strategies. In non-day lit commercial applications 80% of desk based workers accepted short-term reductions in their lighting levels by approximately 20-30%, leading to a reduction in energy use and costs.

Enhancing Physicality in Touch Interaction with Programmable Friction

This report from a combined effort of researchers from UBC, NWU, and UCC New Zealand examines possible enhanced touch interaction through variable surface friction. Programmable friction displays vary the friction felt while sliding against a touch sensitive display. Through a series of studies and design explorations, researchers demonstrated the strong potential of programmable friction interfaces. Most importantly, participants preferred the exemplar designs to traditional touch interactions and reported a variety of positive effects, including increased engagement, a sense of realism and reduced dependence on vision. In addition, their examination of programmable friction showed significant performance advantages for drag-based selections and no adverse effects when distracter targets are present.
(IS-2013-104) THE UTILITY SMART GRID BUSINESS CASE: PROBLEMS, PITFALLS AND TEN REAL-WORLD RECOMMENDATIONS
This paper from SGRC describes the challenge utilities face in developing comprehensive investment strategies and identifies difficulties associated with several common approaches to smart grid investment analysis. The final section presents ten investment analysis recommendations based on the Smart Grid Research Consortium’s cost/benefit model that has been applied at 15 utilities. These recommendations are offered both to guide utility in-house analysis and to assist utilities in evaluating smart grid analysis undertaken by vendors and consultants.

(IS-2013-103) The Greenest Building: Quantifying the Environmental Value of Building Reuse
This report from the National Trust for Historic Preservation makes a case for reusing existing buildings rather than replacing them with new buildings. The following renovations were studied: commercial offices, warehouse-to-offices, mixed-use, elementary schools, single-family, multifamily, and warehouse-to-multifamily. Environmental savings were 4-46% over new construction. It takes 10-80 years for a new 30%-more efficient building to match in savings the environment cost of construction. The savings varies by building renovation type and materials used.

(IS-2013-102) Birth Of A New Era - The Internet of Interactions
This report form Harbor Research examines the growth of interconnected systems and how businesses react to and adapt to this environment. Interconnected systems include connected devices, integrated networks, value-added services, and new applications. These interconnections are enabled by linking devices to devices and to people. Harbor Research recommends that companies focus on systems and services rather than products. “The Internet of Interactions” is coming where everything will be in a constant state of re-configuration.

(IS-2013-101) Avoiding a Train Wreck: Replacing Old Coal Plants with Energy Efficiency
This paper from the American Council for an Energy-Efficient Economy notes that 40,000 MW of coal generating plants need to be replaced. This paper argues for investing in energy efficiency improvements by large energy users rather that replacing coal plants. More stringent environmental rules make coal plants more costly. Shifting to natural gas may not be practical as a base-load fuel. Energy efficiency may include combined heat and power, waste recovery, and improved manufacturing processes.

(IS-2013-100) Connecting your business: The top 10 things to consider when procuring M2M services
The report from Machina Research examines 10 issues that are important when purchasing machine-to-machine equipment. Among these are a statement of needs, network technologies and software access methods, services
provided, costs and any service fees (preferably in a standardized format for price comparisons), and responsiveness and adaptability of vendors. Purchasers should weight the results against their own criteria.

(IS-2013-99) 2050 Pathways for Domestic Heat
This report from Delta Energy and Environment summarizes how the U.K. goals for greenhouse gas reductions of carbon emissions can be achieved for residential heating. Customer purchases based on first costs and operating costs will not achieve the 2050 carbon reduction goals. The solution for a 96% reduction is electric heat (directly and with heat pumps) and zero-carbon heat networks (community heat distribution). A 90% reduction is possible while retaining some low carbon appliances in suburban homes. More peak electric generators will be needed.

(IS-2013-98) Green Light to faster internet
This report from Local Self-Reliance in partnership with Common Cause describes the creation of municipal telecommunications services called Greenlight offering high-speed Internet, telephone, and television in Wilson, North Carolina (an hour east of Raleigh). The system includes fiber-to-the-home providing a basic tier service of 10 Mbps Internet access for downloading and uploading (compared to most cable and DSL at 1-3 Mbps). Greenlight offers data rates up to 100 Mbps. The network serves the county residents and public services. The North Carolina legislature, under pressure from private cable and telephone companies, barred such municipal systems anywhere else in the state in 2011.

(IS-2013-97) Telecare and Telehealth a game changer
This report from Deloitte examines the benefits of home health care using technology proposed in the United Kingdom. Telecare consists of alarms and sensors to monitor activities at home. Telehealth is remote measurement of physiological parameters of persons at home. The data are read and analyzed by a remote clinician. The objective is to improve care. The impediments are installation costs, resistance from clinics, funding of services, lack of public and patient understanding, lack of staff education, and lack of leadership. The U.K market is growing with 20% of the population expected to be over 65 by 2035. Case studies are presented.

(IS-2013-96) Power Perspectives 2030 – On the road to a decarbonised power sector
This report from the European Climate Foundation examines how the European nations can achieve the European Union goal of an 80% reduction in greenhouse gas emissions by 2050. It lays out a roadmap for 2030 that puts the European countries on a path toward the 2050 goal while maintaining reliable power. To achieve these objectives 50% of power will be produced from renewable sources by 2030 including wind, solar, hydro,
geothermal, and biofuels. The conventional sources will be 28% gas, 6% coal, and 16% nuclear. Business-as-usual would miss this goal by 50%.

(IS-2013-95) The SALFORD low-energy house: Learning from our past
This report presents the SALFORD low-energy house design. The house was designed in the late 1970s for Salford City and about 250 houses were built then. It consumes about 75% less energy than the UK average for space heating and over 40% less than for houses built to the 2010 UK Building Regulations. The key design principles include a high thermal capacity internal structure protected by a highly insulated, well-sealed envelope. These principles can still be applied today to build net-zero residential houses.

(IS-2013-94) An introduction to US policies to improve building efficiency
This report summarizes major efforts in USA on energy policies to encourage energy efficiency in residential and commercial buildings. It covers the energy programs operated by the federal government, states, municipalities, utilities, and nonprofit organizations. It was prepared both as an Energy Policy introduction for Americans and as a US Energy Policy summary for Chinese energy policymakers and energy efficiency practitioners (as it was commissioned by the China Energy Foundation). It is believed to be also useful to other countries when developing appropriate energy programs and policies.

(IS-2013-93) Next Generation Technologies Barriers & Industry Recommendations for Commercial Buildings
This report was prepared by US Commercial Buildings Consortium (CBC) to provide information on next-generation technologies, systems, and practices for commercial buildings, and to identify market potentials, barriers, and strategic solutions needed to accelerate their deployment and widespread use.

(IS-2013-92) Into the cloud, out of the fog
This report from Ernst & Young examines the increased use in cloud services and the associated threats. Their 2011 Global Information Security Survey shows that, despite economic pressures, many respondents recognize the need to safeguard and secure data. In fact, survey respondents indicate their information security budgets are increasing. However, the survey also shows that the recognition of the challenges posed by new technologies does not always translate into appropriate actions to address that risk. The survey revealed a growing gap between business needs and the capabilities of the corresponding information security efforts. Ernst & Young believes that an effective strategic information security plan that focuses less on short-term fixes and more on a holistic approach integrated with long-range strategic corporate goals is necessary.
This report from Verdantix examines cloud computing and its ability to create a lower carbon business model. The adoption of cloud computing allows firms to deliver on sustainability while reducing costs. Executives are coming to view cloud computing as a way to transition to a lower carbon business model while increasing the efficiency and effectiveness of business operations. From an economy-wide standpoint, US businesses with annual revenues of more than $1 billion can cut CO2 emissions by 85.7 million metric tons annually by 2020 as a result of spending 69% of infrastructure, platform and software budgets on cloud services.

(IS-2013-90) Understanding ZigBee Gateway
This report from the ZigBee Alliance examines their ZigBee Gateway specification. The use of standard interfaces for the ZigBee and IP network connection creates the opportunity to have universal adapters and operate the connection with IP back-end systems such as Service Platforms or Machine-to-Machine platforms in a standard fashion. The specification and the resulting implementation serve as an Application Programming Interface specification so that developers of Gateways can build application-specific devices. The main intention is that the specification can provide a foundation so that developers could add their application-specific code, whether in the form of an energy service portal or an in-home device, to allow homeowners to interact with any number of applications, including lighting or entertainment control infrastructure.

(IS-2013-89) Active for more comfort: The Passive House
This report from the IPHA provides a detailed overview of the “passive house”. The term passive house does not refer to a specific construction method, but instead a set of standards. These include: exceptionally high level of thermal insulation; well-insulated window frames with triple low-e glazing; thermal-bridge-free construction; airtight building envelope; comfort ventilation with highly efficient heat recovery. This leads to a house with significantly lower energy needs. The heat stays inside and doesn’t need to be provided by an active system.

(IS-2013-88) Cleantech on the rise: Generational opportunities for 21st-century
This white paper from Grant Thornton concentrates years of the firm’s professional experience on four areas they believe cleantech companies must excel at if they are to succeed in the sector: the ramifications of global governmental policies; global operational and funding opportunities; corporate management and talent; and the need to stay focused.
(IS-2013-87) Lighting Control Protocols
This report from the Illuminating Engineering Society examines technologies for controlling building lighting. Applications include lighting management according to occupancy, emergency lighting indications, and user control of workspace lighting. Light levels from fixtures are varied as a function of occupancy, time, motion, and the presence of daylight. Seventeen varieties of lighting control signaling methods and communications protocols are surveyed.

(IS-2013-86) Guidelines for the Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles
This directive from the United Kingdom specifies requirements for reducing emission from vehicles of all sized to improve energy efficiency. Targets for lowering carbon dioxide emission were provided. Alternate fuels are listed. Cost impacts are included.

(IS-2013-85) Achieving High Performance Through Solar Photovoltaic Integration with the Smart Grid
This report from Accenture examines the challenges and opportunities for expanding solar power generation based on a survey in 2011. 50 persons from 31 utilities in North America were questioned. Solar power equipment may be owned by the customer (51%), the utility (34%), or a third party (15%). The goal as of 2011 was to drive energy cost from solar to 6 cents per kWh. Operational challenges of integrating solar with a power grid are discussed.

(IS-2013-84) Emerging hot water technologies and practices for energy efficiency
This report from the American Council for an Energy-Efficient Economy examines 16 methods for improving the efficiency of water heating equipment. The expected savings is about 37% of energy costs for water heating and 5% of overall energy costs for homes and buildings. Seven of the 16 methods are cost-effective today, and 11 of 16 become effective with mature market costs. Shifts from centralized water heaters to distributed equipment is anticipated.

(IS-2013-83) How an Electricity Efficiency Feed-in Tariff Can Cut Energy
This report from the Green Alliance in the United Kingdom explores how to reduce consumer demand for electricity and consequently how to reduce carbon dioxide emissions. The report suggests that paying consumers to reduce demand through a feed-in tariff is cheaper than building new plans. The goal is to achieve a 35% reduction in consumption by 2035. The challenges of demand reduction even with energy market reforms are discussed.
(IS-2013-82) Achieving High Performance Through Solar Photovoltaic Integration with the Smart Grid
This report from Accenture examines the challenges and opportunities for expanding solar power generation based on a survey in 2011. 50 persons from 31 utilities in North America were questioned. Solar power equipment may be owned by the customer (51%), the utility (34%), or a third party (15%). The goal as of 2011 was to drive energy cost from solar to 6 cents per kWh. Operational challenges of integrating solar with a power grid are discussed.

(IS-2013-81) Crossing the sustainability chasm: strategies and tactics to achieve sustainability goals
This study from IBM examines the strategies for successful implementation of building energy sustainability. Many managers plan and measure energy consumption, but fail to cross the chasm, that is, they fail to achieve actual sustainability. 130 executive and professional responsible for large buildings were surveyed. They were categorized as achievers (34%), planners (58%), and stragglers (8%). Achievers typically involve senior management. Methods pursued by the achievers are reported.

(IS-2013-80) Intelligent Buildings and the Bid Specification Process
This paper describes the main findings of a landmark research study undertaken by the Continental Automated Buildings Association to improve the understanding of the market imperfections and the inconsistencies that exist in designing and implementing intelligent building projects through the bid specification process.

(IS-2013-79) Emerging patent thickets and standards in the medical devices and telehealth
This report from Cambridge IP examines patent thickets and standards in telehealth. The study focused on two broad issues: a) the effects of patent thickets on innovation and market dynamics; and b) the role of technology standards and patent pools as a possible response to the emergence of patent thickets. The research was based on a case study of the emerging space of Telehealth, and particularly on the use of patents for wireless-enabled medical devices. The methodology used a combination of patent landscaping around 5 technology areas, interviews with industry experts, and scholarly literature review. We also made policy recommendations for the facilitation of innovation and technology diffusion, and consistent with the broad outlines of the existing patent system.

(IS-2013-78) The future of connected health devices
This report from IBM explores the practically underserved portion of the health device market comprised of information seekers that are neither fitness-focused nor chronically ill. These consumers are relatively healthy, but could use some help managing a health-related challenge. As our environments at home and on the go grow more instrumented, interconnected and intelligent, health monitoring solutions also can become more intuitive,
comprehensive and affordable – all critically important factors in winning over information seekers and healthcare payers. Likewise, the analytical insights enabled by this groundswell of information will be invaluable to the healthcare and life sciences communities.

(IS-2013-77) Broadband in America - 2nd Edition
This report from FCC’s Omnibus Broadband Initiative updates and expands on the original report that was submitted to the Federal Communications Commission (FCC) in November 2009 as part of the FCC’s development of a National Broadband Plan (NBP). The first edition encompassed a comprehensive examination and analysis of companies’ announcements and similar public information, industry analysts’ reports, and other relevant data sourced to the broadband service providers to measure and assess broadband plans. Also at the FCC’s request, the report included an assessment of where broadband deployments will be in 3 – 5 years and a comparison of results with previously released plans that are in progress or complete. The first three sections of this second edition are general updates of the factual data submitted to the FCC in late 2009. The fourth section is entirely new: it comprises analysis and commentary by a few leading broadband experts who provide their insights into some of the issues associated with broadband in America.

(IS-2013-76) Marketer Perceptions of Mobile Advertising
This report from OVUM consulting provides a survey among marketers at 300 US companies to provide a unique insight into mobile advertising from a buyer perspective. Mobile as an advertising channel has many appealing elements and what stands out from the survey is that this is understood and appreciated by marketers, with immediacy (57%), cost effectiveness (54%), increased engagement (52%) and reach (49%) flagged as top priority benefits by respondents. Ovum estimates there will be 335.44 million connections by the end of 2011 rising to 391.84 million by the end of 2016.

(IS-2013-75) Behind The Switch: Pricing Ontario Electricity Options
This report from the Pembina institute provides an integrated and dynamic model of realistic scenarios for electricity prices in Ontario, including projected growth rates for renewable power, various sensitivities to key price parameters, as well as realistic potential of natural gas generation development possibilities. The model examines the 20-year time period between 2010 and 2030. This study’s results illustrate that electricity prices will increase in Ontario as the major infrastructure investments, system refurbishments and changes to the electricity generation fleet are developed. Given the long-term nature of much of the electricity contracts in Ontario, be they nuclear, natural gas or renewable energy, relatively few realistic alternatives can be foreseen, particularly as nuclear and hydroelectricity continue to dominate the overall generation fleet. The analysis for this study indicates that there is little to gain in cancelling Ontario’s feed-in tariff, particularly just prior to a pricing review which is likely
to result in decreases to original rates. There is at best a small savings to be made by shifting from more natural gas, and would result in likely to be no noticeable impact on consumer rates in the short term, and which poses modest consumer risks if the system grows increasingly dependent on natural gas markets.

(IS-2013-74) 2011 Energy Efficiency indicator: IFMA Partner results
The annual EEi survey was launched in 2007 by Johnson controls and IFMA, it examines building decision-makers’ attitudes, priorities, practices and investment plans related to energy management. In 2011, its fifth consecutive year, the survey reached 3,886 decision makers around the world with responsibility for managing commercial buildings and their energy use. Conducted in March and April 2011 by the institute for Building Efficiency, the survey reached respondents representing many types of buildings on six continents. For the fifth year, IFMA served as a global partner on the survey; members provided the “frontlines” perspective of executives and managers responsible for facilities budgets and energy use in commercial buildings around the world. Comparing 2011 results to those from the previous four years provides an outlook on trends in energy management and insights into the evolution of the energy efficiency marketplace in the face of prolonged economic uncertainty.

This report from EIS Alliance examines Customer Energy Management Systems. A Customer Energy Management System (CEMS) is a building-hosted control system programmed to monitor and save energy by managing building equipment. A CEMS performs centralized monitoring, control of electrical loads to reduce energy usage and cost, and sophisticated energy forecasting. The development of the smart grid will allow the role of the CEMS to expand, to the benefit of energy users and energy providers alike. On the energy user side, consumers will enjoy more flexibility and greater ability to contain costs. On the energy provider side, the CEMS will become a tool for enhancing grid stability and efficiency. Without the smart grid to enable direct communications from the energy service or distribution system provider, a building is simply a static load. The smart grid will allow the sharing of energy information across the electrical grid among many stakeholders.

(IS-2013-72) Achieving the 30% Goal: Energy and cost savings analysis of ASHRAE Standard 90.1-2010
This project was conducted by Pacific Northwest National Laboratory (PNNL) in support of the U.S. Department of Energy’s (DOE’s) Building Energy Codes Program (BECP). DOE’s BECP supports the upgrading of the building energy codes and standards, and the states’ adoption, implementation, and enforcement of those codes and standards as they are incrementally upgraded. When the model energy codes and standards for buildings are being updated, BECP reviews the technical and economic basis of these documents. For commercial and multi-family high-rise residential buildings, which are the subject of this report, the basis for the energy codes is the
ANSI/ASHRAE/IES Standard 90.1.

(IS-2013-71) The Connected Campus
This report from Siemens examines the technological revolution taking place in institutions of higher learning. IHLs need to ensure the best information and communications technology infrastructure is available, not just for their staff, but also for students – supporting communication anywhere, anytime on any device. Running a world-class IHL not only requires advanced infrastructure for the physical campus, but also the virtual campus which supports a rapidly growing cadre of distance learners. Millions of global students now earn their degrees completely online, paying top dollar. Others subscribe to free short courses. The Connected Campus fundamentally transforms the way we teach, learn and work – delivering operational excellence, unprecedented student and faculty engagement, and campus safety.

(IS-2013-70) Green Building Performance
This report from GSA Public Building Service examines green buildings in order to compare them with the national averages to see how much more efficient they truly are. The General Services administration (GSA) selected 22 representative green buildings from its national portfolio, including 12 buildings whose performance was assessed initially in 2007. The evaluation was comprehensive, measuring environmental performance, financial metrics, and occupant satisfaction. Results were compared to both industry and GSA baselines. The results of the study confirmed that, on average, GSA’s sustainably designed buildings use less energy (25% less) and water, emit less CO₂ (36% less), cost less to maintain (19% less), and have occupants who are more satisfied (27% higher) than those working in typical buildings.

(IS-2013-69) New IT Energy Efficiency Incentives: Opportunities Hiding in Plain Sight
This report from Cirrant highlights the “scotoma” of the existing IT Network energy management model and provides a perspective to the future paradigm in IT Network Infrastructure. This unmanaged energy, a large amount of which is presently being consumed unnecessarily, due to insufficient incentives, represents 86% of the US IT power budget. Standards based technologies are available which can be used to dematerialize much of the hardware that is currently manifested in the 3-tier architectural design, via a hybrid design consisting of fiber, wireless, and copper. This new design can diminish the need of wiring closets throughout a building and significantly reduce the power consuming HVAC, TER real estate space, and administrative costs. Dematerialization by itself will result in significant CAPEX and OPEX savings.
(IS-2013-68) The Building Performance Tracking Handbook
This handbook was created to introduce the basic concepts behind building performance tracking for commercial buildings. While geared toward medium to large buildings or portfolios of buildings, many of these same concepts apply to smaller commercial buildings. Building performance tracking is a strategy to help building owners ensure that mechanical and electrical systems operate as intended and that energy use is not higher than necessary. The handbook content was developed through a California Commissioning Collaborative research project, which discovered several key findings about building performance tracking today: building performance tracking is typically an informal process that varies considerably among building owners and managers. Sophisticated software and hardware tools are available, but it’s not always clear how to compare the wide variety and select the most suitable option.

(IS-2013-67) Green Building and Sustainable Development in the Commercial Real Estate Industry
This report from BEPA examines the commercial real estate industry that is becoming increasingly aware of how building energy efficiency trends can impact the value of property. Sub-par building energy performance is already being viewed by some as a deficiency associated with the property. A key to making energy efficiency investment is the ability to project energy savings with a high degree of confidence, and then after the investment is made, verify performance in a technically supportable, consistent and transparent manner. To accomplish this, many energy service companies (ESCOs) rely on the guidance provided in the International Performance Measurement and Verification Protocol (IPMVP) document.(4) The recently published ASTM E 2797-11, Building Energy Performance Assessment (BEPA) Standard,(5) provides a prescriptive data collection and analysis methodology that readily supports the guidance provided in the IPMVP as it pertains to commercial, public and institutional (C/P/I) buildings.

This report from the NRCC provides a comprehensive post-occupancy investigation of the performance of “green” and “conventional” office buildings. Green buildings exhibited superior indoor environment performance compared to similar conventional buildings. Outcomes that were better in green buildings included: environmental satisfaction, satisfaction with thermal conditions, satisfaction with view to the outside, aesthetic appearance, disturbance from HVAC (heating, ventilation and air conditioning) noise, workplace image, night-time sleep quality, mood, physical symptoms, and reduced number of airborne particulates.
(IS-2013-65) IP Address Management: Smoothing the Way to Cloud-Based Services
This report from Cisco examines the issues associated with IP addressing and cloud services. Cloud computing offers many operational advantages to service providers. An important element of successful cloud-based offerings is fast, efficient provisioning and service delivery. However, as IP addressing becomes much more complex, providers will need a new, easier way to manage IP addressing and multitenant services.

(IS-2013-64) Guidelines on Security and Privacy in Public Cloud Computing
This report from NIST examines the emergence of cloud computing, as it promises to have far-reaching effects on the systems and networks of federal agencies and other organizations. Many of the features that make cloud computing attractive, however, can also be at odds with traditional security models and controls. The primary purpose of this report is to provide an overview of public cloud computing and the security and privacy considerations involved. More specifically, this document describes the threats, technology risks, and safeguards surrounding public cloud environments, and their treatment.

(IS-2013-63) Wireless and the environment
This report from BSR examines possible environmental advantages to wireless technology. The primary area where wireless enables a benefit for the environment is in providing information, where previously, geographic or other barriers made this impossible. While transportation and utilities are obvious beneficiaries in areas such as route optimization and monitoring and controlling energy usage, other industries as well as the government are finding that wireless technology can play an important role in reducing environmental impact - while creating efficiencies and improving the bottom line.

(IS-2013-62) 2011 Green Building Opportunity Index
The 2011 Green Building Opportunity Index is the first office market assessment tool to provide weighted comparisons of top U.S. office markets on the basis of both real estate fundamentals and green investment considerations. As in the 2010 version, the Index compares each market's relative position to its peers in six categories: Office Market Conditions, Investment Outlook, Green Adoption & Implementation, Mandates & Incentives, State Energy Initiatives and Green Culture. For 2011, the Index has been enhanced by adding five new markets and refining the methodology and data inputs – yielding a more comprehensive view into the factors that influence successful development, retro-fitting, leasing and sales of investment grade green office buildings.

(IS-2013-61) Building energy codes resource guide
This report from the U.S. Department of Energy provides information for local and state governments in the US on energy codes and regulations. Because of their authority over building design and construction, states and local
jurisdictions are key players in the effort to improve building energy efficiency. There are two primary baseline documents that states and local jurisdictions can adopt to regulate the energy efficient design and construction of new buildings: the International Energy Conservation Code (IECC), developed by the International Code Council (ICC), and Standard 90.1, developed by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) and the Illuminating Engineering Society (IES).

**IS-2013-60) A Guide to Access Control for the Utilities Sector**
This report from BSIA examines access control in the utilities sector in Britain. Access control provides the ability to control, monitor and restrict the movement of people, assets or vehicles, in, out and around a building or site. There is also huge potential in terms of integrating HR and other systems, such as time and attendance, visitor management, automatic number plate recognition, Fire, Intruder and CCTV, which can cut costs and streamline administration costs. Utility companies have never been more vulnerable than in today's climate, where threats to security include terrorism, natural disaster, theft and internal crime. The protection of key facilities such as water treatment works, power plants, remote sites and network infrastructure (particularly electricity substations) is also high on the political agenda.

**IS-2013-59) EPRI Smart Grid Demonstration Initiative**
This report from EPRI examines the smart grid demonstration initiative. The EPRI Smart Grid Demonstration Initiative is a seven- year international collaborative research initiative demonstrating the integration of Distributed Energy Resources (DER) in large scale demonstration projects. This three-year update picks up where the two-year update left off; last year it primarily reported on methodologies and tools that were used in developing the foundational research plans for each project. Most of the projects are transitioning from planning phases into deployment phases. Thus, the theme of this update is “State of Deployment.” To capture the State of Deployment of each project, this year’s annual update shares small examples of the people, equipment and work being performed by the members of this initiative. The examples you will see in the following pages depict the full range of activities of a 3 to 5 year demonstration project from planning, deployment, data collection and analysis.

This report from the WBCSD examines the current state of energy use in buildings worldwide, and attempts to find ways that we can meet the 77% reduction in our carbon footprint by 2050. Based on extensive research conducted over the past four years, the Energy Efficiency in Buildings (EEB) project has developed recommendations and an actionable roadmap to transform the building sector. Detailed analysis shows there is a path to achieving the necessary reductions and that, by 2050, energy savings in buildings can equal the total energy consumed in today’s transportation. It is clear that financial, behavioral and knowledge barriers must be
overcome for individuals, governments and businesses to aggressively adopt energy saving options. It is also clear that delaying action will only increase the ultimate CO2 emissions reductions and associated costs needed for climate stability.

(IS-2013-57) Unified Communications Matters to Enterprise Success
This report from Bell Cisco examines the possible advantages to investing in unified communications technologies. The primary benefit to these unified communications technologies are that it allows the company to have a constant connection to its mobile knowledge workers. Others benefits include video communications and cloud services. Bell Cisco claims that these technologies are becoming not only helpful, but entirely necessary in today’s business arena.

(IS-2013-56) SPECIAL EUROBAROMETER 364: Public Awareness and Acceptance of CO2 capture and storage
This report outlines people’s knowledge, understanding and attitude towards CO2 capture and storage (CCS) in 12 European Union countries. The key learnings have been summarised and a more detailed account of these findings is provided in the main body of the report.

(IS-2013-55) Health care comes home: the human factor
The Agency for Healthcare Research and Quality asked the National Research Council (NRC) to explore home health care issues through the lens of human factors and make recommendations for improving the situation when health care is provided in the home environment. In this report, the NRC Committee on the Role of Human Factors in Home Health Care examined the wide range of people, tasks, technologies, and environments involved in health care in the home to provide an understanding of the most prevalent and serious threats to safety, the quality of care experienced, and care recipient and provider well-being associated with this care. The committee sought to enhance the viability and quality of home-based health care through recommendations that promote systems that successfully accommodate the diversity, strengths, and limitations of humans, both as care recipients and caregivers, and facilitate necessary improvements to the physical environments of homes.

(IS-2013-54) Workplace as a Service White Paper
This White Paper offers a conceptual approach to delivering Workplace as a Service (WPaaS) in the context of the larger Everything as a Service (EvaaS) phenomena. The reference architecture is designed to facilitate the delivery of legacy and new business applications securely on edge devices. The overall approach creates a trusted environment on the edge device ensuring sensitive data is protected while used and securely removed from edge devices post interaction. Using additional capabilities such as geo-positioning data, identification
attributes, user role and context information, and authorization parameters can extend the secure and trusted nature of the solution.

(IS-2013-53) Oncor uses MDM Data to Boost Operations, Customer Satisfaction
This case study describes how a Texas utility integrated its outage management system with its meter data management system in order to improve its customer service with respect to outage management. The approach describes how the Automated Metering Infrastructure has been leveraged to enhance the awareness and accuracy of power outages and to aid in the diagnosis and resolution. The results indicate that more than half of the outages were resolved before the customers knew about it, and in other cases, failing equipment was identified and repaired before it could result in an outage.

(IS-2013-52) Energy Management Information Systems
This handbook on Energy Management Information Systems (EMIS) provides a comprehensive overview of the key components of an EMIS including metering, data collection, data analysis, reporting, and investment justification. The objectives and benefits of an EMIS are clearly identified and a deep review is performed on measurements and the effective design of reports. It is useful for those wishing to get an introduction of EMIS as well as those wanting to utilize a systematic approach towards evaluating their own system and to become aware of best practices and advanced techniques related to the energy management.

(IS-2013-51) Intelligent Buildings: Integrated Systems and Controls
International Specialized Skills (ISS) Institute sponsored Dr. Gerard Healey to conduct survey in England, Ireland, Netherlands, USA and Canada on how construction and property industries deal with high performance buildings challenges specifically integrated systems and controls. The study reviews current and emerging best practices, including multi-discipline coordination; degree of integration and optimization strategies; and practical issues associated with the specification, construction, commissioning, tuning and maintenance of integrated building systems. The surveys found that there is a need for integrated system and controls training in Australia’s construction industry in order to fully materialize the benefits of the high performance building systems. Dr. Healey recommends addendum to existing courses for each discipline and targeted multi-discipline courses on specific technologies.

(IS-2013-50) The Emerging Tablet Market: What Online Retailers Need To Know
This report from Bizrate provides insight on the demographic using tablets for online shopping and how businesses can use this information to increase customer satisfaction and sales. According to Bizrate, tablet users earn more money than non-tablet users and shop online more frequently. However, a majority of those who
have used a tablet for online shopping found that they had frustrations, and would rather use a computer or other device. An improvement to mobile versions of websites and retailer specific apps would inevitably lead to an increase in sales. To collect the data used in this report, Bizrate used their own surveys that are completed by an online shopper immediately after a purchase.

(IS-2013-49) Best Practices for Conducting Online Ad Effectiveness Research
This report from IAB outlines a series of best practices for conducting online ad effectiveness research. IAB believes that while online ad effectiveness research is an important tool for marketers seeking to understand how their campaigns perform, it is challenged by serious methodological limitations and irresponsible study management. Questions around recruitment, sample bias and deployment are hampering the validity of this research and are undermining the industry as a whole. By examining each phase in the delivery of online ad effectiveness research, IAB hopes to understand the complexities and challenges inherent in this research but also best practices to remedy the industry’s most vexing problems.

(IS-2013-48) The ROI of cloud apps
This report from Forrester explores the massive growth in the usage of Cloud apps by businesses and provides an analysis of the up-front benefits and the long-term costs. Forrester believes that while Cloud apps provide numerous up-front benefits (namely faster deployment speed, more frequent upgrades, and reduced support needs), they may not be the best option for some businesses. Sourcing executives must understand their planned usage as best as possible, in order to tailor their Cloud app plan to their own needs and minimize the long-term costs. Forrester uses a Total Economic Impact (TEI) to provide a realistic view of expected outcomes.

(IS-2013-47) CMOS Digital Isolators Provide Data Protection for Smart Meters
This report from Silicon Labs examines CMOS digital isolators for use in smart meters. A primary concern in smart meter design is the integrity of measurement data, which can directly impact a utility provider’s billing revenue. Despite the popularity of optocouplers and transformers as isolation technologies, both of these solutions have tangible weaknesses that should be of concern for metering applications. CMOS digital isolators offer the optimal isolation solution for smart meters by providing superior immunity to electrical noise and external fields.

(IS-2013-46) Manitoba Hydro Place
This report from CTBUH examines the Manitoba Hydro Place. The Manitoba Hydro Place is internationally held as a model of excellence in sustainability through its natural passive systems which create dramatic efficiencies in energy use and human comfort. It sets a precedent for the seamless integration of architectural excellence and
climate-responsive, energy-efficient and sustainable design while enhancing and improving the quality and comfort of the human experience and the civility of urban life.

This report from Kiwi Power examines the demand response on integrated intelligent lighting controls and their ability to increase efficiency and reduce costs. Demand response is a means by which demand on an electrical distribution network can be dynamically managed to meet movements in supply. Integrated intelligent lighting controls provide the opportunity for dimming based demand response strategies. In non-day lit commercial applications 80% of desk based workers accepted short-term reductions in their lighting levels by approximately 20-30%, leading to a reduction in energy use and costs.

(IS-2013-44) Staying Secure in the Cloud – How to manage your network and data in a new age of computing
Cloud computing can reduce or eliminate the need to build and maintain expensive infrastructure, but it is important to address questions about security, risk and compliance as well. This white paper explains how an organization can implement the right measures in order to take full advantages of cloud computing by looking at the major considerations involved in cloud security.

(IS-2013-43) The Connected Consumer Challenge: Extending the electronics experience through services
Today’s consumers expect to do more with their connected devices, demanding high performance and integrated device experiences. To provide this experience, electronics companies must expand their traditional focus on quality product manufacturing to include new capabilities for service excellence. This white paper looks at these new areas of service excellence, which include: open collaboration, customer insight, service operation, software development and flexible infrastructure.

(IS-2013-42) Risk of Sick Leave Associated with Outdoor Air Supply Rate, Humidification, and Occupant Complaint
This paper demonstrates an association between expert ratings of outdoor air supply rate and the presence of sick leave among employees of a large U.S. manufacturer. This paper shows that the cost of providing additional ventilation may be more than of offset by the savings that result from reduced sick leave.
(IS-2013-41) State of the Industry 2011
This report looks at the current commercial integration industry and identifies both the vertical markets that are showing strength and the ones that are leveling off. This report also covers the eight trends that will define commercial integration as well as how commercial integrators can increase their revenue.

(IS-2013-40) How to Succeed in the House of Worship Market
This report provides a detailed overview of the House of Worship market by discussing the pros and cons of the market, how to capitalize on church energy management needs, and how to interact with clergymen. The report also discusses the challenges with this market which include marketing, selling service contracts and dealing with old churches.

(IS-2013-39) Connecting Cities: Achieving Sustainability Through Innovation
This report from Cisco discusses their Smart+Connected Communities initiative, which helps to transform physical communities into “connected communities” that achieve economic, social and environmental sustainability. This report discusses the issue of urban development and the role of information and communications technology (ICT) on the sustainable development of cities.

(IS-2013-38) Becoming a Social Business: The IBM Story
This report from IDC explores the rise in consumer-oriented social networking software. IDC views social software as an enabler to the cultural shift and business process changes that need to take place in order to transform a company into a social business. The positive outcomes of a social business include a more open, efficient organization that has deeper customer relationships, quicker decision making capabilities and speed-to-market potential. IDC uses example case studies of IBM’s evolution to a social business to show the positive outcomes of becoming a social business.

(IS-2013-37) Western Wind and Solar Integration Study
This study explores the integration of 30% wind and 5% solar power into the power system operated by the WestConnect group of utilities. It was prepared for NREL by GE Energy and evaluates the operational impact of an increased penetration of renewable energy. The model utilizes analytics to evaluate the impact of a variety of different scenarios, and discovers that it is operationally feasible to achieve the target but will require alterations to current practices - including, balancing area cooperation; sub-hourly scheduling; renewable forecasts in unit commitment; and access to underutilized capacity.
(IS-2013-36) Bringing Smart Water Networks Into Focus
This paper on smart water networks presents the results of a series of interviews and surveys with utility companies. It describes the opportunity of using smart technologies to address water supply challenges. The report deals with improving leak detection through sensors and analytics; enhancing the strategic planning of capital expenditure; automated monitoring of water quality; and improving the efficiency of operations and maintenance activities. It describes some of the barriers towards adoption of these methods, including the lack of funding, political and regulatory support, availability of technical solutions, and the challenges in preparing a business case.

(IS-2013-35) HomePlug AV2 Technology
This report, published by the HomePlug Powerline Alliance, provides an in-depth review of HomePlug AV2 Technology. HomePlug AV2 provides a major step forward in high-bandwidth capabilities and interoperability for cost-effective “no new wires” networking that supports HD / 3D video and other bandwidth-hungry applications by leveraging existing power line wiring throughout the whole home.

(IS-2013-34) Strategic Metering
This report, published by Oracle Corporation, notes that utilities that permit metering or billing departments to control smart metering design almost invariably discover that initial investments fail to provide optimal return on investment. In fact, without strategic executive leadership and involvement of all departments, utilities embarking on smart metering risk near-term revenue loss, less-than-optimal service delivery, and long-term excessive IT costs that customers and communities may not tolerate.

(IS-2013-33) Making Smart Grids/Smart Meters Smarter Through Real-Time Business Visibility and Situational Awareness
This report, published by Oracle Corporation, argues that the utilities industry has a unique opportunity to harness untapped business value from their smart meter and smart grid programs using complex event processing technology. This technology can address real, critical business requirements for situational awareness; for example, real-time outage detection and power restoration.

(IS-2013-32) Understanding ZigBee Gateway – How ZigBee extends an IP network
This report, published by the ZigBee Alliance, is designed to provide a basic understanding of the capabilities, mechanisms, and recommended practices of the ZigBee Gateway. The report is intended to assist developers, system designers and integrators in the strategic planning and implementation of gateways between ZigBee networks and IP networks such as the Internet.
The purpose of this report is to explore environmental opportunities and challenges that arise from existing and emerging uses of wireless (licensed spectrum) technology, with a particular focus on the areas of transport, utilities, agriculture, and public services in the U.S. The report was commissioned by CTIA – The Wireless Association and prepared by BSR.

This paper, published by the Smart Grid Research Consortium, describes the challenge utilities face in developing comprehensive investment strategies and identifies difficulties associated with several common approaches to smart grid investment analysis. The final section presents 10 investment analysis recommendations based on the Smart Grid Research Consortium’s cost/benefit model that has been applied at 15 utilities. These recommendations are offered both to guide utility in-house analysis and to assist utilities in evaluating smart grid analysis undertaken by vendors and consultants.

(IS-2013-29) Developing the communications platform to enable a more intelligent electric grid
Duke Energy predicts that a new digital grid will have more efficient and reliable transmission and distribution systems; it will leverage energy efficiency programs to reduce wasted energy and it will integrate more distributed energy resources into our grid and decrease carbon emissions. This white paper, published by Duke Energy, describes the firm’s efforts to innovate and collaborate with its ecosystem of partners to identify, develop, and incorporate new applications and technologies that best leverage the new emerging digital grid.

(IS-2013-28) Evaluation of Steam Cleaning in AHU Coil Sanitization and Energy Conservation
The paper from Pure Air Control Services, Inc. investigates indoor air quality degradation caused by contaminants in air-conditioning equipment. A detailed analysis was performed on an air-conditioning coil that had been operating since 1967. Bacteria and fungi were discovered and cataloged along with reduced airflow. A cleaning procedure using a jet of steam at 350°C was effective in removing nearly all of the contaminants and in increasing airflow. This should improve indoor air quality.

(IS-2013-27) Insights into a Customer-Centric Strategy for the Smart Grid
This consumer research, sponsored by PwC and conducted in the Fall of 2011, provides directional insights on customer attitudes and behaviors towards energy usage and the impact of the smart grid. The paper outlines how the smart grid enables a transition to a more interactive, value-based relationship between the utility and its
customers. Key findings include what customers find important and what they are willing to pay for these services. The core elements of a successful customer-centric smart grid strategy are provided. This is a helpful reference document.

(IS-2013-26) Guidelines for Conducting a Cost-Benefit Analysis of Smart Grid Projects
This report provides guidance and advice for conducting cost-benefit analyses of Smart Grid projects. The assessment framework is very thorough, and is structured into a set of guidelines to tailor assumptions to local conditions, monetize both benefits and costs, and to perform a sensitivity analysis of the most critical variables. The framework also provides the ability to contextualize externalities that cannot be easily monetized. An illustrative case study is provided.

This research, conducted in December 2011, is a follow up to a previous study, and provides a quick reference to consumers’ awareness and favorability of the smart grid and smart meters. Results are provided across five segments and four regions, and are further delineated by gender and ethnicity. A number of benefit statements were tested with participants, and ranked as to whether or not the benefit increased or decreased appeal. In general, awareness remains low but favorability is reasonably high. This report is a basic but good reference.

(IS-2013-24) Electricity Subsector Cybersecurity Management Process
The paper is in form of Government Document published by US Department of Energy, detailing the Risk Management Process for Electricity Subsector Cybersecurity. The paper begins with Introduction and Overview for the topic of discussion. Later, the paper has been structured in different Tiers. While Electricity Subsector Organization and Mission and Business Processes have been discussed at length in Tier-1 and 2, in Tier-3 and 4, IT and Industrial Control System have been put forth. The paper finally ends with various useful Appendices for further details.

(IS-2013-23) Energy Roadmap 2050 (EU)
The paper is in form of Government(s)’ Official Document published by European Commission, Brussels presenting extremely useful futuristic guidance. The paper begins with Introduction, Need for Secure-Competitive-Decarbonized Energy System in 2050. Later, Overview of Today’s Scenarios have been presented. Then the paper identifies the Challenges and Opportunities while moving from 2020 to 2050. The authors then after presents their suggestions on Rethinking Energy Markets and Investment Mobilization. The paper also suggests to include public and steering the implementation of this strategy globally. The paper finally ends with marking The
Way Forward with useful supporting information.

(IS-2013-22) World Energy Outlook 2011 Executive Summary
The paper is in form of Research Report published by International Energy Agency (IEA), USA presenting an interesting Short Term Futuristic View on Global Energy Scenario. The paper begins with an introduction about IEA. Later, in next section of an Executive Summary, the paper puts forth some critical facts and highlights major areas of our immediate concern. This includes Direction, Uncertainty-Long Term Situation Relationship, Effects of some steps already taken, Rising Transport Demand and Upstream Costs and their relationship with Cost of Oil, Opportunities in fields such as Natural Gas and Renewables, keeping an eye on Russian Oil conserves and their consumption. The paper finally ends with wish to achieve energy for all without costing the earth as low as possible.

(IS-2013-21) Proactive Customer Communications: Using Automated Multi-channel Communication as Part of a Successful Adoption of AMI/Smart Grid
The paper is in form of Research Paper published by Twenty First Century Communications, USA presenting interesting information on Customer Communication in AMI/Smart Grid. The paper begins with Executive Summary and Background information with briefs on AMI and Smart Grid. Thereafter, an interesting comparative analysis has been presented in Today’s Grid v/s Smart Grid. Later, four communication related issues for AMI and Smart Grid are presented with Real-life situations. Solutions of the aforesaid problems have been suggested in the next section with supporting details. The paper finally ends with AMI/Smart Grid Communication Tips and additional resources for further reading.

This report by the Conference Board of Canada details the energy consumption profile of commercial buildings within Canada. Based upon a literature review and subsequent interviews, it highlights some of the issues that constrain a wider adoption of energy management strategies within the industry, such as how the investment decisions are made. Guidance is then provided through the definition of a collection of best practices that can be employed to overcome the mentioned barriers. Topics related to technology, data, training, investment, and communications are included in the analysis.

This report explains the benefits of implementing an energy management solution. It indicates that an attractive ROI can be realized through reduced energy costs, and discusses how government regulations and incentives
can be realized through the implementation of an energy management system. The importance of a measurement and verification approach is highlighted, and that the use of dashboards to view energy consumption is necessary to monitor current energy usage. The report finishes up with some aspects of how ‘space hibernation’ can be employed to help reduce energy consumption.

(IS-2013-18) The Case for Utility-owned Smart Grid Networks
The document is in form of White Paper published by Technology Partners FZ, LLC, presenting an interesting case of Utility-owned Smart Grid Network. The paper begins with explanation of design level intricacies especially into the areas such as Real-time Monitoring and Communication. Later, the importance of inclusion of AMR and AMI in Smart Grid has been put forth with necessary justifications. Discussing various facets, specific needs and exclusive requirements from Communication Network of Smart Grid, the author(s) suggest that the same should be better owned by the Utility itself rather than Telco. The paper finally ends with brief on requirements for Demand Response Management.

(IS-2013-17) Smart Grid Security
The document is in form of White Paper published by NRG Expert, UK presenting an interesting view on Smart Grid Security from various aspects. The paper begins with expressing rising concerns over Cyber Threats and Issues-Challenges for Smart Grids to face, with clear of Security Breaches with details. Paper identifies 3-fold security issues relevant to Smart Grid Network viz – (1) Data Privacy, (2) Energy Theft and (3) Other Malicious Intent, and further discusses them at sufficient depth including details of specific incidents in each. The paper finally ends with information regarding Market Size and Key Players for the same matter.

(IS-2013-16) The EMEA Smart Grid Rollout
The paper is in form of Research Paper published by Oracle Corporation, USA presenting an interesting Research Report with Survey Results on The EMEA Smart Grid Rollout. The paper begins with an Overview of the Key. Next, the needs for full utilization of Smart Meters are put forth. Along with supporting details and charts, it is justified that the utilities are not making out the full benefits offered by Smart Grid Deployments. Further, it is also discussed with necessary details that how conventional IT Systems are unable to support the intelligence requirements in form of Data Communication for Smart Grid Intelligence, along with the finding that Electric Vehicles are not currently the priority for the utilities. Each aforesaid section is also included with Oracle Perspective. The paper finally ends with Concluding Notes along with suggested methodology.
**IS-2013-15 Smart Grid Basics: Turning Information into Power**
This report from the United States Department of Agriculture discusses Internet usage on U.S. farms. As of 2011, DSL remains the most common method of accessing the Internet, with 38 percent of U.S. farms using it, up from 36 percent in 2009. A total of 62 percent of U.S. farms now have Internet access and 65 percent of farms have access to a computer. Farms using computers for their farm business remains virtually stable at 37 percent compared to 36 percent in 2009. Charts and graphs are included in this report.

**IS-2013-14 Farm Computer Usage and Ownership**
This report from the United States Department of Agriculture discusses Internet usage on U.S. farms. As of 2011, DSL remains the most common method of accessing the Internet, with 38 percent of U.S. farms using it, up from 36 percent in 2009. A total of 62 percent of U.S. farms now have Internet access and 65 percent of farms have access to a computer. Farms using computers for their farm business remains virtually stable at 37 percent compared to 36 percent in 2009. Charts and graphs are included in this report.

**IS-2013-13 Cisco Any Device: Planning a Productive, Secure and Competitive Future**
This report from Cisco discusses their “Any Device” vision, which allows for greater employee choice in devices while maintain a common, predictable user experience that maintains or enhances global organizational competitiveness, productivity and security. Enterprises and large organizations must decide whether to allow or deny certain users, devices and locations access to company networks, data and services. This report explores the steps and business decisions that information and security officers, enterprise information technology and information security architects should consider as they begin their journey to Any Device.

**IS-2013-12 Passivhaus Education Buildings**
This report from Architype and Thomas Vale Construction outlines the benefits of Passivhaus, which is an internationally established Quality Assurance standard designed to minimize energy consumption while optimizing the comfort of occupants. It achieves savings in space heating energy of around 85 percent and total primary energy of around 70 percent, which delivers significant reductions in running costs through the life of the building. Passivhaus creates buildings that by design, simply use less energy by using natural materials, high levels of natural daylight and excellent ventilation to create a healthy and fresh atmosphere. Passivhaus is now being used in some UK schools.

**IS-2013-11 The Evolution of Networks in Latin America**
This report discusses the correlation between growth trends in Latin America and the demand for telecommunications and information technology. Initiatives are in place to make mobile phone and internet use
more accessible. The migration from 2G mobile subscribers to 3G and 4G subscribers means carriers must evolve to an all-IP network to meet demands. More towers and additional equipment will also be needed and more carriers may be moving to sharing infrastructure with their competitors.

(IS-2013-10) New ZigBee PRO Feature: Green Power Connecting Battery-Free Devices
The Paper is Research Report published by ZigBee Alliance presenting useful update of about Strategic Planning and developments of the Smart Grids. The paper begins with fundamental concepts about Sensor and Control Networks of current and future. Later the paper discusses Battery-Free Communication and Efficient Usage of Energy. Details regarding Energy Harvesting, Proxy and Sink, Pairing and Security are also described. At the end, the basics of ZigBee Technology are presented. Finally, the paper ends with Concluding notes.

(IS-2013-09) Getting Started with Building Energy Management
The Paper is Private Research Report published by Noesis Energy in form of Article that presents useful description about the Building Energy Management. The paper begins with establishing the need for managing the energy use identifying the key energy challenges, then introducing the Energy Management. Later the paper discusses the procedure developing two types of Energy Profiles and methodologies of Energy Usage Recording. Thereafter, setting of organizational goal has been discussed with details of EMP Components and identifying opportunities. The paper ends with useful notes for checking the performance for the same context.

The Paper is an outcome of IEEE Sponsored Research published by ZPryme in form of Case Study that presents useful description of about Strategic Planning and developments of the Smart Grids. The paper begins with introductory information such as Executive Summary and Emerging Themes, Assessments, Implications and Recommendations including details of Survey Respondent Characteristic. Later, Grid-Scale Energy Storage and Distributed Generation are described with necessary details. Thereafter, Microgrids are introduced with Industry Collaboration and relevant Market Issues for Energy Storage, Distributed Generation and Microgrids. Finally, the paper ends with narration of Zpryme Outlook for the same context.

(IS-2013-07) Microgrids: An Oracle Approach
The Paper is Private Research Report published by Oracle in form of White Paper that presents interesting preliminary information about Microgrids developed by Oracle. The paper puts forth Oracle’s approach towards design and development of Microgrids. The paper begins with establishing needs and requirements for Microgrids. Introductory concepts of Microgrids are explained and later the paper discusses the design of
Microgrid for connecting one or more substations. The details of controlling the Microgrids are also described with useful supporting information. The paper ends with Results and Concluding notes at the end for the same.

(IS-2013-06) Smart Grid Security-Preparing for the Standards-Based Future (without neglecting the Needs of Today)
The Paper is in form of Private organization Research Article that presents useful assessment of benefits and impacts of the Smart Grids. The paper begins with fundamental concepts such as the needs of security in contexts of present and future. Then the paper identifies and describes challenges for smart grids in terms of security from all possible aspects. The paper also puts forth important points such as Auditability and Compliance in the same contexts with useful mentions about People and Processes as well as Systemic Controls and Needs for the Smart Grid to be Future Ready. The paper finally ends with summary by the authors outlining the entire article.

(IS-2013-05) Smart Grids: Strategic Planning and Development
The Paper is Private Research Report published by Oracle in form of White Paper that presents useful description of about Strategic Planning and developments of the Smart Grids. The paper begins with basic concepts in form of Introduction and later the paper discusses the procedure of decision making along with puts forth Bottoms-up and Top-down approaches for development of Smart Grid. Details regarding vendors and customer-centric criteria, regulatory information, etc have also been included. The paper ends with Concluding notes for the same context.

(IS-2013-04) The Smart Grid: An Introduction
The Paper is in form of Govt. Research Report that presents extremely useful Introduction about The Smart Grid. The paper begins with basic concepts and preliminary introduction about the Smart Grid in Chapters 1, and timeline of hierarchical developments in the area in Chapter 2, later the in Chapters 3 to 5, paper puts forth the limitations of present Electric Grid and the differences between Conventional Electric Grid and Proposed Smart Grid. Chapter 6 presents an Assessment of involved complexities from the requirements of Utilities, Regulators, etc. and Chapter 7 describes the Recommended Framework in form of Smart Grid Platform. Chapters 8 and 9 outline undergoing works in the same area and the benefits for everyone respectively. The paper ends with Resources and Glossary for the various terminologies related to the Smart Grid.

(IS-2013-03) Smart Grids: The future challenges for distribution grids
The Paper is in form of Pvt. Org. Research Report that presents useful information about the future challenges for the distribution Grids. The paper begins with basic concepts in form of basic definitions and technical descriptions
discussing important terminologies relevant to Smart Grids in Chapter-1. Later in Chapter-2 the paper clearly identifies and discusses with necessary details Future Challenges for distribution grids. In Chapter-3 the paper describes the excerpts from author’s organization RWE and the projects under execution at RWE, along with necessities of aligning distribution grids to the growing demands. Finally, the paper ends with Concluding Notes on the subject.

(IS-2013-02) A vision of smarter cities
An urbanizing world means cities are gaining greater control over their development, economically and politically. Cities are also being empowered technologically, as the core systems on which they are based become instrumented and interconnected, enabling new levels of intelligence. In parallel, cities face a range of challenges and threats to their sustainability across all their core systems that they need to address holistically. To seize opportunities and build sustainable prosperity, cities need to become “smarter.”

(IS-2013-01) Clear Energy Trends 2011
A study of the clean (green) energy market; status quo and trends are described for solar, wind, clean fuels and other clean energy sectors. Evolution of the market since 2000 and expected development for the years to come.
(IS-2012-131) Emerge Alliance Control Applications
This report from the eMerge Alliance describes how to enhance the energy-related performance of building automation systems with the addition of sensors and distributed controllers in a mesh network at the fringe of the system. These sensors include daylight, motion, temperature, air quality, etc. Local power sources or power harvesting from heat, motion, or light are recommended instead of batteries. Data from these sensors could be processed and displayed on an energy dashboard. Other applications include enterprise-level control and participation in smart-grid demand response programs.

(IS-2012-130) Benefits and costs of improved IEQ in U.S. offices
This report from Lawrence Berkeley National Laboratory examines the costs and benefits of system that improve indoor air quality (IAQ). Improvements are possible with small increases and sometimes savings in the energy costs for operating a building. The objective is to increase the ventilation rate (VR) by up to 50%. The technology uses economizers attached to HVAC equipment for gathering outdoor air. A key finding: “The estimated benefits of the scenarios analyzed are substantial in magnitude, including work performance increases, reductions in SBS [Sick Building Syndrome] symptoms, absence reductions, and thermal comfort improvements in millions of office workers.”

(IS-2012-129) How ClimateTalk™ Open Standards Complement Smart Grid Objectives
This report introduces the plans by the ClimateTalk™ Alliance to specify interconnections for HVAC and water heating equipment to participate in energy management programs. This equipment accounts for as much as 60% of home energy costs. The ClimateTalk Alliance specifications provide relatively low-cost interconnections to an energy management system. The positioning of an energy management system between a smart grid and end-devices reduces the communications complexity and cost for connecting HVAC and water heating equipment to a home network. A Universal Serial Bus (USB) with Plug and Play provides the interconnection.

(IS-2012-128) Is the time ripe for gas demand response?
This report from principals at the Brattle Group examines the effectiveness of managing natural gas consumption by residential customers. Electric companies are increasing the consumption of gas for running electric generators at peak times. This is causing fluctuating gas prices during the day. Decreasing residential consumption through thermostat setbacks by a few degrees is proposed. The authors claim that customers would accept such programs based on some studies in Canada and the United States.

(IS-2012-127) Assessment of Demand Response and Advanced Metering
The report from the United States Federal Energy Regulatory Commission (FERC) is the 2011 annual survey requested by Congress on demand response programs for all class of customers. Smart meter deployments increased from 8.7% to 13.4% between 2009 and 2011. Privacy protection for the more frequent consumption data collected is discussed. FERC is requesting that demand response be considered on par with generation when planning regional energy requirements. Demand response programs and actions by various states are summarized.

(IS-2012-126) The Old Model Isn't Working: Creating the Energy Utility for the 21st Century
This report from the American Council for an Energy Efficient Economy examines the financial deterrents for utilities to invest in energy efficiency programs. The issues are program cost recovery, lost energy sales, and maintaining investment returns for shareholders. The cost for energy savings programs is up to four times less than the cost of supplying that energy. Some costs are treated as expenses or short-term capital projects, or recovered through a customer charge. Some utilities are allowed frequent rate adjustments. Some utilities are offered performance incentives.

(IS-2012-125) Considerations in Broadband Architecture Moving to FMC
This report from the Broadband Forum examines trends among telecommunications providers to integrate customer services for voice, video, and Internet across wired and wireless media. This combined system is called Fixed/Mobile Convergence. There is a movement toward sharing a network transport infrastructure. Connectivity is provided via the wireless network or wired, which offers improved quality of service. Operators may combine customer databases and bills for wired and wireless services. The objective is to provide a uniform Quality of Experience to customers. The organizations involved in convergence technology are reviewed.

(IS-2012-124) TR-069 Deployment Scenarios
This report from the Broadband Forum describes the TR-069 specification, CPE WAN Management Protocol (CWMP), for network management of a variety of telecommunications data services. TR-069 specifies local area network management of devices such as residential gateways and set-top boxes. It can also enable new services such as managed Wi-Fi, content filtering, Internet time blocking, online backup, and home surveillance without a site visit. Future plans this and related specifications are discussed.

(IS-2012-123) Smart Buildings: Ten Trends to Watch in 2012 and Beyond
This report by Pike Research provides a brief overview of current smart building technologies and presents a forecasting of ten trends on these smart building technologies including mature technologies like submetering and
evolving new technologies like Cloud-based building energy data management, automatic demand response, and building information modeling.

(IS-2012-122) Sustainable Industries: Parallels to the Internet Boom, Bust...and...Rebirth
This four-page report provides a very short overview of the clean energy sector (in comparison to the lifecycle of the Internet) with 2009Q1-2011Q3 data for global venture capital and private equity new investment, global merging & acquisition volume, and global asset financing of new build clean energy assets.

(IS-2012-121) E-communications Household Survey
This is the Special Eurobarometer 362 co-ordinated by Directorate-General Communication. The survey was carried out by TNS Opinion & Social network. The Interviews were conducted among 26.836 EU citizens in the 27 member states. It is a statistic presentation of how the households in EU uses and/or have access to fixed telephone lines, mobile phones, computers and the Internet in 2011. There are comparisons between two other surveys in 2007 and 2009.

(IS-2012-120) Information Marketplaces - The New Economics of Cities
Cities have for centuries developed solutions for the physical aspects of urbanity but the use of information has just started. To use information as an asset in creating smart cities is necessary and there is a huge amount of information or raw data collected in a city that can be refined and used by entrepreneurs to create values and benefits for citizens. The report discusses how to connect smart cities to values and how to build city value chains. Examples from NY, Rome and London and other cities are provided on how information has been used to create values for the city and the citizen.

The paper emphasizes on Recommending Policy Framework for development of Smart, Modernized and Scalable Grid for Clean Energy future of the USA. One of the major focus of the paper has been installation of ICT for the electricity sector. The recommended policy framework in the paper has been an outcome of an extensive outreach and research process for identification of policies for enhancement of the Smart Grid Investments and creates a useful support to the Clean Energy Strategy of the Administration. The paper on one hand includes the modernization of the Grid, on the other hand it also throws light on care of HV T&D lines as well as facilitating integration of variable renewable energy.

(IS-2012-118) PV Pricing Trends: Historical, Recent and Near-Term Projections
In recent years, the no. of installations of PV has been showing firm uptrend in the USA and globally. This paper presents useful information regarding carefully studied pricing movements based on its various criteria of impact and further examines the possibilities of PV stakeholders for transition towards Market-driven PVs. The paper ends with useful recommendations in form of suggestions to enable the PV pricing in the USA to match that of in Germany by indicating substantial cost reductions in the BOS.

(IS-2012-117) Assisted Living installation practice
This paper from the Foundation for Assistive Technology (FAST) discusses the importance of good installation practice. It presents experiences from a project aimed to refining and develops activity monitoring service using learning from 300 installations. It shows that it takes different skills to handle the preparation and installation of an assistive system and there is no guidelines or standards to use. It also presents the results from two concurrent online surveys, one for installers and one for commissioners of telecare and telehealth. It finally wraps up arguing for more and new training and education in the sector.

(IS-2012-116) Smart Metering Implementation Programme
This paper shares their experiences at different hierarchical levels in Smart Metering Implementation Programme in the UK. The paper initially begins with sharing of Conclusions and Consultations. Later, the background and progress of the programme. Later the paper puts forth the Vision and Strategic Context of the programme. Additional ideas regarding the programme have been also presented. The paper ends with indicating future areas for work with Forward Look and Conclusions Sections.

(IS-2012-115) Utility Scale Smart Meter Deployments, Plans and Proposals
This paper nicely compiles and summarizes current smart meter installations in the UK, as well as planned deployments and proposals, by investor-owned utilities, large public power utilities, and some rural electric cooperatives. Based on submitted and approved proposals, important and useful information regarding the responses to survey questions and other public information have also been included.

(IS-2012-114) Smart Metering for Electric and Gas Utilities
This paper provides detailed and useful information on Smart Metering for Electric and Gas Utilities. Useful guidelines with relevant issues especially regarding implementation have been clearly identified and discussed. Cost benefit analysis and support from Oracle have also been quite interestingly put forth. However, the reviewer suggests that involvement and discussions with organizations such as ISA, IEC, IEEE, IET, etc. and many other MNC manufacturers, Worldwide Solution Provider Companies, shall be useful in further enhancement and further generalization of the paper to increase its spread.
(IS-2012-113) Achieving High Performance Through Solar Photovoltaic (PV) Integration
This paper begins with Accenture’s Study on Impact of high penetration of Solar PV. Later in Section-I, the paper describes Trends, Opportunities and Challenges for Solar PV and its integration, subsequently in Section-II, the paper suggest useful guidelines on Recommended Actions and New Business Models for high penetration for Solar PV and its integration. The paper ends with Concluding Notes at the end.

(IS-2012-112) Smart Cities
This document described the Smart Cities project that has been established in Northern Europe. The project aims to form a collaboration between government and academic partners to develop and deploy electronic services across cities. This unique transnational consortium will share experiences and best practices across the region, especially in the area of electronic delivery of government services. It includes the focus on six work packages, including User Profiling and Wireless services, and identifies the participating cities that will pilot the technology.

(IS-2012-111) Mobile Payment – Stepping into Uncharted Territory
This report from Parks Associates examines the growth of the mobile payment industry. A mobile payment is described as a purchase for which a mobile phone is used in the payment process. These payments can be made in-person or remotely. The market for merchants is large as only 30% of U.S. merchants currently accept payment cards. Mobile payment technologies provide a gateway between consumers and merchants, allowing more merchants to accept payment cards and allowing more variety in where consumers can make purchases. Predictions in the growth of the mobile payment market are discussed.

(IS-2012-110) Trends in Digital Gaming: Free-to-play, Social and Mobile Games
This report from Parks Associates explores current trends in digital gaming. Most gamers are casual gamers and have been attracted to the gaming world by social or free-to-play games through platforms like smartphones and tablets. Free-to-play games allow players to play for free and only pay when they want to enhance their gaming experience. Social/Facebook games are often viral and can scale up their user base very fast. The number of mobile phone gamers is on the rise with the increase of smartphones. Tablets will have a large impact on the mobile gaming market and its monetization potential. Revenue models for mobile gaming are discussed.

(IS-2012-109) Impact of Smart Grid on Connected Homes 2012 Study: Executive Summary
In 2012, CABA conducted the Impact of Smart Grid on Connected Homes Landmark Research study with the objective of greatly improving the understanding of residential Smart Grid development and deployment in terms of: identifying market demand and growth areas for new products; comparing competing product strategies and
communication of competitors; determining product preferences for end-users; developing messaging that resonates with the target audience; defining critical success factors to expand product offerings to end-user markets; and establishing a market approach and foundation for strategic decision-making efforts.

(IS-2012-108) The Internet of Things (a Cisco white paper)
The number of Internet-connected devices is growing faster than the number of people on the planet, and surpassed the world population in 2008. Looking forward, this Cisco white paper presents an Internet vision based on different types of sensor devices, communicating across disparate networks, under a common set of standards.

(IS-2012-107) UPnP Forum Update
This slide deck describes the Universal Plug and Play (UPnP) organization, its technology & certifications, its market momentum, 2011 achievements, and future plans.

(IS-2012-106) The Business of Health & Wellness: Engaging consumers and making money
Cambridge Consultants distills key findings from discussions on the future of the health & wellness market, the nature of the market, factors leading to consumer engagement, and the future of technology, products and business models in this space. One view is that sustainable revenues will only come from reimbursement for solutions that demonstrate a reduction in healthcare costs, while another approach targets consumers directly, encouraging them to improve their own health and wellbeing.

(IS-2012-105) Exploring the Digital Nation – Home Broadband Internet Adoption in the United States
This report by NTIA and the Economics and Statistics Administration presents the most accurate statistical profile of home broadband services adoption, citing Census data that shows that disparities among groups still persist. Persons with low incomes, seniors, minorities, the less-educated, non-family households, and the unemployed tend to lag behind others groups in home broadband use.

(IS-2012-104) Broadband Forum: Value Proposition for Connected Home
This report outlines the value proposition that The Broadband Forum (BBF) brings to Service Providers and consumers to enable the next generation family of value-added managed services for the Connected Home, such as Home Monitoring, Control, Security, Media, Health, Energy management, and others via its evolving set of standards. Connected Home Services are usually described as web based cloud services that provide consumer applications, delivered over a broadband Internet connection, to various in-home devices.
(IS-2012-103) The Tablet Revolution and What it Means for the Future of News
Eighteen months after the introduction of the iPad, 11% of U.S. adults now own a tablet computer of some kind, and about half (53%) get news on their tablet every day. They spend about 90 minutes reading long articles and browsing headlines, but most say they would not pay for news content on these devices. Tablet news users also say they now prefer their new devices over television, PCs or print publications as a way both to get quick news headlines and to read long-form pieces.

(IS-2012-102) Exploring the Digital Nation: Computer and Internet Use at Home
This report by the US Economics & Statistics Administration and National Telecommunications & Information shows that just over 68% of households subscribe to broadband services and that broadband adoption varies across demographic and geographic groups. Lower income families, people with less education, those with disabilities, Blacks, Hispanics, and rural residents generally lag the national average in both broadband adoption and computer use.

(IS-2012-101) HOME Networking Foundations: From LANs to RF Distribution to Windows 7
This Advantage Series from CE Pro contains four related articles about key aspects of home networking, including: (1) Networking Basics FAQ, (2) Designing Virtual LANs to Bridge A/V & IP Networks, (3) 5 Reasons Windows 7 is Good for Installers, and (4) RF Distribution: A Refresher Course.

(IS-2012-100) Cloud Computing for Electronics (an IBM White Paper)
From consumer electronics to medical devices, industry sub-segments are all trying to respond to lower consumer spending and stricter access to capital in their own unique ways. This paper provides a view of cloud computing for the electronics industry and describes the technologies and functions required to improve efficiency, reduce costs and enable new capabilities.

(IS-2012-99) Seventh Broadband Progress Report and Order on Reconsideration
The FCC is required to conduct an annual inquiry concerning broadband deployment, and this latest report shows that still too many Americans remain unable to fully participate in our economy and society because they lack broadband access. As many as 26 million Americans live in areas unserved by broadband, and about one-third don’t subscribe due to barriers such as cost, lack of digital literacy, and a perceived lack of need.

(IS-2012-98) ZigBee: Expanding Communication Services
This paper presents ZigBee as a special opportunity for the global telecom industry to innovate by building large-scale solutions based on the “Internet of Things.” With support for thousands of devices in a single multi-hop
network, the ZigBee standard provides a low power, low data rate, and low cost solution that’s ideally suited for personal area network applications in telecommunication devices.

(IS-2012-97) Mobile Medical Applications – Draft Guidance
This draft guidance when finalized will represent the U.S. Food and Drug Administration’s (FDA’s) current thinking on this topic. Its purpose is to inform manufacturers, distributors, and other entities about how the FDA intends to classify and regulate select software applications intended for use on mobile platforms (mobile applications or “mobile apps”), depending on risk.

(IS-2012-96) Connecting the Dots: Business Megatrends and Our Industry 2010
This marketing white paper by Stiernberg Consulting lists 12 megatrends as companies in the entertainment technology, music products, and AV systems industry emerge from the economic downturn of 2008 leaner, meaner and better equipped to serve customers than ever before.

(IS-2012-95) Residential Building Retrofits Working Group Blueprint
This presentation by The Residential Building Retrofits Working Group of the State and Local Energy Efficiency Action Network (SEE Action) provides a vision of the Home Energy Upgrade Market, market sizing, forecasts, barriers to expansion, and working group priorities and target projects.

(IS-2012-94) Measuring Broadband America
This report presents the detailed results of the first rigorous, nationwide study of actual home broadband performance in the United States, based on a study of the 13 largest broadband service providers, which collectively account for approximately 86% of all U.S. wireline broadband connections.

(IS-2012-93) Cloud Computing for Electronics (an IBM Executive Report)
Globalization, deregulation, commoditization and the impact of the Internet have been significant drivers of business transformation, particularly in the electronics industry. Cloud computing can help companies cope with rapid change, and this paper describes what’s needed to improve efficiency, reduce costs and enable new capabilities, by significantly reducing the distances and costs between companies and their customers, and by improving their operational dexterity and customer focus.

(IS-2012-92) Beyond content (an IBM Executive Report)
Media consumption has not just gone digital; it’s connected. Consumers of all ages are trading printed books for e-readers, traditional television for Internet-connected TVs and mobile phones for smartphones, as well as adding
new device categories – like tablets. While these new devices present opportunities to further engage consumers, they also trigger disruption in the established media ecosystem as new entrants compete for consumer loyalty. So Media and Entertainment (M&E) companies must now focus on enhancing the consumer experience, embracing new distribution platforms and expanding revenue models through digital content.

(IS-2012-91) The connected consumer challenge (an IBM Executive Report)
IBM’s latest industry study provides insights that help electronics companies expand their traditional manufacturing focus and think more about what their products actually do, with an increased emphasis on software & service development, IT infrastructure, and open collaboration to glean customer insight.

(IS-2012-90) Consumers driving the digital uptake
This paper from IAB Europe summarizes McKinsey & Company market research assessing the consumer value of free – i.e. Internet advertising supported – digital services. A key finding is that user benefits from Web services are significantly larger than the advertising revenues, user interruptions, or privacy issues associated with those ads. This value is six times larger than what they are willing to spend to avoid the advertising disturbance and privacy risks.

(IS-2012-89) Economic Value of the Advertising – Supported Internet Ecosystem
This paper by two Harvard consultants summarizes an ad industry-funded study of the size, scope and benefits, both social and economic, of the “advertising supported Internet” and lists the bigger companies in each Internet segment, including service providers, hardware & software companies, consulting firms, content sites, etc. While a narrow view would look only at the $23.4 billion spent on paid advertising, the broader view of this study considers also the Companies with websites to connect with customers & job seekers, Politicians using the Web to explain their positions on issues, and Government Agencies striving to electronically serve citizens.

(IS-2012-88) Digital Omnivores: Insights into Today’s Connected Consumer
This publication is a presentation on digital devices. It analyzes the impact of digital devices that connect consumers beyond the personal computer (PC). It describes how these digital devices have penetrated and are changing consumers’ media consumption habits and how do consumers utilize these devices separately and in tandem to access digital content.
(IS-2012-87) Data Needs for Achieving High-Performance Buildings
The report discusses the data needs for measuring the performance of commercial buildings. In addition to energy usage data, other identified high-performance building attributes include safety and security, accessibility, cost effectiveness, water use and indoor environmental quality.

(IS-2012-86) Utility Cyber Security
This report from Pike Research was published in the fourth quarter of 2011 and provides a perspective on seven cyber security trends to watch within the smart grid space. Based upon 18 months of research by Pike Research, they provide forecasts of cyber security investments partitioned by region and segments through to 2018. The report continues on to expose that the lack of enforceable standards and the aging infrastructure could lead to vulnerabilities for the smart grid, and suggests that a system-level consideration of security must be followed. The report finishes up by proposing the top five most promising solutions to solving some of these smart grid cyber security concerns, including control network isolation and data encryption.

(IS-2012-85) Top 50 Technologies, TechVision 2020 Program
The paper highlights and evaluates top 50 technologies, relative research and funding which are going to influence the world by 2020.

(IS-2012-84) Next-generation television The need for home networking in Europe
The paper highlights and evaluates contemporary home networking standards, equipment, devices, TV set top boxes, Satellite boxes, Wireless Accesspoints, IPTV etc. The paper also highlights how complex future home network will be and addresses the solution.

The proposal is meant to set up the framework to help achieve EU target of 20% primary energy saving by 2020 and for even more, further in the future. For the public sector, the proposal outlines rules for renovation and purchasing building outlining high energy efficiency standards. Energy audits are also required for large companies and also set out regulations for energy companies for billing and metering. For the energy sector, there are new guidelines that need to be followed when refurbishing old electricity generation installations or building new ones certain requirements must be met. Finally the proposal requires an assessment to be done in 2014 to determine of the goals for 2020 can be met.
(IS-2012-82) Europe’s Energy Efficiency Plan 2011
EU’s goal is to have 20% less of its projected primary resource consumption by 2020. EU is currently on course; they are 10% less than projected. The next step is to take steps to reducing energy consumption in the following areas: building, transportation and products and process. The document also talks about challenges such as legal obstacle and training required for them to reach these goals. The document talks about what type of support can be expected from various institutions one can expect when making energy efficient changes.

(IS-2012-81) A Flair for Sharing – Encouraging Information Exchange Between CERTs
With the increased use of the internet for almost everything in today’s society there is a need for more security. We need to create security with respect to fundamental human rights. Due to the nature of the internet it is important for countries to share information about security issues and attacks on Critical Information Infrastructures. The purpose of this paper is to identify several factors and perform an assessment on what effects they can have on cross-border information sharing between national and government CERTs (Computer Emergency Response Teams)

(IS-2012-80) Using Electrical Vehicles to Meet Balancing Requirements Associated with Wind Power
Due to the fact that there is a large range in the amount of energy produced by wind generation there is often an imbalance on the grid. One solution to handle this imbalance is to utilize plugged in hybrid and electric vehicles. The report looks at both charging and discharging strategies for balancing the power grid.

(IS-2012-79) The ROI of Cloud Apps
This paper looks at the long term and five year value of cloud applications for business and what, if any, benefits does it have. The analysis involves the following categories: customer relationship management (CRM), enterprise resource planning (ERP), collaboration (including email), and IT service management. The document then gives recommendations of the best way to get value from cloud applications.

(IS-2012-78) Applying Privacy by Design Best Practices to SDG&E’s smart Pricing Program
The document describes certain privacy issues related to SmartGrid data and how San Diego utility (SDG&E) dealt with them. The document talks about protecting customer’s privacy and the results from using PbD (Privacy by Design) principles in the planning of the Smart Pricing Program. The report was developed jointly with the office of the Information and Privacy Commissioner of Ontario.
(IS-2012-77) Global Smart Grid Federation Report
The document surveys the activities undertaken by the Smart Grid Federation and looks at the key opportunities and challenges of each. The document shows the importance of sharing and collaboration, which will enable the transformation of the energy infrastructure. The document looks at the situation in individual countries and what they are doing to achieve a smart grid as well as what role the government is playing in these projects.

(IS-2012-76) Capturing the Full Electricity Efficiency Potential of the U.K.
Results of a study on UK electricity demands and potential for demand reductions. This document also takes into consideration new electrical demands such as hybrid cars. The project plans to target the three largest categories per sector. Major barriers are discussed as well as design options.

(IS-2012-75) Clean Energy Solutions for American Cities
Even though America is having economic trouble, the majority of the cities are still committed to reducing energy consumption by implementing new energy efficient technology. This presentation looks at what are the most common and popular technologies that are being implemented currently and what are the goals of individual cities strategies. The document also looks at major partners and the types of funding that is given for different technologies. All the information is given in clear charts and graphs that are easy to follow.

(IS-2012-74) The U.S. Smart Grid Revolution – Smart Grid Workforce Trends 2011
The GridWise Alliance with the help of KEMA has performed market research on the U.S. utility industry and its workforce. This document is intended to shed light on the aging workforce issue in the United States and offer solutions for training and re-training the existing workforce to deal with the advent of the smart grid.

(IS-2012-73) Affluent Consumers in a Digital World
This paper summarizes and puts into context the results of a survey conducted by Ipsos Mendelsohn in 2011 about the impact of digital advertising in the US between households with greater than 100K total income and those with less.

(IS-2012-72) Sustainable Competitive Advantage: The 4th Economic Revolution
This paper looks at sustainability from 5 key areas namely: collaborative growth and efficiency; zero waste; renewable resource; climate resilience; and eco-performance measurement. The areas are proffered as organizational competencies and examples are given of different companies that use them to effect change and drive sustainable competitive advantage.
(IS-2012-71) Technology Map of the European Strategic Energy Technology Plan
The report is prepared by the Joint Research Centre of the Economic Union. This report addresses 20 different technologies, covering the whole spectrum of the energy system, including both supply and demand technologies. Included in the report are: a concise authoritative assessment; current and future market penetration; barriers to deployment; and reference values for operational and performance modeling. This report is an excellent reference for understanding the current and future direction of low-carbon energy technologies.

(IS-2012-70) Renewable Energy Facts and Fantasies
This book contains a series of interviews with 25 subject matter experts in the area of renewable energy. The book, authored by the editor of 2GreenEnergy.com, is grouped into three areas: technology; politics; and, advocacy, economic and other issues. A handy and easy to understand primer on the basic physics involved in renewable energy is included. At times opinionated, it is however accessible and easy to read. The areas covered are both wide ranging and topical.

(IS-2012-69) The 2011 State Energy Efficiency Scorecard
This 2011 report, published by the ACEEE (American Council for an Energy-Efficient Economy), presents an assessment of the policies and programs that are being implemented to improve energy efficiency. Each state is ranked based upon a scorecard which reflects their leadership in developing policies and programs, and considers various components such as utility and transportation policies, and building codes. The results are compared against a 2010 benchmark which allows us to review the progress that each state has made. The report also provides perspectives on what they consider are the most effective policies and projects. Overall, the data presented is useful in understanding the best practices across the states and what is the current strategy within each state.

(IS-2012-68) Ready or Not? Protecting the Public’s Health from Diseases, Disasters, and Bioterrorism, 2011
For the past decade, since the September 11, 2001 attack and anthrax events, the United States has grappled with how to best prepare for public health emergencies. This 90-page report, from the Robert Wood Johnson Foundation and the Trust for America’s Health, details specific programs at-risk for major cuts or elimination due to austerity. The report examines areas with major gaps in federal policies and offers recommendations for improving all-hazards preparedness. It also inspects state and local public health budget cuts; provides a review of 10 years of progress and gaps in preparedness; presents a timeline of major public health preparedness events; and reviews several special other topics.
(IS-2012-67) 2012 State of the Consumer Report
This market research report, by the Smart Grid Consumer Collaborative, examines low consumer awareness of smart grid and smart meters, overall attitudes toward the technology, interest in smart grid/meter-enabled programs, what benefits resonate with different consumer segments, and best practices in promoting the smart grid and energy management.

(IS-2012-66) The Seven Steps to Strategic Facilities Capital Planning and Management
A seven-step guideline an organization may take for improving property portfolio management. (Define the process; Gather data; Analyze benchmarks; Prioritize capital projects; Demonstrate impact of funding; Create defensible budgets; and Develop process for continuous update). Each step is described in detail.

This paper provides detailed and useful information about various wireless topologies for applications development such as AMR, AMI, DA and SCADA. It also provide useful guidelines for making choice of final topology among available options for implementation. Interesting comparative analysis have been provided by including almost all applicable parameters of comparison.

(IS-2012-64) The Future of the Electric Grid – An Interdisciplinary MIT Study
This report, the fifth in the MIT Energy Initiative’s Future of series, aims to provide a comprehensive, objective portrait of the U.S. electric grid and the identification and analysis of areas in which intelligent policy changes, focused research, and data development and sharing can contribute to meeting the challenges the grid is facing. It reflects a focus on integrating and evaluating existing knowledge rather than performing original research. Authors hope it will be of value to decision makers in industry and in all levels of government as they guide the grid’s necessary evolution. The Report identifies the challenges and suggests valuable recommendations for resolving them with an aim of Reliable-Efficient-Effective-Scalable and Customizable Smart Electric Grid.

(IS-2012-63) Draft NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 2.0
This document, Release 2.0 of the NIST Framework and Roadmap for Smart Grid Interoperability Standards, details progress made in Phases II and III of NIST’s three-phase plan since the establishment of the Smart Grid Interoperability Panel (SGIP) in November 2009.
(IS-2012-62) Guide to Developing a Cyber Security and Risk Mitigation Plan
This document is intended to help cooperatives develop a cyber-security plan for general business purposes and think about security in a systematic way, consistent with the current Federal thinking. The basic concept is not “do this and you are secure” but a commitment to a process of continuous improvement.

(IS-2012-61) Smarter Home & Digital Convergence: Transforming Consumer Electronics, Media & Entertainment and Telecommunications Industries
This paper summarizes key technologies for deploying cloud services in smart homes with digital convergence. The focus is on cloud functions for home management. IBM Dallas Demo Center is highlighted to justify the deployment of related technologies and services. The key contribution of this paper is related in justifying the distributed infrastructure control of smart homes via cloud technology.

(IS-2012-60) The Potential of Smart Meter Enabled Programs to Increase Energy and Systems Efficiency: A Mass Pilot Comparison
This report by VaasaETT Global Energy Think Tank summarizes the findings of 100 consumption reduction pilots involving 450,000 consumers from Europe, USA, Canada, Japan and Australia. The report assessed these pilots in three general areas: energy conservation, peak clipping and bill reduction. A number of different feedback and information channels were analyzed, with In Home Display providing the highest reductions in consumption. Consumers also reacted positively to various dynamic pricing models with a pilot participant satisfaction of 75 to 90% and have a lasting effect over a number of years. Consumption reductions varied within individual programs, and surrounding variables have a substantial impact on program success levels over and above supportive technology used or program structure. A utility rollout program strategy is provided. Smart meter enabled programs are consistently effective when developed in accordance with the needs of end consumers and enabled through constructive regulation. The report is extensive and provides a good reference summary of a number of consumption reduction pilots from five global regions.

This report by the ACEEE builds on historical USA energy efficiency investments and their contributions to the nation’s economic well-being. It highlights three economy wide, long-term scenarios that explore contributions in more energy efficient behaviors and investments might play to reduce overall energy use by 2050. The three scenarios cover residential, commercial, industrial, transportation and electricity power sectors. Detailed analysis by sector is provided. Net projected economic benefits total $12 to $16 trillion cumulatively over the 39 year long time horizon, representing a 42 to 59% reduction in energy usage and net projected annual gains in GDP of $100
to $200 billion by 2050. This report provides an economic analysis suggesting the need for further investment in energy efficiency, and the significant positive impact that would be a result.

**Visible and Concrete Savings: Case Studies of Effective Behavioral Approaches to Improving Customer Energy Efficiency**

This report by the ACEEE covers 10 selected case studies of successful behavioral programs that contribute to energy reduction. Although limited in number, the case studies cover programs that provide long term, cost effective and significant energy savings in three areas: buildings & utilities, industry and transportation. Recommendations cover various programs, including: web sites & in home displays, pay-as-you-go, advanced billing, corporate management, labeling, social norms and networks, and market segmentation. Summaries are provided in table format and include quantified results. This report is a good overview of a variety of successful behavioral based energy reduction programs.

**Aging in the Connected Home Executive Summary**

The CABA Aging in the Connected Home 2011 research study is a collaborative, industry-funded research program that brought together organizations from the healthcare sector with connected home solutions providers. As Baby Boomers reach retirement age, 71 million Americans will be over the age 65, in which 90% indicate that they wanted to remain in their homes. As such, home healthcare services, as well as products designed to help the aging adult move through their home and interface with their home in a safe and efficient manner have seen rapid growth in demand. The objective of this study is to determine the key needs of the seniors and their caregivers as they seek to maintain their independence. The Framework for Social Impact is the methodology employed to identify these issues. Understanding the needs of seniors and their caregivers is vital to the design of products, services and home solutions that will enable the aging to maintain their independence in their homes. A thorough understanding of the unmet needs of aging seniors, and their caregivers, as well as the constraints that prohibit them from remaining in their homes, will provide the necessary stimulus for true innovation amongst healthcare providers and home solutions providers in optimizing the development, design and utilization of the connected home. The report was prepared for the Continental Automated Buildings Association (CABA) by Sandra Bates, President, The Innovation Partners and covers Healthcare Providers and Home Solutions Providers. The study participants were comprised of Ascension Health, Ingersoll Rand/Trane/Schlage, TELUS and United Health Care.

**Smart Grid Impact on Intelligent Buildings 2011 Executive Summary**

The broad purpose of this collaborative research study was to identify, define and size the principle business opportunities presented by the growth of smart grids, in relation to intelligent buildings. The research provides a
market size forecast and roadmap for smart grid and intelligent buildings, contributing to business process transformation deemed necessary to capitalize on investments in smart technology.

(IS-2012-55) State of the Connected Home Market 2011 Research Study Executive Summary
In 2011, CABA conducted its fourth wave of the State of the Connected Home Market Landmark Research, to update its understanding of North American consumer attitudes and behaviors about "connected home" products and services. The research was previously conducted in 2003, 2005 and 2008. The broad purpose of this study is to validate past and current trends, and to characterize consumers’ understanding of the connected home today, and in the future. The 2011 State of the Connected Home Market study identifies key emerging areas of opportunity over the next two years to advance the connected home space in the U.S. and Canada. In addition, the 2011 study has a special focus on uncovering how converged solutions can and should map to key unmet consumer lifestyle-related needs, particularly in the areas/ecosystems of entertainment, family and energy management. Organizations that participated in CABA’s State of the Connected Home Market 2011 study included: 3M Company, ADT Security Services, Best Buy Co., Inc., Broan-NuTone LLC, BSH Home Appliances Corporation, Carrier Corp., Consolidated Edison Company of New York, GE Energy Services, Honeywell International, Hydro One Networks Inc., IBM, Ingersoll Rand/Trane/Schlage, Landis+Gyr, Microsoft Corporation, Moen Inc., NYSERDA, Pacific Gas & Electric, Qualcomm, Schneider-Electric, SecurTek Monitoring Solutions, Sempra Utilities, Shell, Southern California Edison Company, TELUS Corporation, USNAP Alliance, Verizon Wireless and Whirlpool Corporation. CABA commissioned Zanthus, an independent market research and consulting firm, to conduct several State of the Connected Home Market research studies over the years, including the current 2011 research study.

(IS-2012-54) Microbusiness & Small Business Managed Services Needs
The Microbusiness & Small Business Managed Services Needs Assessment Study, conducted by CABA’s Internet Home Alliance Research Council in early 2007, was designed to assess the current state of the managed services market and to identify any potential areas for further development within the micro- and small business markets (where the former is defined as companies with fewer than 10 employees and the latter is defined as companies with between 11 and 100 employees). The key objectives were to profile target companies; assess the level of in-house IT/telco support; identify current and/or future managed services needs; and evaluate the incidence of current IT/telco change initiatives. AT&T, Cisco Systems, Costco Wholesale, Hewlett-Packard, Level Platforms and SupportSoft led, funded and participated in this research.
(IS-2012-53) Home Networking Study
The Home Networking Study, developed by the CABA Internet Home Alliance Research Council, provides an up-to-date, comprehensive understanding of opportunities and barriers to home networking as they occur throughout the adoption cycle: from purchase through installation, use and maintenance. Of particular interest to project sponsors are factors affecting consumer interest in advanced network applications in areas such as entertainment and home control. Cisco Systems, AT&T, SupportSoft, and Whirlpool Corporation led, funded and participated in this research.

(IS-2012-52) Digital Youth Study
The Digital Youth study, developed by the CABA Internet Home Alliance Research Council, examined youth influence on consumer technology purchase. It found that youth age 8-18 have influence on the purchase of products/services that are primarily used by youth and not by parents. They exert little influence on the purchase of: desktops, laptops, Media Center PCs, external hard drives, printers (color laser, all-in-one inkjet, standard inkjet, snapshot photo), broadband, digital cameras, satellite radio, HDTV, and DVRs. Cisco Systems and AT&T led, funded and participated in this research.

(IS-2012-51) Digital Kitchen Study
The Digital Kitchen was a CABA Internet Home Alliance Research Council study that investigated consumer electronics and appliances in use in North American kitchens to determine which new products and services homeowners would like to see added to their kitchens in the future. The study examined how technology is connected and integrated into people’s lives through intuitive interfaces and culminated in a display at the 2007 Kitchen/Bath Industry Show (KBIS). Whirlpool Corporation, Bell Canada, Cisco Systems, Inc., Direct Energy, Hewlett-Packard, HomeCrest Cabinetry, Intel Corporation, Microsoft, The National Association of Home Builders (NAHB), and the National Kitchen and Bath Association (NKBA) led, funded and participated in this research.

(IS-2012-50) Custom Mobile Advertising Study
Custom Mobile Advertising was a CABA Internet Home Alliance Research Council study that estimated the size of the maximum total addressable market for specific advertising concepts that could be offered via in-vehicle technology, mobile phone technology, and across both platforms. The goal of the study was to gauge interest in specific types of advertising content and advertising delivery mechanisms (such as voice and text). The study examined numerous consumer preferences for various features, including: connectivity options (wireless vs. wired); user interface (voice, text, on-screen menus); media and advertising storage and transfer options (mobile phone, PC, in-vehicle device, other); and user profile controls (computer, phone, in-vehicle).
(IS-2012-48) Follow the Leaders: Improving Large Customer Self-Direct Programs
State sponsored energy efficiency programs are typically funded by consumer fees paid through a Cost Recovery Mechanism (CRM). Some states allow industrial and large commercial sectors to opt out of the CRM fees and “self-direct” all or a portion of these fees to internal energy efficiency investments. This report discusses the challenges and opportunities of various “self-report” programs in place today (as of October 2011), and provides a number of recommendations. This report is a good reference document for developing and implementing opt-out programs, and reinforces the need for policy oversight to ensure that energy efficiency objectives are achieved.

(IS-2012-47) Green Work Styles: An Analysis of Energy Behavior Programs in the Workplace
This report focuses on energy behavior programs, which are designed to reduce energy consumption through a change in employees’ attitudes and behaviors. The report reviews five case studies and provides general strategies for the successful development and implementation of commercial sector programs. Common key requirements from the different case studies are identified. This report is a good reference document for developing and implementing employee and tenant based commercial energy efficiency programs.

This report provides the results of an online survey conducted in March & April of 2011, and follows up on a previous survey conducted in March 2010. Survey participants included 152 C-Suite Executives with operations located in the USA and Canada. The report further examines utilities’ vision for the next decade, how smart grid plans and expectations are evolving, and how utilities can more effectively communicate these changes to their customers. Key priorities identified and ranked include: improving service reliability & operational efficiency AND controlling customer costs (both identified as the primary concern); developing demand response and energy efficiency programs; updating physical infrastructure; and, implementing smart meter. This ranking reflects a change from the previous year’s survey. Results are provided by country and size of utility. Consumer benefits and concerns are discussed, and specific examples are provided. Smart grid predictions and key issues on the road ahead are discussed. This report provides insight into the C-Suite thinking that will drive smart grid investment over the next decade.

(IS-2012-45) Smart Grid Challenges & Choices: Utility Executives’ Vision for the New Decade
Steve Winter Associates and HR&A Advisors, in collaboration with Deutsche Bank and Living Cities, analyzed 231 energy retrofit projects, including over 21,000 individual units, in New York City. The report examined affordable housing consisting of four main fuel and electricity comparative building types and the effectiveness of various energy efficiency upgrades. Insights were developed in three key areas: 1. Pre- and post-retrofit building
performance trends; 2. Reliability of savings projections; and, 3. Framing an approach to incorporate energy savings projections into underwriting. The report provides a solid analysis and argument for the financial underwriting of energy efficiency programs for multi-family buildings.

(IS-2012-44) Speeding Up the Smart Grid: Technique for Delivering More Robust, Higher Data Rate Communications for Automatic Meter Reading
This paper from ON Semiconductor examines improved techniques for power line carrier (data via electric power lines) for remote meter reading in Europe. Automatic Meter Reading in Europe operates on 9-95 kHz configured as a single channels carrying 2400 bps. Proposals are presented to replace the single channel with multiple S-FSK (spread frequency shift keying) channels at 4800 bps each. Systems architectures using a data concentrator are presented.

(IS-2012-43) The Tough Realities of Renewable Energy
This report from 2GreenEnergy examines challenges in transforming the energy industry to the wide-scale use of renewable energy sources. Reliance on fossil fuels is unsustainable for ecological and logistical reasons. Renewable energy deployment has high front-end costs that the public is resisting. Change will be difficult because of the lobbying power of the fossil fuel industry.

(IS-2012-42) Impediments to Renewable Energy
This report from 2GreenEnergy examines a survey of 500 people on the topic, “The world is moving to clean energy, but at a far slower rate than many people would like to see. But why, exactly, is it so slow?” The consensus is that traditional energy industry lobbying efforts are inhibiting moves toward clean energy. The author concludes, “The US must not be content to become an after-thought in the global energy picture.”

(IS-2012-41) Is It Too Late? Living with a World Energy Crisis
This report from 2GreenEnergy examines a survey of 300 people on the topic, “Will population growth and energy resource depletion have dire consequences over the coming years?” Most agree that a growing supply of energy is needed, that food shortages will affect many, and that transportation costs will rise as fossil fuels are depleted. Most are not focused on the long-term affects of global warming. Most think that clean energy sources will become more attractive than fossil fuel sources. Many are pessimistic about the future of humankind. All agree there is an urgent need to move forward with renewable energy sources.
(IS-2012-40) China Is Investing in Renewable Energy – But Why?
This report from 2GreenEnergy examines a survey of 200 people about the goals of China in fostering the development of renewable energy sources. Some of findings: China looks after China; China is shifting from “made in China” to “designed in China”; green energy will be profitable; air pollution caused by coal leads to health problems; China has a long-range vision; China needs energy for a growing population; China does not want to be dependent on imported energy sources, etc.

(IS-2012-39) Excellence in Consumer Engagement
This report from the Smart Grid Consumer Collaborative guides utilities with customer smart grid programs to improve customer relations. 40 people from 21 utilities engaged us such programs were interviewed. Messages with engage customers are discussed. The basis tenants include addressing custom complaints, stages messaging, employee education, fostering consumer goodwill, saving money, incentive to enroll, simple smart grid programs, impetus for customers to act, customer segmentation, and focus on sales, not just service.

(IS-2012-38) Initial Findings from the Ultra Low Carbon Vehicle Demonstrator Programme: How quickly did users adapt?
This study from Ultra Low Carbon Vehicle Demonstrator Programme in the United Kingdom explores trials with 340 cars to determine driver acclimation to electric vehicles (EVs). The drivers took more than 110,000 trips covering more than 677,000 miles and charged their cars almost 20,000 times. They adapted well to EVs. The major finding is that drivers prefer a longer driving range between charges: 92 miles for private drivers and 121 miles for fleet drivers.

This report from Johnson Controls explores energy conservation through improvements in new and existing buildings. Policies that can impact building energy conservation are reviewed. Among these are building efficiency codes, energy conservation targets, public awareness campaigns, financial incentives, utility programs, and workforce training. There are opportunities now for collaboration between building owners and policy makers.

(IS-2012-36) Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities
This report from the American Council for an Energy-Efficient Economy explores the potential for various initiatives to motivate consumer to reduce energy consumption. The results for 60 studies were review. Potential savings range from 4-12%. The largest savings come when detailed appliance consumption is report. Advanced Metering Infrastructure (AMI) may be an effective method for delivering data to consumers. Third-party suppliers
of energy information are likely to play important roles. Eventually, energy management will be done automatically by interacting with appliances.

This report from Pike Research was issued in 2011 with predictions regarding electronic vehicles (EVs) in 2012. The largest sales volume of EVs will be in Asia followed by North American (66,000+). EV rentals will become a popular form of car sharing. A registration tax on EVs will replace lost road taxes on gasoline. EV prices will stay about $30,000. Commercialization of fuel cells will be led by Germany, Japan, and Korea.

(IS-2012-34) The Future of Energy
This 2011 report from The Future Laboratory in the United Kingdom evaluates energy requirements in Europe by 2050. Supplies will be strained as worldwide demand is expected to increase 115%. Smart grids integrating renewable energy sources and storage will be commonplace. Data will be as important as energy in smart grids. Various aspects of smart grid technologies and projects are presented. Electric vehicles will be major catalysts for smart grids.

(IS-2012-33) Home Energy Management in Europe: Lots of solutions, but what’s the problem?
This paper from Delta Energy & Environment examines trends in home energy management in Europe. Home energy management tools inform customers, automate information flows to appliances, and control appliances via pricing or remote signals. Products and target markets are reviewed. The future of in-home displays for energy management is questioned. European energy management trials are summarized.

(IS-2012-32) Smart Energy Program Consumer Study: Understanding Consumer Lifestyle Drivers and Energy Attitudes As Motivation for Smart Energy Program Participation
This report from Best Buy summarizes a consumer study of attitudes toward energy management. Customer lifestyles were correlated with energy management technology adoption. Feature sets were proposed. The goal is to identify marketing and messaging strategies including education outreach to customers. Customers were categorized as Home Safeguarding, Life Maximizing, and Environmentalism. Energy management features include automation & information and remote management. Detailed analysis data are presented.

(IS-2012-31) Clean Energy: Ten Trends to Watch in 2011 and Beyond
This report from Pike Research examines trends in electric power systems, technologies, and renewables related to cleaner energy. Utilities are becoming more involved with generation, especially renewables such as solar and wind. DC (Direct Current) transmission and distribution are growing in popularity for microgrids. Power plants are
being moved offshore with DC planned for bringing this power from distances greater than 50 miles. Geothermal energy for utility base-load is growing in the western U.S. The U.K. is harnessing wave and tidal energy. The sun provides 10,000 times more energy than the world needs, but 0.1% is being used for power. China plans to produce 15% of energy needed from wind and solar by 2020. Nuclear power is not likely to grow in popularity.

This report from Accenture explores changes in the utility industry related to residential customers. About 40-60% of the traditional utility business of viewing customers solely as cash flows will need to change. New programs that support smart home technology will be required. Motivations are distributed generation, electric vehicles, and home area networks. Consumers will be able to shop among competing service providers and retailers for energy management. Utilities will need stronger consumer capabilities with more product and service innovations. Various energy management programs and channels are reviewed.

(IS-2012-29) Energy Efficiency Comparisons of Wireless Communication Technology Options for Smart Grid Enabled Devices
This paper from General Electric (GE) examines options for wireless home area network (HAN) communications by devices engaged in energy management. GE estimates that such devices could surpass one billion by 2025 in the 120-million U.S. households. The top candidates are Wi-Fi, based on the IEEE-802.11 standard, and ZigBee, based on the IEEE-802.15.4 standard. Bluetooth was judged not suitable because of limit range. ZigBee chipset in high volumes (more than 100,000) cost $2.00 to $2.20 than Wi-Fi. Test results showing that ZigBee is more energy efficient than Wi-Fi by about ½ Watt are included. Wi-Fi consumes more power than ZigBee when not transmitting data.

This report from the U.S. Department of Energy examines the feasibility of marketing net-zero energy buildings on a large scale by 2025. Projections are based on buildings constructed in 2005 and expected technology developments over the following 20 years. With 2005 technology 22% of these building could achieve net-zero by 2025 and 64% with newer technologies. Up to 37% of excess energy could be sold into the grid. The analysis is based on using photovoltaic cells to generate electricity.

(IS-2012-27) Here comes the sun: a field trial of solar water heating systems
This report from the Energy Savings Trust in London examines solar hot water for energy conservation and green-house gas reduction in the United Kingdom and the Republic of Ireland. A trial program showed that properly installed solar water heaters could provide up to 60% of household hot water, with a median of 39%.
84% of customers were satisfied with the results. Pipe insulation was important for delivering maximum benefits. Details of field trials at 88 houses are included.

(IS-2012-26) Getting to Zero: A Pathway to a Carbon Neutral Seattle
This report was prepared from the City of Seattle Office of Sustainability and Environment about making Seattle the first carbon-neutral city. The goal by 2050 is to reduce emissions by 90% from 2080 levels. Reductions will come from the use of public transit, bicycles, walking, increasing the energy efficiencies of buildings, renewable energy sources, and electric vehicles. Additional benefits are improved health and employment. The objective is to head off a possible increase in the temperature of the earth by 9°F by the end of the 21st century. Methods to accomplish carbon reduction are discussed.

(IS-2012-25) Telco Triple-Play Service Fulfillment
This paper from Heavy Reading examines the competitive market for voice, video, and Internet service offering called “triple-play” from cable and telephone companies. This paper argues that for telephone companies to compete effectively against cable companies, they must upgrade their network to fiber optics. This is enabling growth for telephone companies worldwide as the number of landline customers decreases. In 2009, AT&T and Version gained 2 million video customers compared to a loss of 1.3 customers by cable operators. The need for operations support system (OSS) best practices in the back office support is discussed.

(IS-2012-24) Time of use tariffs: reforming the economics of urban water supply
This report from the National Water Commission of Australia examines the potential benefits of smart water meters to record hourly consumption. The study also considered using the smart meters to implement time-of-use rates for water. A key issue was whether water consumption was elastic, meaning it responded significantly to price changes. The degree of elasticity varied by activity in the following order from the most elastic: outdoor watering, clothes washing, dish washing, cooking, person hygiene. Residential outdoor consumption was about 38% of the peak, while residential indoor consumption was 51% of the peak in this study that also included 11% commercial customers. Reduction in peak demand would not necessarily lead to smaller future water systems.

(IS-2012-23) Volatility of Power Grids under Real-Time Pricing
This paper from the IEEE Transactions on Power Systems examines the impact on system stability of offering real-time electricity pricing to consumers. It is assumed that the retail price will reflect the dynamic wholesale price. Consumer reaction in-turn will impact the wholesale price. This feedback mechanism might lead to system instability. The authors advise more study before real-time pricing is implemented on a large scale.
(IS-2012-22) Myths and Realities About Crossing Over Residential and Commercial Market Segments in the Electronic Systems Industry
This paper from Stiernberg Consulting examines the similarities and differences between residential and commercial consumer electronics companies. Listed are 12 myths and realities about transforming a business between these two markets. Among the issues addressed are product adaptation, regulatory standards, company reputation, selling practices, market size, product innovation, branding, product quality, and product features including packaging and manuals.

(IS-2012-21) PG&E’s Smart Grid Deployment Plan
This report presents plans by Pacific Gas & Electric for upgrading the utility to incorporate smart grids. Some of the topics addressed include the use of digital technology, optimization of grid operations, deployment of distributed energy resources, optimization of appliance operation, smart appliances, electric storage, consumer information and control options, communication standards for the grid, and removal of barriers to the adoption of smart grids. Considerable detail is including in this report of almost 300 pages.

(IS-2012-20) RS-485/MODBUS based Intelligent Building Automation System using LabVIEW
This paper from Dharmsinh Desai University and the Indian Institute of Technology Roorkee proposes a building automation system for residential buildings. Services offered include energy management, lighting control, water management, security and safety, entertainment audio/video distribution, remote control of appliances, and Internet access. The infrastructure network is based on a wired RS-485 topology running a MODBUS communications protocol. The software for this system is based on OLE (Object Linking and Embedding). LabVIEW was used to simulate this system. Possible extensions include links to a cellular telephone network, more functionality, and an enhanced graphical user interface.

(IS-2012-19) Benchmarking Energy Utility Efficiency Portfolios in the U.S.
This report by M.J. Bradley & Associates, LLC highlights the importance and challenges of benchmarking electricity utility energy efficiency portfolios, and initiates a benchmarking process that will evolve over time. Benchmarking allows for direct comparison of spending and energy savings across electric utility energy efficiency portfolios. The report discusses the difficulties involved in benchmarking energy efficiency portfolios, evaluates and recommends a suite of metrics, and demonstrates these metrics using a diverse set of electric utilities. This report is a good reference document for understanding the relative performance of utility based energy efficiency programs.
**IS-2012-18 A Framework for the Evaluation of Smart Grids**
Ofgem appointed Frontier Economics and EA Technologies to develop a framework that will allow smart grid investment opportunities to be evaluated. This November 2011 report provides the proposed methodology for consultation in developing this framework. The key areas outlined in this extensive report include: smart grid evaluation framework; value drivers and scenarios; smart grid and conventional investment strategies; value chain analysis; and, proposed model specification. Once the consultation has been completed (December 2011), a second report will provide a simple and transparent evaluation model. This model will allow users to assess how the net benefits of smart grid technologies might change with different developments in the electricity sector. This paper is beneficial to those interested in public policy and research in the energy sector. Timing for completion of the second report was not provided.

**IS-2012-17 The Benefits of Smart Grid Business Software**
Oracle provides a business overview as to why utilities will need to invest in new hardware, software, business process development and staff training. Consumers will invest in home area networks, smart appliances and devices. Smart Grid business software can ease the transition to a more flexible, reliable and responsive electricity grid. A high level overview of the benefits that will ultimately help consumers, utilities and the community is presented. This paper is a very basic primer, and a quick summary of the benefits of a smart grid.

**IS-2012-16 Consumer Motivation: Facts, Myths and Motivations**
Using a combination of primary (consumer group interactions and online surveys) and secondary research (existing studies, industry scan), this 2011 paper from EPRI provides a background on consumer motivations in adopting smart grid technologies, and the importance of education for this adoption to be meaningful in its implementation. In general, consumers react positively to the benefits derived from the smart grid, however there are a number of identified challenges that will need to be addressed. The research covers: consumer perceptions and motivations for smart grid adaptation; importance of education; data privacy; industry challenges; consumer information sources; and, a ranking of consumer benefits associated with value and the various technologies. Although this paper does not provide detail on the specific technologies currently available, the study provides a good understanding and importance of consumer motivators in adopting smart grid technologies.

**IS-2012-15 Smart Grid Impact on Intelligent Buildings 2011 Research Study Executive Summary**
The purpose of this CABA Intelligent Buildings Landmark Research was to identify, define and size the principle business opportunities presented by the growth of smart grids, in relation to "intelligent buildings". An examination of smart grid yielded immediate value to all stakeholders in the intelligent building industry, as smart grid and auto demand response held more relevance in the industry today - with opportunities in existing buildings and new
construction. Energy capacity/supply problems need to be addressed in the short-term, and made available in emerging technology. This serves to add to market education and understanding, and address market knowledge gaps. As well, open and interoperable communication between energy suppliers and commercial energy users is an eventuality - which was further explored in relation to smart grid development and intelligent buildings. The purpose of these initiatives was two fold – an educational and validation exercise for industry participants and a means to drive public opinion and facilitate policy decisions at industry stakeholder, public authority and government organization levels. There were twenty-nine sponsoring organizations involved in this landmark research study. The research was undertaken by research and buildings technology consultancy, BSRIA, on behalf of CABA.

**IS-2012-14) State of the Connected Home Market 2011 Research Study Executive Summary**

CABA's 2011 State of the Connected Home Market study identifies key emerging areas of opportunity over the next two years to advance the connected home space in the U.S. and Canada. In addition, the 2011 study has a special focus on uncovering how converged solutions can and should map to key unmet consumer lifestyle-related needs, particularly in the areas/ecosystems of entertainment, family and energy management. In addition to the “State of the Connected Home Market 2011” study, Southern California Edison conducted an additional, comprehensive residential energy study in the California market, “Future Outlook for Residential Energy Management”, which they have graciously offered to include as an addendum to the main study. The Southern California Edison report provides a comprehensive, detailed and insightful examination of residential energy management in the southern California market, which serves as a complimentary extension of the Energy Ecosystem findings contained in the State of the Connected Home Market report. We offer our sincere thanks to Southern California Edison for making this important research report available to CABA and the sponsoring organizations of the State of the Connected Home Market study.

**IS-2012-13) Introduction to ISO 15926**

This paper provides detailed and useful documentation on complete standard and useful guidelines for its implementation. However, the reviewer suggests that involvement and discussions with organizations such as ISA and many other MNC manufacturers, Worldwide Solution Provider Companies, shall be useful in further enhancement of the standard. The same shall more generalize the standard, thereby increasing its acceptance at all levels.

**IS-2012-12) Wireless Communications in SCADA Systems**

This paper from Sierra Wireless Inc., USA keeps its major emphasis on “Suitability of Wireless Telemetry Links for SCADA Systems”. The paper begins with discussion about how wireless telemetry could be useful instead of conventional wired telemetry identifying relative merits. The paper also identifies key areas of power distribution system controlled by SCADA where deployment of wireless communication is feasible and also indicates potential
benefits arising of it. In the end, the paper concludes with establishing requirements and best practices for wireless communication in the SCADA based critical transmission and infrastructure solutions. The author organization marks end of the paper with suggesting how wireless communication could be useful in evolution of Smarter Grids along with mention of features of their own product/system.

(IS-2012-11) Introduction to OPC Building Automation
This whitepaper describes how OPC can complement a Building Automation system by providing a standardized way to exchange data with various Applications. It explains that BACnet provides a suitable communications mechanism for the controllers, and that OPC can provide an independent layer to exchange data between these building automation systems and enterprise applications such as Historian and Reporting systems.

(IS-2012-10) Submetering of Building Energy and Water Usage
This paper describes the benefits and complexities of the submetering of energy and water within buildings. Submetering can enable the efficient management of these resources through an understanding of the current usage, which can help drive targeted building system improvements. Additionally, the understanding of the current usage can lead to the conservation of these resources as a result of occupant behavioral changes. These benefits can lead to improved building performance and reduced resource consumption. The paper continues on to recommend that a life cycle cost approach is the most appropriate method for evaluating the feasibility of a submetering investment.

This paper combines multiple sources of research to result in a consumer barometer of sorts towards the smart grid. It is focused on the North American residential market and includes research from the likes of Accenture, Best Buy, EPRI, GE, and IBM. The paper finds that few Americans know what the smart grid is and suggests ways to segment the consumer base in North America while improving upon the market’s knowledge of the smart grid.

(IS-2012-08) CO2 Monitoring for Demand Controlled Ventilation in Commercial Buildings
This report from the Environmental Energy Technologies Division Indoor Environment Department Lawrence Berkeley National Laboratory Berkeley, CA reviews the accuracy of 208 of commercially available CO2 (Carbon Dioxide) IAQ monitors in order to test their ability to achieve the energy savings that California Title 24 code requires for demand control ventilation DCV applications. The report also investigates the relative benefits of multi point detection and location within occupied rooms in tests conducted in 34 commercial properties. The authors
make certain recommendations regarding the further development of the accuracy of CO2 sensors in order to achieve Title 24 compliance as well as more research to determine spatial location for monitoring points.

This EcoPinion online survey, conducted in November 2010, highlights consumer acceptance of prepay services. A significant number of consumers like the idea of a prepaid energy offer, citing “convenience” and “ease”, with 17% very interested and another 25% somewhat interested. The research covers: market comparison of expectations and consumer satisfaction with other industries’ prepayment offers, potential market size, pricing expectations, concerns, communication channels, payment type, and product features / benefits and expectations. Recommendations are provided as to how a prepay bill payment service could be implemented.

(IS-2012-06) EcoPinion – Separating Smart Grid From Smart Meters? Consumer Perceptions and Expectations of Smart Grid
This EcoPinion online survey, conducted in May 2010, builds on previous work in this area. The research highlights three challenges managing consumers’ expectations for the smart grid. Research areas covered include: cost / benefit expectations, preferred communication channels, privacy expectations, consumer concerns and overall appeal. The report also considered the relationship between the smart grid and smart meters. While the smart grid holds much promise in the eyes of consumers, the report highlights potential issues that service providers will have to manage when they implement the smart grid and smart meters. Indeed, the research provides insight as to why a number of smart grid programs, that have been implemented, have not been well received by consumers. While conducted in May 2010, the consumer insights and analysis are still relevant.

(IS-2012-05) EcoPinion – Lighting the Path Forward for Greater Energy Efficiency
This EcoPinion online survey, conducted in March 2011, highlights consumer expectations regarding CFL and LED energy efficient lighting. The report provides an industry background. In general, consumers are receptive to more energy efficient lighting options, even when considering pricing premiums. The research covers: market penetration, consumer satisfaction, performance comparisons, preferred communication channels, recommended positioning and messaging, impact of cost and advancements in technology. Some of this information is available by age group. This research provides insight into the market transformation from traditional incandescent lamps to more energy efficient lighting options.
(IS-2012-04) The Road to Customer Intimacy – Leveraging Investments in Customer Insights to Maximize Returns
This paper discusses how product development for consumer electronics manufacturers must change in order to be successful. It lists new ways that consumers are revealing their preferences and needs via social media and electronic communications and the need to capture that information and incorporate it into the manufacturing process to meet ever changing consumer needs and preferences.

(IS-2012-03) The elephant in the living room: How our appliances and gadgets are trampling the green dream
This Energy Savings Trust report is the follow up to a previous publication, The rise of the machines, and looks at how the regulatory, manufacturing and retail landscapes have changed; how appliances and gadgets have changed; and how there is a need to change the way that they are used. It re-examines the trends and future scenarios for domestic appliance electricity consumption in the UK that have emerged in the intervening years, and sets this within the context of achieving the UK’s 2020 emissions reduction targets. While this report is framed within a UK context, it provides general recommendations for changing people’s behavior and introducing energy savings measures into homes.

(IS-2012-02) Achieving Energy Savings in California Buildings
This report is the California Energy Commission staff’s draft recommendations for achieving zero-net-energy residential building by 2020, and zero-net-energy commercial buildings by 2030. The report provides background, analysis, key challenges and recommendations in the following areas: policy framework, technical strategies, market driven strategies, energy efficiency standards, use assessments, rating & labeling programs, whole-building cost-benefit approach, funding programs, and compliance & enforcement. The recommendations cover both new and existing buildings. This report provides a vision and plan to achieve the goal of zero-net-energy buildings.

This report provides a research framework and priorities for a longer term energy efficiency & carbon emissions reduction strategy and roadmap. The longer term goal is to create efficient districts and cities while improving the quality of life of European citizens. The report includes: market background, regulatory context, consumer and demographic trends, commercial/industrial trends, key challenges, research priorities, recommended funding requirements and anticipated impacts. The roadmap provides a thorough, holistic, systematic approach and considers both district and geo-clusters as Europe moves toward net zero energy and carbon emissions, with the
goal of carbon neutral and energy positive buildings by 2050.

(IS-2011-169) Home Area Network – Opportunities for Added Value Services and Technology Considerations
This short paper from Secure Meters Group argues for the leverage of the infrastructure that comes with the deployments of Smart Metering that is going on in many countries around the world. If these deployments use interoperable communications, it is possible to provide additional services and functions. Services that could provide ‘Safety & Security, ‘Comfort’ and ‘Savings’. The key is a partnership between equipment and service providers using interoperable products.

(IS-2011-168) Europe’s buildings under the microscope
Buildings Performance Institute Europe (BPIE) has undertaken an extensive survey across all EU Member States, Switzerland and Norway reviewing the building stock energy performance in terms of the existing building stock characteristics and policies in place. This survey provides an EU-wide picture of the energy performance of the building stock and how existing policies influence the situation. The data collected was also used to develop scenarios that show pathways to making the building stock much more energy efficient, in line with the EU 2050 roadmap.

(IS-2011-167) What Have We Learned From Energy Efficiency Programs?
This paper, sponsored by the American Council for an Energy-Efficient Economy, reviews a number of energy efficiency financing programs that have been implemented in a number of States over the last several years. While a number of these programs have many years of experience and have issued thousands of loans, this market has yet to come to scale. Quantitative research analysis of both residential and commercial data includes: participation rates, loan sizes, terms, energy savings, and funding sources. Recommendations are provided. This report is a first step at scaling up energy efficiency financing.

(IS-2011-166) The Costs and Benefits of Smart Meters For Residential Customers
This white paper from the Institute for Electricity Efficiency provides a framework for quantifying the costs and benefits of residential smart meters from a wide variety of perspectives across a range of electric utility and customer types. Drawing on previous research, utility pilots and analysis, it shows how the magnitude of both costs and benefits might vary according to different utility and customer parameters. While results will vary by utility profile and customer engagement type, the white paper provides a framework that is general enough to be adapted by individual utilities and regulators in conducting their own analysis.
(IS-2011-165) CABA Aging in the Connected Home: 2011 Executive Summary
In 2011, CABA conducted another wave of the State of the Connected Home Market Landmark Research to update its understanding of North American consumer attitudes and behaviors about “connected home” products and services. The research was previously conducted in 2003, 2005 and 2008. The broad purpose of this study is to validate past and current trends, and to characterize consumers’ understanding of the connected home today—and in the future. The 2011 State of the Connected Home Market study identifies key emerging areas of opportunity over the next two years to advance the connected home space in the U.S. and Canada. In addition, the 2011 study has a special focus on uncovering how converged solutions can and should map to key unmet consumer lifestyle-related needs, particularly in the areas/ecosystems of entertainment, family and energy management. CABA commissioned Zanthus Corp., an independent market research and consulting firm, to conduct several “State of the Connected Home Market” research studies over the years, including the current 2011 research study. There were twenty-eight sponsoring organizations involved in this Landmark Research study. As well, a special addendum of the detailed table of contents, background, objectives, methodology and summary findings from a separate report regarding consumer energy management, written for Southern California Edison, is included in the report.

(IS-2011-164) Health Care Comes Home: The Human Factors
This 200-page report presents the results of a comprehensive study by a multidisciplinary Committee on the Role of Human Factors in Home Health Care to examine a diverse range of behavioral and human factor issues resulting from the increasing migration of medical devices, technologies, and care practices into the home, with the committee’s conclusions and recommendations concerning the best use of human factors in home health care.

(IS-2011-163) The future of connected health devices
This report from IBM Institute for Business Value presents an excellent analysis of the health / medical device market, based on interviews with medical device makers and consumer electronics companies as well as inputs from more than 1,300 current device users and caregivers. It suggests solution providers to target a large, fragmented and often overlooked population who seek better information to effectively manage their health.

(IS-2011-162) Health Care Comes Home: The Human Factors
Health care delivered at home is valued by patients and, when managed well, can promote healthy living and well-being. These changes in the location of care are involving more people, both professional and lay, who are sometimes performing difficult tasks, with unfamiliar equipment, in environments not designed to support these
activities. All of these factors need to be addressed, and among the most critical are the human-systems interactions, also known as human factors, otherwise the safety, efficacy, and efficiency of that care will suffer.

(IS-2011-161) The connected consumer challenge
Consumers are making electronics choices today based on the “experiences” a particular device can offer, forcing electronics companies to expand their traditional product attribute-based view to include service. This 4-page marketing flyer describes an IBM study that suggests these companies need to capitalize on this trend by offering not only advanced technology via products, but also services designed to enhance the consumer experience.

(IS-2011-160) Broadband in America – 2nd Edition
This report updates an earlier independent analysis of publicly announced broadband network deployments and plans for the purpose of informing the FCC’s efforts in developing its National Broadband Plan. By 2013-4, broadband service providers expect to offer about 90% of homes advertised speeds of 50 mbps downstream over wired connections and 5 mps over wireless, leaving the rest with significantly inferior choices.

(IS-2011-159) ANSI Workshop Report Standards and Codes for Electric Drive Vehicles
This report from the American National Standards Institute is a summary of workshop held in April 2011 on electric vehicles. The goal was to explore methods for expanding the acceptance and use of electric vehicles that draw electricity from the power grid. The main focus was on consumer acceptance and conformance to standards. Also addressed was training the various industries involved such as insurance adjusters, service technicians, emergency responders, and codes enforcement personnel. The presentations and breakout group discussions are summarized.

(IS-2011-158) Toward LifeHome 21
This document provides guidance to those who may have to make decisions on the appropriate design, specification, construction and adaptation of “assisted living enabled” buildings. This group of people will include developers, architects, designers, builders, various consultants, health care workers, designers of health care equipment and systems, and the general public who are involved in caring for the elderly or less able.

(IS-2011-157) Warmer Bath: a guide to improving the energy efficiency of traditional homes in the city of Bath
This 79-page guide highlights an energy hierarchy that starts with various ways to reduce the need for energy, followed eliminating energy waste, and moves to low carbon or renewable energy, including a cost/benefits analysis, lots of good examples and photos, and ways to monitor progress.
(IS-2011-156) Advancing Renewable Energy and Energy Efficiency at Speed and Scale
This report from the U.S. Department of Energy explains how the National Renewable Energy Laboratory is promoting the adoption of clean energy technology. The lab is streamlining the process for technology partnership agreements and accessing licenses for intellectual property. An Energy Information Portal has been established to publicize results from all 17 national energy labs. Examples of projects and a list of web-based resources are included.

This report from the U.S. Department of Energy examines the impact of Renewable Energy Certificates (RECs) on the development of renewable energy sources. To promote the use of renewable power, some states mandate that renewable power plants issue an REC (with a specific serial number) for each 1 MW of power generated. RECs may be sold to utilities and consumers that cannot access the actual power, but want to contribute to the development of renewable power sources. Some RECs are issued on a voluntary basis. The impact of RECs on the development of renewable energy sources is analyzed and methods for encouraging such projects are discussed.

This report from the U.S. Department of Energy reports on a project to examine the rebuilding of houses in New Orleans following hurricane Katrina. The focus is on energy efficiency improvement and the reduction of moisture retention. Anticipated saving are 10-13% in energy costs. Example houses and construction rebuilding details, including mistakes, are included.

(IS-2011-153) Alternative Fuels and Advanced Vehicles: Resources for Fleet Managers
This report from the U.S. Department of Energy illustrates web-based information for fleet managers. The intent of this information is to help manage costs, meet legal mandates, achieve corporate goals, support the economy, and promote green activities. Resources include cleancities.energy.gov, afdc.energy.gov (alternative fuels and advanced vehicles), and fueleconomy.gov.

(IS-2011-152) Testing Active Power Control from Wind Power at the National Wind Technology Center
This report from the U.S. Department of energy outlines a project in 2011 and 2012 to determine the integration of wind turbine power into an electric grid and the cost. Topics to be investigated are outlined. The fundamental question is whether the fluctuating power output of a wind turbine can benefit a grid in adapting to fluctuating loads in the medium and short term. Can wind power supplement frequency regulation for short-term (up to 10
seconds) adaptation and supplement automatic generator control for medium-term (up to 10 minutes) adaptation to fluctuating loads?

(IS-2011-151) Process Development for High VOC CdTe Solar Cells
This report from the U.S. Department of Energy is a technical analysis of cadmium telluride (CdTe) material used in photocells for solar energy. The parameters that affect performance are analyzed and potential improvements are considered. The focus is on increasing the open-circuit voltage VOC from 850 mV. This paper is intended for a materials scientist.

This report from the U.S. Department of Energy studies the process of determining the proper sized heating and cooling equipment for a house. As houses have been built tighter with better insulation and windows, the same rules-of-thumb have been used to select heating and cooling equipment. Many times the choices are over-sized, thereby wasting initial costs and operating costs. The resulting system may be uncomfortable for the occupants because it may not dehumidify properly. Example installations in Orlando and Chicago houses are presented.

(IS-2011-149) Wind Energy Workforce Development: A Roadmap to a Wind Energy Educational Infrastructure
This report from the U.S. Department of Energy examined training need for the emerging wind power industry. Wind power is expected to increase from 2% in 2008 to 20% in 2030 employing 350,000 in manufacturing and construction compared to about 60,000 in 2009. Educational programs are described at public schools, community colleges, colleges, and universities.

This report from the U.S. Department of Energy surveys the fuel cell market. Fuel cells combine hydrogen and oxygen to produce water, electricity, and heat. Fuel cell systems are at fixed locations, in vehicles, or portable. The investments and performance of companies in this field are reported.

(IS-2011-147) Active Power Control from Wind Power
This report from the U.S. Department of Energy proposes a program for integrating wind power into an electricity grid. The goal is to optimize the economics and to enhance reliability. Various techniques are outlined. A project with tasks to study this issue is outlined.

(IS-2011-146) Stationary and Portable Fuel Cell Systems Codes and Standards Citations
This report from the U.S. Department of Energy is a compilation of references to codes and standards for fuel cells. Which codes apply depends on the jurisdiction. Some jurisdictions may apply their own codes.

(IS-2011-145) Report on Transmission Cost Allocation for RTOs and Others
This report from the U.S. Department of Energy examines cost allocations models for electricity transmission systems. Allocating costs is complicated because transmission lines may cover multiple regulatory jurisdictions and possibly independent generating companies. About $10 billion per year will be spent to grow the transmission network 8% by 2018. Various costing methods are presented. The U.S. Federal Energy Regulatory Commission (FERC) is likely to support “beneficiary pays” transmission cost allocation.

(IS-2011-144) Summary of Needs and Opportunities from the 2011 Residential Energy Efficiency Stakeholders Meeting
The meeting brought together more than 200 professionals representing organizations with vested interest in energy efficiency improvements in residential buildings to identify or reinforce a wide variety of needs and issues associated with delivering high-performance homes in both new and existing home scenarios.

This report from the U.S. Department of Energy outlines methods for reducing energy consumed in buildings by plug and process loads (PPLs) in office buildings. These are tenant devices not related to the building operation or environmental control. Occupants are advised to measure PPLs to determine usage. The employee needs for a variety of devices and for operation during non-business hours in standby modes should be reduced. Intelligent power control is recommended.

(IS-2011-142) Assessing and Reducing Plug and Process Loads in Retail Buildings
This report from the U.S. Department of Energy outlines methods for reducing energy consumed in buildings by plug and process loads (PPLs) in retail stores where some of these loads generate sales. Suggestions are included for savings such as turning off bending machines during closing hours. A total saving calculator is included.

This report from the U.S. Department of Energy explores various incentives for promoting the deployment of renewable energy sources. A spreadsheet called Cost of Renewable Energy Spreadsheet Tool (CREST) has
been developed to evaluate various cost-based incentives. A discounted cash flow method is recommended for measuring the cost of energy to set rates.

(IS-2011-140) Hybrid and Plug-In Electric Vehicles
This report from the U.S. Department of Energy provides an overview of electric vehicle options and relative performance. The cars surveyed include hybrid electric vehicles (gas engine + battery to capture breaking energy), plug-in hybrid electric vehicles (charge from gas engine or from electric socket), and all-electric vehicle (charge from socket only). Fuel savings for the car range from 20% (highway driving with a hybrid electric vehicle) to 100% (all-electric vehicle).

(IS-2011-139) Interim Test Procedures for Evaluating Electrical Performance and Grid Integration of Vehicle-to-Grid Applications
This report from the U.S. Department of Energy examines the connection of an electric car battery to the electric grid both for charging the battery and for providing power from the battery to the grid. Detailed test procedures are presented based on IEEE Std. 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems. Some of the tests include power conversion efficiency, power reserve, and charging time.

This report presents AHAM’s (Association of Home Appliance Manufacturers) methodology and technical analysis of smart appliance network protocols, including Wi-Fi, Zigbee, and HomePlug Green PHY, with respect to the following key communications layers: Application (APP), Network (NET), and Media Layers (MAC, PHY).

(IS-2011-137) Innovative Feed-In Tariff Designs that Limit Policy Costs
This report from the U.S. Department of Energy examines the pricing of Feed-In-Tariffs (FIT). FIT is a payment by a utility for excess renewable energy sold back by the customer to the utility. FIT rates are intended as incentives for developing renewable energy sources. However, the incentives must be priced in a manner that encourages investment without penalizing the utility. Pricing schemes such as payment caps, level adjustments, and auctions are discussed. Case studies are included.

This report from the U.S. Department of Energy examines impediments to effective systems for managing energy consumption by buildings. The focus is on metadata to name the energy-related data collected so these data can
be organized and applied to algorithms without the need for customization to each building. The naming system in BACnet and oBIX were examined and recommendation made for a standard naming point solution.

(IS-2011-135) FY 2010 Progress Report for the DOE Hydrogen Program
This report from the U.S. Department examines progress in research, development, and demonstration programs on hydrogen production and fuel cell technologies. $244 million was allocated to the fuel cell program in 2010. Progress in the following areas is presented with considerable detail: hydrogen production, hydrogen delivery, hydrogen storage, fuel cells, manufacturing, and basic research. Additional topics covered include technology validation, safety, codes, and standards, education, market transformation, systems analysis and integration, and international activities.

(IS-2011-134) The Home Appliance Industry’s Principals & Requirements for Achieving a Widely Accepted Smart Grid
This 25-page Smart Grid white paper from AHAM (Association of Home Appliance Manufacturers) describes 3 essential requirements for the Smart Grid’s interaction with consumers. (1) Pricing must provide incentives to manage energy use more efficiently and enable consumers to save money. (2) Communication Standards must be open, flexible, secure, and limited in number. (3) Consumer Choice & Privacy must be respected; the consumer is the decision maker.

(IS-2011-133) Study on the Future of Interconnection Charging Methods
This report submitted to the European Commission buy TERA Consultants examines tariffs for charging for mobile telephone calls in the European Union. In North American, the cell phone owner pays to make or to receive calls. In Europe, the caller pays a special (higher) charge to call a cell phone. (Call from the U.S. to a European cell phone cost up to 10 times more than terminating on a landline.) This report examines alternative charging schemes and the effect on customer rates and industry competition. The two schemes are called CPNP (Calling Party Network Pays) and BAK (Bill And Keep – shared costs).

(IS-2011-132) Sizing the Clean Economy
This report from the Brookings Institution examines the U.S. clean energy economy. It seeks to quantify the existing market, growth prospects, and methods that might spur industry developments. The clean energy sector employs more people than the fossil fuel industry. 26% of the work is in manufacturing. The report recommends government incentives for a low carbon economy. The clean energy economy is now driven by a vision of more jobs and a growing industry segment, not just environmental concerns.
This report from the Federal Energy Regulatory Commission (FERC) responds to a congressional mandate to develop a U.S. plan for demand response. Congress requested that FERC determine how to advise state regulators of demand response, how to educate consumers, and what tools would help customers, utilities, and regulators. This report lists specific activities to fulfill this mandate such as establishing a national forum, conducting educational programs, sponsoring technical papers, providing assistance to states, creating a panel of experts, distributing demand response grants, and identifying tools.

(IS-2011-130) National Action Plan on Demand Response
This report from the Federal Energy Regulatory Commission (FERC) responds to a congressional mandate to develop a U.S. plan for demand response. Congress requested that FERC determine how to advise state regulators of demand response, how to educate consumers, and what tools would help customers, utilities, and regulators. FERC recommended the creation of a coalition of government agencies, customers, utilities, and interest groups. Methods for forming such a coalition are described with examples from other successful coalitions.

(IS-2011-129) The future of digital terrestrial broadcasting
The report provides a manufacturer's perspective of what a compelling and competitive Digital Terrestrial TV platform should look like in a post-switchover environment. It concludes that if the DTT platform is to remain competitive it must integrate broadcast and broadband to seamlessly offer consumers choice of content and innovative services, with manufacturers free to innovate and sell consumers compelling products at a price they will pay.

(IS-2011-128) Intergovernmental Panel on Climate Change: Summary for Policymakers
This report from the Intergovernmental Panel on Climate Change provides policy recommendations to support renewable energy and climate change mitigation. Renewable sources were surveyed and found to supply about 13% of worldwide energy. Solar electricity has the highest potential for growth. The report explains why dependence on renewable energy sources will grow.

(IS-2011-127) Modernizing Ontario's Electricity System: Next Steps
This report from the Ontario smart Grid Forum presents recommendations to support electric smart grids in Ontario. The Forum includes utilities, commercial, public, and university representatives. Recommendations cover privacy and security, third-party access to real-time consumption data, consumer engagement, electric
vehicle engagement, storage integration, standards, innovation and economic development, and measuring smart
grid success. The report emphasizes that a smart grid should be carefully planned.

(IS-2011-126) SBI Energy White Paper: Smart Grid Utility Data Market
This paper from SBI Energy examines data management required to support electric smart grids. Data intensive
applications include demand response, real-time pricing, automated and self-healing grid, and pre-failure
replacement of equipment. The current focus on smart grid hardware, such as smart electric meters, needs to
shift to data applications.

(IS-2011-125) Internet matters: The Net’s sweeping impact on growth, jobs, and prosperity
As with electricity, the Internet has influenced every corner of the world, not just those countries that first
developed it. It transformed the way we live, work, play and socialize, and almost $8 trillion exchanges hands
each year through e-commerce. This report provides new insights from a holistic perspective that examines a
range of players from enterprises & consumers to companies that form part of the Internet supply chain and those
that leverage the technologies for their own business needs. It equates the Internet with wealth creation and
describes it as one of the biggest drivers of global economic growth.

(IS-2011-124) A FUTURE OF INNOVATION AND GROWTH: Advancing Massachusetts’ Clean-Energy
Leadership
Clean Edge Inc. prepared this report for the Massachusetts Clean Energy Center. Massachusetts ranked second
behind California in producing clean energy. It is a leading state in energy efficiency, solar, and energy storage.
Recommendations for government and utility programs to sustain this position are presented.

(IS-2011-123) Technology for Aging in Place: 2011 Market Overview
Aging in Place refers to home designs and technologies that allow people to live at home as long as possible as
they age. 80% of older people live in their own homes, and 90% of them want to stay there. If they move, it will be
to another private home. This report describes the need and current market for solutions that help make homes
safer and more comfortable for aging adults so they can live full lives in their homes of choice.

(IS-2011-122) U.S. Smart Grid: Finding new ways to cut carbon and create jobs
This report from Center on Globalization, Governance & Competitiveness at Duke University examines potential
job creation among vendors to support an electric smart grid. The report identifies 334 locations in the U.S. where
job might be created. The U.S. could lead the world in smart grid information technology. However, competition
from China, Korea, Japan, and India will be strong. They already surpass the U.S. in some smart grid areas. The
report notes that while most U.S. projects have focused on advanced meters, “important smart grid applications that will be built upon the network infrastructure—including those needed to accommodate grid-scale renewable energy, distributed power, and electric vehicles—are still in their infancy.”

(IS-2011-121) How State Government Enable Local Governments to Advance Energy Efficiency
This report from the American Council for an Energy-Efficient Economy reviews state programs advancing energy efficiency. States programs related to transportation and buildings are examined. The leading states in each program category are highlighted.

(IS-2011-120) FCC’s Seventh Broadband Progress Report and Order of Reconsideration
The report shows that too many Americans still are unable to fully participate in our economy and society because they lack basic broadband services. Some 26 million Americans live in areas that are un-served by broadband. A full one-third of U.S. households don’t subscribe due to other barriers such as cost and lack of literacy or perceived need. Adoption rates are lower among blacks, Hispanics, rural, low-income, less educated, disabled, seniors and the unemployed. The costs of digital exclusion are high and growing, limiting healthcare, educational, and employment opportunities that are essential for consumer welfare and America’s economic growth and global competitiveness.

(IS-2011-119) EcoPinion: Resurgence for Retail Electricity Choice and Competition?
Federal government deregulation of the electric industry gave power-generating companies the right to connect to the grid and sell power to electric utilities, and many states extended that to allow power sales directly to end consumers. Federal deregulation resulted in more competition in wholesale energy, but consumer retail competition is spotty. This paper reports on what consumers think of energy competition and efforts to restructure the retail markets.

(IS-2011-118) EcoPinion: Is Prepay the Way?
While the business case for smart grid has largely been built on the operational efficiencies on the utility side of the meter, the customer-facing benefits of smart grid are less understood. This report examines consumer perceptions of the Pre-Pay concept, which could arguably be the “killer app” of smart grid. Pre-pay allows consumers to pay for energy upfront and then to monitor their usage, account information and energy management through daily communications with suppliers.
(IS-2011-117) EcoPinion: Separating Smart Grid from Smart Meters?
While millions of “smart meters” are being installed in homes and businesses across the country, their focus has been on enabling the “smart grid” to exist, with benefits for utilities. But with more focus on consumers, the grid could introduce even more change and innovation. This paper examines what consumers think about the smart grid, how they expect to benefit from it, their concerns, and how we should be talking to them.

(IS-2011-116) CENELEC Project Report Smart House Roadmap
Given the increasing need for system interoperability, the purpose of the Roadmap project is to (1) provide a snapshot of existing SmartHouse specifications & initiatives; (2) collect & analyze current & future consumer needs; and (3) recommend ways to support competitive markets for equipment suppliers, system integrators and application & service providers.

(IS-2011-115) Moving Forward: Findings and Recommendations from the Consultative Council
This report from the U.S. National Institute of Building Sciences recommends policies to encourage high performance buildings. A top-down approach is taken rather than starting with components. Metrics for energy and water efficiency are needed. The report urges a focus on economic growth, environmental stewardship and social progress. More emphasis is need on effective codes and standards.

This report from the International Energy Agency (IEA) explores greenhouse gas emission reductions from buildings. The goal is to reduce overall emissions by 50% by 2050, of which one-third comes from buildings. The residential sector contributed 67% of this reduction. The IEA recommends improved heating and cooling technology to reduce emissions with impetus from national government policies. Active solar thermal for building heat is discussed. Innovation is need for heat pumps, combined heat and power, and thermal storage devices. Recommended actions by stakeholders are presented.

(IS-2011-113) Behavior and Energy Savings
This report from the Environmental Defense Fund reports on a study that sought to effect residential energy conservation. The subjects were shown comparisons of their energy usage compared to their neighbors. This led to consumption reductions in range of 0.9% to 2.9% with an average of 1.8%. The key is to target the right conservation program to the right household by size, number of occupants, and age of the occupants.
(IS-2011-112) Realizing the Benefits of BIM
This report from Autodesk explains the benefits of Building Information Modeling (BIM). A BIM model can be used for all aspects of design and construction. BIM facilitates collaboration on the physical and functional aspects of a building. Design-to-fabrication integration is enabled by BIM.

This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in new and retrofit small office buildings (up to 20,000 square feet). The goal is to achieve a 30% improvement over minimum code requirements while enhancing the work environment and reducing greenhouse gas emissions. Recommendations cover the building envelope and windows, lighting systems (including daylighting), heating, cooling and ventilation, building automation, water heating, external façade lighting, and electrical loads. Examples are presented.

(IS-2011-110) Consumer Attitudes about the Benefits of Smart Grid Technologies
This study from Parks Associates discusses customer attitudes toward smart energy technologies. Consumers are willing to buy energy efficient products to save money. They are willing to pay something for equipment that promises to save energy costs. Parks Associates suggests combining security and energy monitoring. Consumers are not keen on allowing remote control of appliances by service providers.

(IS-2011-109) Beyond Landline: Evolving Consumer Expectations for Technology Support
Accenture research shows that today’s consumers are engaged in an increasingly wide range of technology-based activities across their homes and businesses, that there is a proliferation of new devices and new ways to interact with technology, and that most would welcome having one company support it all. The paper examines issues that consumers want technical support to address and over what mode and concludes that communications providers are well positioned to deliver.

(IS-2011-108) Joint Petition To ENERGY STAR To Adopt Joint Stakeholder Agreement As It Relates To Smart Appliances
This document is a petition from the Association of Home Appliance Manufacturers to the U.S. Environmental Protection Agency (EPA) seeking a 5% Energy Star credit for smart grid-enabled appliances. Appliances such as refrigerators, clothes washers, clothes dryers, room air conditioners, and dishwashers would have the ability to delay energy consuming operating modes in response to a utility “delay load signal.” No response from the EPA has been reported as of August 2011.
This report from the American Council for an Energy-Efficient Economy reviews programs for Energy Efficiency Resource Standards that are in 26 U.S. states. Strategies that have achieved saving goals are analyzed in two categories: “established saver” and “rapid start.” The former has long-running programs, while the latter seeks customers who have not done much yet to save energy. Funding, regulatory, and operational methods for achieving successful programs are discussed. Case studies are included.

This report from the American Council for an Energy-Efficient Economy reviews programs for Energy Efficiency Resource Standards that are in 26 U.S. states. These programs set goals for annual or cumulative energy savings (such as 2% per year or 20% by 2020). The effectiveness and limitations of these programs are surveyed and discussed. The focus is on electricity, but some gas programs are included. Maximum savings were about 1.2%. Cumulative targets for 2020 are as high as 27% (Vermont). All states with such programs are on track to achieve their goals. Case studies are included.

This report from the National Science and Technology Council of the U.S. White House discusses energy policies for electric smart grids. The policy is built on a framework that supports cost-effective smart grid investments, innovation, customer involvement based on informed decisions, and securing the grid. Topics discussed include smart grid standards, demand response, access to usage data, customer privacy, and energy management equipment.

(IS-2011-104) The Dawn of IPv6
Most companies polled show concern over their readiness to support Internet Protocol Version 6 (IPv6), which is needed to extend the number of unique addresses to individual nodes on the Internet. IPv4 could run out of addresses this year, and Network Address Translation (NAT), which allows a single device to represent a local network, is only a temporary fix. The paper shows how IPv6 will impact the world, including increased security, mobility and Quality of Service (QoS).
(IS-2011-103) U.S. Department of Energy 2011 Strategic Plan
This report is an overview of the U.S. Department of Energy (DoE) for 2011. DoE runs national laboratories, research facilities, and field office with a staff of 15,000. Developments in clean energy sources and equipment by other countries are compared to the U.S. Trends include decreased petroleum use, gradual electrification of the vehicle fleet, increasing production of advanced biofuels, and reduced greenhouse gas emissions.

(IS-2011-102) 2010 BOMA BESt Energy and Environment Report
This report from BOMA Canada is a survey of the energy and efficiency performance of 300 buildings. It assesses the performance and provides recommendations. Good results were found for emissions, indoor air quality, and environmental management. Improvements were needed for energy, water, and waste. Buildings were evaluated using the BOMA Building Environmental Standards (BEST) and BEST certification levels (1-4: lowest to highest compliance). Performance statistics are included.

This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in schools (K-12). The goal is to achieve a 30% improvement over minimum American national standard 90.1-1999. Expected benefits are productivity increases of 2-25% from better air quality, acoustics, and lighting including daylighting. Recommendations cover the building envelope and windows, lighting systems, heating, cooling and ventilation, building automation, air treatment, and water heating plus plug loads, renewable energy, and using the building as a teaching tool. Example properties are included.

This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in non-refrigerated warehouses. The goal is to achieve a 30% improvement over minimum American national standard 90.1-1999. Recommendations cover the building envelope and windows, lighting systems, heating, cooling and ventilation, and water heating plus exterior lighting and plug loads. Methods for quality assurance and commissioning are described. Example properties are included.

This report from ASHRAE (American Society of Heating, Refrigerating and Air- Conditioning Engineers) provides guidelines for saving energy in a variety of medical buildings. The goal is to reduce energy consumption by 30% over American national standards while providing an environment for healing patients. A medical facility uses on
average 3.5 times as much energy as a commercial building, much of it for lighting. Recommendations cover the building envelope and windows, lighting systems, heating, cooling and ventilation, building automation, outside air treatment, and water heating. Example medical facilities and technologies are included.

This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in retail buildings up to 20,000 square feet. The goal is to achieve a 30% improvement over minimum American national standard 90.1-1999. Recommendations cover the building envelope and windows, lighting systems, heating, cooling and ventilation, and water heating plus exterior lighting and signage. Methods for quality assurance and commissioning are described. Example properties are included.

This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in new and retrofit small hotels and motels (up to four stories and 80 rooms). The goal is to achieve a 30% improvement over minimum American national standard 90.1-1999. Recommendations cover the building envelope and windows, lighting systems, heating, cooling and ventilation, water heating, water conservation, and electrical loads. Methods for quality assurance and commissioning are described. Example properties are included.

This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in new and retrofit small to medium-sized office buildings (up to 100,000 square feet). The goal is to achieve a 50% improvement over minimum code requirements while enhancing the work environment and reducing greenhouse gas emissions. Recommendations cover the building envelope and windows, lighting systems (including daylighting), heating, cooling and ventilation, building automation, water heating, and electrical loads. Two office buildings were simulated. Project organizations to achieve these goals were presented.

(IS-2011-95) CABA Intelligent Buildings Roadmap
The CABA Intelligent Buildings Roadmap was a collaborative industry-funded research project that explored the opportunities offered by emerging intelligent building technologies. The Roadmap’s primary objective is to identify strategies for developing intelligent buildings that have the greatest potential to drive broad acceptance. Published in 2007, the report examines the challenges facing intelligent building implementation within North America and identifies the market developments and industry initiatives needed to support the wider adoption of these
technologies. The report was prepared for the Continental Automated Buildings Association (CABA) by Building Intelligence Group LLC.

(IS-2011-94) Integrated Design & Delivery Solutions
This white paper from the University of Salford in the United Kingdom examines the benefits of integrated design and delivery solution for building construction. The techniques include product modeling and computer-aided design, standards-based exchange of product model data, the use of industry foundation classes, and building information modeling. Interoperability among software tools is needed to shield users from the complexity of the underlying technology.

(IS-2011-93) Powering our Lives: Sustainable Energy Management and the Built Environment
The UK Government’s Foresight Programme explores how to help manage the transition to secure sustainable, low-carbon energy systems that meet the needs of society, the economy, and expectations of individuals. Buildings account for about half of the UK’s carbon emissions, so they seek innovative & integrated solutions across building standards, urban design, planning and energy systems. This 213 page report examines different long term scenarios to identify uncertainty and risk, and to develop new insights into how the challenges can be met.

(IS-2011-92) Research Priorities for the Definition of a Multi-Annual Roadmap and Longer Term Strategy
The European Energy Efficient Building Public Private Partnership (EeB PPP) produced this roadmap as part of a one billion Euro project. The project goal is to reduce energy consumption and carbon emissions by existing and new buildings. This challenge is considered too large to be addressed by each building owner separately. Instead, work at a district level is proposed. The objectives are initially to reduce building energy consumption, make the building energy self-sufficient, and eventually, make the building an energy generator for the district. General technology issues are discussed. Financial issues are presented.

(IS-2011-91) A study of expected information needs that will be required by the wider building industry in the immediate and medium term
This report from Branz is a survey of information needs by building industry groups. About 1000 from the following groups were polled in 2010: architects, designers, builders, educators, building officials, and government agencies. Tops concerns are the building structure, materials, codes, and energy. Performance-based standards for each building were considered.
The operation of commercial and residential buildings accounts for some 23% of total greenhouse emissions. Although public and corporate sectors recognize the need to address energy efficiency and climate change, this South African report suggests that government initiatives and policy instruments could result in improved energy efficiencies of 40% to 50% in new commercial buildings and 30% to 40% in residential. The challenge remains translating intent into action. Recommendations included.

(IS-2011-89) The Business Value of BIM in Europe
This report from McGraw Hill Construction investigates BIM (Building Information Modeling) adoption in the U.K., France, and Germany. The adopters are more committed to BIM than Americans. 38% of those surveyed are adopting BIM with an expected increase to 75% in two years. The key benefits are reduced errors, reduced time for specific projects, and the ability to offer new services. Details of the survey are included with case studies.

(IS-2011-88) Building the Future: Four Visions of the New Zealand Built Environment in 2025
This 166-page report combines evidence, expertise and futures thinking with four scenarios to help the reader understand and influence the forces of change in the New Zealand building industry. It summarizes a large body of work and is intended as a reference document, rather than a book to be read from cover to cover. Details about trends and drivers that are directly relevant to the scenarios are given in this report, along with references.

(IS-2011-87) Understanding Perceptions and Usage Patterns of BIM Software Among Key Player Segments in the UK, France, and Germany
McGraw-Hill Construction conducted a survey among almost 1000 building professionals in Europe about Building Information Modeling (BIM) usage. About one-third are using BIM. Architects see the most value compared to engineers and contractors. The prevalent opinion of BIM: “Better multi-party communication and understanding from 3D visualization, along with improved project process outcomes, top the list of importance to the overall experience of value from BIM.”

(IS-2011-86) Zero and Net-Zero Energy Buildings + Homes
This supplement to Building Design and Construction is a collection of eight articles on zero-energy buildings. Net-zero energy buildings are defined. Case studies are presented. A paper on technologies for achieving net zero buildings is included. The business case and financing for net-zero buildings are analyzed. Codes and standards are discussed. How to achieve zero carbon emissions is presented. Trade and government groups in this field are listed.
(IS-2011-85) Green Building & Human Experience: Testing Green Building Strategies with Volunteered Geographic Information
This report from the U.S. Green Building Council explores methods for gathering data from building occupants. It focuses on the human experience, Volunteered Geographic Information (VGI); and green buildings. VGI tracks volunteers as they use the building and nearby environment. The intent is to shift from a best-practices guide to evidence-based practices.

(IS-2011-84) A Local Government Guide to LEED for Neighborhood Development
This report from the U.S. Green Building Council is intended for local governments. It helps identify “development projects that successfully protect and enhance the overall health and quality of our natural environment and our communities.” Three stages for LEED (Leadership in Energy and Environmental Design) certification are (1) conditionally approved plan, (2) pre-certified plan, and (3) certified neighborhood development. The LEED Neighborhood Development Rating System is referenced. Examples are provided.

(IS-2011-83) Transforming America’s Power Industry: The Investment Challenge 2010-2030
This paper from the Brattle Group examines the investment required through 2030 to maintain a reliable electricity system. Four scenarios are studied: base level, realistically achievable levels of energy efficiency and demand response programs, maximum achievable levels, and carbon reductions that may be mandated. The projected investment ranges from $1.5 trillion to $2 trillion. Energy efficient and demand response programs could reduce generation requirements 38% to 48%. Renewables would account for 29% of total power generated. Investments in transmission and distribution could surpass generation.

This report from the Cascadia Green Building Council provides a strategy to foster water processing for reuse locally so the net water consumption in a building is zero. The following topics are covered: rainwater harvesting, including strategies for potable and non-potable uses, greywater reclamation and reuse, and on-site wastewater treatment and reuse, including composting toilets. 0.007% of the total water on earth is available for human use. The U.S. uses 30% of water for agriculture, 50% for industry, and 11% for domestic. Each person uses an average of 65-78 gallons per day. Case studies are included.
According to the TIA, rising demand for wireless broadband internet access has created a spectrum crisis that jeopardizes economic productivity, job growth, innovation, and societal gains. Allocating additional spectrum for wireless broadband will produce numerous economic and societal benefits, but failure to do that could result in wireless data gridlock. Mechanisms should be established to permit fast and flexible spectrum reallocations.

(IS-2011-80) Technology Roadmap: Smart Grids
This report from the International Energy Agency (IEA) presents a roadmap toward a secure energy future with lowered carbon emissions. The roadmap focuses on the benefits of a smart grid for real-time monitoring and management. Large-scale trials and implementations of smart grid are recommended. The IEA set a goal of a 50% reduction in carbon emissions by 2050. The largest growth in energy consumption will occur in India (six-fold) and the Middle East (four-fold). The elements of a smart grid are described. Policies and pricing are presented.

While still relatively strong, FTTH growth has slowed somewhat since 2008. That’s largely because Verizon, which represents over 73% of all North American FTTH connections, has approached its deployment targets, slowed its network build, and turned its attention to marketing. Other factors include general economic conditions. U.S. growth in 2011 is largely because stimulus money is now starting to flow to FTTH projects among smaller commercial providers and municipalities.

This paper from the American Council on Renewable Energy is a survey of the U.S. projects, markets, and economic impact of renewable energy on a state-by-state basis. The survey covers wind power, photovoltaic power, geothermal, small hydro, ocean power, biomass, bioethanol, and biodiesel sources.

(IS-2011-77) A Model for Stakeholder Collaboration
This report is from the National Action Plan Coalition, a coalition of organizations involved in demand response for energy management. It summarizes results from the Washington PowerCentsDC demand response pilot program. The intent is to present a case study of a smart grid application. 900 customers participated in a test of dynamic electricity pricing facilitated with smart meters. Summer usage was reduced by one third. The importance of involving all utility departments was stressed.
Passivhaus Requirements: Logical or Arbitrary?
The holy grail of cold-climate energy-efficient design is the house without a heating system, but most of these homes are neither “passive” nor without heating systems. The Passivhaus standard does, however, set a high bar for air tightness, super-insulation, and high-performance windows to achieve energy efficiency without fancy equipment.

Guidance on the Design and Construction of Sustainable, Low Carbon Warehouse Buildings
This paper contains a proposal from Tata Steel and the British Constructional Steelwork Association for designing and constructing sustainable, low and zero-carbon buildings in the United Kingdom. This is responding to U.K. laws mandating greenhouse gas emission reduction of 34% by 2020 and 80% by 2050 compared to 1990. New non-residential buildings are to achieve zero emissions by 2019. This paper focuses on techniques applicable to warehouses. Changes to the building structure and building services such as heating, cooling, and lighting are presented. Lighting improvements had the biggest impact. Local power generation is considered.

This paper contains a proposal from Tata Steel and the British Constructional Steelwork Association for designing and constructing sustainable, low and zero-carbon buildings in the United Kingdom. This is responding to U.K. laws mandating greenhouse gas emission reduction of 34% by 2020 and 80% by 2050 compared to 1990. New non-residential buildings are to achieve zero emissions by 2019. This paper focuses on techniques applicable to supermarkets. Lighting was the largest contributor to emissions (about 50%), which could be ameliorated with efficiency improvements and skylights in the roof. Improvements in heating and cooling were difficult to achieve. Wind turbines in the parking lot are considered. Embodied carbon was considered, that is, carbon contained in building materials that could be emitted when the building is demolished.

Guidance on the Design and Construction of Sustainable, Low Carbon School Buildings
This paper contains a proposal from Tata Steel and the British Constructional Steelwork Association for designing and constructing sustainable, low and zero-carbon buildings in the United Kingdom. This is responding to U.K. laws mandating greenhouse gas emission reduction of 34% by 2020 and 80% by 2050 compared to 1990. New non-residential buildings are to achieve zero emissions by 2019. This paper focuses on techniques applicable to schools. Design and structure examples that provide better performance are presented. Cases are shown of school buildings that reduced carbon emissions 25% by using only energy efficiency measures at an increased capital cost of 0.14%.
(IS-2011-72) The smart grid and the promise of demand-side management
This report from McKinsey is an overview of demand-side management. McKinsey uses this term to cover load shifting (demand response) and energy conservation. They define “Six Levers of Effective Demand-Side Management”: rates, incentives, access to information, utility controls, education and marketing, and customer insight and verification.

(IS-2011-71) 2011 Master Index of Women and Technology
According to the research, Canadian women are avid users of mobile technology including cameras, MP3 players, cellphones and smartphones. However, the way women use these devices is often dependent on their age, income and life stage. Almost half (46%) of Canadian women admit they could not go a week without their mobile devices and the access they provide to social media networks, online shopping and keeping track of videos, music and other documents.

(IS-2011-70) Making the cloud relevant: E-business, IT as a Service, and Everything as a Service
This paper from Hewlett-Packard is an opinion piece about the value of cloud computing. The author maintains that cloud computing will solve new problems and will solve old problems “quicker, cheaper, and with higher quality results.” Cloud computing will force information technology department to offer new services. Stages of evolution of cloud services are described.

(IS-2011-69) Magic Quadrant for MSSPs, North America
This report from Gartner analyzes managed security service providers and offers guidance on choosing one that fits the needs of the company. The main functions are firewall management, intrusion detection, and intrusion prevention. The dilemma of outsourcing data security especially to providers in foreign countries that may be subject to government surveillance is considered. The strengths and cautions for a variety of companies are reviewed.

(IS-2011-68) Creative Partnerships Are Key To M2M Market Development for Wireless Carriers
Connecting new smart devices to networks is poised for rapid growth. Virtually all products that use electricity today possess inherent data processing capability and the potential to be networked in a wide array of applications including automotive telematics, commercial transportation, mobile health, smart grid and consumer electronics. Leading cellular network operators are advancing the use of wireless Machine to Machine (M2M) communications, but going it alone is risky.
This report from the U.S. National Institute of Standards and Technology (NIST) analyzes the causes and spread of a disastrous fire in a furniture store in Charleston, South Carolina (6/18/07). Nine firefighters were killed. The absence of sprinklers and compartmentalization of the building were direct causes of the spread of the fire. NIST provided 11 recommendations to minimize such future fires.

(IS-2011-66) Electricity Reliability: Problems, Progress and Policy Solutions
This paper from the Galvin Institute focuses on methods for improving the reliability of electricity. The authors maintain that reliability can be achieved with better metrics and without increased costs. Smart grids per se will not ensure enhanced reliability. Case studies of utilities that successfully increased reliability are presented. Underground wires are urged.

(IS-2011-65) EcoPinion Lighting Survey Report: Lighting the Path Forward for Greater Energy Efficiency
An important transformation is taking place in the market for residential lighting, moving away from traditional incandescent lamps to energy efficient lighting options such as CFLs and LEDs. This study found that American consumers are clearly ready to adopt the new lighting options and are happy with the results. Two-thirds installed CFLs in their homes over the past year, and 27% installed some sort of LED fixture. As prices of new lighting options fall, market penetration will increase.

(IS-2011-64) Energy Efficiency Investments as an Economic Productivity Strategy for Texas
This paper from the American Council for an Energy Efficient Economy assesses methods for assuring that the State of Texas can supply electric energy needed to support a population growth of 1.3% per year through 2030. The state already has plans for a 3.5% decrease in demand for energy by 2030 through a 30% increase in energy efficiency. This paper argues that energy efficiency should be coupled with an increased use of combined heat and power (CHP) systems. CHP plus energy efficiency increases would save about 23% in energy costs by 2030, which translates to $14 billion in savings between 2012 and 2030.

(IS-2011-63) The comScore 2010 MOBILE Year in Review
As mobile smartphones, 3G and unlimited data plans continue to play a more prominent role on the digital stage, it’s imperative for marketers to understand how consumers are using mobile devices and perhaps more importantly what synergies and differences vary between the PC-Internet screen and the mobile media screen. comScore offers an overview of the prevailing trends in mobile media usage across geographies including the U.S., EU, and Japan and considers their implications for the year ahead.
(IS-2011-62) 2010 Canada DIGITAL Year in Review
The report analyzes digital media trends including overall Internet usage, high-growth categories, online display advertising, online video, search and mobile. It includes many good charts and considers trend implications for navigating the uncertainties of the year ahead.

This paper from Sera Architects describes voluntary actions by a neighborhood of Philadelphia to encourage recycling. This program is part of a larger concept called Civic Ecology. Civic Ecology integrates economic, ecological, and social systems plus a long-range plan for 10, 20, and 50 years.

(IS-2011-60) Public Attitudes Toward Energy Efficiency and Appliance Efficiency Standards: Consumers See the Benefits and Support the Standards
This paper from the Consumer Federation of America reports on a survey of consumer opinions about home appliance efficiency. The public is more aware of energy consumption by autos than at home, even though the total for each category is about the same. Most people favor increased efficiency of large appliances and standards for energy efficiency even if appliance prices increase as a result. 1000 people were contacted for this survey.

This report from The Zero Energy Commercial Buildings Consortium examines how to achieve the goals of net zero energy consumption by commercial buildings. Such buildings currently consume 40% of the energy used nationally and produce 40% of the greenhouse gases. This organization examined the building structure, systems, information technology, codes, and economic issues. Barriers to technology advancement include integrated design, sensors and controls, costs, and a lack of skilled workers. Issues affecting each technical area are examined.

This report from The Zero Energy Commercial Buildings Consortium examines market and policy barriers to achieving net zero energy buildings. The topics covered include codes and standards, integrated design and building delivery, benchmarking and performance assurance, voluntary programs, finance and valuation, owners and tenants issues, and workforce development. The gaps and barriers for each topic are examined. Recommendations are provided.
Provides U.S. intermediate & advanced media agencies with a baseline on what’s going on in digital out-of-home (DOOH) advertising, offers ideas on the opportunities, and discusses the challenges. Covers the shift to consumer-driven marketing, the state of buying in a still-distressed economy, how networks and planners are making an impression, what’s working, growth areas, what still needs works, and the ABC’s of DOOH.

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(IS-2011-55) Revealing the Values of the New Energy Consumer
This report serves primarily as marketing collateral to sell Accenture’s guide, “The New Energy Consumer: Strategic Perspectives on the Evolving Energy Marketplace” and related consulting services. It does include some useful market research and four key observations: (1) while consumers regard their utilities as primary providers of energy-related products, dynamic business models are emerging; (2) price is pivotal but not the only factor; (3) utilities need to differentiate their propositions and experiences; and (4) consumers will respond if they do.

This paper from Johnson Controls provides an overview of net zero buildings. Such buildings generate as much energy from renewable resources as they consume over a period of a year. Net zero buildings are required or encouraged for new construction by national and local mandates by 2020, 2030, 2040 or 2050. Case studies are included. “Aiming for ‘near-zero’ in larger commercial structures would seem a worthy goal, both achievable and financially attractive when considering the long-term cost of operating a commercial building.”

(IS-2011-53) Digital Out-Of-Home Communications: The future is here and now
2054-era technologies from Minority Report are starting to appear in the market today. They include facial recognition, fingerprint & retinal scanning, augmented reality, multi-touch, gesture-based interfaces, neural interfaces, personalized advertising, and wearable computers. Market drivers and enablers include a mobile society, social media, convergence, the Cloud, near field communication, RFID, QR codes, open standards, digital signage, suggestive selling, and virtual sales assistance. The report also gives important insights and discusses implications of these trends.
This report from the Office of Energy Efficiency at Natural Resources Canada is an annual survey of energy usage for manufacturing in the country. Energy for manufacturing accounted for 21% of the total usage in 2008. Petroleum and gas had the largest increase, while paper decreased the most. Energy consumption by manufacturing sector is presented. Electricity has surpassed gas as the top energy source for manufacturing in Canada.

(IS-2011-51) Implementing Telework: Lessons Learned from Four Federal Agencies
Telework is touted as a winning strategy for government with potential savings of nearly $3.8 billion from reduced real estate costs, electricity savings, reduced absenteeism, and reduced employee turnover. But Telework adoption has been slow and presents technological, social, operational, and management challenges. This report offers practical implementation advice to agency leaders and front-line managers faced with applying the newly-enacted “Telework Enhancement Act of 2010” to over one million federal workers.

(IS-2011-50) Appliance and Equipment Efficiency Standards: A Money Maker and Job Creator
This study estimates net employment and wage impacts of U.S. DOE appliance, equipment, and lighting efficiency standards. These mandated standards are a key part of the nation’s energy policy, energy & economic savings for consumers and the broader economy as well. Existing standards generate an estimated 340,000 jobs, or about 0.2% of all jobs, and new standards will raise this about 12% to 380,000 jobs by 2030. The increase results from saving some $34 billion in energy costs and consumers shifting spending away from utilities and onto other things.

(IS-2011-49) Building Information Modeling
This report from InfoComm presents an overview of Building Information Modeling (BIM) and the relevance to audio/video professionals. BIM is “a digital representation of physical and functional characteristics of a facility.” BIM is a data repository for building design, construction, and maintenance information. BIM affects the building consultant, integrator, system designer, and manufacturer. BIM can track design changes.

This report from Deloitte highlights the growing threat of cyber security from organized criminals and governments. The results of a survey of top financial institutions, banks, and insurance companies worldwide are presented. Data loss prevention is a key issue. The need to protect paper copies of data is stressed. It was noted that many organizations provide employees with wide access to sensitive data.
(IS-2011-47) Next Generation Broadband Access White Paper
The Broadband Forum, successor of the DSL Forum, provides an optimistic overview of next-generation access technologies and shows how they can enable new services while coexisting with older broadband infrastructure. Covered technologies include: VDSL2, FTTx, LTE, and WiMAX, among others.

(IS-2011-46) Key Considerations for Home Energy Efficiency Retrofit Rebate and Financing Incentive Integration
This paper from the Electric & Gas Industries Association examines funding options for home energy management programs. The emphasis is a simple way for contractors to present the savings and net cost of improvements for energy improvements to homeowners. Programs that expedite incentives in various regions of the U.S. are summarized. Financing options are discussed.

(IS-2011-45) Energy Management Information Systems
This handbook from the Canadian Office of Natural Resources of Natural Resources Canada presents instructions to management and operations on an energy management information system covering metering, data collection, data analysis, reporting and cost/benefit analyses. Analysis is key to gleaning knowledge from data collected. Examples are provided. A checklist for an effective system is presented.

(IS-2011-44) U.S. Digital Media Year in Review 2010
The report provides an overview of prevailing trends in digital media usage during the year and considers their implications for the year ahead. It examines U.S. Internet usage, search activity, e-commerce, online video consumption, online advertising and mobile, and offers a prognosis for which digital strategies will be most critical for success in 2011.

(IS-2011-43) Demystifying the Cloud
The report from Bell Canada provides an overview of "cloud computing": outsourcing corporate information technology (IT). Some cloud vendors run systems dedicated to one company, while others share servers among many clients. Some users pay for services as needed, rather than entering into long-term contracts. Three cloud models are presented: Software as a Service (e.g., billing), Infrastructure as a Service (e.g., storage and computing), and Platform as a Service (e.g., application development). An advantage of cloud computer is the ability to scale quickly as business increases. Guidance for companies to choose the best cloud system is provided. Examples of successful cloud projects are included.
The report from Best Buy examines how to develop a consumer market for energy management products and services. The solution is to focus not just on cost-savings, but on benefits and control. Energy management must be integrated with other home functions such as entertainment. Best Buy divides customers into those focusing on (1) financial and physical protection, (2) comfort and convenience, and (3) being "green." Any consumer product for energy management must be easy to use, convenient, and offer a return on the time and money invested.

(IS-2011-41) Revealed: The art of music listening
There’s “listening”, and then there’s audiophile listening with musicality that the average person doesn’t notice. Today’s high-end audio is a pleasing blend of old analog and new digital technologies, including CDs, multichannel SACD and DVD-A formats, portable MP3s, high-res lossless digital files, and even vinyl. This report offers consumer advice such as choosing equipment, positioning speakers, and training your ear. It includes advertising from top brands.

(IS-2011-40) Next Generation Technologies Barriers & Industry Recommendations for Commercial Buildings
This report from the Zero Energy Commercial Buildings Consortium (CBC) presents results from a survey commissioned by the U.S. Department of Energy on new technologies to make buildings more energy efficient. The CBC was asked to “identify market potential, barriers, and strategic solutions needed to accelerate their deployment and widespread use.” The CBC studied the building envelope, mechanical and plumbing systems, lighting, information technology, combined heat and power generation, and electric grid interaction. The report emphasizes the need for integrated design of these systems and continual monitoring during operations. More work-force training is needed. DC microgrids are proposed for lighting and building controls.

(IS-2011-39) 2010 Building Performance Institute, Inc. End of Year Report
This report from the Building Performance Institute (BPI) reviews accomplishments in 2010. BPI certifies contractors, totaling more than 20,000 by the end of 2010. The BPI was authorized by the American National Standards Institute (ANSI) to write American national standards for retrofitting residential buildings for energy efficiency. BPI is writing 10 standards related to home energy retrofits.
(IS-2011-38) Total cost comparison study of analog and IP-based video Surveillance
This report from Axis Communications compares video surveillance using analog and digital technology based on an IP (Internet Protocol) network. The cost of purchasing and operating a video system are analyzed. The digital IP system is less expensive for 14 or more cameras.

(IS-2011-37) NTCA 2010 Broadband/Internet Availability Survey Report
The National Telecommunications Cooperative Association represents small and rural telephone companies. Its 2010 survey of members found increased broadband deployment and identified technologies used: 94% DSL, 68% FTTH, 20% unlicensed wireless, 13% licensed wireless, 8% satellite, and 7% cable modem. The report also identifies funding, competition, challenges, Internet backbone connections, and new services such as VoIP and Video, along with trends from their 2000 report.

(IS-2011-36) Smart Grid White Paper: The Home Appliance Industry's Principles & Requirements for Achieving a Widely Accepted Smart Grid
This report from the Association of Home Appliance Manufacturers (AHAM) is a statement of principals for smart grid design as it affects large home appliances. Pricing should be the incentive for consumer energy management. Communications standards must be "open, flexible, secure, and limited in number." Consumer should have choices and have their privacy respected. AHAM estimates that with full consumer participation in demand response programs, consumers could contribute 10% to the reduction of peak demand, with businesses adding another 10%. Consumers should be able to override any energy savings instructions sent to an appliance by a utility.

The white paper from ENEA examines the challenges of designing application software for a processor with multiple cores. Multiple cores accommodate parallel processing of data. Key considerations in software design are configuring the applications for multiple cores, portability among various processors, scalability, and performance. Multiple cores can enhance execution speed unless the process is limited by I/O activities or contention for shared memory. Various strategies are discussed.

(IS-2011-34) Assessment of Communication Standards for Smart Appliances
The Association of Home Appliance Manufacturers (AHAM) set out to identify communications protocols and rank them by their ability to meet the Smart Grid needs of appliance consumers. Each technology was evaluated
against consumer driven requirements identified by participating AHAM members based on their industry knowledge and expertise. Each technology was then evaluated through a scoring system. For the Application layer, SEP 2.0 and OpenADR scored highest. For media and network layers, Wi-Fi, ZigBee and HomePlug Green PHY, scored highest.

(IS-2011-33) Cloud Computing: Hackett Study Identifies Emerging Best Practices and Experiences of Early
This report from the Hackett Group assesses the potential growth “cloud computing” business. Cloud computing consists of information technology (IT) services provided via the Internet by the corporate IT department or by an outside service provider. Companies are considering cloud computing to reduce IT investments. Cloud computing works best when designed from the ground up, rather that added to an existing IT infrastructure.

(IS-2011-32) Consumer Driven System Level Requirements
This detailed comparison grid is useless on its own and is meant to supplement CABA document RV311f. Each communications technology was evaluated against a set of consumer driven requirements, as identified by participating AHAM members based on their industry knowledge and expertise. Each technology was then evaluated through a requirements-driven scoring system by an independent consultant to rank its ability to meet the unique needs of appliance consumers.

(IS-2011-31) Advancing Broadband – A Foundation for Strong Rural Communities
USDA summarizes the initiative awards aimed at advancing the reach of broadband to rural communities and connecting about 7 million rural Americans, 360,000 businesses, and 30,000 community institutions like schools, hospitals, and fire and police service. $3.4 billion was awarded to 297 recipients in 45 states, with 89% going to last-mile infrastructure projects. The report details how the money was spent and describes the specifics of each award.

(IS-2011-30) Remote work - A practical guide to the new business reality
Today’s remote workers aren’t just telecommuters who work from home offices. They’re salespeople, technicians & service personnel, consultants, educators and business travelers – all working, collaborating and staying connected wherever the job takes them. People used to go to work – now work moves with them, allowing them to reach new levels of creativity and output. This paper presents common benefits of Remote Work and gives advice for overcoming perceived barriers.
(IS-2011-29) Use of Residential Smart Appliances for Peak-Load Shifting and Spinning Reserves
This report from Pacific Northwest National Laboratory examines the potential impact of smart appliances on electric utility demand response. The following appliances were analyzed: refrigerator, clothes washer, clothes dryer, room air-conditioning, and dishwasher. Two aspects were studied: appliance operation deferral to off-peak hours; appliance operation delay for up to 10 minutes. The possible benefits to lowering utility spinning reserves are presented.

(IS-2011-28) Magic Quadrant for Cloud Infrastructure as a Service and Web Hosting
The paper from Gartner examines the business of “cloud computing”: outsourcing corporate information technology (IT). Cloud Infrastructure as a Service is an extension of web hosting for some companies and a substitute of in-house IT for others, typically new companies. Options for running cloud service businesses are described. A survey of cloud companies, mostly located in the U.S., is included. The strengths and weakness of these companies are presented.

(IS-2011-27) An MPG Rating for Commercial Buildings: Establishing a Building Energy Asset Labeling Program in Massachusetts
This report from the Massachusetts Department of Energy Resources presents a method for reducing energy consumption in commercial and industrial buildings. The approach is a system for comparing energy consumption among similar buildings independent of tenant activities by examining windows, insulation, mechanical, and electrical systems. The Massachusetts proposal is compared to other programs such as LEED (Leadership in Energy and Environmental Design), EPA (Environmental Protection Agency) Energy Star Portfolio Manager, and European directives on rating buildings. A building labeling pilot program is described.

(IS-2011-26) Smart Metering & Infrastructure Program Business Case
This brochure from BC Hydro describes the plans for installing smart meters. The schedule for installation is presented. The benefits claimed are faster outage notification, restoration notification, low theft rates, more accurate meter reads, etc. Options in-home displays will be offered.

(IS-2011-25) Health Impacts of Radio Frequency from Smart Meters
Wide deployment of smart electric meters for better management of power generation and distribution caused the California legislature to question the health effects. Carefully monitored scientific study shows that the FCC standard is sufficient to protect public health at the power level and frequencies used by smart meters. These
FCC guidelines provide a significant factor of safety against thermal impacts of RF emissions, but non-thermal impacts over long term exposure is not well known and needs further study.

(IS-2011-24) 2008 State of the Connected Home Market Study Executive Summary
In one of the more striking examples of cross-industry collaboration, 10 top companies – Whirlpool Corporation, Bell Canada, Cisco Systems, Direct Energy, Hewlett-Packard Company, Leviton, Microsoft, Procter & Gamble, Legrand and Zensys/Z-Wave teamed up to conduct one of the most in-depth studies ever launched into the state of the connected home. Consumers were most interested in an easy, seamless way to integrate all their smart home devices from mobile to TV to appliance. This research is a follow up to the previous State of the Connected Home studies that were completed in 2003 and 2005.

(IS-2011-23) North American Intelligent Buildings Roadmap Executive Overview
The research project was designed to outline long-term opportunities in the intelligent building industry. The Roadmap provides an understanding of the collective influence of emerging trends within the intelligent building industry, such as energy efficiency, renewable technology, IT convergence and the integration of buildings with the smart grid. The Roadmap also investigated the current and future direction of the intelligent building market in North America and the opportunities it represents for participants within the value chain. The research also examined the influence of current and emerging intelligent building technology solutions, with an analysis that considers commercialization, market preferences and product acceptance.

(IS-2011-22) Intelligent and Integrated Buildings Technologies: Market Size in North America 2010 Executive Summary
This report provides an in depth analysis of the growing North American markets for integrated and converged intelligent building control systems ranging from environmental control technologies, to fire detection, to security to lighting systems to IT convergence. By assessing the developments in technology and technical standards in the past five years, our report is able to make an unparalleled forecast of what lies ahead in the next five years. The result is the authoritative analysis of the size and potential of the North American intelligent building technologies marketplace.

(IS-2011-21) Energy as a Managed Service Executive Summary
The report found that the concept of energy as a managed service is appealing to the great majority of North American homeowners. The majority of consumers surveyed said that they would consider purchasing energy as a managed service if it was available at a reasonable price. The research was conducted for CABA by POCO Labs, a management consultancy which specializes in strategic consulting. The following organizations

(IS-2011-20) BeyWatch White Paper
This paper introduces Building Energy Watcher, a consortium supported by the European Commission's DG Information Society and Media. The aim of this research project is to propose ICT (information and communication technologies) for energy efficient white goods, with the objective of saving 20% of the EU’s energy consumption by 2020, thus also reducing carbon dioxide (CO2) emissions and energy bills. Ultimately, the group envisions zero-footprint homes that can contribute surplus energy to the smart grid.

(IS-2011-19) VoIP News: Large Enterprise PBX Comparison Chart
This article from VoIP News compares the features of telephone switching equipment for large companies. Some of the features compared include size of company supported, hardware and software, support for mobile communications, and support of IP devices. Twelve products are compared.

(IS-2011-18) ICT for a Low Carbon Economy
This report from the European Commission examines how information and communications technology (ICT) can improve building operating efficiency in terms of energy consumed. “The ICT sector can deliver simulation, modelling, analysis, monitoring and visualisation tools that are vitally needed to facilitate a whole building approach to both the design and operation of buildings.” Buildings in Europe consume 40% of energy produced and are the largest sources of CO2. Energy consumption throughout the design, construction, and operation of buildings is examined. Technologies for intelligent buildings are reviewed.

(IS-2011-17) Executive Summary: Smart Appliances
Governments worldwide are developing policies, infrastructure, and tools to improve ways to manage energy, including smart grid and smart meter initiatives. Fueled partly by stimulus funds, smart household appliances will have a significant role to play moving forward and appears on the cusp of moving from the development stage to commercialization and growth. This market research excerpt covers energy management and demand response applications, communications technologies, standards, and key industry players.
Towards an ICT Infrastructure for Energy-Efficient Buildings and Neighbourhoods for Carbon-Neutral Cities
This report from a workshop held by the European Commission examines the role of public-private initiatives to create smart cities. The goal is to demonstrate methods for achieving the European Union objective of a 20% increase in energy from renewables, a 20% reduction in energy consumption, and a 20% decrease in greenhouse gases by 2020. The workshop considered the role energy positive cities that generate more energy than they consume. Consumer involvement and concerns for energy costs and privacy were mentioned.

ICT for a Low Carbon Economy: Smart Electricity Distribution Networks
This report from the European Union reviews the role of information and communications technology (ICT) in the infrastructure of a smart grid for electricity. ICT will help Europe achieve goals for improving energy efficiency and shifting to renewable energy sources. ICT applications to generation, transmission, distribution, metering, and customer services are reviewed.

Multi-Agent Coordination in the Electricity Grid, from Concept towards Market Introduction
This paper from the Electric Research Center of the Netherlands describes a system for coordinating the generation and consumption of electricity. The operating environment is expected to include distributed energy resources. Each generator includes software agents that represent the power source, the pricing, the market bids, and a goal such as maintaining balance within a cluster. Agents communicate by issuing event notices. Details and field test results are included.

Generations 2010
This 29-page report from Pew Research explores how different generations use the Internet and usage trends by application type. It segments users by age into Teens, Millennials, Gen X, Younger Boomers, Older Boomers, Silent Generation, and GI Generation. Email and search engine use remain the backbone of online activities. The youngest generations are far more likely to use social network sites, but interestingly, the fastest growth has come from Internet users 74 and older.

Ontario's Long Term Energy Plan
This report from the Government of Ontario examines the strategic plans for electricity generation. The present supply is decreasing and is dependent on coal-fired generating plants. The Province plans to use more renewable sources of energy and demand response to reduce peak demands. Coal plants will be eliminated by 2030. Other sources of electricity are reviewed.
(IS-2011-11) M & A in the Canadian Renewable Energy Sector
This report from Price Waterhouse Coopers surveys mergers and acquisitions of Canadian companies involved in renewable energy. Most mergers and acquisitions are in Europe (60%), while 16% are in North America. The target companies are involved in wind, solar, and hydro. Opportunities for Canadian companies are analyzed and transactions are surveyed. Canadian companies may partner with companies in Brazil, China, and India. “The future of the Canadian renewable sector does indeed look bright.”

(IS-2011-10) The Digital Entertainment Revolution
Internet-connected TVs, Blu-ray players and video game consoles are shifting the digital entertainment ecosystem and creating new opportunities and threats. Content producers such as the studios now compete not just with each other but with user generated content, and the broadcast TV schedule is being supplanted with “everything on demand.” Still, research suggests the $10 billion in new service opportunities by 2013 will mostly enhance traditional TV rather replacement it.

(IS-2011-09) Analog Mobile TV: The World’s Most Widely Available Option for Mobile TV
If the world is going digital, why does analog TV make sense for phones? Because of established broadcast standards and single-chip TV receivers, In-Stat predicts the number of viewers of free analog TV on mobile phones will be greater than subscription-based mobile digital viewers. The report compares the cost of analog and digital services, including Over-the-Top services like YouTube and Hulu and includes survey data supporting a similar conclusion.

(IS-2011-08) High Speed Access Report
In addition to providing market research and forecasts for fiber-optic-based Internet technologies; this 20-page report describes the increased adoption of reconfigurable optical add-drop multiplexer (ROADM) technologies, which providers use in the core of their networks. It compares the technical and market success of FiOS versus U-verse and shows adoption forecasts for major broadband technologies and service providers. U.S. adoption currently stands just above 65%.

(IS-2011-07) Overview of Greywater Reuse: The Potential of Greywater Systems to Aid Sustainable Water Management
This report from the Pacific Institute explores the benefits to developing countries of using greywater. Greywater is household waste water that does not contain sewage (called black water). Treatment options for filtering greywater are presented. Treatment is especially important if the greywater is stored.
(IS-2011-06) European Internet access and use in 2010
Market research data from the European Union shows that households with Internet connections doubled from 30% in 2006 to 61% in 2010. The report highlights the demographic and geographic differences and measures broadband adoption and applications like e-shopping, e-government, e-security and advanced communications and content services, including the fact that 80% of young Internet users are active on social media.

This report from the European Union provides a strategy for improving the energy efficiency of buildings. The long-term goal is zero energy consumption on average in buildings and eventually energy positive buildings, thus making them power plants. This would entail integration of distributed energy resources and smart grids at the district level. Buildings account for 40% of total energy consumption in Europe. Areas of research to achieve these goals are presented. A roadmap for 2011-2013 is introduced.

(IS-2011-04) Carbon Usage Effectiveness (CUE): A Green Grid Data Center Sustainability Metric
The Green Grid, a consortium of companies, education institutions, and government agencies, is proposing metrics to measure the energy efficiency of data centers. Among the metrics are power usage efficiency (how much power goes to information technology) and carbon usage effectiveness. Carbon usage effectiveness measures how much of data center energy results in carbon emissions. These measures apply to the data center operations, not the life cycle of the data center equipment. Formulas for computing these metrics are presented.

(IS-2011-03) Executive Summary: Building Energy Management Systems
This report from Pike Research summarizes trend in building energy management systems (BEMS). BEMS varies according to building age, size, and usage. Demand response will become an important impetus for BEMS because it combines information technology and energy management. BEMS revenues are projected to more than double from 2010 to 2016.

(IS-2011-02) Home Energy Saving through Wireless Sensor Networks
This short, two-page, paper presents a home automation system based on wireless sensor networks (WSN) that measure and profile light, temperature and user presence. The objective is to predict behavior and better manage energy consumption. The system is being developed within the AIM project and the European Union’s Action Plan for Energy Efficiency.
(IS-2011-01) CABA Connected Home Roadmap 2010 Executive Summary
The Continental Automated Buildings Association has completed a consumer market study that examined all aspects of the connected home marketplace. CABA’s “Connected Home Roadmap 2010” project was a large-scale study created to provide insights into consumer attitudes concerning technologies, value propositions and future market adoption. The Roadmap project examined the following market segments: safety, security, health, energy management, monitoring, entertainment, home control and automation.

(IS-2010-180) ZigBee Crosses the Chasm
This report from On World is a market survey of ZigBee radio technology and products. The market for short-range radio communications chips is projected to be 307 million by 2014. In 2009 the largest market for ZigBee and IEEE 802.15.4 (the radio standard used by ZigBee and others) was metering followed by consumer electronics. ZigBee RF4CE is being considered by consumer electronics companies to replace infrared remote control units. ZigBee/Pro has applications in homes, buildings, and medical products.

(IS-2010-179) Accelerating Successful Smart Grid Pilots
This paper from the World Economic Forum explores how to motivate the creation of sustained pilot projects for electric smart grids. This report found about 90 pilots mostly focusing on advanced metering infrastructure (remote meter reading, data collection, and data management). “Challenges remain around data privacy, security, interoperability and standards.” “The majority [of pilot projects] still face a number of barriers that are reducing their ability to achieve their full potential.” Recommendations for effective pilot programs are presented.

(IS-2010-178) Accelerating Smart Grid Investments
This paper from the World Economic Forum explains how a smart grid can benefit the world facing energy shortages and climate change. Financing smart grid by shareholders and customers is discussed. The case for a smart grid should be based on societal benefits, not just financial benefits. Examples of smart grid features are presented.

(IS-2010-177) The Smart Energy Report
This report from Aclara is a summary for a September 2010 conference called Smart Energy International. Various executives voiced their opinions on the future of electric smart grid. Some of the views included: the peaking and demise of smart grid, the lack of environmental drivers for a smart grid, the lack of customer education about smart grid, the benefits of grid frequency regulation, and the need to minimize data collection to protect consumer privacy (“If you don’t need it, why collect it?”).
(IS-2010-176) Smart Metering for Water Utilities
This paper from Oracle argues for water meters that can be read remotely on an interval basis. Among the claimed benefits are encouraging customer conservation and detecting water leaks. The integration with a Meter Data Management system is discussed.

(IS-2010-175) Bluetooth Special Interest Group: Remote Control
This brochure compares Bluetooth for remote control of consumer electronics to other methods. The other remote control methods include traditional infrared (IR) and a new radio system recently developed called RF4CE. Guidelines for a Bluetooth remote control unit are included.

(IS-2010-174) Telios: Low-Cost Bridging of Telehomecare and the Home Media Center
This paper from the University of California Irvine explores methods for remote health care. The objective was to find a method that did not require expensive equipment purchase. The health care is provided via the Internet. The user interface is a television with a custom remote control for accessing health data. Local medical equipment is interfaced to the Internet for remote reading. The system is called Telios.

(IS-2010-173) Lifestyle AMI Home Automation Networks
Bill Melendez argues for a power monitor showing appliance energy consumption to motivate energy conservation. This would be part of a home automation system that informs consumers about energy costs, savings, warning messages, and appliance status. The author urges manufacturers to build such devices.

(IS-2010-172) Implementing load shedding technology: A possible solution
This paper from Bill Melendez is a description of a method of energy management for devices in a home. The proposal is to equip appliances, especially motorized devices, with sensors that can detect grid instability and shut down the device if the grid become unstable. This provides more reliable load shedding than could be done by a utility demand response system.

(IS-2010-171) Health Device Profile: Implementation Guidance
This is a specification for Bluetooth communications intended for linking medical devices to a base station. It specifies how to implement a profile (subset) of the Bluetooth protocol for medical devices such as a glucose meter, scale, blood pressure cuff, and pulse oximeter (pulse rate and blood oxygen saturation). This profile operates in conjunction with ISO/IEEE 11073-20601, Personal Health Data Exchange Protocol. It can accommodate one or multiple devices linked to a single base station.
(IS-2010-170) Mobile Broadband: The Benefits of Additional Spectrum
This report from the United States Federal Communications Commission is an analysis of likely spectrum requirements to support mobile broadband data. The estimated growth of data traffic through 2014 is presented with a doubling of usage every year. An extra 275 MHz of spectrum will be needed by 2014 for the expected data demand. Detailed supporting evidence is included.

(IS-2010-169) EECC Final Action hearing Voting Recommendations
This report from the Energy Efficient Codes Coalition presents recommendations on energy codes proposed by the International Code Council. Recommendations as of October 2010 for supporting or opposing more than 200 sections of the proposed codes are listed.

(IS-2010-168) The Impact of Dynamic Pricing on Low Income Customers
This report from the Institute for Energy Efficiency of the Edison Foundation examines the expected impact of time-varying electric rates on low-income residential customers. The finding, based on utility trials, show that these customers can save money on time-of-use tariffs since their consumption tends to be flat over time. They will save more if they actively shift energy-consuming applications to off-peak times. Results from eight trials are presented.

(IS-2010-167) Visible and Concrete Savings: Case Studies of Effective Behavioral Approaches to Improving Customer Energy Efficiency
This report from the American Council for an Energy Efficient Economy provides profiles of programs to influence customer behavior to conserve energy. The objective is to determine how to make these programs more effective by persuading customers and matching their actions to the available technical and economic choices. Some of the customer motivations include information about energy consumption, social pressure, corporate culture to conserve, convenience, relevant benefits, and recognition. Details of the programs profiled are presented.

(IS-2010-166) Providing New Services for "Life-Segments" in the Networked Digital Industry (circa 2012)
This report from the University of Southern California is a survey of about 1500 people aged 12 and up about adoption of various digital technologies for home use. It was published in May 2009. The researchers divided the market into early adopters, the majority, and laggards. All three groups have about 85% ownership of desktop computers (for e-mail and browsing), TV, and DVD players. Early adopters are prevalent buyers for DVRs, HD-DVD, and HDTVs. Only 35% of early adopters favor multi-media phones. All groups use instant messaging.
Time shifting is motivating early adopters toward Internet TV. Some early adopters are willing to pay for this access. Free and easy installation motivates all groups. Details are provided.

(IS-2010-165) Master Table of Contents & Compliance Requirements
This 2302-page document outlines the communications specification for Bluetooth (short range radio communications) and defines compliance requirements for manufacturers wishing to license the Bluetooth technology to incorporate into products. It includes an overview of the architecture plus details of the communications protocol.

(IS-2010-164) AMI/HAN Business Concept and Model
This paper from HEMS Technology compares business models for marketing AMI/HAN services and products. Two scenarios are compared: selling OEM to a distributor and selling OEM to a service company. In the first case the distributor sells at retail to consumers and to a service company; in the second case the service company sells to consumers. Other variations are discussed with the goal of minimizing overhead infrastructure to maximizing margins for AMI/HAN manufacturers.

(IS-2010-163) Filter Recommendations for Coexistence with LTE and WiMAX
This paper is a Bluetooth specification on how to avoid radio interference from other systems. It is intended to instruct designers how to incorporate LTE or WiMAX radios in the same product with Bluetooth without interference. WiMAX and LTE (3G cellular) operate in band adjacent to the unlicensed 2.4-GHz band where Bluetooth transmits. A reference systems design is included.

(IS-2010-162) Automated Meter Reading Implementation Manual
This paper from Bill Melendez is a manual for lay persons to understand automatic meter reading. It explains the methodology for organizing a retrofit of existing meters with radio transmitter to remove reading. Management of the field crew is included with a detailed installation checklist.

(IS-2010-161) A Home Energy Management Network
This paper by HEMS Technology explains the utility goal to manage energy peaks versus the consumer goal to conserve energy. The author recommends a home energy management system using home automation to respond to energy peaks by turning off appliances. Energy management offered by a service provider who is not the utility is discussed. Also, applications of home automation for other services such as telehealth are suggested.
(IS-2010-160) Performance of integrated mechanical systems for residential heating and ventilation
This standard from the Canadian Standards Association specifies the performance of core functions for residential Integration Mechanical Systems (IMS) and overall performance. It measures thermal performance and energy consumption for space heating, water heating, and ventilation. Laboratory test methods are specified in detail.

(IS-2010-159) Strengthening Clean Energy Technology Cooperation under the UNFCCC: Steps toward Implementation
This report from the National Renewable Energy Laboratory was prepared for the United States government to examine strategies for achieving greenhouse gas reductions through global cooperation. It is estimated that $10 trillion is required to stabilize greenhouse gasses between 2010 and 2030. The methods proposed include research and development, national and international public policies, and financing sources. The programs in support of these goals by various international agencies are reviewed.

(IS-2010-158) 2008 Fuel Cell Technologies Market Report
This report from the United States Department of Energy reviewed the state of the fuel cell industry in 2008. Some successful installations, applications, and manufacturers are described. About 9000 portable fuel cells were shipped in 2008. The cost per kWh of fuel cell generated energy has dropped from $275 in 2002 to $73 in 2008. $367 million in private equity was invested in this field in 2007 and 2008. The capacity of stationary fuel cells is increasing. Some governments are starting to include fuel cells in renewable standards portfolios.

(IS-2010-157) Large Hospital 50% Energy Savings: Technical Support Document
This report from the National Renewable Energy Laboratory was prepared for the United States Department of Energy to determine potential energy saving in hospitals in various U.S. locations. The report using simulations to demonstrate a potential savings of at least 50% in all U.S. climates. Among the methods for achieving this saving are improved lighting systems with daylight and occupancy sensors.

(IS-2010-156) Temperate and Humid Climates
This report from the National Renewable Energy Laboratory was prepared for the United States Department of Energy to guide school administrators on how to save energy in school buildings. The guide covers 10 major topics and includes a checklist. Among these topics are siting, day-lighting and windows, building shell, lighting, HVAC, water conservation, recycling, transportation, and building materials. This guide was developed for temperate and humid climates, such as Atlanta. Indoor air quality was also included.
(IS-201-155) An Electric Revolution
This report from the Galvin Electricity Initiative examines the state of the electricity infrastructure in the United States. It is highly critical of antiquated equipment, power quality, wasted energy, and lack of incentives to innovate because of monopoly regulations. The report traces the history of DC electricity developed by Thomas Edison and AC from Nikola Tesla. He compares both to microgrids with distributed generation including local generation with excess sold to the utility. Proposals for reforming the electricity industry are presented.

(IS-2010-154) OSRAM SYLVANIA Commercial Lighting Survey Fall 2010
This survey from Osram Sylvania reports on consumer opinions about various lighting technologies. Tungsten, halogen, compact fluorescent lamps, and LED lamps were compared. Energy efficiency is a top consumer concern along with longevity, and value-for-money. About 25% of consumers are aware of the U.S. pending policy to phase out 100-Watt tungsten bulbs in January 2012. About 75% of consumer are concerned with the color quality of the light produced. As of 2009, about 5% of those surveyed used LED lamps in sockets.

(IS-2010-153) 2nd Annual Sylvania Socket Survey 12.19.2009
This OSRAM Sylvania survey of commercial lighting designers is reported. Energy conservation, operating costs, longevity, initial costs, and aesthetics were key factors in choosing lighting technologies. 62% of those surveyed are using LED lighting primarily because of efficiency and operating costs. The biggest barrier to adopting LED lighting is the initial cost.

(IS-2010-152) Canadian Housing Observer 2009
This extensive report from Canada Mortgage and Housing Corporation provides statistics for the Canadian housing market in 2009. It focuses on initiatives in the private, not-for-profit, and government sectors on affordable housing for low-income persons and families (about 13% of the population). Affordable housing is defined as costing less than 30% of household income before taxes. Housing starts have been relatively strong above 200,000 annually. There was a slight decrease in starts and prices in 2008, but Canada did not experience a banking crisis like other countries. The relationship of water availability to housing is discussed with consideration for using rainwater, storm-water, and wastewater.

(IS-2010-151) 2010 U.S. Smart Grid Vendor Ecosystem
This survey from the Cleantech Group examines private sector developments in support of smart grid to complement the government stimulus. This report focuses on companies in metering, demand response, and distribution grid management where $2.75 billion will be spent in 2010. Summary information is provided about
home energy management, building energy management, and grid interconnection. Leadership in smart grid connectivity has been provided by smart grid companies and communications vendors. Details about companies involved are included.

(IS-2010-150) Smart Devices and Services Connection by CDMA2000
This Harbor Research paper explains the benefits of interconnecting devices for machine-to-machine communications using wireless communications based on CDMA (Code Division Multiple Access), cellular telephone technology. Such devices might include cars, the power grid, industrial equipment, and heart monitors. About 160 million cellular devices will be interconnected by the end of 2010. The technical advantages of CDMA, such as coverage, data security, network capacity, low latency are discussed. Application examples are presented from diverse fields such as transportation, healthcare, E-reader, smart grid, and asset monitoring.

(IS-2010-149) Wi-Fi Provides Rx for Healthcare Challenges for Utility-Owned Wide Area Networks
This Aerohive brochure describes applications of Wi-Fi radio networks using IEEE 802.11n communications protocol. Such a network can deliver throughputs up to 170 Mbps with requisite quality of service. Security features in the network make it compliant with U.S. Federal law for the privacy of health records (Health Insurance Portability and Accountability Act – HIPAA). The benefits of connecting Wi-Fi access points into a mesh network are discussed.

(IS-2010-148) The Evolving Nature of Working at Home
Herman Miller Company reports on trends in working at home. Up to 80% of companies in Asia offer this option. Savings in office space depend on the numbers who always work at home. Whether telecommuting coupled with business-oriented social networking via the Internet can substitute for office interaction is open to debate. The need for office furniture at home is discussed.

(IS-2010-147) Why and How We Meet
This paper from Herman Miller Company examines meeting types and meeting rooms. Virtual meetings via Second Life, a virtual 3-D world, and telepresence are discussed. The benefits of exchanging subtle cues and enhanced collaboration during face-to-face meetings are presented. Meeting spaces need to evolve as technology changes.

(IS-2010-146) Patient Rooms: A Changing Scene of Healing
Herman Miller Company examines changes in patient room layouts in hospitals. The biggest motivator is the introduction of new patient care technologies, medical record access, and possibly videoconferencing for remote
diagnosis. Other factors are rooms that can be easily cleaned and disinfected, local storage of commonly-user medicines, pathways to minimize falls, noise reduction, outdoor views, and family involvement.

(IS-2010-145) Generations at Work
This paper from the Herman Miller company is a sociological overview of personnel interactions across generations. The report describes the characteristics and work-style preferences of baby boomers (age 49-67), gen Xers (age 33-48), and millenials (age 13-32). Baby boomers emphasize: be authentic; gen Xers: be creative; and millenials: be connected. Each group has a preference for the work-space environment.

(IS-2010-144) Culture and work styles in the BRIC countries
Herman Miller Company developed a white paper about workspace differences among offices in Brazil, Russia, India, and China. Some the differences discussed stemmed from varying degrees of collaboration versus hierarchy business structure. Office amenities vary according to land costs, local regulations, and social practices such as breaks and lunch. Another consideration is the quantity of paper records required. Some comparisons with U.S. offices are presented.

(IS-2010-143) WLAN Design and Site Surveys
This AirMagnet (a Fluke company) brochure compares an ad hoc design of a wireless local area network in a buildings with a methodical planned design. With the ad hoc method, coverage and signal levels are not assured. A site survey is recommended. The equipment and locations may need to be changed as the number of users and their applications change.

(IS-2010-142) Designing the Inpatient Unit Central Core for an Aging RN Workforce
This brochure from Herman Miller examines the challenges of creating a comfortable and productive work environment for nurses. The average age of nurses is increasing as is their use of computer terminals. A work environment is proposed that accommodates physiological limitations such as visual and auditory acuity and muscular capabilities. Since nurses spend more than 50% on documentation and care coordination, a redesigned nursing core is proposed. Various design options are discussed.

(IS-2010-141) Advertising Effectiveness: Understanding the Value of a Social Media
This report from Nielsen examines the impact of social media on brand advertising. Ads that elicit spontaneous consumer comments are called “earned” impressions and have the highest impacts compared with paid ads or paid ads with social information. The methodology for determining the impact of earned impressions is presented. The key to earned impressions is an ad that “sparks engagement and connections between brands and users.”
Global Trends in Online Shopping

Nielsen presents the results of a survey of 27,000 customers in 55 countries conducted in March 2010 about shopping via the Internet. 46% bought books in the prior three months, while 41% bought clothes. One-third buy from online stores with no physical presence. 44% spend less than 5% of monthly budget online. 57% of customers read online product reviews. This study presents statistics from Asia Pacific, Europe, North America, Latin America, the Middle East, Pakistan, and Africa.

The Benefit of the Wireless Telecommunications Industry to the Canadian Economy

The Canadian Wireless Telecommunications Association studied the economic impact of wireless communications on Canadian business. Canadian wireless goods and services generate $16 billion, $14 billion in supplier sales, and $9 billion in indirect benefits. Statistics are presented about investments by the wireless industry in network infrastructure. The effects of wireless business on employment and productivity are estimated.

Current Situations and Trends In Buildings and Facility Operations

Laney College conducted a survey among building managers to assess the training of operations and maintenance personnel to assess the impact on building energy consumption. Existing buildings are operating below par. Methods to save energy may not have been included in the original building design. A transition to high performance buildings requires better-skilled and respected operations personnel, improved tools, and better measurements for better performing buildings. Improved integration among building design, construction, and operation is needed. Gaps must be closed in three areas: people, process, and technology.

Smart Systems Evolution

Harbor Research reports on the impact of data networks on electromechanical and electronic devices as they are connected to a data network. Networking may cut across vertical markets with common device interface. The article speculates whether existing large engineering companies are prepared for this convergence. “These companies are large bureaucracies founded on focused products addressing focused markets.” Success will require taking risks in system design, business relationships, and the use of assets.

Home Broadband 2010

The Pew Research Center did an annual survey for 2010 of Internet usage in America. Internet usage grew among African-Americans in a market that overall was flat from 2009. About 66% have high-speed Internet
access, while 5% have dialup access. Adoption is skewed toward those with more education and income, and lower age: 80% among the 18-29 year olds while only 31% above 65 year olds. There is more support for government efforts to expand broadband access among those under 30 years old than over. The applications used via the Internet were surveyed and are reported.

Nielsen reports on a worldwide survey of television viewing among 27,000 viewers in 55 countries. Consumers in many markets spend more than four hours per day watching TV (lowest in central Europe among those markets surveyed). More than half of those with Internet access watches TV online with the highest concentration in Asia Pacific. About 12% have or will buy 3D TVs. About 22% would like access to Internet TV on their television set. About 11% watch videos on mobile devices. Extensive survey statistics are presented.

(IS-2010-134) Business Case for Independent Security in Modern Wireless Networks
This AirMagnet (a Fluke company) brochure explains how to choose an effective method for monitoring a Wi-Fi deployment in a building for secure data packet communications. It is possible to embedded security checks in the existing access points. However, AirMagnet argues for a dedicated server that scans all data packets transmitted for rogue packets.

(IS-2010-133) Conducting a Site Survey
This AirMagnet (a Fluke company) brochure presents a guide for installers of 802.11 Wi-Fi radios for local area networks. The topics covered include preparation to learn about the customer and building, performing a site survey, analyzing performance and anomalies, reporting, and periodic checking of the building every 3-4 months.

(IS-2010-132) AirMagnet Expertise in 802.11n Deployments
This AirMagnet (a Fluke company) brochure explains the technical options for wireless data transmission using 802.11 radios. The IEEE 802.11 standard specifies multiple transmitter antennas and multiple receiver antennas. MxN refers to M transmit antennas and N receive antennas. The standard allows various signal configurations where the multiple transmitters can add signal redundancy or can aim the signal. Also, a variety of coding schemes is allowed that trade-off signal bandwidth, noise immunity, and data transfer rate ranging from 7-600 Mbps. Co-existence with older versions of Wi-Fi is discussed.
(IS-2010-131) AirMagnet PCI Wireless Guideline
AirMagent, a security unit of Fluke, has outlined the requirements for credit and debit card merchants to comply with data security requirements. This report discusses the Payment Card Industry Data Security Standard (PCI DSS) where wireless networks are used. The merchant must determine if there are any other wireless networks operating in the environment. Data encryption and password access are discussed.

(IS-2010-130) Solid-state lighting: an energy-economics perspective
This paper from Sandia National Laboratories in the U.S., examines the potential impact of solid state lighting on the demand for and use of artificial lighting. The cost trends for new lighting technology is presented. The authors speculate on new applications such as the ability to tailor light color and lamp position using an array of emitters. Lighting now uses about 6.5% of the world supply of energy. Increased lighting use with new technology can increase productivity according to the authors.

(IS-2010-129) Medical Device Networking for Smarter Healthcare
Lantronix examines applications of interconnected medical devices and the technology options for connectivity. Applications include operating room and anesthesiology, intensive care, patient room, hospital lab, mobile cart, and home monitoring (the fastest growing segment). The benefits are discussed. Wired and wireless interconnection methods are presented. Applicable international standards are described.

(IS-2010-128) Smart Grid Insights: Smart Appliances
Zpryme Research and Consulting predicts the growth of appliances with capabilities to interact with smart electric grids. They claims that smart appliance sales will increase from $3 billion to $15 billion between 2011 and 2015 driven by “pricing, environment, energy efficiency, Smart Grid build-out, and government subsidies.” The report contains lots of projections for smart appliance market growth in the U.S., U.K., China, and Australia. The bases for these projections are estimates of the authors.

(IS-2010-127) Understanding the role of the Internet in the lives of consumers
Harris Interactive reports on a consumer survey of users and expectations of the Internet. Consumers in Canada, China, France, Germany, Japan, the United Kingdom, and the United States were surveyed at the end of 2009. Nine key insights are presented with supporting data. There are now about 330 million Internet users in China. The influence and trustworthiness of bloggers and microbloggers (such as Twitter users) are considered. 85% of Chinese, compared to 17% of French, think the influence of the Internet will grow over the next two years. The
authors note that the French have 25 years of experience with the Internet and the French predecessor called Minitel.

(IS-2010-126) Preparing for the Approaching Revolution in Public Safety Communications
This brochure from Alcatel-Lucent introduces LTE (Long Term Evolution) methods for wireless data communications. LTE is being developed for use by cell phone operators. It provides about 15 times the bandwidth of the current 3G data network used with cell phones. Applications include voice, data, and video. The potential utility of LTE for public safety providers is discussed. Deployment issues are presented.

(IS-2010-125) Social Norms and Energy Conservation
This study from MIT and NYU reports on a technique to motive consumer energy conservation. 80,000 customers in Minnesota received energy conservation information quarterly resulting in a 1.9% drop in energy usage. It is estimated the cost-effectiveness of the program could increase by 80% if the program were targeted at those households with the highest expected response to energy information, such as those with relatively high consumption levels.

(IS-2010-124) The Design of Eco-Feedback Technology
This study from the University of Washington explores how to motivate positive ecological actions with appropriate human-computer interface technologies. Among the motivations are cost/benefit analyses, altruism, and community spirit. Effective methods for providing ecological messages, including comparing the individual actions to a group and feedback, are discussed. Feedback should be coupled with specific recommendations for saving energy.

(IS-2010-123) Mobile Workforce Management and the Aging Utility Workforce
Oracle Corporation explores challenges faced by utilities in supporting a mobile workforce (formerly called field engineers) as a large number of employees plan to retire. The baby-boom generation (born 1945-1960) has constituted a stable pool of talent for utilities. As this generation retires, utilities need to transfer the accumulated knowledge to new workers. Software techniques for managing a mobile workforce and storing field data are discussed.

(IS-2010-122) A Policymaker’s Guide to Feed-in Tariff Policy Design
This report from the National Renewable Energy Laboratory of the U.S. Department of Energy explains how utilities should price electricity they buy from local generation sources. Such sources of power include photovoltaic panels on buildings, wind turbines, and geothermal plants. The feed-in tariff is a long-term
agreement between a utility and the owners of the local generators for the price at which the utility will buy excess power generated. The intent is to encourage a long-term investment in renewable power. Options for pricing strategies and intended goals (such as encouraging renewable energy) are discussed. Funding for feed-in tariffs may come from the ratepayers or from taxes.

(IS-2010-121) The EPRI Smart Grid Demonstration Initiative
The Electric Power Research Institute (EPRI) reports on trials of distributed energy resources (DER). DER includes demand response, storage, distributed generation, and renewable generation. EPRI developed analytic methods, systems development, and integration tools to apply to demonstration sites in Canada, Ireland, France, and the U.S. A summary of each demonstration is provided. Abstracts of EPRI reports on smart grid are listed.

(IS-2010-120) Home Broadband Adoption 2009
The Pew Research Center reports on the growth of broadband Internet access in 2009. The largest growth areas were among senior citizens, those with incomes less than $30,000, and rural residents. The average bill is about $39 per month. 7% use dial-up access. 35% of dial-up users would switch to broadband if the prices were lower. 63% of Americans have broadband compared with 55% in 2008. Wireless access is growing.

(IS-2010-119) How wireless ISPs play a vital role in bringing broadband to underserved markets
This report from Motorola explores business strategies for deploying wireless Internet access by Wireless Internet Service Providers (WISPs) in rural areas. One way to justify the business is to market it to consumers and to the local government for operations such as healthcare and education. The spectrum available for WISPs is discussion, including using TV channels that are not carrying a local broadcast signal (called "white space"). Example installations are presented.

(IS-2010-118) Consumer Usage Patterns and Attitudes of U.S. FTTH and Broadband Consumers
The Fiber-to-the-Home (FTTH) Council did a survey of 1000 FTTH customers about the impact of TV and Internet delivery via fiber optics. Consumer awareness of FTTH is increasing from 28% in 2008 to 41% in 2009 of those surveyed. FTTH is used by 6% of broadband customers in the U.S. Those using FTTH are more satisfied than cable or DSL customers. The Council claims that deployment of FTTH will encourage telecommuting and decrease greenhouse gases.
(IS-2010-117) 3D CAD & Electronic Document Management: Use and Benefits The Underutilized Information Asset
This report from Trinity Technologies introduces a data management strategy called Paladin: Project Application Leveraging And Data Integration. The objective is to gather data in an enterprise and make it available to all users so these data can be shared, not duplicated. A guiding principle is to manage data locally while accessing these data globally. Methodologies and benefits are explained including a transition from paper-based to electronic data. Examples are presented.

(IS-2010-116) Coordination of Energy Efficiency and Demand Response
Lawrence Berkeley National Laboratory (LBL) reports on the potential benefits of combining energy efficiency with demand response. Energy efficiency reduces energy consumption, while demand-response shifts energy consumption in time. An overall savings in the "non-coincident summer peak demand" of 14-20% is possible by 2030. Coordinated program offerings, marketing, and education are proposed. Integrated building codes and appliance efficiency standards are discussed.

(IS-2010-115) Connecting America: The National Broadband Plan Broadband Plan
This report from the U.S. Federal Communications Commission (FCC) provides a strategic plan for high-speed Internet access. About 1/3 of the U.S. population does not have broadband access available. The FCC intends to develop policies that will deliver high-speed Internet to everyone who wants it with speeds of 100 Mbps for downloading available by 2020 to least 1/3 of the U.S. population. Among the potential applications healthcare, education, government interaction with citizens, and real-time access to energy consumption data.

(IS-2010-114) Methodological Approach for Estimating the Benefits and Costs of Smart Grid Demonstration Projects
The Electric Power Research Institute (EPRI) reports on a method for evaluating the effectiveness of various smart grid demonstration projects. The technique is a cost/benefit analysis that is applied methodically to all projects. The categories of benefits include economic, reliability and power quality, environmental, and safety / security. The beneficiaries are utilities, customers, and society (such as public health). Additional stakeholders include equipment manufacturers, environmental and other special-interest groups, and governments (including regulators). The methodology is explained in detail.

(IS-2010-113) Demand Response and Open Automated Demand Response Opportunities for Data Centers
Lawrence Berkeley National Laboratory (LBL) reports on the potential application of an energy management system called Open Automated Demand Response (OpenADR) for data centers running servers and data storage
computers. Data centers run all the time, but the processing loads are usually not near capacity. Savings are possible by concentrating data processing loads so machines not needed may be turned off. A process called virtualization is described for managing these data processing loads. This also reduces cooling and lighting requirements in data centers. Methods for controlling energy usage in data centers are presented.

(IS-2010-112) Information Security
This report from the U.S. Department of Commerce National Institute of Standards and Technology provides an overview of security and the need to integrate data security into business practices. A goal is to assess security risks and the trustworthiness of data in light of the security risks. A Risk Management Framework is introduced and explained.

(IS-2010-111) Smart Grid Cyber Security Strategy and Requirement, Volume 3
This is a report from the U.S. Department of Commerce National Institute of Standards and Technology Cyber Security Task Force. The security needs of a smart grid for electricity are analyzed. Also, the privacy implications of a smart grid are described. Possible architectures for a smart grid are presented with a high level view of security requirements and privacy threats in a smart grid.

(IS-2010-110) Smart Grid Cyber Security Strategy and Requirement, Volume 2
This is a report from the U.S. Department of Commerce National Institute of Standards and Technology Cyber Security Task Force. The security needs of a smart grid for electricity are analyzed. Also, the privacy implications of a smart grid are described. Possible architectures for a smart grid are presented with a high level view of security requirements and privacy threats in a smart grid.

(IS-2010-109) Smart Grid Cyber Security Strategy and Requirement, Volume 1
This is a report from the U.S. Department of Commerce National Institute of Standards and Technology Cyber Security Task Force. The security needs of a smart grid for electricity are analyzed. Also, the privacy implications of a smart grid are described. Possible architectures for a smart grid are presented with a high level view of security requirements and privacy threats in a smart grid.

(IS-2010-108) Northwest Open Automated Demand Response Technology Demonstration Project, Document 6
Lawrence Berkeley National Laboratory (LBL) reports on the performance of an energy management trial using Open Automated Demand Response (OpenADR) with five commercial and retail buildings in the Seattle area. An LBL contractor ran a server that sent event notices a day in advance to client machines at the trial sites in
anticipation of cold winter mornings and hot summer afternoons. The client application shed heating, air-conditioning, and lighting loads, depending on the building. An average of 12% in the winter and 8% in the summer of peak load were saved in these trials.

(IS-2010-107) Northwest Open Automated Demand Response Technology Demonstration Project, Document 5
Lawrence Berkeley National Laboratory (LBL) reports on the performance of an energy management trial using Open Automated Demand Response (OpenADR) with five commercial and retail buildings in the Seattle area. An LBL contractor ran a server that sent event notices a day in advance to client machines at the trial sites in anticipation of cold winter mornings and hot summer afternoons. The client application shed heating, air-conditioning, and lighting loads, depending on the building. An average of 12% in the winter and 8% in the summer of peak load were saved in these trials.

(IS-2010-106) Toward a Smarter GridABB’s Vision for the Power System of the Future, Document 5
ABB presents an overview of the reasons to evolve the electric grid to a smart grid. Among the key motivations are power outages that cost the U.S. economy $25 billion to $180 billion per year, transmission losses that have doubled in 30 years, accommodating distributed energy resources, the need for greater power quality to operate digital technology, and environmental concerns. Some characteristics of a smart grid are two-way real-time communications, digital metering, and mesh power flow rather than radial from a few generators. EPRI (Electric Power Research Institute) estimates that the benefits outweigh the costs for a smart grid by between 4:1 and 5:1. Smart grid examples are presented.

(IS-2010-105) Toward a Smarter GridABB’s Vision for the Power System of the Future, Document 4
ABB presents an overview of the reasons to evolve the electric grid to a smart grid. Among the key motivations are power outages that cost the U.S. economy $25 billion to $180 billion per year, transmission losses that have doubled in 30 years, accommodating distributed energy resources, the need for greater power quality to operate digital technology, and environmental concerns. Some characteristics of a smart grid are two-way real-time communications, digital metering, and mesh power flow rather than radial from a few generators. EPRI (Electric Power Research Institute) estimates that the benefits outweigh the costs for a smart grid by between 4:1 and 5:1. Smart grid examples are presented.
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(IS-2010-100) Toward a Smarter Grid: ABB’s Vision for the Power System of the Future, Document 3
ABB presents an overview of the reasons to evolve the electric grid to a smart grid. Among the key motivations are power outages that cost the U.S. economy $25 billion to $180 billion per year, transmission losses that have doubled in 30 years, accommodating distributed energy resources, the need for greater power quality to operate digital technology, and environmental concerns. Some characteristics of a smart grid are two-way real-time communications, digital metering, and mesh power flow rather than radial from a few generators. EPRI (Electric Power Research Institute) estimates that the benefits outweigh the costs for a smart grid by between 4:1 and 5:1. Smart grid examples are presented.

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(IS-2010-98) Toward a Smarter Grid: ABB’s Vision for the Power System of the Future, Document 1
ABB presents an overview of the reasons to evolve the electric grid to a smart grid. Among the key motivations are power outages that cost the U.S. economy $25 billion to $180 billion per year, transmission losses that have doubled in 30 years, accommodating distributed energy resources, the need for greater power quality to operate digital technology, and environmental concerns. Some characteristics of a smart grid are two-way real-time communications, digital metering, and mesh power flow rather than radial from a few generators. EPRI (Electric Power Research Institute) estimates that the benefits outweigh the costs for a smart grid by between 4:1 and 5:1. Smart grid examples are presented.

(IS-2010-97) Smart Metering Implementation Programme
This report from the Government of the United Kingdom is a proposal for mandates regarding the deployment of smart gas and electric meters primarily for residential customers. The objectives of the government are presented along with questions for the public. This report covers in-home energy displays, consumer premises equipment,
home networks, and meter data management functions centrally. The government is seeking feedback by the end of September 2010 on such issues as data privacy and consumer protection. Every customer will be entitled to a free in-home display that shows the cost of energy consumed.

(IS-2010-96) Mobile Access 2010
The Pew Research Center reports on a survey of wireless Internet access via cell phones and laptop computers among more than 2000 American adults. 59% use wireless access compared to 32% in 2009. The two most frequent uses of cell phones besides voice are taking photos and test messaging, mainly by young adults. 55% own a laptop computer. The ethnic groups that predominate in cell phone uses are African-Americans and Latinos. Overall, cell phone ownership is 82% of Americans as of May 2010. Detailed statistics are provided.

(IS-2010-95) 2009-2010 Standards and Technology Annual Report
The Telecommunications Industry Association (TIA) issued this annual report on standards development by TIA committees. The TIA is a standards-developing organization authorized by the American National Standards Institute. Among the ANSI standards developed by TIA are voice and data communications via private radio networks, microwave transmissions, multi-media access (including modems), satellite systems, premises cabling, cell phone networks, and healthcare. TIA committees also formulate U.S. positions for ISO and IEC (international standards committees).

(IS-2010-94) The Digital Economy and the Green Economy: Opportunities for strategic synergies
This report from the International Institute for Sustainable Development (IISD) is a submission to the Government of Canada on sustainable development based on a combination of digital technology and green industries. Business opportunities include green ICT (Information and Communications Technology), smart grids for electricity, improved transportation and buildings, cloud computing, the Internet of Things (networked devices), and universal broadband access. The report notes that to continue business as usual would require the resources of 1.5 planet Earths by 2050. ICT will enable communications-based services such as e-commerce, digital media, tele-work, e-government, e-education, and e-health. A solution in collaboration with Mexico and the United States is recommended.

(IS-2010-93) Wireless Monitoring in Home Healthcare
This report from Berg Insight summarizes the market for home healthcare devices using wireless communications. Applications include monitoring hearth rhythms, diabetes glucose, and cholesterol. Data will be gathered into central services and be made available via mobile phones. The market potential in the EU and US
is 250 million patients. About 50 million would benefit from a wireless-monitoring device. The corporate players are listed. Large telecommunications companies may enter this market.

(IS-2010-92) Mobile Widget Platforms: Reaching the Long Tail with Disposable Applications
This report examines the market for cell phone-based applications. These applications, called widgets, operate outside of a browser to provide a targeted web-based service. The market opportunity depends on customers buying open-platform phones, rather than Apple iPhones and the industry developing APIs (Application Programming Interfaces). The mobile widget market was $72 million in 2008 with an anticipated growth rate of 80%.

(IS-2010-91) The new science of personalized medicine: Translating the promise into practice
This report from Pricewaterhouse Coopers assesses the market potential for medicines that are individually designed for the patient. The design is based on the person’s genetics and cell proteins. These drugs are intended to minimize drug reactions, to be preventative, and to involve the patient in care. The U.S. personalized medicine market was about $232 billion in 2009 and is expected to grow at 11% annually. This offers opportunities for companies that excel in consumer marketing such as food companies. Prevention and wellness medicines may be offered by nurses and physicians’ assistants.

(IS-2010-90) A resource guide for using health IT to support the patient centered medical home
This study funded by Merck examines the Patient Centered Medical Home concept and role of Information technology (IT). “The basic premise of the medical home concept is continuous, uninterrupted care that is managed and coordinated by a personal provider with the right tools that will lead to better health outcomes. “The focus is on access to medical records by all healthcare providers while maintaining patient confidentiality. The value of IT is in enhancing transfer of care, referral, consultation, and collaboration among healthcare providers. Examples of health IT in various settings are included.

(IS-2010-89) Analyses written at the request of REIL
This report from the Yale School of Forestry & Environmental Studies examines the benefits of power distribution from local sources via direct current (DC). DC power distribution within buildings via a DC microgrid is recommended for DC sources such as photovoltaics and for grid power after conversion from AC (alternating current). The authors claim a decrease in conversion losses from 32% to 10%. DC can be used by variable speed drives and can be combined with energy storage and electric vehicles. DC networks are easier to interconnect than AC networks because frequency synchronization is not an issue. The paper also discusses tax and ownership issue of DC microgrids.
(IS-2010-88) 802.11n: The End of Ethernet?
This report from the Burton Group compares office data and voice (VoIP) using wireless 802.11n versus wired Ethernet. The wireless technology (a version of Wi-Fi) delivers about 150 Mbps versus 1 Gbps for some versions of Ethernet. This report analyzes the performance differences between these technologies. The issues of convenience and portability favor wireless solutions in offices not just for data, but also for voice. More voice calls in offices are conducted wirelessly than on a corded phone now. A local area network based on 802.11n can supplement cell phone technology.

(IS-2010-87) The Revolution in Warehouse Lighting: LEDs and Intelligent Lighting Systems
This report from Digital Lumens explores the potential savings in electricity by changing lighting systems in warehouses. Most such facilities use high-intensity discharge (HID) lighting. Conversion to LED lighting with intelligent control is recommended. The lighting control would reduce light output in unoccupied areas and when there is ample sunlight. Electricity usage was reduced by a factor of 20 in an example presented.

(IS-2010-86) CPUC California Solar Initiative; 2009 Impact Evaluation
This report from Itron reviews the effect of the California Solar Initiative in 2009. Solar installations grew by about 55% over the previous year. 12% of installations, representing 40% of capacity, are owned by third parties. The cost per residential Watt of solar electricity generated is about $8.50. About 390,000 MWh of solar power were generated in 2009 in California (enough to power 66,000 houses). Among the impacts of solar power generation are a reduction of the load on transmission lines and a reduction in demand at peak times. Recommendations for improving the program are presented.

(IS-2010-85) GSA Schedules: the Shortest Path to Federal Dollars
This book written by Richard White explains how to become a vendor to the U.S. government. The focus here is on establishing a relationship with the government rather than submitting a bid for selling goods when a request-for-proposal is issued. The method is to become a pre-approved vendor at pre-agreed prices. The author acknowledges that this method may cost the government more, but can deliver goods quicker, especially for responding to emergencies. Methods for complying with government requirement are presented.
(IS-2010-84) Economic Benefits of a Comprehensive Feed-In Tariff
This report from the University of California at Berkeley examines the impact of feed-in tariffs on local power generation. Feed-in tariffs are rates for power paid to owners of local generators who sell their output or their excess into the electricity grid. A stable feed-in tariff is intended to encourage investments in local power generation. California has a goal of 33% renewable power sources by 2020. The impact on employment and state taxes is presented.

(IS-2010-83) Applying OSIPS to ICAM
This report from the Security Industries Association surveys various standards for access to buildings. Various American National Standards are reviewed that SIA has developed system integration and performance testing in the family of OSIPS (Open, Systems Integration and Performance Standards).

(IS-2010-82) The Four Hottest Markets in Telecom Equipment: LTE, WiMAX, Data Center Ethernet, Femtocells
This report from Infonetics Research provides a summary of developments in telecom technologies. LTE (Long Term Evolution) will provide high speed Internet access via cell phone networks. WiMAX is an alternative to LTE that may be attractive in developing countries and in rural settings. The demand for wideband Ethernet switches is growing as more video is being processed by data centers. Femtocells extend cell phone coverage into buildings where reception from cell towers was a problem.

(IS-2010-81) Technology for personalised, preventative healthcare
This report from the European Commission examines how ICT (Information and Communication Technology) can impact healthcare for Europeans. Topics covered include e-health to make healthcare accessible and personal health systems for monitoring. Spending on healthcare in Europe is increasing from 9% of GDP (gross domestic product) to about 16% by 2020. Disease information and remote monitoring may reduce doctor visits except for serious illnesses. Various projects involving ICT are reviewed in this report.

(IS-2010-80) Educating Europe, Exploiting the benefits of ICT
This report from the European Commission explores how ICT (Information and Communication Technology) helps educate and train Europeans. ICT enables life-long learning and personalized learning; it is not just a substitute for books. Mobility and flexibility in education are stressed. A repository for educational materials has been established called the Learning Resource Exchange (http://lre.eun.org). Tools for educators to create new content are available.
(IS-2010-79) How Technology Innovation is Enabling the Transformation of Health Care
This report from Ernst & Young explores the role of technology in improving healthcare. Topics covered include health records, telemedicine, mobile delivery of healthcare information, a trend toward patient-centric care. The latter involves customer access to data covering medical pricing and medical quality. Some innovations using technology include remote viewing of intensive care patients remotely via two-way video, the delivery of test results delivery via iPhone, and social network for patients to compare notes.

This paper from the American Council for an Energy-Efficient Economy analyzes energy legislation that has been proposed in the U.S. Congress for 2010. The potential impact on energy efficiency will maximize the benefit to society. It should reduce consumer costs and generate 166,000 jobs in 2030. [The leaders in Congress announced on July 21 that Congress is not likely to enact this bill. A scaled-down version may be proposed according to news reports on July 25, 2010.]

(IS-2010-77) Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities
This paper from the American Council for an Energy-Efficient Economy analyzes various techniques for encouraging consumers to shift consumption of electricity from peak demand times to off-peak times. A potential saving of 100 billion kWh of energy is possible by 2030. They studied methods of providing information about energy usage to consumers in North America and Europe. The most effective approach of those considered was real-time information about appliance energy usage with an average savings of 12%. Programs need to be tailored “to inform, engage, empower, and motivate people.”

(IS-2010-76) Energy Savings and Performance Gains in GSA Buildings
This report from the U.S. Government Services Administration presents seven methods for saving 500 million kWh of electricity per year in government buildings. These methods include heating, cooling, and air quality improvements (including windows), computer equipment improvements, and lighting enhancements. Some examples of specific recommendations are adjustments of temperature settings, air-conditioning filter replacement, the use of LCD computer screens, consolidation of printers, and combining ambient, task, and outdoor lighting.
(IS-2010-75) Door Locking Options in Schools
This report from the National Institute of Building Sciences is a short summary of options for locking school doors while provide safe and rapid egress in emergencies. Door-locking options and state requirements are presented.

(IS-2010-74) Broad Agency Announcement
This document is an announcement from the Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities. U.S. government about research grants available from various laboratories of the U.S. Army Engineer Research and Development Center. The functions of the various laboratories are presented. Hundreds of research opportunities are listed. [The reader is cautioned to acquire an updated announcement before responding.]

(IS-2010-73) Smarter cities for smarter growth
This paper from IBM explores how technology can improve services in large cities. Topics covered include transportation, public safety, citizen education and training, and access to healthcare data. Examples from large city deployments are presented.

(IS-2010-72) Drive to Energy Efficiency
This report from Sustainability Resource Planning suggests how businesses can react effectively to calls for using energy in ways that sustain energy supplies. While politicians debate strategies such as a carbon tax to reduce green house gases, businesses are not sure what actions are cost effective. This paper recommends a focus on energy efficiency including retrofitting buildings and using renewables. “Having a thick skin and waiting it out is not the proactive stance. A forward-acting agenda to stay on top and innovating as the energy market evolves is the best option to harvest opportunity in the years ahead.”

(IS-2010-71) Razorfish: Actionable Analytics
This paper from Razorfish, Inc. describes a marketing program for measuring the effectiveness of web-based advertising. Razorfish methods for increasing online sales and choosing between brand and direct response advertising are presented. The value of web analytic tools is discussed and contrasted with “Rich Internet Applications.” Methods for customer relationship management include cross-channel personalization (web sites tailored to the visitor) and follow-up e-mails.
(IS-2010-70) An Overview of the DESERTEC Concept
This report from The Club of Rome proposes energy sources that replace fossil fuels to provide energy for a world population of 10 billion by 2050. The proposal calls for solar collectors covering 3000 deserts to generate 18,000 TWh per year. Each person requires a collector of 20 square meters to supply the average energy consumed. High voltage DC transmission lines are recommended because underground transmission is possible. Multiple medium-capacity transmission lines can provide system redundancy. This concept is called DESERTEC.

(IS-2010-69) Digital Mom
This report from Razorfish, Inc. studies how technology and social media are affecting how mothers socialize, shop, and parent. Mothers were divided into five categories based on experiences, values, and motivations. This report is based on a survey of 1500 mothers who use at least two social media. Digital channels are starting to rival TV as sources of commercial information. Mobile web casting and podcasting are becoming important. Marketer should seek to engage mothers by more than banner ads on social networks.

(IS-2010-67) DOE Solid-State Lighting CALiPER Program, Summary of Results: Round 10 of Product Testing
This report from The U.S. Department of Energy examines the performance of solid state lighting using LEDs (Light Emitting Diodes) for parking garages, outdoor lighting, cove lighting, and replacement lamps. The performance of 2010 products was compared to those of 2009. There was no improvement in efficacy. However, the light output is greater from wallpack luminaires (an array of LEDs). The coverage, light colors, and degradations over time were studied.

(IS-2010-66) Demonstration Assessment of Light-Emitting Diode (LED) Freezer Case Lighting
This report from the U.S. Department of Energy examines the performance of LEDs (Light Emitted Diodes) for supermarket freezer case lighting. A 5.4-year payback was reported from savings in energy and maintenance. A trial was run in a supermarket freezer case in Eugene, Oregon. Additional savings came from reduced heat load from the lamps in the freezer cases. Users found the light distribution and food package coloring about the same as with fluorescent lighting.

(IS-2010-65) Demonstration Assessment of Light-Emitting Diode (LED) Parking Lot Lighting, Phase I
This report from the U.S. Department of Energy examines the performance of LEDs (Light Emitted Diode) for parking lot illumination. A three to five year payback (depending on the cost of electricity) was reported from savings in energy and maintenance. A trial was run in a retail store parking lot in Manchester, New Hampshire.
Nearly all users would recommend the LED illumination compared to high-pressure sodium and metal halide lighting.

(IS-2010-64) Smart Grid System Report
This report from U.S. Department of Energy reports on a workshop to assess progress toward a smart grid for electricity. This report focuses on 20 metrics for measuring smart grid advancement in various parts of the electricity grid. As noted, "A smart grid is socially transformational. As with the Internet or cell phone communications, our experience with electricity will change dramatically. To successfully integrate high levels of automation requires cultural change."

(IS-2010-63) Energy Savings Potential of Solid-State Lighting in General Illumination Applications 2010 to 2030
This report from the U.S. Department of Energy examines the national energy savings possible from LEDs (Light Emitted Diodes), also known as SSL (Solid State Lighting). Methodologies are described in detail for each type of lighting replaced. It was noted that commercial lighting demand is 10 times higher per square foot than residential. Energy savings depend on price and performance developments for LEDs. Most of the savings comes from replacing fluorescent lamps in commercial settings with LEDs.

(IS-2010-62) Roundtable Discussions of the Solid State Lighting R&D Task Priorities
This report from the U.S. Department of Energy summarizes a three-day workshop in November 2009 to set research priorities for solid state lighting. Advocates for various research projects were gathered from industry and some academia. They proposed projects for LEDs (Light Emitting Diodes) and OLEDs (Organic LEDs). A list of suggested priority tasks was produced ranked by "high priority," (19 projects) "close calls," (5 projects) and others.

(IS-2010-61) Empowering the smart grid with WiMAX
This paper from the National Rural Telecommunications Cooperative (NRTC) explores applications of WiMAX wireless network technology for smart grid communications. WiMAX can provide communications for distribution and distributed generation, metering, mobile fleets, and backhaul to the utility network operations center. Also, NRTC is proposing to use the bandwidth of WiMAX to deliver broadband services to residential customers. Since the utility owns the WiMAX network (as compared with using a 4G cellular network from a telecommunications carrier), the utility can control message priorities on the network.
(IS-2010-60) Demand Response & Smart Grid-State Legislative and Regulatory Policy Action Review: October 2008 - May 2010
This report from the Demand Response Coordinating Committee survey developments in the U.S. states in smart grid, demand response, and smart metering as of May 2010. This report focuses on policy developments in the states. A separate section is devoted to each of the 50 states. Nineteen states had no smart grid legislative or regulatory policy activities.

(IS-2010-59) Guide to Operating and Maintaining EnergySmart Schools
This report from the U.S. Department of Energy provides a guide to improving energy efficiency in school buildings. A goal of 30% energy reduction is proposed through various methods. Improved operations and maintenance can save up to 20% without a significant capital investment. New schools can use 50% less energy than existing schools. A procedure for developing an energy management plan is presented. This report is targeted at elementary and secondary schools.

(IS-2010-58) Accuracy of Digital Electricity Meters
This report from the Electric Power Research Institute (EPRI – a research organization funded by investor-owned utilities) explains the differences between electromechanical and digital solid-state meters for electricity consumption. Sources of errors may include clerical mistakes when changing from the old to the new meter, the temporary use of estimated bills until the communications network is running, meter failures, and software glitches. Hot weather during the installation period may result in higher bills because of electricity used for cooling. Also, time-of-use rates instituted when digital meters are installed may result in higher bills for some customers. Old electromechanical meters may register low, thereby resulting in lower bills than digital meters.

(IS-2010-57) Home Plug Green PHY: The Standard For In-Home Smart Grid Powerline Communications
This paper from the HomePlug Powerline Alliance, Inc. introduces and summarizes HomePlug Green PHY, a reduced capability and reduced cost version of HomePlug AV. HomePlugAV is designed for audio/video transmission via power line. It supports data rates up to 200 Mbps depending on local conditions. The HomePlug AV sender and receivers adapt dynamically by testing the channel and choosing from among six coding techniques. HomePlug Green PHY uses one coding methods with a maximum data rate of 10 Mbps. Methods for conserving power in devices using HomePlug Green PHY are described. Applications for electric vehicles are presented.
(IS-2010-56) Preparing for the Future: How Asset Management Will Evolve in the Age of Smart Grid
This paper from Telvent provides an overview of changing requirements for managing the assets of an electric utility. In a smart grid environment there are more distributed assets that may extend to and into customer premises. Also, the assets cannot be easily compartmentalized. Currently, there are management systems for work management, location tracking, planning using modeling, SCADA, and fixed asset accounting records. Attempts to create a Common Information Model (CIM) have had limited successes in generation and transmission. CIM for low-cost distributed assets is expensive. Challenges are posed by electric vehicles, distributed generation, distribution telemetry, and smart switches. Spatial databases and workflow analysis are recommended.

(IS-2010-55) Federal Identity, Credential, and Access Management (FICAM) Roadmap and Implementation Guidance
This report from the Smart Card Alliance presents details that were summarized in a companion paper approved for the CABA library: “A smart Card Alliance Summary of the Federal Identity, Credential, and Access Management (FICAM) Roadmap and Implementation Guidance”

(IS-2010-54) A Smart Card Alliance Summary of the Federal Identity, Credential, and Access Management (FICAM) Roadmap and Implementation Guidance
This report from the Smart Card Alliance introduces concepts for U.S Federal Identity, Credential, and Access Management. This established a digital identity for access to computers and physical locations. Business and technical issues are presented. Challenges of present systems and desired systems are discussed.

(IS-2010-53) What Consumers Watch: Technology Enhances the Video Experience
This report from Nielsen examines trends in television viewing. The survey finds that total viewing has increased because of new technologies including HDTV, broadband, and smart phones. TV viewing on smart phones is small but growing at more than 50% per year, with more than half the audience in the age range of 25 to 49. TV viewing on the Internet is also growing. More than half of U.S. households have HDTVs.

(IS-2010-52) G.hn: The New ITU-T Home Networking Standard
This paper from two manufacturers presents a technical overview of G.hn, a standard developed by the International Telecommunications Union (ITU), part of the United Nations. G.hn specified a network for multi-media data transmission via power line carrier (data on electricity wires), telephone wires, and coaxial cables. A raw data rate of 1 Gbps is specified. G.hn uses a data-coding scheme called OFDM (Orthogonal Frequency-
Division Multiplexing) with 256 to 4096 carriers, each carrying 1 to 12 bits of data. There are provisions for data encryption on the shared media.

(IS-2010-51) Guidelines for the transition from analogue to digital broadcasting
This report from the International Telecommunications Union, part of the United Nations, is a guide for countries to plan a transition of television broadcasting from analog to digital technology. It applies to over-the-air broadcasting for fixed-location TVs and for mobile TVs. Government involvement is described, although the report notes, “ultimately the market will determine the success of the services that are offered.” This guide was developed for African countries. A few European countries, Korea, and the U.S. have instituted this conversion. A benefit of digital broadcasting is spectrum efficiency since 4-8 digital TV signals can replace one analog signal.

(IS-2010-50) Where Energy Efficiency Collides with Human Health
This report from Environment and Human Health, Inc. examines how the LEED (Leadership in Energy and Environmental Design) program for energy efficiency buildings could be augmented to consider human health. Buildings in the U.S. consume 76% of energy and emit half of the greenhouse gases in the country. As buildings are designed tighter for energy efficiency, human health is impacted by out-gassing from building materials. Of the 110 possible points awarded by the LEDD evaluation, on 15 apply to indoor-environmental quality. This report includes a survey of typical building materials and associated risks. A greater focus on human health is urged for LEED, especially since LEED is being referenced in laws.

(IS-2010-49) Sustainable Energy Security - Strategic risks and opportunities for business
This report from Lloyds, the insurance company, explores the risks to stable energy sources with a potential increase of 40% in energy demand by 2030. Risks include access to oil, the consequences to the environment such as carbon dioxide emissions, and energy demands from Asia, especially China. Policies for carbon reduction are not likely to be uniform. Those countries that lead in these policies are likely to lead in technologies and to exports these technologies. Just-in-time manufacturing will be impacted by higher energy costs for transportation. Energy smart grids will motivate partnerships between utilities and manufacturers. “…an energy transition…is inevitable; the only questions are when and how abruptly or smoothly such a transition occurs.”

(IS-2010-48) Generating the Future: UK energy systems fit for 2050
This report from the Royal Academy of Engineering presents scenarios for the United Kingdom to achieve the goal set into law in 2008 that carbon emissions be reduced by 80% by 2050. This goal can be achieved, not by one technology, but by a combination of renewable energy sources, biomass, nuclear power, and demand
management. Beyond 2050, nuclear fusion is expected to be practical. Combinations of demand response and the electrification of transportation are presented.

(IS-2010-47) Technology M&A - Finding your place in the land of giants
This report from Deloitte examines mergers and acquisitions (M&As) among large technology companies. Even during the 2009 recession, large technology companies accumulated enough cash to fuel M&As. This report recommends how companies should judge the potential value of M&A through a process called “game-boarding.” Issue raised are international cultural differences, bribes, and protection of intellectual property.

(IS-2010-46) Clean Energy 1.0 - Moving beyond green to create sustainable jobs and a long-term energy strategy
This report from Deloitte examines trends in energy resources including green energy. They argue that the movement toward green energy is being tempered by costs and is focusing on clean energy from fossil fuel sources as a transition to green energy sources such as wind and solar. Energy supplies are viewed as critical for economic growth and employment. China has a more stable and predictable market for clean energy than does the U.S. China will increase solar energy production tenfold from 2010 to 2020.

(IS-2010-45) A Life Sciences Industry Stance on Health Care Reform
This report from Deloitte examines the potential impact on the healthcare industry of the health reform law enacted by the U.S. in 2010. Device manufacturers are likely to have increased markets for remote monitoring and tele-medicine, which will be covered by insurance. The impact on drug companies is reviewed.

(IS-2010-44) The conceptual framework: Six zones of health care consumerism
This survey from Deloitte examined consumer attitudes toward healthcare in Canada, the U.S., Germany, France, Switzerland, and the U.K. The insurance systems in these countries are reviewed. In all these countries nearly everyone is insured except in the U.S., where 16% are uninsured. The French, Swiss, and Canadian are the most satisfied with their systems. The U.S. and Germans are the least satisfied. U.S. consumers perceive the most waste. Most do not think they are well insured. To control costs healthcare providers need to move from a patient view to a consumer view so customers are more involved in healthcare. All consumers are open to in-home healthcare using remote technology.

(IS-2010-43) Rising to the Challenge
This survey from Savvis examined information technology (IT) business trends in Singapore, the U.K., and the U.S. in 2009. There is a movement toward outsourcing IT to “the cloud” for an anticipated savings of 12-18%. In-
house IT is expected to shrink by 23% by 2020. The key motivator is budgetary pressure. Current IT outsourcing is 10% in the U.S., 18% in the U.K, and 38% in Singapore. “Security is the main reason why people do not trust the cloud.” 456 IT professionals were surveyed.

(IS-2010-42) The State of Online Video
This survey from the Pew Research Center polled Internet users of video. About 70% have viewed videos online. The types of videos in order of popularity are comedy, educational, movies and TV, and political videos. 14% have uploaded videos mostly to social and video sharing sites. The most common videos posted are home movies. About 10% have paid to watch a video.

(IS-2010-41) The smart phone becomes a search phone
This report from Deloitte presents predictions for the mobile telephone industry in 2010. Internet search engines for mobile phones will grow as a competitive market. Search will include product data plus directions for finding the product using GPS. Voice service may move to mobile VoIP using 3G and Wi-Fi networks. This could impact mobile voice revenues. Mobile network spending is expected to grow 7%, more than double overall telecom and IT spending in 2010. Consumer demand for bandwidth will continue to outpace the growing supply. Tiered pricing on usage may be introduced. Reliability may decrease. Energy consumption for telecom will decrease.

(IS-2010-40) The New Solar Market
This report from Pike Research examines the demand for solar electricity equipment, the buyers, and the suppliers. The report projects a 43% increase in demand in 2010 compared to 2009, reaching 10.1 GW. The largest buyers are in Germany (47% of the market), Italy (10%), the United States (8%), Japan (5%), and France (4%). By 2013 the demand should be 19 GW, a 25% compound annual growth rate. The total available module capacity may reach 30 GW by the end of 2010. This report analyzes the business prospects of the approximately 190 manufacturers. There is a large oversupply; 17 of the top producers could fill the 2010 demand. The price per watt for a solar cell will decrease with lower-cost manufacturing in East Asia, lower-cost materials, lower-cost processes, and economies of scale.

(IS-2010-39) Canadian Commercial Real Estate Sustainability Performance Report
This report from the Real Property Association of Canada explores how to measure environmental, social, and governance performance of commercial real estate companies. Sustainability drivers include corporate responsibility and sustainability, green buildings, and responsible property investing. “Climate change is now a main-stream policy concern.” Green buildings decrease average operating costs by 13.6%. Buildings account for 13% of carbon emissions in Canada. Evaluation methods are discussed.
(IS-2010-38) Winds of Change - East Asia's Sustainable Energy Future
This report from the World Bank analyzes the energy consumption and carbon emissions of five East Asian countries: China, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. It presents a strategy for achieving sustainable energy in two decades. Half the savings come from improvements in energy efficiency and half from carbon reduction by using renewable energy sources. To achieve energy efficiency, subsidies for fossil fuels should be removed. Renewable energy sources include solar, wind, biomass, and nuclear. To achieve these goals, $80 billion per year must be invested for the next two decades. Shifting to renewable fuels will lessen dependence on imported fuel with volatile prices.

(IS-2010-37) Roadmap 2050 - Practical Guide to a Prosperous, Low-carbon Europe, Volume 2
This report from the European Climate Foundation is part of a three volume series. The executive summary has been reviewed and approved. This chapter presents a policy report including financing options.

(IS-2010-36) Roadmap 2050 - Practical Guide to a Prosperous, Low-carbon Europe, Volume 1
This report from the European Climate Foundation is part of a three volume series. The executive summary has been reviewed and approved. This chapter presents a technical and economic analysis.

(IS-2010-35) Roadmap 2050 - Practical Guide to a Prosperous, Low-carbon Europe, Volume 1 – Executive Summary
This report from the European Climate Foundation presents a roadmap for Europe to achieve an 80% reduction in greenhouse gas emissions below 1990 levels by 2050. This will require a reduction in carbon emissions from power generation by 95-100%. Although this would increase the cost of electricity initially, the costs over 40 years will not increase. Also, energy efficiency improvements of about 2% per year are expected. Technologies available today can achieve these goals. Incentives for this carbon reduction would include a charge for carbon. New policies and regulations are required.

(IS-2010-34) Enterprise Estonia Building Automation Comparison of its Local Small Stores Market
This masters thesis focuses on building automation as applied to residential and small building in Estonia. The thesis was written in Estonian and translated roughly by a Google service. Building automation in Estonia is described using technology from a CABA building automation roadmap and the European Building Controls Association. Building automation includes audio/video, security, heating and cooling, lighting, and health care. The technologies of building automation are reviewed. Building automation by 19 Estonian companies is studied (six are subsidiary of foreign companies).
(IS-2010-33) Energy performance of buildings - Impact of Building Automation Controls and Building Management
This document is a European standard issued by CEN, the European Committee for Standardization. It applies to the 27 member nations of the European Union plus Iceland, Norway, and Switzerland. EN 15232:2007 is the designation of this standard that seeks to estimate the effects of building automation and management on energy usage and performance. It is intended for building owners, architects, engineers, and public authorities that set requirements and perform inspections. Building automation systems are categorized in four classes according to energy efficiency features such as variable speed and temperature. Home automation features that contribute to energy efficiency are included.

(IS-2010-32) The IBM vision of a smarter home enabled by cloud technology
This report from IBM examines the future of home automation. IBM predicts that with the prevalence of broadband access from homes to the Internet, home automation services will be hosted “in the cloud.” This means that providers will deliver home automation services from their servers. Applications fields are expected to span entertainment and convenience, energy management, safety and security, and health and wellness. Health and fitness monitoring is expected to generate $2.5 billion by 2012. Cloud services depend on home devices containing instruments for sensing and monitoring conditions, such as functions in an appliance. IBM proposes a local “clone” of the server-based application in case Internet access is down. A Service Deliver Platform on the servers is described.

(IS-2010-31) The Value of Behavioral Targeting
This study from the National Advertising Initiative examines behaviorally targeted advertising. Behavioral targeting delivers web-based ads based on use browsing within the web site and across related web sites. Revenues average almost three times higher for behavioral targeted ads compared to “run of network” (RON) ads. Behavioral ads are more appealing to consumers and generate more sales for advertisers. Consumers are almost eight times more likely to click through targeted ads than RON ads.

(IS-2010-30) The Right Rx for Upgrading Today’s Hospitals
This article from Lantronix, Inc. explains the challenges of computerizing medical records and making them available from a server via the Internet. Among the issues are data security, patient privacy, medical equipment with interface not compatible for Internet data transmission, and lack of qualified information technology persons. Methods for data encryption are discussed. Wireless interfaces for medical equipment are considered.
**(IS-2010-29) Where Has All the Data Gone? The Crisis of Missing Energy Efficiency Data**

This article from the American Council for an Energy-Efficient Economy report on U.S. government projects to gather energy consumption data. Such data are collected and reported by the Energy Information Agency (Department of Energy), the Census Bureau, and the Federal Highway Administration. All have had significant budget reductions. These cuts impact the tracking of the impacts of building codes and other policies. The Council is advocating for more funds for these government agencies.

**(IS-2010-28) Clean Energy Trends 2010**

This report from Clean Edge, Inc. evaluates the economic contribution of the energy sector. Even during the recession in 2009, revenues for local power generation from renewables grew 11.4% over 2008 and are expected nearly to triple in a decade. Investments in clean energy are surpassing investments in fossil fuels. The report predicts the commoditization of solar photovoltaics, smart meters, energy storage devices, wind turbines, and other clean technologies over the next decade. China is leading country in wind farm and solar water heater installations, and is the largest source of photovoltaics. Companies that are investigating products from carbon captured during manufactured are discussed. Other clean tech products are reviewed.

**(IS-2010-27) The New Consumer Behavior Paradigm: Permanent or Fleeting?**

This report from Price Waterhouse Coopers analyzes changes in shopping behaviors as a result of the recession of 2008/2009. Conspicuous consumption is being replaced by more practical choices. Baby boomers are conserving for retirement, so the leaders in retail recovery will by Gen X (29-45, but ¾ the population of the baby boomers) and Gen Y (10-28, outnumber baby boomers, little wealth, but seekers of instant gratification). Online shopping is enabling consumer to pick specific products, rather than browse. The market for luxury goods will shrink. Purchasers of discretionary products will favor attributes of value over time, usefulness, versatility, and green. Retailers need to offer relevant products.

**(IS-2010-26) Radio spectrum - why Europe needs effective co-ordination**

This report is the transcript of a presentation by the Vice President of the European Commission and Commissioner for the Digital Agenda, Neelie Kroes. Topics covered include the re-allocation of television bandwidth for wireless data communications, competition among terrestrial and satellite providers, efficient use of spectrum already licensed, and harmonization across European Union borders. The need for faster action by the International Telecommunications Union (a sector of the United Nations) was also mentioned.
How will this recession affect the future of retailing?
This report from Price Waterhouse Coopers was written in 2008 to estimate the impact of the recession on the retail sector. Even as the retail sector recovers, there is a long-term trend favoring aggregation rather than the expansion of retail. Also, many retailers are expanding private brands. Consumer clout is growing with the use of tools from social networking. Predictions for various retail sectors are included.

Federal Communications Commission: National Broadband Plan
This report is a summary of decisions taken by the U.S. Federal Communications Commission in March 2010 regarding high speed Internet access using broadband communications. The FCC supports a policy of a competitive market for broadband with access to all especially deployment in high cost and low-income areas. The FCC is planning to support broadband with appropriate radio spectrum (extra 500 MHz within 10 years) and rules to encourage competition for equipment such as set-top boxes. A goal of a minimum 4 Mbps download speed is proposed with a desired service of at least 100 Mbps. Possible applications of broadband by government agencies include healthcare, education, energy management (including real-time consumption data), economic growth, civic engagement, and public safety. Access rates of 1 Gbps are proposed for public institutions in every community.

What global executives expect of information security - in the middle of the world's worst economic downturn in thirty years
This report from Price Waterhouse Coopers was written in 2009 to determine the effect of the recession on purchases of products to ensure data security. This survey of 7200 persons found that expenditures would increase or stay the same. Investments in data security were considered worthwhile. Many were concerned that they did not know where their privacy-related data were stored. Also, social networking will challenge the requirements for data security.

AARA Survey Analysis
This research brief from Pike Research examines consumer sentiment on energy and environment provisions within the American Recovery and Reinvestment Act of 2009.

Real Prospects for Energy Efficiency in the United States
This executive summary from the National Academy of Sciences explores the impact of technology on improving energy efficiency. Potential savings by 2020 would come from buildings (53%), industry (35%), and transportation (12%). Some of the technologies that will impact buildings include LED lighting, new window systems, new cooling systems, and more efficient electronics.
(IS-2010-20) BroadbandSuite 3.0 Companion Guide
This article from the Broadband Forum provides an overview of specifications developed for telephone companies to deliver Internet access. The initial technology was DSL and now has moved to IP-Ethernet and fiber optics. The objective is to improve the delivery of IPTV and a better “Quality of Customer Experience” (QoE). Each specification is summarized. Future specifications will include IPv6 transition, converged network, and multi-service architecture.

(IS-2010-19) Energy Management Systems for Commercial Buildings
This executive summary report from Pike Associates analyses the evolution of energy management for large buildings. Heating, cooling, and lighting account for 57% of building energy consumption. Energy expenditures for these functions were considered fixed costs. There is now a shift in thinking due to energy awareness, government policy, and applications of information technology. Long term, building design will move toward net-zero buildings and electricity demand response. Shorter term, the focus will be on energy efficiency.

(IS-2010-18) Green Telecom Networks
This executive summary report from Pike Research examines the impact of green practices on the information and communications and technology (ICT) industry. It focuses on plans by fixed and mobile telecommunications companies to reduce greenhouse gases. Although ICT accounts for only 2% of emissions, the industry is growing and may be able to reduce overall emissions by 15% over the next 10 years. Most approaches require higher initial investments. The industry is starting to evaluate life-cycle costs. Some of the approaches for reducing energy include equipment-cooling improvements, turning off unused equipment, use of renewable energy sources, and more efficient design of circuits for processors.

(IS-2010-17) Home Energy Management
This executive summary report from Pike Research analyses the potential market for energy information devices (EIDs) that provide consumers with data about home energy consumption. The early market is driven by utility decisions and deployments. Later EIDs will move into retail channels. Shipments are estimated at 5 million units by 2015 with 11 million users of web-based energy displays (called web dashboards).

(IS-2010-16) Green Jobs Study
This study by Booz Allen Hamilton for the U.S. Green Building Council estimates the jobs and investments created by green building construction. Buildings account for about 40% of greenhouse gas emissions. Green categories include energy efficiency, water efficiency, resource efficiency, responsible site management, and
improved indoor air quality. The numbers from 2002-2008 are 2 million jobs worth $100 billion; 8 million jobs from 2009-2013 worth $400 billion. During these periods LEED-related jobs were $830 million and are projected at $12.5 billion. The analysis methods are presented with a breakdown of job-types created and energy saved.

(IS-2010-15) Summary of the Architecture, Engineering, Construction, Owner Operator Phase 1 (AECOO-1) Joint Testbed
This report from two building consortia covers a trial of improved communications among the design team for a new building to facilitate energy efficiency. Methods explored were testbeds and interoperability programs. The need to integrate building data into a building information management system was discussed. The use of XML and web-based services is considered.

(IS-2010-14) 4th Annual Green Building Survey
This article from experts in the green building marketplace examines the market for green buildings. 92% of 1600 design and construction professionals surveyed in 2009 supported green and sustainable construction because it saves energy and lowers operating expenses. LEED certification dropped 4.7% in 2009 because of the average 4% that LEED increases costs. Green leases that promise energy conservation are growing slowly.

This report from the American Council for an Energy Efficient Economy examines the potential impact of energy efficiency legislation such as the proposal for cap and trade. Jobs are expected to increase to support new energy efficient technologies. If no energy policy bill is enacted, energy consumption is expected to increase by 28% with a doubling of energy costs by 2050. These figures are based on an average economic growth rate of 2.6% for the next 40 years. Electricity generation and transmission is only 32% efficient. This study uses the Dynamic Energy Efficiency Policy Evaluation Routine. Modeling system to model the U.S. economy.

(IS-2010-12) Cisco Lab Setpoint Increase
This report from the Silicon Valley Leadership Group examines a case study of energy conservation by adjusting air-conditioning. Cisco raised the room and chilled water temperatures (about 8°F and 4°F respectively) in data centers to achieve a savings of 13-21% savings in cooling costs.

(IS-2010-11) Dynamic Power Management: Adjusting Data Center Capacity in Real-Time
This report from the Silicon Valley Leadership Group examines the management of servers as a method to reduce energy consumption. The objective is to determine when servers need to be processing data rather than
standing-by waiting for traffic. The focus is shifting from “always on” to “always available.” Servers used for retail sales showed an average usage of 19.83% with a peak usage of 85%. A saving of almost 57% was predicted with the “always available” model.

(IS-2010-10) Control of Computer Room Air Conditioning Using Sensors in the IT Equipment
This report from the Silicon Valley Leadership Group examines the role of information technology (IT) in improving the energy efficiency of data centers. Greater energy efficiency can be achieved by measuring temperatures at the point-of-use by servers rather than at the return air duct of the air-conditioning system. Energy reductions in the range of 30-40% are predicted.

(IS-2010-09) Control of Computer Room Air Handlers Using Wireless Sensors
This report from the Silicon Valley Leadership Group examines methods for improving the energy efficiency of data centers. The benefits of a wireless network for sensors, fan speed control, and chilled water flow were reported. Energy consumption was reduced 21%. This reduction was achieved by reducing the energy needed to cool the air and to move the air while achieving the temperature goal of the data center.

(IS-2010-08) Next Generation Broadband Access White Paper
This article from the Broadband Forum describes the growth of Internet access. By 2025 almost 90% of customers are expected to have access service at 100 Mbps or higher. Applications are expected to include the delivery of HDTV. DSL access has the greatest penetration in China followed by the U.S. VDSL2 has the potential of 100 Mbps. China leads in fiber optics subscribers. Specifications from the Broadband Forum support these deployments.

(IS-2010-07) MMBI White Paper on Use of MPLS in LTE
This article from the Broadband Forum introduces Multiprotocol Label Switching (MPLS) for use in the backhaul network that links mobile telephone radio access networks (RANs) with the communications network. MMBI is the MPLS in Mobile Backhaul Initiative. It advocates for the use of MPLS in developing the next generation of mobile data networks called LTE (Long Term Evolution). Mobil data traffic recently surpassed mobile voice, and voice traffic is declining. MPLS combines TDM (Time Division Multiplex) voice and data packets onto an IP network. Technical details are included.

(IS-2010-06) Energy Efficiency, Dematerialization and the Role of the Broadband Forum
This report from the Broadband Forum recommends methods for communications and information companies to use materials in a manner that promotes energy conservation. Information and communication technology (ICT)
accounted for 2% of greenhouse gases in 2007. ICT is the largest growing business sector, so this percentage is likely to grow. Applications of broadband connections to the home for consumer energy management are discussed. To conserve energy, networked devices should be always available, rather than always on. The article proposes substituting communications and displays for travel, physical media, and paper.

(IS-2010-05) Data Passport
This report from comScore surveys Internet usage and trends worldwide. Over the past decade the predominant users of the Internet shifted from the U.S. to Asia, led by India and China. There are also high growth rates in Latin America, the Middle East, and Africa. The most popular applications are instant messaging, social networking, entertainment, and email. 35% of those aged 18-34 watch TV only online. Advertising across multiple media is becoming important to raise consumer awareness. Social networking and browsing on mobile devices tends toward an older demographic because of the cost of the browser phone.

(IS-2010-04) Concepts to Enable Advancement of Distributed Energy Resources
This article from EPRI (Electric Power Research Institute) explores the impact of smart grid on control in an electric utility. The premise is to replace “command and control” with “inform and motivate.” An objective is to communicate with smart grid devices in a technology-independent manner that focuses on the smart characteristics of these devices. For demand response, smart devices can be told the situation and requested to respond appropriately without being commanded, for example, to turn off. Applications of this principle to distributed energy resources are discussed. EPRI recommends that utilities “should not be in a role of operating buildings or becoming the surrogate control system for a product or device.”

(IS-2010-03) Growth through Innovation in the Electronics and High Tech Industry
This article from Accenture discusses drivers and methods for corporate product innovation even during a recession. Innovation is now occurring in developing countries in addition to the traditional developed countries. The importance of customer-focused rather than technology-focused innovation is stressed. Innovation may come from collaboration among related companies.

(IS-2010-02) Mobility Takes Center Stage: The 2010 Accenture Consumer Electronics Products and Services Usage Report
This article from Accenture explores the growing market for consumer electronics. The most popular items are cell phones and personal computers. Web-enabled phone ownership tripled between 2007 and 2009. Mobile devices are more popular in emerging markets. More consumers in developing countries than in the U.S. are willing to pay a premium for environmentally friendly products. By 2009 Internet access was considered more
important than cable or satellite TV. Almost 60% of Baby Boomers were using social networking in 2009, up from about 20% in 2008. 160,000 technology-literate people were surveyed in eight countries: China, France, Germany, India, Japan, Malaysia, Singapore, and the United States. 85% of the respondents purchased consumer electronics during the recession, although cost was a factor in purchase decisions.

**IS-2010-01 The Role of Social Media in Commercial Property**
This paper from RICS, a U.K. organization that “advances standards in land, property, and construction,” investigates the potential benefits of social media for property professionals. Social media are part of Web 2.0 and enable personal branding. Methods such as blogs, Twitter, Wiki, RSS feed, tagging using Folkonomy, Facebook, and Crowdsourced content are discussed. A key issue is trusting and training employees to use these tools as brand ambassadors for the company. Examples of use in the commercial real estate industry are presented. It is important for a company to keep track of the information disseminated via social media about the company.

**IS-2009-159 Green, High Performance Schools**
This article from Air Quality Sciences explains the benefits of public and private schools that combine energy conservation with improved indoor air quality. A major concern is the increased initial cost to build a green school, even though the operating costs over a 40-year (or more) lifetime are expected to be lower for a green building than traditional construction that meets building codes. Good indoor air quality is claimed to improve student attendance and performance. The chemical constituents of indoor air are presented. Among the pollutants are volatile organic compounds, mold, and formaldehyde. The impact on asthma and autism is discussed.

**IS-2009-158 Greening of Corporate America**
This article from McGraw Hill Construction surveyed executives to determine changes in attitudes toward sustainability between 2006 and 2009. A small majority of executives now sees business opportunities in sustainable products and a benefit to their companies to promote sustainability. The most popular sustainable activities are recycling, employee engagement, green buildings, and involvement with programs from governments and non-governmental agencies. Practices by many companies are presented.

**IS-2009-157 Creating Business-Class VoIP; Ensuring End-to-End Service Quality and Performance in a Multi-Vendor Environment**
This article from Frost & Sullivan explains the challenges of using VoIP (Voice over IP) for telephone services. As of 2007 about 50% of companies surveyed were planning to substitute VoIP for switched telephony services. Although costs may be lower and flexibility increased, more responsibility rests on the company to ensure quality
of service and availability. VoIP telephone service is sharing the same path and bandwidth as data traffic. Also, more responsibility rests at the periphery of the network with the company than with a switch that may be maintained by a telephone company.

This report from the Center for the Study of Energy Markets at the University of California at Berkeley examines the economic impact of green buildings. Buildings that are certified as green command higher rents by about 3-6% and sell for about 16% more. These conclusions are based on a study of more than 10,000 buildings. Buildings consume about 40% of the world energy and emit about 30% of the worldwide greenhouse gases. Buildings were rated using Energy Star and LEED (Leadership in Energy and Environmental Design). The statistical methodology is described in detail.

(IS-2009-155) Solid State Lighting: Benchmarking Analysis
This paper from Cleantech Approach evaluates the market potential for solid state lighting. Lighting accounts for 20-25% of U.S. electricity consumption. 40% of lighting is used in buildings, both commercial and residential. LEDs outperform incandescent and halogen lights on a payback basis, and are a slight improvement over compact fluorescent bulbs. Detailed analyses are included.

(IS-2009-154) The Smart Grid: An Introduction
This booklet from the U.S. Department of Energy introduces the electric grid and explains technologies that could improve reliability to create a “smart grid.” The state of the electric grid reliability is discussed, including the increased rate of failures leading to blackouts. Topics for a smart grid are presented including AMI (Advanced Metering Infrastructure), visualization (distributed sensors), and distributed generation. Technologies and projects for a smart grid are mentioned.

(IS-2009-153) A National Assessment of Demand Response Potential
This report for the Federal Energy Regulatory Commission in the U.S. fulfills a Congressional mandate to explore the potential benefits of electric demand response. Under a scenario of full participation, the projected growth over 10 years in peak consumption could be reduced by about 20% for no net gain in the peak. Possible demand response programs range from limited to advanced programs that include dynamic power pricing and wide deployment of advanced metering infrastructures. The greatest impact of demand response is in regions that use a lot of air-conditioning. Demand response techniques need to be studied, coordinated across states, deployed nationwide, encouraged with federal tax policies, and accompanied by consumer education.
(IS-2009-152) Fan Industry - Facing up to the Energy Challenges
This article from the Air Movement and Control Association (AMCA) presents the history and status of standards for measuring the energy efficiency of fans. Considerable technical detail is provided. Methods for measuring efficiency are discussed. The long-term objective is to reduce the energy consumption of fans. National and international standards are referenced.

(IS-2009-151) Quantifying "Green" Value: Assessing the Applicability of the CoStar Studies
This paper from the Green Building Finance Consortium analyzes a March 2008 study that claimed LEED-certified buildings rented for a 36% premium over non-LEED buildings. Energy Star buildings had a 9% premium in rents. The methodology used in these calculations was critiqued especially the fact that real estate prices were rising fast during the period of the study and the granularity of building detail was missing. Investment decisions in green buildings require both qualitative and quantitative analyses.

(IS-2009-150) High Performance Green Building: What's it Worth?
This paper from a consortium of organizations in British Columbia and Washington state explores the relationship between green features in a building and the financial impact on the building rents and value. It seeks to link building designers with the financial community. Valuation specialists performed this study by evaluating three buildings in Vancouver, Seattle, and Portland. The impact of green choices on building values is discussed. Various methods for establishing valuations are considered based on cost, recent sales, and income generated from rents.

This article from Greener World Media surveys the growth of LEED buildings in 2009. Although the number of building starts did not grow significantly, the square footage of LEED development expanded about 40%. The reasons why are explored. Water shortages are expected to deter new building construction, rather than energy shortages. Details about the benefits of LEED buildings are presented.

This article from Trilliant, an electric metering company, examines the pros and cons of including a gateway in an electric meter. The gateway translates communications telemetry between a neighborhood network and a home network. Although the number of smart meters to be deployed may reach 100 million over the next five years and half may include gateways, the number of households with home networks may reach only 20% by 2013. There are technical challenges for the gateway to communicate successfully with a home network if the gateway uses radio or power line carrier, depending on the meter location. Also, a gateway in a meter cannot adopt the variety
of competitive home network technologies. The conclusion is that a gateway should be in a home device, not in a meter.

(IS-2009-147) Industrialization in the Construction Sector
This report written by the National Research Council of Canada explores the potential for using more factory processes in building construction. Increases depend on improved business models for collaboration between the building and manufacturing industries, technological innovations and transfer, and appropriate regulations. In 2007 about 8% of Canadian construction was prefabricated. This report explores two scenarios for 2025: increase from 8% to 25%; increase from 8% to 10%.

(IS-2009-146) LEEDing Retail to Greener Pastures
This article from Research Review explains the LEED rating system for buildings. The LEED rating is based on a weighed score of sustainable site, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and innovation and design process. A new LEED rating for retail spaces is discussed. LEED for retail weighs the scoring with energy being the largest constituent in the score. Some California cities now require all large private-sector developments to achieve LEED status.

This paper from Clean Edge, Inc. explores the creation of new employment opportunities in the “clean tech” industries. Clean tech is defined as renewable materials and energy, use of natural resources more efficiently, and reduction of pollution and toxic wastes. Job locations and average salaries are presented. Colleges offering training for these positions are highlighted. Opportunities in electric smart grid are discussed. Resources for seeking these jobs are listed.

(IS-2009-144) Green Noise or Green Value? Measuring the Price Effects of Environmental Certification in Commercial Buildings
This report from the University of Reading in England examines the financial benefits of green buildings. These building offer premiums in rental prices and sales prices. This study is based on LEED and Energy-Star certified buildings in the U.S. Detailed calculations are included. Certification now applies to only a small percentage of buildings, but is growing.

(IS-2009-143) How Real is the Vision of a “Smart Grid”?
This report from GP Bullhound of the U.K. presents stock analysts’ views of investment opportunities in smart grids. They review companies involved with smart grids such as Silver Spring Networks, Trilliant Networks, and
Tendril. Smart grid and demand-response are described. There is doubt about the economic benefits of a smart grid. The benefits depend on consumer behavior change, concerted efforts by all stakeholders, and new business models.

(IS-2009-142) Hidden Reservoir: Why Water Efficiency is the Best Solution for the Southeast
This report from American Rivers analyzes the water supply in the Southeast U.S. The long-term solution is not to build dams, but to improve efficiencies. Examples include stopping leaks, charging for waste water, improving landscaping to minimize waste, increasing household water fixture efficiency, using gray water, and maintaining rivers.

(IS-2009-141) The Digital Single Market: A key to unlock the potential of the knowledge based economy
This presentation from a European Union Commissioner examines the impediments to the growth of Internet usage in the European Union. A key limitation in Europe is regulation that varies by country. Rights to digital media are not clear across Europe and availability on a variety of devices is limited. The Commissioner warned that only U.S. citizens might have the right to European content from sources such as Google. The presenter explained the need for net neutrality.

(IS-2009-140) SRSM & Beyond Project
This document from the Energy Retail Association of Great Britain provides requirements for electricity and gas smart meters. Communications capabilities to a wide area network and to a home network are specified. Customer displays of energy consumption are included. Detailed specifications are presented.

(IS-2009-139) Ethernet Point-to-Point vs. PON - A comparison of two optical access network technologies and the different impact on operations
This paper from Keymile compares fiber optics networks that use active Ethernet Point-to-Point (PtP) versus PON (Passive Optical Network). PtP depends on a fiber optics line from optical multiplexer in the central office to each subscriber, while PON uses a single source and splitters with filters for each subscriber. Upstream PON uses a time-division multiplexed time slot assigned to each subscriber. PtP could be terminated in a building equipment room. PtP can offer higher data rates than PON. PtP might be suited for large companies. The growth of IPTV may push Internet speed requirements to 100 Mbps with 1000 Mbps a possible requirement in 10 years. Performance and cost comparisons are included.
This report from Clean Edge, Inc. examines financing options for U.S. clean tech investments. The financing options include the Green Bank, Clean Energy Victory Bonds (like World War II Victory Bonds), tax credit bonds, federal loan guarantees, and Clean Tech city Funds (operated by about 10 cities now). The Green Bank would be created by the federal government, like the Export-Import Bank. This report argues that strong federal involvement is required.

(IS-2009-137) GreenFormat, an Online Tool Providing Structure for Environmental Product Evaluation
This paper introduces the GreenFormat from the Construction Specifications Institute. The GreenFormat is a web-based tool that provides data about the sustainable aspects of building products. Factors include life-cycle costs, end-of-life, and climate-change data. GreenFormat depends on reporting by manufacturers that complies with ISO 14201 guidelines for responsible data reporting.

(IS-2009-136) NTCA 2009 Broadband/Internet Availability Survey Report
This survey from the National Telecommunications Cooperative Association (NTCA) reports on deployment of Internet access by NTCA members in 2009. 98% of members (rural telephone companies) offer broadband Internet access; of those 98% utilize DSL with 59% delivering via fiber. Some use wireless (licensed and unlicensed), satellite, and cable modem. Data rates vary from 200 kbps to 6 Mbps or more. 89% of operators face competition from cable and wireless companies. The broadband subscription rate by customers is 37%. 54% of operators see VoIP (Internet telephony) as a threat. 75% of operators offer video services.

(IS-2009-135) 802.11n Drives an Architectural Evolution
This article from Hewlett-Packard (HP) explains how to maximize performance of a wireless local area network (WLAN) using 802.11n radios. HP recommends moving from centralized LAN management to access points that are controlled across the LAN.

(IS-2009-134) Designing Space to Support Knowledge Work
This paper from the Environmental Design Research Associates explores optimal designs for an office to house a communications design organization. A quantitative measure of office space layout is presented with a qualitative description of social interaction among the occupants. The effect of office layout on the work process is explored. A corporate space redesign is presented with survey results before and after the change.
(IS-2009-133) Do Green Buildings Make Dollars and Sense?
This paper from the University of San Diego and CB Richard Ellis surveyed tenants of green buildings. 534 tenants in 154 Energy Star buildings were surveyed. Rents of green buildings are higher. Working in a green building is important for tenants. Methods for measuring productivity in green buildings are discussed. It is noted that green buildings are more intensively managed. “Our results continue to support the notion of green paying off.”

(IS-2009-132) Estimating the Exaflood
This article from the Discovery Institute in Seattle explores the data impact of video and rich media on the Internet. U.S. Internet traffic is expected to reach 1021 bytes (one zettabyte). The 2015 Internet will be 50 times larger than the 2006 Internet. Applications in 2015 will include movie downloads, video calls (the largest volume of data on the Internet), cloud computing, gaming, IPTV, business IP, and other applications (phone, e-mail, photos, music, and web browsing). The history of the growth of Internet traffic is presented.

(IS-2009-131) Retrofits that Deliver
This article from the National Electrical Manufacturers Association (NEMA) examines the benefit of retrofitting a lighting system. New indoor lighting can save energy and produce appropriate light levels (many spaces are over-lit). Other issues include choosing the correct lamps, maintenance, and the impact of solid state lighting such as LEDs.

(IS-2009-130) IPD Cost Code
This report from Investment Property Databank (IPD) of the U.K. examines the measurement of building performance. The IPD Cost Code, fifth edition, is introduced for measuring the cost performance of commercial property. Details are included for determining which costs to include. Categories for each element of cost are provided, including information technology and communications. Case studies for various organizations are presented. Methods for reducing costs are discussed.

(IS-2009-129) Towards a Smarter Future: Government Response to the Consultation on Electricity and Gas Smart Metering
This report from the U.K. Department of Energy and Climate Change explains the plans for smart electric and gas metering mandated by 2020. Residential meters must include displays. This document is the Government response to 270 public comments on questions posed by the Government. Centralized communications for smart meters is planned with local coordination.
(IS-2009-128) Satisfaction with Certified Green Buildings-an Inquiry of Building Occupants in Minnesota
This paper from Dovetail Partners reports on a survey of occupants of green buildings in Minnesota. The basic topic was whether nine green buildings that were LEED registered remained green after occupancy. Favorable findings were reported on dual-flush toilets, dimmer switches, exhaust fans, paints and materials with low volatile organic compounds (VOCs), rain barrels, tankless water heaters, Energy Star appliances, programmable thermostats, wood from responsibly-managed forests, and use of local materials. Better education for manufacturers, contractors, and users is recommended.

(IS-2009-127) Doubling Down on Green
This article from the National Real Estate Investor and the U.S. Green Building Council reports on a survey about green investments during the recession of 2009. While new construction in 2009 was near zero, 73% of developers retrofitted properties with green features. 66% of developers think that green features will become required by building codes. Green building space commands about 2% higher rents than non-green space. Tax incentives would promote the installation of green features. Two-thirds of developers and corporate leaders see green as important.

(IS-2009-126) Rolling Out Golden Shield in China's Second-Tier Cities
This report from China Origins Associates describes where China is investing in high tech surveillance. China plans to track the movements of every person in the country using video and facial recognition. All new commercial and residential buildings will be connected to the government network. This project is called Strengthening of Police Through Science and Technology. Partnerships with major Western technology companies are planned for this program.

(IS-2009-125) The smart way to display
This report from the Energy Saving Trust in the U.K. presents the findings from consumer research into user interfaces for energy management. Some of the findings include: use an analog indicator instead of numbers, use cost instead of energy consumed, interactivity should not be default mode, a portable display is not important, provide daily and cumulative consumption costs. Details of the study and focus group results are presented.

(IS-2009-124) Understanding ZigBee RF4CE
This article from the ZigBee Alliance presents extensions to the ZigBee protocol for networking consumer electronics. The application-layer protocol is described along with a discovery process. The application language includes a generic profile and an application component for specific device functionality.
(IS-2009-123) ZigBee Wireless Sensor Applications for Health, Wellness and Fitness
This article from the ZigBee Alliance explains how ZigBee devices can carry messages defined by an IEEE standard for health care applications. Such applications might include monitoring vital signs, activity and motion, home safety, and physical fitness.

(IS-2009-122) ZigBee - WiFi Coexistence
This report by Schneider Electric examines interference between ZigBee and WiFi. In most residential situations the interference may delay ZigBee packets. If WiFi were used for high volume data such as video, the impact could be more severe. In that case, a frequency-agile version of ZigBee is recommended that can change frequency while in operation. Also, the interfering nodes should be separated by at least 2 meters. Test results are presented.

(IS-2009-121) The Web of Things
This paper from Tridium explores technology that allows devices to be networked using versions of the Internet protocol. The author argues for using the 6LoWPAN Internet specification both for wireless (the original intent) and for wired networks including serial links. The goal is to make device data available as Web services. Protocols for representing device messages (oBIX encoded in binary) and for encoding device packets (Chopan) are proposed. Unresolved issues include data security and scripting.

(IS-2009-120) Mobile WAN Optimization Can Help Cut Costs and Avoid Future Upgrades
This brochure from the Yankee Group explores how to deliver Internet access for mobile users that provides application performance comparable to a PC running at headquarters. Mobile WAN (Wide Area Network) optimization is introduced.

(IS-2009-119) Integrated Edge Services: The TCO Advantage
This brochure from the Yankee Group examines the technology needed by service providers to deliver Internet, TV, and voice. The challenges are to integrate these services into a digital platform and to accommodate higher data rates. Pressure to increase data rates is coming from increased video transport via the Internet. The equipment that handles these data stream consists of edge routers that interface with customers. To lower operating costs, the triple services of Internet, TV, and voice need to be fully integrated at the operations level. Operator cost models are provided.
(IS-2009-118) Wild About Widgets Differentiating Video Platforms in the Age of Internet TV
This brochure from The Diffusion Group examines plans to include Internet access capabilities within TV sets. The author cautions manufacturers that a minimalist incorporation of Internet capability will limit market share and revenue. The Diffusion Group surveyed 2000 adults and found overwhelming support for using widgets (icons) to access Internet-based services via a TV. Widgets might access favorite TV shows, movies, weather, or news. The conclusion is that the Internet should enhance traditional TV viewing, rather than deliver social networks or online videos. Customers are willing to pay about $25 more for a TV with built-in widgets.

(IS-2009-117) TVE vs. OTT - Are You Ready for a Throwdown?
This brochure from The Diffusion Group explores the battle between cable TV delivery of TV programs and movies versus direct access by customers via the Internet. Cable operators are proposing TV Everywhere that allows Internet access only to cable TV subscribers. There will be a battle between the walled-garden approach of TV Everywhere and distribution available to all via the Internet. The author predicts the growth in Internet TV access from 20 million in 2009 to 63 million in 2014 with both walled-garden approach and open access co-existing.

(IS-2009-116) Over-the-Top, Cord-Cutting, and the Consumer
This brochure from The Diffusion Group explores those market segments attracted to TV programs delivered via the Internet. It explores how many are using Internet delivery in place of broadcast of cable TV, as opposed to supplementing these. It proposes a new offering of 20-30 channels plus selected movies customized to the viewer. Two-thirds of 2000 surveyed are interested in replacing or supplementing or both a custom service with a traditional cable TV service. Some demographic details are included. Those favoring replacement are seeking lower cost and personalized TV.

(IS-2009-115) Online Video Threats and Opportunities for Pay TV Operators
This brochure from The Diffusion Group examines the business opportunities in Internet video distribution instead of inserting the program in a TV channel on cable. Some Pay TV content providers are allowing subscribers to access the Pay TV content via the Internet, but with restrictions or for an additional fee per month.

(IS-2009-114) The Business Dynamics of Pay TV versus Internet TV
This report from The Diffusion Group examines the growth of Internet access to entertainment that is now offered as Pay TV. Many viewers are now choosing to watch advertiser-supported video via the Internet on computers and mobile devices. So far, advertising revenues from on-line video does not match broadcast ad revenues.
Furthermore, cable operators are generally not licensed to show content on the Internet. The content producers are exploring distribution channels that are not limited to cable TV channels.

(IS-2009-113) New communication behaviours in a Web 2.0 world – Changes, challenges and opportunities in the era of the Information Revolution
This white paper from Alcatel-Lucent explores the impact on business of Web2.0. Internet advertising will grow as more time is spent on the Internet instead of watching TV. This advertising will be tailored to users’ preferences. Mobile usage will grow with dual-mode WiFi/mobile phones. Emerging trends include collaboration, social interaction, personalization, active participation, less face-to-face communications. Web 2.0 is characterized by more user interaction. The Web 2.0 technologies market will grow from $746 million in 2008 to $4.6 billion in 2013. The future beyond Web 2.0 is the semantic web that understands user requests.

(IS-2009-112) When Corporate Network Safety Starts at Employees’ Homes - Protecting Your Network from Home Wireless Hackers
This brochure from WatchGuard Technologies explains techniques for making WiFi connections more secure. These methods involve programming the access point to suppress the SSID broadcast and encrypt the data. Further techniques include installing a proxy-based firewall, using strong passwords, avoiding malicious web sites, preventing connections to a bogus access point, allowing only known computers on the WiFi network, and using IPsec-based VPN for accessing a corporate network.

(IS-2009-111) The Future Branch Office
This white paper from Citrix examines the growth of branch offices that need full IT capabilities as employees are dispersed. The trend is to centralize the servers at headquarters while focusing on improving wide area networks (WANs) for access. As WAN performance increases, more applications and desktop functions can be run remotely. However, large files may be staged on local servers. Eventually, no IT staff will be needed at branch offices and policies will be centralized. With centralized IT, some services can easily be outsourced via cloud computing.

(IS-2009-110) Acceleration 101
This white paper from F5 Networks, Inc. explains techniques for improving throughput via a wide area network running Internet protocols. It explains methods such as balancing the loads based on traffic to multiple servers containing the same, compression, data duplication, caching, optimizing TCP, optimizing http and applications, and offloading SSL process (data encryption) to remote offices. Some data compressors can run up to 1 Gbps. Data duplication updates local caches based on changes in data streams.
(IS-2009-109) The Education "Last Mile" - Closing the Gap from School to Work  
This report from the Intelligent Community Forum describes a project for 2010 to prepare people for work with the proper education. The objective of ICF is to match community job skills needed with the education offered in that community. Examples are presented from Canada, Taiwan, France, U.S. and Sweden.

(IS-2009-108) Unlocking Energy Efficiency in the U.S. Economy  
McKinsey & Company has analyzed why the potential of $130-billion annual savings from energy efficiency is not exploited. They estimate that 23% in energy expenditures can be saved by 2020. The barriers to reaping these savings are lack of information and education, incentives and financing, codes and standards, and third-party involvement. A strategy is presented that includes recognizing energy efficiency as an important resource, developing national and regional programs, finding sources of funds, aligning suppliers, users, and governments, and fostering innovation.

(IS-2009-107) Networked Systems Herald the Next Evolution of Restroom Efficiency  
This brochure from Sloan explains the benefits of networked plumbing fixture in restrooms.

(IS-2009-106) ZebOS® 7.7 Network Platform Carrier Operation Maintenance Functions and Applications  
This brochure from IP Infusion provides an overview of IEEE 802.ag, a standard for Ethernet Operations, Administration, and Maintenance (OAM). Ethernet OAM defines fault management functions, performance management functions, and network resilience functions. Acceptance of this paper for the CABA Information Library does not constitute endorsement of those portions of the brochure that describe the company's software product.

(IS-2009-105) 2008-2009 Standards & Technology Annual Report  
This annual report from the Telecommunications Industry Association (TIA) summarizes standards activities in the following fields: mobile and personal private radio and communications systems, point-to-point communications systems, multi-media access, satellite equipment and systems, user premises telecommunications requirements and cabling, terrestrial mobile multimedia multicast, vehicular telematics, and healthcare ICT. Also, the TIA hosts U.S. technical advisory group for ISO/IEC standards information technology equipment, cabling, optical radiation safety and laser equipment, fiber optics, and intelligent transport systems. The TIA is the project secretariat of the third generation partnership (Internet access via cell telephone network).
(IS-2009-104) Insulation Energy Savings: Key Issues and Performance Factors
This report from Honeywell explains the benefits of building insulation in achieving the national goal of energy consumption reduction in commercial buildings. Closed-cell spray polyurethane foam (ccSPF) insulation is described. This material is impervious to most heat flow and to vapor. It can be applied to building materials, roofs, and walls. An analysis of the performance of this material in various environments is presented.

This report from the U.S. Environmental Protection Agency examines how to measure the effectiveness of energy efficiency programs. A combination of the following measurements are recommended: the participant cost test (PCT), the utility/program administrator cost test (PACT), the ratepayer impact measure test (RIM), the total resource cost test (TRC), and the societal cost test (SCT). Additional benefits include greenhouse gas reductions and a portfolio of renewables. Methods and examples for applying these measures are presented.

(IS-2009-102) ENERGY STAR Snapshot: Measuring Progress in the Commercial and Industrial Sectors
This report from the U.S. Environmental Protection Agency (EPA) examines trends in commercial and industrial building performance rating and certification. EPA ratings are used the most by schools and offices. The states leading in increased adoption of EPA ratings are California, Illinois, Ohio, and New York. The leading cities are Los Angeles, San Francisco, and Houston.

(IS-2009-101) IP for Smart Objects
This paper from the Internet Protocol for Smart Objects (IPSO) Alliance is an overview of the benefits of equipping devices with Internet protocol interfaces for communications. The Internet protocols are summarized. The claimed benefits of IP are open, lightweight, versatile, ubiquitous, scalable, manageable, stable, and end-to-end.

(IS-2009-100) Video Consumer Mapping Study
This report from Nielsen Media examines consumer preferences for viewing video. It examines shifts in practices with the introduction of streaming video via the Internet. The viewing of 376 Americans were observed in their homes for a few days each. Viewing was categorized by screen: TV, PC, mobile, and others (e.g., GPS, cinema). 98-99% of viewing is on the TV among all ages and uses live TV (not DVD or DVR). PC is the number-two medium, then radio, then print. TV views saw about 60 minutes of ads and promos per day. Consumers tend to under-report their TV viewing and over-report their PC and mobile viewing.
(IS-2009-99) 2008 Ex Post Load Impact Evaluation for Pacific Gas and Electric Company’s SmartRate™ Tariff
This report from Pacific Gas and Electric describes a limited trial of time-of-use pricing of electricity among 10,000 customers. Peak charges were 60¢ per kWh for residential and 75¢ per kWh for non-residential customers; off-peak was 3¢ per kWh. The average load reduction for residential customers was 16.6% and reached 19.2% on a few critical days. Reductions by non-residential customers were slightly lower and decreased over time.

(IS-2009-98) A National Assessment of Demand Response Potential
This report from the U.S. Federal Energy Regulatory Commission (FERC) fulfills a congressional mandate to examine progress on demand response programs. FERC projected the effectiveness of demand response by 2019 under four levels of aggressiveness toward promoting demand response: business as usual, expanded business as usual, achievable participation, and full participation. Under the full participation scenario the projected growth in peak demand for electricity can be cut to zero from the projected 20% growth under the business-as-usual scenario. State-by-state analyses are presented along with recommendations for achieving each scenario.

(IS-2009-97) 6LoWPAN: Incorporating IEEE 802.15.4 into the IP Architecture
This paper from the Internet Protocol for Smart Objects (IPSO) Alliance describes a method for transmission IPv6 messages via an IEEE 802.15.4 radio (the radio used for ZigBee). IEEE 802.15.4 is a LoPAN (Low Powered Personal Area Network). IPv6 expand the Internet address space from 32 bits to 128 bits. This increases the size of message headers. Fragmentation of messages is introduced to simply routers. Details of the LoPAN protocol for IPv6 (6LoPAN) are presented.

(IS-2009-96) Lightweight IPv6 Stacks for Smart Objects: The Experience of Three Independent and Interoperable Implementations
This paper from the Internet Protocol for Smart Objects (IPSO) Alliance describes software to enable devices to communicate using IPv6 (Internet Protocol with an expanded address space.). Methods for data compression, and datagram fragmentation are specified. Code size and battery requirements are presented.

(IS-2009-95) Moving Toward Utility-Scale Deployment of Dynamic Pricing in Mass Markets
This paper from the Edison Foundation explores the deployment and performance of dynamic pricing systems for residential energy. The response of customers is facilitated by equipment that reminds them of high energy cost periods or equipment that manages energy consumption. Results from utility trials are presented.
(IS-2009-94) **G.hn – Compatibility with Existing Home Networking Technologies**
This is a paper from the HomeGrid Forum, a trade group promoting the adoption of the ITU-T standard called G.hn. G.hn defines transceivers for sending data on coaxial cables and electric power wires using power line carrier (PLC) technology. There are many existing PLC technologies deployed. G.hn has defined methods to coexist with some of these technologies. Dual-mode transceivers are proposed for interoperability between G.hn and legacy PLC devices. Co-existence with MoCA (Multimedia over Coax Alliance) specification is described.

(IS-2009-93) **How the Internet of Things, Social Networks & creative collaboration will shape future market structure**
This report from Harbor Research examines the parallels between the growth in social networking and networks of devices. Connected devices could potentially be anything that uses electricity. The author predicts, “In a collaborative device community, devices themselves can blog, send & receive messages, report status, share files and interact on a peer-to-peer basis along with humans.” A practical application is report product maintenance. This is described as a shift in information technology from “what happened” to “what is happening.” The benefits of collaborative development communities using social networks are explored.

(IS-2009-92) **Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S.**
This report from Electric Power Research Institute (EPRI) examines energy efficiency and demand response programs that could reduce the growth in electricity consumption. The goals are to reduce the annual growth in consumption through 2030 from the historical 1.7% to 0.83% and even 0.68% under an ideal set of conditions. Likewise EPRI examined the goals of reducing the summer peak demand from 2.1% historically to 0.83% and to 0.53% ideally. To achieve these goals by 2030 will require a total investment of $41 to $63 billion depending on the target growth rate.

This report from the David Susuki Foundation in Vancouver is a guide for companies of how to impact greenhouse gas emissions. Methods are proposed for measuring, reducing, and offsetting emissions. Examples of techniques used for emissions management by a variety of companies are presented.

(IS-2009-90) **The Ocean: The Next Frontier in Renewable Energy?**
This report from Greentech Media estimates the potential for generating energy from ocean activities. Ocean waves, current, and tides could supply 8% of the U.S. energy and 25% of the world energy. The ocean energy
industry is projected to reach 1 GW by 2016 with sales of $650 million per year. Capital costs are expected to decrease. Technical challenges are discussed.

(IS-2009-89) Assessment of Demand Response & Advanced Metering
This report from the U.S. Federal Energy Regulatory Commission (FERC) surveys the installation of AMI (Advanced Metering Infrastructure) systems and demand response from 2006 to 2008. AMI installation increased from less than one percent to 4.1%. National Rural Cooperative utilities had the largest increase in penetration levels to 16.4% in 2008. Demand response programs accounted for 5.8% of the peak in 2008. FERC is examining regulations to encourage AMI and demand response. Among these are regulations related to time-of-use rates, customer access to meter data, measurements of load reduction, and financial investments required for demand response.

This report from Environment Canada presents data on greenhouse gas emissions from 1990 to 2006. Emissions grew 22% during this period, which is 29% above the target of the Kyoto Protocol. However, the growth rate decreased by 2.8% from 2003 to 2006 as the service sector expanded and some technological improvements were introduced. The challenge is continue this decrease as population and economic activities increase.

(IS-2009-87) Jump-Starting Your EE Portfolio: Quick Start, Quick Return Energy Efficiency Programs
This report from the Edison Foundation describes a portfolio of programs for utilities to offer customers for achieving energy efficiency. Among these are appliance efficiency and recycling, demand response, lighting and consumer electronics improvements, plus commercial and industrial programs for lighting HVAC, and motors. The pros and cons of offering programs to suppliers versus customers are examined.

(IS-2009-86) Residential Electricity Conservation Through Smart Home Energy Management Technology: A Case-study in Milton, ON (Additional note)
This report is a refinement of a report of the same name based on analyzing consumer reactions to a home energy management system. The previous report was extended with an estimate for savings for a full year. The 90th percentile reduced consumption by about 20% and peak usage by about 23%, while the 10th percentile increased consumption by about 25% and peak consumption by about 24%. Overall, the result reported in the previous study should be modified from average consumption reduction of 19% to 16% and a peak consumption reduction from 24% to 18%.
(IS-2009-85) Residential Electricity Conservation Through Smart Home Energy Management Technology: A Case-study in Milton, ON
The University of Waterloo in Ontario examined how 123 consumers reacted to demand response events with the assistance of a home energy management system. Some consumers lowered consumption, while others did not. These households were compared to a control group without the energy management system. Of this who used the system, electricity consumption was reduced 4 to 14% overall, while peak consumption was reduced 5 to 23%.

(IS-2009-84) Analysis of the Waxman-Markert Climate and Energy Bill
This report from the Alliance to Save Energy (ASE) is a commentary on the energy bill being considered in June 2009 by the United States House of Representatives. It includes a cap on greenhouse gases with a provision for polluters to trade the right to pollute within the limits of the cap. The ASE claims that cap and trade is “the most significant energy efficiency policy ever implemented in this country.” Other provisions in the bill strengthen building codes, mandate 20% of electricity by 2020 come from renewables, and establish building, home, and appliance rating systems. Funding for energy efficiency is estimated at $3 billion per year from 2012 to 2050.

This survey from the Solar Electric Power Association surveyed the electric utility industry in early 2009 to determine how utilities were integrating solar electric sources into their grids. Solar power includes photovoltaics and concentrating solar power to a point where the heat generates power. The leading utility for total solar megawatts is Pacific Gas & Electric, while the total solar watts per customer is San Francisco Public Utilities Commission for municipal buildings. The top municipal utility was the Sacramento Municipal Utility District.

(IS-2009-82) Utility of the Future
This report from a 2008 KEMA, Inc. forum examines the challenges facing electric utilities. The need for a smart grid was discussed especially to accommodate power from renewable sources. Reduction of greenhouse gases was another major topic. A commissioner from the U.S. Federal Energy Regulatory Commission (responsible for the wholesale electric market) estimated that a $1 trillion investment in electricity generation, transmission, and distribution was needed. Other topics included advanced metering, electric cars, and building automation.

(IS-2009-81) Renewable energy country attractiveness indices
This survey by Ernst & Young rates national performance in developing renewal energy sources. The rating is weighted 75% for wind, 10% for solar, and 15% for biomass and other technologies. The U.S. Germany, China, India, and Spain lead the index in all renewables. Canada ranks ninth. The effects of the economic slowdown are discussed. Country-by-country performance is presented.
(IS-2009-80) Increasing Water Efficiency in California’s Commercial, Industrial, and Institutional (CII) Sector
This paper from the Natural Resources Defense Fund examines the long-term water supply in California. California is seeking to reduce per capita consumption 20% by 2020. The largest uses are office buildings, golf courses, and schools. The secondary benefits include lowered energy costs and the consequential effects on the environment, and improved fisheries. Policy changes to encourage water conservation are presented.

This report from the Energy Information Agency of the U.S. Department of Energy projects the world energy market through 2030. Usage will grow 44% with 73% of the growth outside the developed countries. Consumption of all fuels will grow. However, production of biofuels will increase six-fold. The effects of the current downturn that have reduced energy consumption are expected to end after 2010. Renewable electricity will be fueled by wind and hydro, but not solar unless subsidized. Electricity from nuclear plants will increase about 40%. Carbon dioxide emissions are expected to increase 39%. The 2030 oil price is projected at $130 with a low of $50 and a high of $200 per barrel.

(IS-2009-78) Development of an Operation and Maintenance Rating System for Commercial Buildings
This report from the University of Washington presents a study for the National Center for Energy Management and Building Technologies of the U.S. Department of Energy. This study created a rating system to quantify the performance of outsourced building operations and maintenance services. The ratings cover building energy usage; operation, maintenance, and functionality of the heating, ventilation and air conditioning (HVAC) systems; building occupant satisfaction; and building operation and management. Detailed survey forms are included in the report.

This is a thesis written by a masters student at the University of Waterloo in Ontario. The effectiveness of a home energy management system to reduce average and peak electricity usage is reported. The home energy management system presented time-of-use rates via the web and allowed users to choose their level of conservation. Control was exercised via a home gateway and X-10 control of thermostat, light switches, etc. Overall, about 3% load reduction and 13% peak reduction was achieved with about 3% shift in load to off-peak.
(IS-2009-76) Market failures and policy or policies' success
This publication from the International Energy Agency (IEA) focuses on the energy used by consumer electronics, including appliances, computers, and communications devices. The IEA is an inter-governmental agency of 28 countries including Canada and the U.S. Total energy use by these devices is expected to double by 2022 and triple by 2030. The IEA recommends government policies that encourage energy conserving products. They specifically recommend products that power only those functions active in the device.

(IS-2009-75) The U.S. Smart Grid Revolution - KEMA's Perspective for Job Creation
This study from KEMA, Inc. projects the impact of $64 billion in expenditures on smart grid projects from 2008-2012. About 278,600 jobs are expected to be created during this period. This paper surveys the transition of the electric utility industry to accommodate a smart grid. The smart grid will include advanced metering infrastructure (AMI), renewables, and increased reliability.

(IS-2009-74) Mobile Advertising: Buy In or Lose Out
This paper from Oracle examines the growing market for ads inserted in web pages delivered to mobile telephones. 23% of users click on such ads. This market may reach $1 billion by 2012 in the U.S. Methods of inserting ads in text messages are discussed. Billing options with ad subsidies are considered.

(IS-2009-73) Transforming the Market
This report from the World Business Council for Sustainable Development (WBCSD) examines energy used by buildings in Brazil, China, Europe, India, Japan, and the U.S. These countries account for two-thirds of energy consumption. Motivations to achieve energy reduction are needed beyond market forces. The report recommends incentives, integrated design, innovation, advanced technology, training, and an “energy aware culture.” They warn against complacency and false optimism. Case studies are included.

This study from the Peterson Institute for International Economics examines financial motivation for building manager to improve building efficiency. The goal is to achieve a 50% reduction in green house gas emissions by 2050. The researchers examined what would motivate the owners of residential and commercial building to make change to reduce emissions. A worldwide investment of $1 trillion per year is needed to achieve the goals. 83% of this investment will be paid back in 20 years through lower energy consumption. The authors conclude “Imposing a price for carbon alone will be insufficient to achieve the necessary emission reductions from buildings, and barriers to adoption must be addressed through building standards, fiscal spending, and new approaches for financing energy-saving design and technology at scale.”
(IS-2009-71) Bus-based Installation Technology in Residential and Commercial Buildings
The South Westphalia University of Applied Sciences in Germany conducted a market survey of opinions regarding building and home automation systems that use a communications bus. Most respondents favored this technology for increased comfort and convenience. Three-quarters of companies interviewed already incorporate this technology. Key applications are lighting, shading, and HVAC. The leading systems installed in Germany are KNX and LonWorks.

(IS-2009-70) Transforming Innovation into Market Growth: Digital Media
This report from Enterprise Florida surveys the impact of the conversions of media from analog to digital. A total of 4800 Florida companies are involved in game production, wireless and mobile data services, e-music, e-learning, and video production.

(IS-2009-69) Job Opportunities for the Green Economy
This study from the University of Massachusetts at Amherst examines the effect on employment of the expansions of industries that address global warming. The following areas were studied: building retrofitting, mass transit, energy-efficient automobiles, wind power, solar power, and cellulosic biomass fuels. Employment impacts in 12 U.S. states were studied. The conclusion is that workers with a wide range of skills can benefit from these growing industries.

(IS-2009-68) Evaluation Manual for Intelligent Building in Taiwan
This report from Taiwan explains the criteria used in Taiwan for labeling a building as “intelligent.” Various evaluation systems from Japan, China, and Europe are discussed. The following criteria are used: Information & Communication, Safety & Security, Health & Amenity, Energy Saving Equipment, Premises Distribution System (PDS), System Integration, and Facilities Management.

(IS-2009-67) The Economic Stimulus Plan and the Construction Industry
This report from the law firm of Akerman Senterfitt reviews the U.S. law passed in February 2009 that allocates $135 billion for building construction. Funds are available for transportation, federal buildings, energy projects, and water and environment projects. These funds are intended for “shovel ready” projects to stimulate employment. There are provisions in the law requiring states to make quick decisions about using the funds. Project announcements are found in fedbizopps.gov. This paper examines the Buy American provisions of the Act.
(IS-2009-66) Widgets drive mobile content consumption
This paper from Fiercewireless explores the use of widgets on mobile device to generate revenue. Widgets are icons that initiate light-weight applications such as a local weather forecast or information about a museum. The use of widgets tailored to the user can create brand loyalty to the phone maker and can draw users to advertisers.

(IS-2009-65) Energy Efficiency in Buildings: Transforming the Market
This paper from the World Business Council for Sustainable Development explores building efficiency in six markets: Brazil, China, Europe, Indian, Japan, and the U.S. Energy consumption for building operation was studied. Building operations account for 80% of the total energy consumed during the life cycle of the building that include construction and demolition. Buildings consume 40% of energy produced. The report proposes methods to reduce energy consumption sufficient to decrease carbon output by 77% by 2050. Codes, incentives, designs, and technologies to achieve this goal are discussed. Financial incentives alone are inadequate today; taxes and subsidies are recommended. The net cost is estimated at $250 billion per year in the six market studied.

(IS-2009-64) Accelerating Unified Communications with an Enterprise-Wide Architecture
This article from the Yankee Group explores unified communications in a business. Unified communications combines voice, video, data, and mobile communications. Data communications now include instant messaging, called presence. Voice should be implemented with VoIP (Voice over Internet Protocol). This integrated communication not only saves money, but also improves competitiveness. The writer recommends a corporate-wide system, rather than upgrades at each site to foster system integration. Incorporating the industry standards SIP for communications and XML for data description are proposed. Suggestions for selecting a supplier are presented.

(IS-2009-63) Meeting Aggressive New State Goals for Utility-Sector Energy Efficiency
This report from the American Council for an Energy-Efficient Economy reviews the response of utilities to state mandates for improved efficiency. It examines which states achieved the greatest improvement and the relevant factors that contributed to this increase. Data from the top 14 states are presented. The top three states were California, Massachusetts, and Connecticut. Important factors were funding for energy efficiency programs and strong requirements for complying. No states have achieved the expressed goal of 1.5-2% increase in efficiency per year. The programs implemented by the successful utilities are reviewed.
(IS-2009-62) Micro-CHP Accelerator
This paper from the Carbon Trust analyzes the benefits of small combined heat and power (CHP) systems in both commercial and residential buildings. Some of the results found: best savings are with long consistent heating periods; can save 15-20% of carbon emissions in commercial applications; there is a need for skilled operators; can save 5-10% of carbon footprint for older large houses and insignificant savings in newer small houses. The report recommends a policy that considers the installation environment. Devices with increased power generation efficiency should be considered.

(IS-2009-61) Economics of Emerging Electric Energy Storage Technologies and Demand Response in Deregulated Electricity Markets
This 2008 Ph.D. thesis from Carnegie Mellon University explores energy storage techniques and demand response for large users. Two storage methods were explored: battery and flywheel. The flywheel is 90% efficient with a much longer life than a battery and could be justified economically. The demand-response program provided a subsidy for load reduction when costs were high.

(IS-2009-60) Manufacturers in the Residential Systems Market Identify Market Opportunities and Constraints
This survey from Stiernberg Consulting examines the challenges to expanding markets for consumer products. Manufacturers of audio, control, automation, AV networking, video, media storage and management, wire/cable, lighting, furniture, racks, and accessories were questioned near the end of 2008. The top challenges were pricing pressures and shrinking margins, long product development cycles, limited talent, and new competition. Competition includes the entry of big-box retailers into the installation market. On a positive note, the economy problems are keeping people home and demanding more entertainment.

This article by the International Facility Management Association provides recommendation for strategic planning techniques for facilities management. The general method involves understanding, analyzing, planning, and acting. Costing issues are discussed. A strategic plan should consider life-cycle costs for buildings.

(IS-2009-58) Carbon Footprinting
This paper from the Carbon Trust provides a guide to estimating the carbon footprint or an organization. The carbon footprint is defined as “The total set of greenhouse gas emissions caused directly and indirectly by an individual, event or product.” An organization is responsible for carbon emissions via the company buildings, the
consumption of electricity, and the transportation required for goods and people. A method for calculating the carbon footprint is presented.

(IS-2009-57) Building Fabric - Energy Saving Techniques to Improve the Efficiency of Building Structures
This paper from the Carbon Trust provides practical advice for reducing heat losses by rehabilitating the ceiling, walls, windows, floors, and doors of a building (called the “building fabric”). About a 10-15% of energy is wasted through heat losses via the building fabric. Techniques for improving the building fabric are presented.

This 2008 Ph.D. thesis from Carnegie Mellon University explores the justification, costs, impact, and customer acceptance of technique for demand management of electricity. Studies of customer responses to time-varying pricing are reviewed. An economic analysis of the cost of providing peak supply versus customer willing to pay for a reliable electricity supply is presented. The cost of an advanced metering infrastructure (AMI) to support time-varying pricing versus the cost of peaking generators is explained. About 10-15% reductions in peak can be achieved with modest programs, although some customers will see increased bills. Also, installing AMI is not cost-effective for small customers.

(IS-2009-55) Combined Heat and Power for Buildings
This paper from the Carbon Trust explains how to use a single plant in a building both to generate electricity and to provide building heat from the excess heat of the generator. This scheme utilizes 90% of the energy supplied to the generator. Such units need to be operated about 5000 hours per year to be economical. Various sizes of combination power and heat units are discussed. An example installation at a university saved about 14% in energy costs with an up-front cost of about $800,000. These units may be installed for standby power generation.

(IS-2009-54) Making the Business Case for a Carbon Reduction Project
This paper from the Carbon Trust provides practical advice for convincing corporate decision-makers to support company projects that reduce carbon. For example, start with a small project or a trial, generate success, and build on this success. Financing and risks should be presented to management.

(IS-2009-53) Low Carbon Refurbishment of Buildings
This paper from the Carbon Trust provides practical advice for reducing the carbon footprint of commercial buildings. It specifically provides guidance for the rehabilitation of existing buildings to mitigate carbon in the U.K.
Rehabilitating without considering carbon may result in increased emissions. Issues such as the building envelope, lighting, heating and cooling, and office and food equipment are discussed.

(IS-2009-52) Air Conditioning: Maximising Comfort, Minimising Energy Consumption
This paper from the Carbon Trust provides practical advice for reducing the cost of air conditioning commercial buildings. It also presents methods in building design to minimize the need for air conditioning. Air conditioning technology is summarized. A checklist for building managers is included.

(IS-2009-51) Global Carbon Mechanisms
This paper from the Carbon Trust explores methods used to reduce carbon emissions. As carbon trading credits grow, new mechanisms to encourage practices that reduce emissions are needed. The appropriate pricing of carbon emissions to continue the scheme and to benefit developing countries are discussed. Detailed economic analysis in presented.

(IS-2009-50) Achieving 30% and 50% over ASHRAE 90.1-2004 in a Low-Rise Office Building
This study by ConSol attempted to reduce energy consumption is a low-rise four story 95,000 square -foot building by 30-50% below the ASHRA 2004 level. They were able to achieve only a 15-23% reduction with about a 10-year payback period. The study was done using energy simulation software from the U.S. Department of Energy. The simulation was conducted for the climates in thee cities: Newport Beach, California, Baltimore, and Chicago. Energy efficiency was achieved with improvements in insulation, glazing, lighting, HVAC, and the use of photovoltaics. Greater improvements would require “a design approach that analyzes buildings as holistic systems rather than as disconnected collections of individually engineered subsystems.”

(IS-2009-49) Clean Energy Trends 2009
Clean Edge, Inc. tracks the implementation of the market for clean technologies for energy annually. This study for 2009 projects almost a tripling of markets for biofuels, solar, and wind in10 years. However, retrenchment is expected in 2009 because of the economic recession. Governments are now investing more in this sector. The following five trends were identified: smart grid, storage technology, development of clean energy markets, grid infrastructure improvements, and micropower grids.

(IS-2009-48) Geared for Change - Energy Efficiency in Canada's Commercial Building Sector
This paper is joint development of The National Round Table on the Environment and the Economy (NRTEE) and Sustainable Development Technology Canada (SDTC) about reducing the carbon footprint of commercial buildings. The NTREE seeks to reduce carbon emission by 58% less than the projected output in 2050 if there
were no change. The focus is on clustered buildings that are highly efficient. Achieving this goal requires industry commitment and “stringent regulations.” Buildings should be considered in the context of the city and transportation. Policies will be needed on energy pricing, command and control regulations, subsidies, and information programs. Policies in other countries are reviewed.

(IS-2009-47) Smart Grid: A Practical View
This paper describes some of the features of an electric smart grid. A smart grid overlays information technology on the elements of the electric grid. Losses of electricity (conversion to wasted heat) may occur due to faults to ground and resistive transmission pathways. The grid needs to be monitored for these faults with a distributed communications network, similar to a cellular telephone network. An Internet Protocol-based network is recommended.

(IS-2009-46) Sony Online Entertainment Realizes an Estimated 50% IRR on Its Service Strategy
This article summarizes the methods used by Sony to provide customer support for game products. Sony purchase specialized software to provide details about customer problems during game play. The integration of customer support into the game business at Sony is described with a summary of takeaways to benefit other companies. Sony was able to achieve a 50% return on the investment in this new system for customer service.

(IS-2009-45) Lighting the way: Understanding the smart energy consumer
This paper from IBM is a survey of 5000 consumers about their attitudes toward energy management. Cost is a key motivating factor for consumers to manage energy and to change patterns of usage. 65-75% of consumer said that environmental factors are important. Various demographic groups were analyzed. Consumers question the potential savings with a smart meter, unless the savings are guaranteed.

(IS-2009-44) How to Design a Solar-Powered Computing Device
This paper from Intel describes applications of solar power supplies built into computing devices. Examples include routers in remote locations, sensors, data acquisition, and femtocells (for extending cell phone networks). Power management is important in the design of such devices to minimize the solar collector size and power storage required.

(IS-2009-43) Strategies for Smart Services
This paper from Harbor Research discussed companies shifting from selling products to selling services. Services are facilitated by embedded intelligence in products. Examples from manufacturers are presented. The effect of this shift is explained: “When products become networked, the predominant value shifts from the product
itself to the experience of owning and using the product inside an ‘aware,’ responsive support environment.” The business value of interconnecting products is discussed.

(IS-2009-42) Designing the Future of Information
This paper from Harbor Research explores two approaches to applying the Internet for interconnecting devices. Work from Maya Design, called Internet Commons, and from the MIT Center for Bits and Atoms, called Internet 0, are presented. Both are important for what Harbor Research calls “The Pervasive Internet.” The Internet Commons facilitates data fusion using a markup language called RDF (Resource Description Framework) as part of a new Information Device Architecture (IDA). Internet 0 is a version of the Internet suite of protocols intended for embedding in low cost devices.

(IS-2009-41) Securing the Future
This paper from Harbor Research presents the challenges of providing network security when the Internet interconnects devices. They maintain that the client-server model of the Internet needs to be changed for machine-to-machine communications. Between 500 million and one billion devices are expected to be interconnected by 2010. A framework for data security needed for machine-to-machine communications is presented.

This report from Lawrence Berkeley National Labs examines cost trends for photovoltaics used to supply power. The average cost has dropped from $10.50 in 1998 to $7.60 in 2007 (in 2007 dollars). Costs are about 1/3 less for systems above 750 kW and for new installations compared to retrofits. A total of 10,600 MW of photovoltaic power has been installed worldwide. The leaders in installations are Germany, Spain, Japan, and then the U.S. The methodology for collecting data about installations is presented along with the findings. The motivations for installations are driven by government incentives. U.S. investment tax credits are expected to spur the installation of residential photovoltaics.

This paper by RSA introduces the security challenges for cloud computing. Cloud computing is the replacement of in-house corporate IT with services rented from a third party using server accessed via the public Internet. The need for increased data security before enterprises move to cloud computing is discussed. Enterprises are tempted by lower IT cost, but need to consider the liability for breaches to achieve security mandated by various regulations.
(IS-2009-38) Highlights of the 2009 International Solid State Circuits Conference (ISSCC)
This is a summary from Digdia of developments in solid state electronics presented at a conference. Among the highlights are LEDs for LCD TV illumination, mobile phone electronics for Internet and TV access, cameras, power reduction dynamically to unused circuits, and chips that can access a variety of radio networks.

This brochure from Onset Computer Corporation explains how to assess the local environment at a wind generator. Appropriate sensors for temperature, wind speed, and wind direction plus data loggers are described. Accessing the data collected by the data logger using a communications network is discussed.

(IS-2009-36) Monitoring Physical Threats in the Data Center
This paper from APC Schneider Electric examines security threats to data centers. These threats include excess temperatures, water leaks, intrusions, harmful air quality, smoke, and fire. The placement of sensors, aggregation of sensor data, and reporting problems are discussed.

(IS-2009-35) Sales 2.0: How Businesses are Using Online Collaboration to Spark Sales
This investigation by TheTechCollective assesses the impact of Web2.0 interactions on the Internet to enhance the selling process, called Sales 2.0. Web 2.0 enables sharing and collaboration. A new technique of combining applications called mash-ups is discussed. When applied to sales it fosters collaboration within companies and with customers. A survey of companies using these new tools is presented. About 25% are using social networking tools such as LinkedIn, Facebook, Myspace, Twitter, and Jigsaw to enhance the sales process.

(IS-2009-34) Inquiry Insights: Client Virtualization, Q3 2008
This paper from Forrester Research explores the value of providing a virtual desktop for working outside the office. These people may be using a portable computer when traveling or working from home. Vendors of desktop virtualization software are reviewed. Application virtualization allows applications to run on a foreign machine without interference from other software on that machine.

(IS-2009-33) Shaping the ICT research and innovation agenda for the next decade
This paper from the European Commission explores the role of the European Union in fostering developments in the ICT (Information and Communications Technology) industry in Europe. Important applications of ICT include energy efficiency, environmental sustainability, and health and social care systems. Proposals for tax incentives and public financing of R&D are discussed. 565 persons were surveyed for this report. The top services were
web-based and the top consumer markets were access to information, social networking, and on-line administration. There was strong support for the public sector to adopt innovative ICT solutions.

This paper from the Rocky Mountain Institute explores how U.S. states use power generation efficiency as a resource. The U.S. could save 1.2 gigawatt-hours annually (30% of usage) if all states were as efficient as New York. Electric productivity was defined as $GDP/kWh normalized for various factors such as mild climates, economy, rates, culture, etc. The top ten states were New York, Alaska, Connecticut, Delaware, California, New Jersey, Massachusetts, Rhode Island, New Hampshire, and Colorado. The methodology for this study is explained.

(IS-2009-31) Cleantech Growth & Go-to-Market Report
This report from Sustainability Development Technology Canada (a foundation with government support) describes best practices and business opportunities for a clean technology industry in Ontario. This organization gives grants for “projects that address climate change, air quality, clean water, and clean soil” and “demonstration-scale facilities for the production of next generation renewable fuels.” Opportunities for Ontario companies to develop clean technologies and to market them beyond Ontario are discussed. In 2008, 2600 companies generated $7 billion and employed 65,000 people in clean technology.

This paper from the Government on Ontario explores plans for mitigating green house gas emissions. Discussed are a Cap-and-Trade program and harmonization with programs in Quebec and North America. The dangerous gases include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, petrofluorocarbons, and sulphur hexafluoride. Ontario and Quebec expected to start a Cap-and-Trade program as soon as 2010. The mechanism for this program is presented with the goal of an absolute reduction in greenhouse gases. The program is expected to be expanded to more Canadian provinces and U.S. states.

(IS-2009-29) Internet of the future: Europe must be a key player
This presentation by a European Union commissioner explores the role of the European Union (EU) in enhancing the Internet. Topics discussed include privacy, security, and governance. The drivers of the Internet are social networks, the Internet of Things (including cloud computing), and the mobile Internet. Social networks are expected to impact business. The Internet can help engage citizens in politics. The EU will focus on the openness of the Internet through “Net Neutrality” and standards, globalization, and economic investments in the Internet.
(IS-2009-28) Tomorrow's Markets
This survey by the owner of the Economist magazine and the U.K. government explores business opportunities in the emerging markets of Brazil, China, Indian, and Russia. 561 executives from 19 countries were questioned. Growth in the emerging markets is expected to offset declines in Europe and North America. The highest growth expectations are in China and India. The next set of emerging nations includes Vietnam, Mexico, the United Arab Emirates, and the Ukraine. Obstacles in emerging markets are legal and regulatory institutions, corruption, and poor infrastructures.

(IS-2009-27) Optimizing Users And Applications In A Mobile World
This report from Forrester Consulting is a survey of about 300 companies worldwide on how IT is adjusting to serve mobile workers away from the office. 63% of those surveyed use mobile connections with 55% via Wi-Fi hotspots. 45% now work from home full time for the companies surveyed. The greatest complaint received by IT help desks is application performance, rather than computer hardware and operating system issues. The VPN (Virtual Private Network) is the prevalent technology for accessing the company servers. Suggestions for improving wide area network communications are provided.

(IS-2009-26) Ubiquitous Broadband: The Future of Global Connectivity
This paper from the Yankee Group describes the size and penetration of the broadband market for Internet access and provides growth projections. The current market is $590 billion annually with the greatest penetration in Japan (89%), Sweden (86%), the Netherlands (81%), and Italy (79%). The market is expected to reach $903 billion by 2012 with ubiquitous access in Asia, Europe, and the U.S. Broadband is defined as Internet access at least 500 kbps or wireless connections via 3G or better. North America lags Europe because of lower 3G wireless availability. The leading countries in 2012 will be Sweden, Italy, the Netherlands, and the U.S.

(IS-2009-25) Ticket to success: escalators in entertainment venues
This paper by Schindler Elevator Corporation explains the parameters for designing escalators for public entertainment structures. The peak volume of people to be moved before and after the event is a key parameter. Also important in the design is accommodating a location exposed to the weather. Technical considerations include escalator placement for multiple floors, motor size (based on anticipated crowd size), color of escalator materials, and noise.
(IS-2009-24) UPnP Technology - The Simple, Seamless Home Network
This brochure from the UPnP Implementers Corporation is a promotional piece for UPnP. It provides an overview of the UPnP Forum and the UPnP Implementers Corporation, and announces that UPnP has been approved as an ISO/IEC standard. A very brief overview of the UPnP networking and control method is included.

(IS-2009-23) Automated Demand Response Cuts Commercial Building Energy Use and Peak Demand
This summary from Lawrence Berkeley Laboratory describes AutoDR. AutoDR is a demand response system for buildings that delivers data about a supply event requiring energy reduction. Energy management systems in building query a utility server for event notices. They then manage local energy consuming equipment, such as air-conditioning equipment and lighting in response. The objective is to shed load so the utility can tailor the demand to the available supply of electricity.

(IS-2009-22) CES 2009 – Top 10 Trends
Digdia presents a summary of key innovation at the 2009 Consumer Electronics Show (CES) held January 2009 in Las Vegas. Among the products noted are LCD TVs that are back lit with LEDs for improved contrast, 3D TVs, and TVs with on-screen short cuts (widgets) to Internet-based information. Many products promoted “green features.” Computer projectors small enough for embedding in a phone are coming. Flash memory is replacing tape and disks for camcorders. Digital photo frames are becoming a very competitive market. Netbooks, sized between a laptop and a PDA, are seeking market share. Mobile TV is growing.

(IS-2009-21) A Recent Whitestone Study of Energy-Saving Retrofits has Lessons for Other Green Projects
This overview of a report from Whitestone Research examines how to achieve U.S. federally mandated energy savings in older buildings. A key issue is initial investments versus life-cycle costs. A detailed analysis showed that a high initial investment saved money over 40 years. It included such features as a roof garden, triple-glazed windows, and a heat recovery chiller. Not all investments have the same or even positive returns. More research is needed.

(IS-2009-20) A U.S. Innovation Strategy for Climate Change Mitigation
This report from the Brookings Institution proposes fiscal and government investment policies for reducing greenhouse gasses (GHGs). Recommendations include establishing a price for GHGs, research and development tax credits, and public support for university and private sector research. An expenditure of $8 billion per year through 2016 for this research is proposed. The U.S. government currently funds 59% of the basis research in universities, non-profits, and government labs. The cost to stabilize GHG emissions is 0.2 to 5 % of global GDP, depending on the targeted GHG level. The U.S will bear about 25% of this cost.
(IS-2009-19) ZigBee Resource Guide
This guide from the ZigBee Alliance is a promotional magazine for ZigBee. It includes ads from ZigBee suppliers and summaries of market potential for ZigBee products. Applications of ZigBee for energy conservation and energy management are described.

(IS-2009-18) ICT & Ageing – European Study on Users, Markets and Technologies
This report from the European Commission discusses telehealth and telecare in Europe. The implementation of telehealth and telecare for an aging population at home is just starting. The potential benefits are not yet recognized by policy service providers and practitioners. More data and education are needed. Large-scale trials are recommended. Issues of privacy and surveillance needed to be addressed. Also, the quality of care, outcomes, and economics must be considered. Telehealth and telecare are based on ICT (Information and Communications Technologies). ICT can impact mobility, social care, health care, and housing. Current technology focuses on a portable alarm device to call for help. Telehealth could benefit 25-60% of older ill people. Services among the European Union countries are reviewed with information about Japan and the U.S. included.

(IS-2009-17) Users’ Guide to Green Performance Contracting
This is working draft report from the non-profit Leonardo Academy investigating how to factor sustainability into performance contracts for upgrading a building. These contracts are intended for upgrading public buildings without expending capital improvement budgets. Long-term energy savings can justify incremental increases in first costs for improvements. Business methods for selecting a contractor are presented.

This 2008 annual white paper from the non-profit Leonardo Academy examines the cost of implementing LEED in an existing building and the cost of operating the building. LEED is the Leadership in Energy and Environmental Design Green Building Rating System. Data are based on 13 respondents. Total costs were about $1.50 to $2.00 per square foot for LEED certification. For most buildings surveyed the operating costs were lower than the average, per statistics of BOMA (Building Owners and Managers Association).

(IS-2009-15) How to Assess the Carbon Footprint of Goods and Services
This is a summary of a publicly available specification from the British Standards Institution (BSI) for determining the carbon footprint in a supply chain. The carbon footprint is a measure of greenhouse gas emissions. The specification, PAS 2050, provides guidance to companies and tools for calculating emission and “prioritising opportunities to reduce emissions.” A process for selecting a product to evaluate and performing the carbon footprint evaluation is presented. This may include consideration of raw materials, manufacturing, distribution,
sales, customer user, and disposal. Methods for calculating and reducing the carbon footprint are presented for a hotel and a food producer.

This report from the British Standards Institution summarizes PAS 2050 (Publicly Available Specification). PAS 2050 defines a method for assessing the life cycle greenhouse gas (GHG) emission of goods and services. Measurement techniques for GHGs are presented. GHG offsets are not to be included. A consistent method for considering the life cycle of products from raw materials to disposal in considered. Procedures for claiming conformance with this PAS are described.

(IS-2009-13) CB Richard Ellis Conference Report
This report from the non-profit Leonardo Academy describes the Cleaner and Green® program for evaluating greenhouse gas (GHG) emission. Offsets to the GHG emissions from holding the 2007 CB Richard Ellis Conference in Toronto are described. The largest source of GHGs was travel, which was partially offset by renewable energy certificates purchased from Community Energy. Renewable Energy Credits fund renewable energy projects that reduce fossil fuel emissions.

(IS-2009-12) The 2007 Leonardo Academy Sustainability Survey Report
This 2007 report from the non-profit Leonardo Academy surveyed 408 commercial, non-profit, and governmental organizations in North America and Asia about sustainability. Sustainability is important for 90% of the respondents; 45% were developing a sustainability plan. Most do not track their emissions, but plan to and almost half are offsetting greenhouse gases. Only 10% own LEED-certified buildings, but more than half plan to retrofit to LEED standards within a decade. More than 60% are using sustainability standards in procurement.

(IS-2009-11) Bright Green Buildings: Convergence of Green and Intelligent Buildings
The Continental Automated Buildings Association has released of a comprehensive report on “bright” green buildings. “Bright” green buildings leverage intelligent technologies to support environmental sustainability while providing a significant return on investment (ROI). The report features several real-world examples that show how property companies around the world have employed advances in green building and networking technologies to increase profits, lower costs, and help the environment.
State of the Connected Home Market Study
In one of the more striking examples of cross-industry collaboration, 10 top companies – Whirlpool Corporation, Bell Canada, Cisco Systems, Direct Energy, Hewlett-Packard Company, Leviton, Microsoft, Procter & Gamble, Legrand and Zensys/Z-Wave teamed up to conduct one of the most in-depth studies ever launched into the state of the connected home. Consumers were most interested in an easy, seamless way to integrate all their smart home devices from mobile to TV to appliance. This research is a follow up to the previous State of the Connected Home studies that were completed in 2003 and 2005 by CABA’s Connected Home Research Council.

Green Building Impact Report 2008
This report from Greener World Media assess the impact of U.S. Green Building Council LEED (Leadership in Energy and Environmental Design) Green Building Rating System. The impact on land, water, energy, material, and indoor environment is considered. LEED is impacting about 5% of the new construction building market with another 30% starting the registration process for LEED certification. LEED buildings consume about 25% less energy than non-LEED buildings. However, the expansion of building floor area is leading to a net increase in energy consumption. LEED is hoping for a zero increase by 2015 or 2020.

Ontario’s Chief Energy Conservation Officer Annual Report 2008
This report from the government of Ontario outlines a strategy for encouraging energy conservation. Topics include energy conservation in government buildings and encouragement for conservation in private buildings and multi-family residential buildings. Electricity billing to individual tenants is recommended. The goal is to reduce the electricity peak in Ontario by 6300 MW by the end of 2025. Opportunities for leadership in energy conservation by the government are discussed. Conservation projects throughout the province are presented.

Building Information Modeling
This report from McGraw Hill Construction is a market survey of the acceptance and use of Building Information Modeling (BIM). The survey was conducted among 23 construction industry organizations including the U.S. Army Core of Engineers. BIM is being adopted from the bottom-up in the construction industry. 62% said they will be using BIM in 30% of projects in 2009. The benefits of BIM include coordination of software and project personnel and improved productivity, communication, and quality control. More training, management acceptance, and lower costs are needed. BIM is defined as “The process of creating and using digital models for design, construction and/or operations of projects.” BIM can impact green buildings. Numerous case studies are included.
(IS-2009-06) Game Consoles and the Emerging Over-the-Top Video Opportunity
This report from The Diffusion Group examines developments enabling delivery of services that compete with Pay TV. Some require dedicated set-top box equipment. Some may be built into televisions. Some may be combined other equipment such as TiVo or the Xbox360 gaming console. Another possible solution links the PC with the TV via an adapter. This report examines how incumbent Pay TV providers can compete with video delivery via broadband Internet.

(IS-2009-05) e-Government and e-Participation
This report from the European Union examines the impact of information and communications technology on the operation of government and the delivery of services. The goals are to improve government effectiveness, efficiency, transparency, and democracy. E-Government is hoped to bring government services to the isolated, the poor, long-term unemployed, the elderly, and people with disabilities. Examples across Europe are presented.

(IS-2009-04) Improving America’s Hospitals
This report from the Joint Commission, a not-for-profit organization that accredits hospitals, assesses the improvements in patient care from 2002 to 2008. It shows improved care for heart attack, heart failure, and pneumonia patients. Compliance by hospitals with Joint Commission quality guidelines is reviewed. The report notes significant variations in hospital quality. Details and methodology are presented.

(IS-2009-03) Big Trouble with No Trouble Found: How Consumer Electronics Firms Confront the High Cost of Customer Returns
This report from Accenture analyzes the growing phenomenon of consumers returning technology products that they think are broken but actually work (about 2/3 of returned consumer electronics). Returns cost manufacturers 5-6% of sales and cost retailers 2-3% of sales. The cost breakdown of returns is 29% for warranty repairs and 20% for processing products with no problems. The remaining major cost is 33% for scrapping the product. This report discusses improved customer education and more efficient processing of “No Trouble Found” products. Consumers will devote an average to 20 minutes to getting a product to work. A “set-up concierge” is proposed to help customers with installation problems. Also, built-in remote diagnostics and customer-assistance are recommended.

(IS-2009-02) Low Carbon, High Growth: Latin American Responses to Climate Change
This report from World Bank examines how Latin America can reduce carbon output even during an economic slump with falling oil prices. Climate change is already affecting temperatures, rainfall, and sea levels of Latin
America. The net effects have been negative. The impacts on the various countries are presented. Policies for growth with low carbon output are discussed.

(IS-2009-01) 10 Best Practices for Online Merchandising
This brochure describes how to create an effective web site for retail merchandising. Two techniques are described: user navigation and user search. About half of shoppers prefer to navigate through a site, while half prefer to search for a particular product. A search technique needs to help customers who do not provide enough specificity so they can locate the desired product. If a search fails, alternate products should be offered. Merchandizing zone techniques on a Web site are discussed for moving selected products, product lines, products with high inventory, or products with high margins.

(IS-2008-154) Mobile Broadband in North America and Europe; Change is Key to Continuing Profitability
According to Parks Associates accessing broadband Internet via mobile devices is growing very fast in Europe and North America. The average monthly bill is $37. This provides business opportunities for telecom companies and consumer electronics makers of cell phones, netbooks (small dedicated laptops), and media players (such as mobile TV). Most applications started with texting and some web surfing, and are moving toward streaming video, music, and games. Carriers tend to price by bandwidth offered. Typically, a mobile phone uses less bandwidth than a mobile PC netbook. High charges for bandwidth and for total data transferred can limit growth. Parks recommends more refined pricing policies.

(IS-2008-153) e-Health Opportunities for Global Service Providers
Parks Associates looks at the need to shift health care from acute to preventive care to deal with the growing elderly population. This paper explore how telephone and Internet companies can participate in offering e-health services as a revenue supplement to selling broadband access. Selling health care services requires the companies to understand the health care industry and to develop a more personalized relationship with customers. Examples are provided. Remote health monitoring will be used by 7.2 million customers in North America and Europe by 2012 (500,000 in 2008).

(IS-2008-152) Virtual Worlds and Social Media
This Parks Associates paper introduced virtual worlds, a computer simulation environment where users are represented by avatars that interact with each other. The most popular application is in gaming, where 10% of teenagers pay in virtual worlds. As these youths move to adulthood, will they expect virtual worlds in Internet communications, social networks, and e-commerce? Virtual world developers are exploring interoperability
among virtual worlds. Virtual world does not have much presence in the adult world because “virtual world has yet to find the best intersection between entertainment, socialization, and community features.”

(IS-2008-151) No Way to Regulate: Mobile TV in Europe
This report from Parks Associates considers the pros and cons of public regulation of radio spectrum technology. It notes the success of GSM as a unified cell network mandated in Europe, while explaining the challenges of a uniform 3G (cellular data network) and DVB-H (TV to cell phones and PDAs). DVB-H is termed a mistake because of the difficulty of offering roaming services with broadcasts in the user’s language.

(IS-2008-150) Know Thy Customer: Customer Analytics to Drive Value-added Services
This paper from Parks Associates examines value-added services that Internet service providers (ISPs) might offer to enhance revenue beyond delivering broadband access. Some companies offer trouble-shooting, but miss the opportunity to sell other services while fixing a PC. Serving a home network is a growing business area. Parks proposes custom analytics: a database to help ISP customer service sell additional services based on individual customer needs to enhance revenue, reduce churn, and reduce costs. An example of how this can be done is presented from HiWired, a company that provides support for the digital home. Parks recommends “holistic digital home support.”

(IS-2008-149) 2008 Wireless Attitudes Study
This market study by the Canadian Wireless Telecommunications Association surveyed adults and teenagers to determine wireless usage in Canada. 72% of Canadian household (highest in Alberta) have cell phones in 2008; 6% use cell phones exclusively at home, while 19% are considering this change. The highest penetration of cell phones is in the age range of 18-34. Applications of cell phone are 61% for personal and 27% for business with more business use among those over 34. Cell phones rank third in importance after computers and Internet access. The most popular cell phone feature was text messaging followed by picture taking. Only 4% download music to the cell phone. The cell phone is not considered a replacement for an MP3 player. Digital camera, or video camera by more than 90% of respondents.

This report from the U.S. Army details progress in the Army Strategy for the Environment (ASE). Performance environmental data from 2004-2007 are presented. The Army seeks to lower the impact of operation on the environment and the community. About $1.5 billion was spent in 2007 on environmental funding. Summaries of various programs are provided in areas such as recycling, hazardous waste, toxic release, compliance with LEED, management of energy and water usage, energy star-compliant HVAC equipment, and fuel cells.
(IS-2008-147) Network Technology Integration Drives Business Success
This brochure from Cisco Systems explains the advantages of integrating data, voice (VoIP – Voice over Internet), and wireless services on one network. An advantage of an integrated solution is the ability to control the Quality of Service and multi-level security. The paper discusses unified WiFi and cellular service.

(IS-2008-146) When Worlds Collide: The Convergence of Physical and Logical Security
This is an introductory document from Honeywell about the motivation to integrate security for physical access and data access. The paper discusses a mandate by the U.S. government for identification verification. Spend in the area is expected to increase from about $700 million in 2005 to $7 billion in 2008. A suggested list of actions for integrating physical and data security is provided.

(IS-2008-145) Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy
This report from the University of Massachusetts proposes government research programs to investigate a “low carbon economy” while stimulating job growth. The proposal calls for an investment of $100 million in retrofitting buildings to improve energy efficiency, expanding mass transit and freight rail, constructing “smart” electrical grid transmission systems, wind power, solar power, and next-generation biofuels. These research grants would be supplemented with federally guaranteed loans for private-sector investments in energy efficiency and renewable energy. About two million jobs would be created and imports for household expenditures would be reduced about 60 per cent.

(IS-2008-144) Carbon Disclosure Project 2008 - Canada 200
This report from the Conference Board of Canada discusses a survey of company actions regarding climate change risks and opportunities, greenhouse gas accounting, and greenhouse gas management strategies. Information was gathered from 55 per cent of the 200 Canadian companies surveyed. More than 80 per cent see climate change as a risk. The future cost of carbon emissions is being factored into capital expenditures by 44 per cent of respondents. This was part of a worldwide survey of 3000 companies with responses from 1550 companies. Survey details from Canadian companies are included.

(IS-2008-142) Towards Carbon Neutral Industrial Facilities
In March 2008, leaders from Eaton Corporation, CABA and Carnegie Mellon’s Center for Building Performance and Diagnostics conducted a visioning workshop to explore approaches to carbon reduction for manufacturing
facilities. The workshop resulted in a research report outlining a number of recommendations as critical to achieving carbon reductions and ultimately carbon neutrality for the manufacturing sector.

(IS-2008-141) 311: The Next Wave
This report from Harvard University explores a telecommunications method for government agencies to communicate with citizens. “311” is a telephone exchange reserved nationwide for non-emergency calls to the government. It can become a single portal for citizens to access government services. Possible benefits and problems with the 311 system are discussed. A key issue is proper training at the 311 call-center.

(IS-2008-140) Net-Zero Energy, High-Performance Green Buildings
This report from the U.S. National Science and Technology Council described plans for Federal R&D into efficient buildings that on average consume no power. This R&D effort was mandated by Congress in energy laws passed in 2005 and 2007. Current technologies can reduce energy consumption in buildings by 30-50%. Commercial buildings consume about 40% of national energy and account for 40% of greenhouse gasses. Also addressed are occupant health and indoor environmental quality. Methods for disseminating research results to industry are presented.

(IS-2008-139) National Water Program Strategy: Response to Climate Change
This report from the U.S. Environmental Protection Agency (EPA) describes the impact of climate change on water resources and possible reactions. Climate change may bring warming air and water, change in location and amount of rain and snow, increased storm intensity, sea level rise; and changes in ocean characteristics. The EPA is pursuing mitigation, adaptation, and research. The EPA has established five strategic goals to address these issues: Water Program Mitigation of Greenhouse Gases, Water Program Adaptation to Climate Change, Climate Change Research Related to Water, Water Program Education on Climate Change, and Water Program Management of Climate Change.

(IS-2008-138) The Smart Grid: An Introduction
This report from the U.S. Department of Energy introduces the concept of the Smart Grid for electricity. The Smart Grid in intended to transform the electric grid on a scale comparable to the change wrought by the interstate highways and the Internet. In additional to reliability, grid issues include energy efficiency, environmental impact, and customer choice. The Smart Grid is a two-way flow of electricity and information. Two-way electricity accommodates locally generated power such as wind and photovoltaics. Characteristics of a Smart Grid include intelligent, efficient, accommodating, motivating, opportunistic, quality-focused, resilient, and “green.” Examples of Smart Grid projects are presented.
This paper by the U.S. Environmental Protection Agency is an annual report on developments and trends in the U.S. wind power market covering 2007. The U.S. added more than 5000 MW of wind power bringing the total to almost 17,000 MW, the largest increase in the world. (Total world increase was 20,000 MW.) About 14% of wind generators are on the electric grid. At this rate of increase, 35% of power would come from wind by 2035. The largest number of new wind generators was installed in Texas. Xcel Energy has the largest wind capacity, while Minnikota Power Cooperative (Minnesota and North Dakota) sells 11% of total power output from wind. GE Wind is the largest U.S. turbine maker.

(IS-2008-136) Windvision 2025: Summary
This paper is a summary version of the Windvision 2025 Backgrounder on Wind Energy report. This paper by the Canadian Wind Energy Association describes wind projects planned in Canada through 2025.

(IS-2008-135) Windvision 2025: Backgrounder on Wind Energy
This paper by the Canadian Wind Energy Association describes wind projects planned in Canada through 2025. Wind power worldwide accounted for 94,000 MW in 2007 and is expected to reach 500,000 MW by 2020 with a global investment of $1 trillion. Canada generated about 1900 MW in 2008. The largest generating country is Denmark and the fastest growing country is the U.S. Wind generation costs will become favorable as the price of oil increases and carbon emissions are charged. The Canadian Wind Energy Association has set a target of 20% power from wind generation by 2025 (the current level in Denmark). This will require 22,000 wind turbines in 450 locations generating 55,000 MW and an investment of $132 billion employing 52,000.

(IS-2008-134) Optimizing Users And Applications In A Mobile World
This paper by Forrester Research surveyed 300 IT manager worldwide to study the challenges of servicing distributed and mobile employees with communications and access to applications. The challenges are growing as companies open branch offices, use outsourcing, and employees choose mobile communications over wired links. Network solutions include virtual private networks (access to company servers), wide-area-network optimization (improved throughput and decreased latency), and virtualization technology (customized PC interfaces according to applications needed).

This report by the New Buildings Initiative compared expected and actual energy performance of 121 LEED-certified newly constructed buildings. These buildings used about 24% less energy compared to the national
average. The Energy Star ratings of these buildings were better than 68% of buildings. The methodology for these measurements is explained in detail.

(IS-2008-132) Carbon Free Prosperity 2025
This report by Clean Edge, Inc. and Climate Solutions examines how business in Oregon and Washington state can prosper in a global clean-technology marketplace. The technologies with the greatest potential impact are solar photovoltaic manufacturing, green building design services, wind power development, sustainable bio-energy, and smart grid technologies. A 10-point action plan to accomplish this goal is described. The number one point is to put a price on carbon. 50 leading stakeholders were interviewed for this survey. 75% carbon-free electricity is expected to be generated by 2025. The challenges of raising capital compared to Silicon Valley and Boston are discussed.

While public policy on cap-and-trade for carbon is being debated, some companies have voluntarily started trading carbon emissions. This report by New Carbon Finance tracks trading in 2007 via the OTC (over-the-counter) market, consisting mostly of bilateral deals. The world market for carbon trading doubled in one year to $64 million in 2007. Offset credits to carbon reduction included renewable energy, energy efficiency, methane destruction, and forestry land projects. The credit per ton of carbon increased by about 50% from 2006 to 2007. Europe bought 47% of carbon credits, while North America bought 34% worldwide. Data were gathered from OTC records and surveys of 150 suppliers.

This paper by Turner Lane Development Corporation describes plans by the Canadian government for encouraging reductions in greenhouse gas emissions. The methodology for quantifying greenhouse gas reductions and assigning a value is described. Until a cap-and-trade system is established in Canada, the government will buy the offset credits earned by companies for reducing greenhouse gas emissions. This will enable Canada to comply with the Kyoto Protocol to reduce emissions between 2008 and 2012 to 1990 levels.

(IS-2008-129) Climate change – a business revolution?
The U.K government provided funding for the Carbon Trust, an independent company. The Carbon Trust surveyed the following industries to determine the potential impact of a low carbon economy: aluminum, automotive, beer, building insulation, consumer electronics, and oil and gas. If climate change initiatives were enacted, some companies would increase value by up to 80%, while others would decrease value by as much as 65%. Much depends on the timing and severity of the initiatives to reduce carbon emissions. Company value is
determined by regulations, consumer behavior, innovations, and the cost attributed to carbon. The methodology for deriving impact estimates is described based on the cost of action versus “business as usual.” The building insulation industry could improve 80% depending on building energy performance regulations.

(IS-2008-128) The US Wireless Teen Market
This market survey of cell phone usage among teenagers reports that 84% of 17 year olds have cell phones (91% female; 78% male). These teenagers help teach adults how to use additional features in the phones thereby generating additional revenue for the service provider. Cell phone purchases increase for back-to-school and for holiday gifts.

(IS-2008-127) The Endless Energy Report
This paper by the GLOBE Foundation provides a guide to energy independence in British Columbia, Canada by 2025 primarily by using biomass, hydro, wind, and solar energy. These renewables would be combined with hydrogen and ethanol and increased energy efficiency in homes and buildings. The results would not disrupt daily activities but would create energy and technology exports. The population of British Columbia is expected to increase by 30% by 2025 with a GDP of $190 billion. Details about energy consumption and energy sources are included.

(IS-2008-126) Energy Implications of Economizer Use in California Data Centers
This paper from the University of California explores methods for cooling data centers. Two techniques are compared: a water-side economizer that uses an air-conditioning compressor, and air-side economizer that blows in outside air and does not cool it if it is cooler than the building interior. The air-side economizer is lower cost, but may introduce air pollution that could affect the computers. Data centers were modeled in various locations in California. In all cases air-side economizers offered savings. For example, in San Jose, the saving was $130,000 per year. The cooler the outside air, the larger the savings. Also, savings are possible by accommodating a wider range of humidity.

(IS-2008-125) Wireless Sensor Technology for Data Centers
This paper explains how a data center can reduce energy consumption by using sensors for monitor temperatures throughout the building. The objective is to avoid over-cooling the building by providing sufficient cooling where needed. The Sacramento Municipal Utility District (SMUD) sponsored this investigation. A wireless mesh network of 400 sensors was installed in the SMUD data center. These sensors recorded 1,800,000 measurements during November 2007. Two computer room air-conditioners were identified that could be turned off. The net annual
savings projected for SMUD was 13% (300,160 kWh), 22% in reclaimed floor space, and 9% additional energy available for data center growth.

(IS-2008-124) CompTIA Sixth Annual Convergent Technologies Research Study: Discovering Trends and Opportunities in International SMB Markets
CompTIA has conducted a survey of small and medium businesses (10-499 employees) in Canada, Germany, US, and UK to determine the role of communications and information technology (IT). Companies in the following fields were examined: manufacturing, finance, insurance, healthcare, government, and professional services. Challenges regarding communications and IT include cost, integration with existing communications devices, and difficulty to use. One-quarter of these companies have converged voice mail and e-mail systems. 17% had an IT security problem in the previous year. 43% of these firms manage their own communications and IT systems. The average company in the survey spent $40,000 on IT and communications in the preceding year.

(IS-2008-123) BIM and Project Management – Advancing Integrated Project Delivery on Capital Building Programs
A new methodology for building design is presented: Building Information Modeling (BIM). BIM is a three-dimensional representation of the architecture and structure of a building and the systems within it (mechanical, electrical, and plumbing). Project management for building design is being replaced with Infrastructure Lifecycle Management (ILM) that spans planning, building, and operating a building. Business value is increased by the integration of BIM and ILM. BIM drawings accompanying contracts can reduce misunderstandings.

(IS-2008-122) Personal Media Storage
CABA commissioned this study with the Aberdeen Group to better understand the role of portable storage products, most notably memory cards, in achieving a fully networked and connected Internet lifestyle. The report was authored by Aberdeen Group.

(IS-2008-121) Web based Family Calendar User Interface
Web-based calendars provide a way for users to gather information about upcoming personal or business events and present them in calendar form. The main purpose of this project was to identify the relative strengths and weaknesses of three existing Web-based calendars: Yahoo Calendar, Microsoft MSN Calendar, part of MSN 8.0, and SimpleDay prototype calendar. This qualitative research project produced detailed evaluations of these applications and recommendations for developing an ideal product. The report was authored by Zanthus.
(IS-2008-120) Health & Fitness Needs Assessment
To assess the most salient consumer needs in the health and fitness area that could be addressed by products or services with a Web component, CABA sponsored a Web survey of 643 single-family, owner-occupied households with Internet access in the U.S. The sample included both primary and mass market consumers. The report was authored by Zanthus.

(IS-2008-119) Home Automation Hub
This report identifies the optimal hub or control point for home automation applications; determines the level of appeal for the home hub concept and for potential applications (temperature control, light control, home security control, appliance service information, and garage door status); and determines preferences for interacting with appliance service information. The report was authored by Zanthus.

(IS-2008-118) Onstar@Home
The pilot team included General Motors, Invensys, Hewlett-Packard, ADT and Panasonic. The member companies jointly designed a prototype solution to be tested in consumer homes. The system was to remotely program and control functions in the home by speaking commands over the phone or on a secure Web site. The project was managed by Zanthus.

(IS-2008-117) Digital Entertainment Migration
The main purpose of this project was to determine the degree to which digital entertainment enthusiasts have an interest in potential non-entertainment features or functions of the connected home. The project was managed by Zanthus.

(IS-2008-115) 2005 State of the Connected Home Market: Family
(IS-2008-114) 2005 State of the Connected Home Market: Career
For the purposes of market analysis, CABA has adopted an ecosystem perspective on the connected home market, dividing the space into three separate, but related ecosystems: family, career and entertainment. In the fall of 2005, the Internet Home Alliance sponsored a comprehensive Web survey. Approximately 1,800 online consumer panelists between 18 and 64 years of age participated across the U.S. The sample was divided equally into three separate lifestyle domain or ecosystem tracks: Entertainment, Family and Career. The project was managed by Zanthus.

(IS-2008-113) State of the Connected Home Market (With Tables)
(IS-2008-112) State of the Connected Home Market
The connected home is a place where entertainment, heating, lighting and other systems are linked into a central network for ease of control. This idea continues to attract considerable consumer interest, according to the 2005 State of the Connected Home Study. This Web survey of 1,834 online consumers in the U.S. was conducted in September 2005 by Zanthus. According to our research, about one in five online consumers considers the connected home concept very appealing, and about one in three would consider setting up such a home given a reasonable cost. Three basic prerequisites for the connected home either reached or exceeded mass market penetration rates in 2005, according to our research. Around a third of all households now have multiple PCs, just under half have broadband Internet access, and nearly one in five have a home network. Among online U.S. households, about half now have multiple PCs and broadband Internet access, and about one in four have either a wired or wireless home computer network.

(IS-2008-111) Digital Entertainment Needs Assessment
The main purposes of the Digital Entertainment Needs Assessment project was to assess consumers digital entertainment needs at home and in their automobiles, with particular attention paid to potential cross over between the two domains. The research revealed several promising digital entertainment concepts, notably, high-definition radio, the home media server and the mobile music store. The project managed by Zanthus.

(IS-2008-110) Safe, Secure and Comforable Home
Safe, secure, and comfortable, these are words that describe an ideal home. In this research study, the Alliance evaluated a number of home automation concepts designed to deliver on this notion. Participants explored the unifying theme of a home information and control solution that will help home owners by managing and providing information about environment, energy consumption, safety, and security. The project was managed by Zanthus.

(IS-2008-109) Connected Home Roadmap
This primary research report is a segmentation study that determines the consumer profiles of those who buy digital lifestyle products and services. This report assists manufacturers and other vendors that cater directly to end-users to identify resource requirements and potential investment opportunities. The report was prepared for the Continental Automated Buildings Association by Ipsos Reid. The report was sponsored by Bell Canada, Brookfield Homes, Global Inventures, Invensys, Leviton, Microsoft, Motorola, Newland Communities, SaskTel and Trane.

(IS-2008-108) Preparing for the Internet Video Revolution: A Profile of the Internet-Connected Living Room Consumer
This paper by MultiMedia Intelligence predicts the business of Internet delivery of audio/video (A/V) to entertainment A/V devices rather than to PCs. Digital Media Adapters link the Internet to A/V equipment. The players in this new business include content owners, operators, equipment manufacturers and technology providers. Some equipment will be purchased by the consumer, while some will be rented from the service provider. The fastest growing adopters of home networks are in the age range of 60-69. The initial households to adopt Internet A/V are those with incomes of $100-150k.

(IS-2008-107) The Changing Face of IFE: The Re-launch of In-Flight Broadband
This paper by MultiMedia Intelligence examines customer preferences for airline entertainment and new offerings. Many customers are supplying music and movies via their personal equipment. New airline entertainment technologies are examined that costs less and weights less. Examples include WiFi access for voice, video, and data.

(IS-2008-106) Ethernet Services: WAN options mature
Verizon has compiled a collection of papers that advocates Ethernet for applications outside of local area networks (LANs). Wide area network (WAN) applications include virtual private networks and Provider Backbone Transport for long-distance packet transport. Ethernet is being proposed to replace or to complement MLPS (Multi Protocol Label Switching) for the wide area networks. The net benefits are lower costs to manage and deploy LANs and WANs.

(IS-2008-105) Utility Solar Assessment (USA) Study
Co-op America Foundation has projected that the U.S. generation of solar power could increase from the current 1/10 of 1% to 10% by 2025. The technology would involve a combination of solar photovoltaics (PV) and concentrating solar power (CSP) (typically mirrors that focus the sun rays on a collector). Cost projections show prices competitive with conventional power generation within a decade. Price parity is expected by 2015. To achieve these goals utilities must be involved and must implement a smart grid. Environmental and carbon production issues are motivating solar power. Solar can supply peak demands for power. Stable tax incentives are advocated.

This report from The Conference Board examines options for reducing greenhouse gases by 2030. The U.S. is the largest emitter of these gases, but the growth rate is much lower than in China, Indonesia, and India. 40% of US CEOs thinks that reduction of these gases is very important. The reduction goals are achievable at a "quite low" net cost with possible economic benefits. However, costs will be concentrated in certain sectors such as
existing buildings and homes with inefficient heating and cooling, and existing coal power plants. Buildings and homes that implement efficiency improvements in heating and cooling, building-shell designs, and consumer and office electronics will benefit.

(IS-2008-103) TIA Standards and Technology Annual Report, 2007-2008
This is the 2007 annual report of the Telecommunications Industry Association (TIA) focusing of standards development. The TIA writes American National Standards and formulates United States positions for 20 international committees and working groups. Some the domestic areas relevant for home and buildings include modems, faxes, telephone, and VoIP (Internet telephony) [committee name: TR-30]; business telephone systems [TR-41]; cabling in buildings and homes [TR-42]; and fiber optics [FO-4]. International standards include home and building systems and wiring [ISO/IEC JTC1/SC25].

(IS-2008-102) Third Annual Cisco IBSG E-commerce Survey: Mobile Emerges as Growth Channel for Retail
Cisco projects the growth of Internet commerce: 50% increase from 2007 to 2011 in the US (to $300 billion) and 100% increase in Europe (to $400 billion). Some retailers are integrating web shopping with mobile data. 85% of the online population worldwide have shopped online. Suggestions for improving the online shopping experience are presented. Social networks are complementing shopping with product reviews and information.

(IS-2008-101) SMART 2020: Enabling the low carbon economy in the information age
This report from the Global eSustainability Initiative explores how the ICT (Information and Communications Technology) sector can contribute toward the reduction of greenhouse gases. ICT accounted for about 2% of total greenhouse gases as of 2007. The goal is to reduce carbon dioxide emissions 15% by 2020, rather than triple emissions if business continued as usual. Costs savings are expect to reach almost one trillion dollars. The largest opportunities for savings are in smart motors, smart logistics (delivery of fuel, electricity, and heat), smart buildings, and smart grids. The concept of SMART transformation is introduced: Standardize, Monitor, Account, Rethink, and Transform. For example, half the energy for data centers is used for backups, uninterruptible power supplies, and cooling. Tele- and videoconferences could replace 5-20% of business travel.

(IS-2008-100) Choosing Data Loggers For Green Building Projects
This report from Onset Computer Corporation explains the function and benefits of data loggers. These are devices that are installed in buildings or houses to measure parameters such as temperature, light level, electricity, or solar radiation. Applications include adjusting heating, cooling, and solar panels. The factors that
determine the performance of data loggers are discussed. Aggregation of data from multiple loggers via the Internet is possible.

(IS-2008-99) High Performance Buildings
This report from the National Institute of Building Sciences to the U.S. Congress summarizes high performance buildings that conserve energy while improving environmental impact, functionality, human comfort, and productivity. The High Performance Building Council was formed in April 2007 to assess the state of knowledge in building performance and constraints imposed by design and performance standards. This study emphasizes the building life cycle that spans "design, construction, operation, occupancy, repair, usability, extendibility, and retirement." Indoor air quality, energy conservation, accessibility, enhancing worker productivity, historic preservation, and aesthetics were identified as important goals. Recommendations are provided.

(IS-2008-98) The Chief Customer/Experience Officer Playbook
Forrester Research has conducted a survey among managers of customer service to determine elements of success. Chief Customer/Experience Officers (CC/EO) from eight companies were interviewed. CC/COs need a plan and need to promote customer-centric approaches. Parts of the company without direct customer contact can effect the customer experience. Forrester recommends establishing a working team and an executive steering committee, establishing metrics for measuring the customer experience, getting feedback from customers, maintaining enthusiasm in the organization to include the customer experience, and improving the plan.

(IS-2008-97) The Increasingly Important Impact of Wireless Broadband Technology and Services on the U.S. Economy
This paper by CTIA-The Wireless Association is an economic summary of the impact on business of wireless telecommunications. By 2005, the productivity value of wireless was greater than the value of the pharmaceutical industry. The healthcare and small business sectors have benefited the most from wireless. Most of the healthcare savings will come from direct input of data via a wireless phone. Technology, computers, and telecommunications have helped the US exceed Europe and Japan in labor productivity. This should generate $860 billion additional GDP by 2016. During this time fame broadband wireless use will grow from 25% of users to 83%. Applications of "mobile telematics" like wireless automatic meter reading are discussed. The states of California, Florida, Illinois, New York, and Texas will benefit the most.
(IS-2008-96) Network Technology Integration Drives Business Success
This document provides an overview of products sold by Cisco Systems for switching and routing, voice signaling, and call processing. The features offered by Cisco for security, implementation of quality-of-service, voice-over-IP telephony, and unified WiFi/cellular phones are discussed. A roadmap for selecting Cisco product is presented.

(IS-2008-95) Carbon Down, Profits Up - Third Edition
This report by the Climate Group surveys corporate and government plans for reductions of greenhouse gas emissions. Organizations are starting to respond to reduction goals as business challenges and opportunities, rather than simply as compliance with mandates. Even though there are costs involved, there is a potential net financial benefit. For example, DuPont saved about $4 billion from 1994 through 2005 by introducing energy efficiencies and reducing CO2 emissions by 32%. Seattle City Light achieved net zero greenhouse gas emissions through conservation and renewables to power all new loads.

(IS-2008-94) A Smarter Way to Mind the Store: IP-Surveillance
This paper from Axis Communications advocates the benefits of IP-based video surveillance for retailers. Systems can be installed that automatically identify suspicious customer or salesperson behavior. Also, the system could monitor traffic flow and congestion at cash registers. Digital cameras offer higher resolution than analog and may operate from power deliver via the data cable using Power over Ethernet technology.

(IS-2008-93) Internet of Things in 2020
The European Commission and the European Technology Platform on smart Systems Integration (EPoSS) report on a workshop on the Internet connectivity of devices anticipated over the next 20 years. IPv6 is expected to offer unique addresses for devices (not precisely defined). These devices will need to “harvest energy” in order to operate, will need to process data, and will need to communicate. Also, these devices will need to be integrated into packages and will need to interoperate. Challenges include governance, privacy, and security. Applications include retail, drugs, food, health, intelligent homes, and transportation.

ARTEMIS (Advanced Research and Technology for Embedded Intelligence and Systems) is the European Technology Platform for Embedded Computing Systems. This paper reports on the first annual ARTEMIS Joint Undertaking (JU) Work Programme for 2008. The objective is to develop reference designs and architectures, seamless connectivity and middleware, and design methods and tools for embedded systems in industrial systems, nomadic environments, private spaces, and public infrastructure. Applications include transportation,
process control, public utilities, medical applications, and energy. ARTEMIS seeks cost reductions of 15% by 2013 while complexity increases 25%. Proposals for funding are solicited.

(IS-2008-91) Expert Group on Services in the Future Internet Consultation Meeting, Brussels 12th November 2007
This 2006 report by the European Commission examines the projected growth of Internet services by 2011. Web based services will grow at 28% per year. These services will span government, business, and consumer applications. Also, users will produce services in a Web 2.0 environment. Eventually, the Internet will become an Internet of Things (IoT) interconnecting sensors and actuators. Trends include wireless access, always-on access, real-time services such as telephony, a simplified user experience, and machine-to-machine interactions.

(IS-2008-90) Integrated Energy Systems in Canadian Communities: A Consensus for Urgent Action
This report from the Quality Urban Energy Systems of Tomorrow in Canada describes how the energy industry will help achieve a 60% reduction in greenhouse gases by 2050. The goal is make Canada "a world leader in urban integrated energy systems." Examples include district energy and small-scale urban energy systems. Urban energy consumption for homes, building, and industry account for half of the energy used. Examples are presented. Market-based pricing of carbon is proposed.

(IS-2008-89) Intelligent Middleware
This study by Forrester Research and Richards|Zeta Building Intelligence, Inc. explores middleware as a method for achieving integration among building automation subsystems. Many building automation systems include some proprietary elements. This report studies the possibility of interconnecting legacy subsystem with middleware software for integration at a high level, taking advantage of IP-based enterprise systems and web-based services. Examples are presented.

(IS-2008-88) Green Building in North America: Opportunities and Challenges
In this report, the Secretariat of the Commission for Environmental Cooperation (CEC) recommends that North American leaders make green building a foundational driver for environmental, social, and economic improvement in Canada, Mexico, and the United States.

(IS-2008-87) Super Buyers: The Key Broadband Segment Buying CE Products
Parks Associates explored the market for consumer products by surveying 2500 buyers. One quarter of the buyers accounted for 80% of all consumer electronics purchased in past year, spending more than $2000 each.
These are called Super Buyers. Super Buyers are not defined by wealth, but by a positive attitude toward consumer electronics. They prefer shopping at specialty stores.

(IS-2008-86) Introduction to Commercial Building Control Strategies and Techniques for Demand Response
Lawrence Berkeley National Laboratory reports on field tests of demand response in 28 non-residential buildings. Most of the buildings were located in California and the rest in New York. Demand response was applied to heating/cooling and lighting. The report concluded with recommendations for tests in other climates. Also, a gradual return to full operation after a demand-response shift is advised to avoid sudden load increases.

Lawrence Berkeley National Laboratory developed statistical models for calculating the baseline electric load of commercial buildings to assess the impact of demand response programs. The models are based on previous-days averages and on predictions based on weather forecasts. The accuracy of these models is reviewed. Models were tested at 32 sites in California. Results are presented.

(IS-2008-84) Demand Responsive Lighting: A Scoping Study
Lawrence Berkeley National Laboratory has studied methods of managing the demand for electricity used for commercial building lighting, which totals 30GWh per year in California. Lighting accounts for 30-33% of the peak commercial electric load. There are opportunities to cut the peak demand with bi-level lighting (required in California) and control systems tied to occupancy sensors and dimmable ballasts. Light reduction has less of an impact on occupant comfort than heating/cooling reduction. Strategies and example of managing energy consumption for lighting are described.

(IS-2008-83) Architecture Concepts and Technical Issues for an Open, Interoperable Automated Demand Response Infrastructure
This report from Lawrence Berkeley National Laboratory explains the Demand Response Automation Server (DRAS) used for managing customer energy consumption. It explains how DRAS supports automated utility/customer interactions for DR bidding, automated event handing, and real-time pricing. DR bidding allows customers to notify utilities how much load they are able to shed when necessary. Auto-DR operates without human intervention as the utility interacts with the home or building. Such operations may control lighting, heating/cooling, and non-critical equipment with the option for the user to opt out. The architecture of such a system is described.
Ethernet Provides the Solution for Broadband Subscriber Access
This paper by the Ethernet Alliance explains how the Ethernet local area network protocol is being applied to the wide area network linking homes and building to a central office or "point of presence" (connection to the Internet). This avoids the cost and inefficiency of converting to other wide area network communications protocols. Methods for carrying Ethernet packets via a fiber optics network are presented.

Quantifying Sustainability: A Study of Three Sustainable Building Rating Systems and the AIA Position Statement
The AIA (American Institute of Architects) has reviewed three rating systems for green buildings: Green Globes for New Construction, LEED for New Construction and Major Renovations version 2.2, and SBTool 07. These rating systems score sustainability features in building design and construction. The three are compared, but not rated by the AIA. Green Globes was developed by the Green Building Initiative using ANSI protocols. LEED was developed by the U.S. Green Building Council. The International Initiative for a Sustainable Built Environment (iiSBE) created SBTool 07 to assess building performance. An overview of each system is provided.

The Ethernet Ecosystem
The Ethernet Alliance, a trade organization, has written this paper to provide a brief history of Ethernet. The Ethernet local area network was invented by Bob Metcalf at Xerox in 1973 and originally operated at 2.94 Mbps. Ethernet applications are expanding to home entertainment networks. Some wide area and metropolitan area networks are now based on Ethernet. Interfaces are being developed between Ethernet, wireless network., and fiber optics networks.

IBM Sensor and Actuator Solutions
This IBM paper explains the expanding roles of sensors and actuators to provide industrial and product services. Applications include retailing, supply-chain management, and product adjustment to market demands. RFID sensor applications are discussed.

Secure Router Virtualization: Critical Solutions for Optimizing IP/MPLS Network Convergence
This Yankee Group paper explains a technology that allows efficient Internet routing of packets representing disparate services. A technique called Multi-Protocol Label Switching (MPLS) accommodates packet with various service requirements (IPTV, virtual private networks, public Internet packets) in a consolidated IP core using secure router virtualization (SRV). SRV can lead to reductions in cost and capital, and improvements in operational efficiency. The hardware and software requirements to accomplish SRV are discussed.
(IS-2008-77) Moving electronics companies from global to globally integrated
IBM reports on how the company has adapted to a global market with reduced national barriers and increased competition from all parts of the world. Five of the leading electronics brands generate 85% of their revenues outside their home countries. IBM has proposed the Globally Integrated Enterprise that does not function as a collection of country-based subsidiaries. IBM emphasizes collaboration by stating, "becoming a globally integrated company is as much about the global sourcing of ideas as it is about the sourcing of labor." Management of this enterprise is based on open collaboration rather than top-down control.

(IS-2008-76) Telecom switches emphasis
IBM surveyed 252 executives from telecommunications companies around the world to assess business changes. Some are changing business models to emphasize service subscription and collaboration with external partners. Along with delivering video and content, these companies are seeking increased ad revenues. The majority of executives expects to partner with companies such as Yahoo and Google. Most revenue is still derived from voice and broadband access.

(IS-2008-75) Technology Meets Medicine: Business Models and Distribution Strategies
Parks Associates reports on the state of technology to promote health outside of a clinical setting. Large hardware, software, and communications companies are investing in heath care technology. Congress is authorizing reimbursement for remote monitoring. Customers for health monitoring are expected to grow from 800,000 in 2008 to 5.3 million in 2012, generating revenues of almost $2.5 billion.

(IS-2008-74) IP Video’s Time Has Come
This report by Video Furnace explains possible applications of Internet TV that benefit enterprises. Examples include digital signage, corporate training, and event broadcasting. The business advantages of IP video are summarized.

(IS-2008-73) Enabling the New World of Pay-TV
This report by Verimatrix summarizes the need of pay-TV companies for data security as video is delivered to customers. Content security is described as 3-dimensional: multiple networks, multiple screens, and multiple layers of protection. Users want access to pay-TV on a variety of players (PC, TV, mobile) with a single purchase. The writer advocates for an IP-centric security system where decryption keys may be delivered for each viewing.
(IS-2008-72) Delivering Secure IP Video
This paper by Video Furnace discusses security vulnerabilities of various software media players and browsers when running IP video. The problem is that media players access operating-system resources and run scripts. A solution is to have the server download with permission of the users a specialized viewer on the client.

(IS-2008-71) Open IPTV Forum Whitepaper
The Open IPTV Forum wrote this introduction to Internet Protocol Television (IPTV). IPTV can be integrated with other media such as text and may be viewed on a variety of fixed and mobile displays. About 55 million IPTV subscribers are estimated by 2010 and will spend $2.8 billion for equipment. The Open IPTV Forum is writing interoperability specifications due by mid-2008. IPTV may be offered by a service provider on a managed network or via the open Internet.

(IS-2008-70) IPTV/VOD: The Open 4th Platform
This 225-page book is a collection of more than 20 papers by Alexander Cameron expressing his views of a worldwide television network using Internet TV (IPTV). Among these papers are an introduction to IPTV, IPTV applications and services, regulations, content, problems, and net neutrality. He paints a picture of the future with home automation and 5000 TV stations where IPTV is dominant in 10 years. IPTV is encoded using the MPEG-4 protocol that carries standard definition TV in 1-4 Mbps and high definition TV in 6-10 Mbps. This book is written from a U.K. perspective with lots of discussion about SkyTV, a satellite operator in the U.K.

(IS-2008-69) "Show me the money": Strategies for success in IPTV
PriceWaterhouseCoopers explores the emerging market for IPTV. They maintain that IPTV vendors need to focus on marketing, partnering, and investment in content and advertising. Long-tail content is recommended over premium sports. By 2012, 30% of TV viewing will be on-demand, compared to 5% in 2007. IPTV has two versions: delivery to PC and delivery to TV. Business arrangements and advertising to support IPTV are reviewed. IPTV needs scalable bandwidth for multiple TVs including high definition.

(IS-2008-68) Multimedia Handsets: The World’s Most Ubiquitous Entertainment Device
This paper from MultiMedia Intelligence predicts the transformation of mobile phones to multi-media platforms. By 2010, 9 out of 10 mobile phones will include a camera, audio, and video. Additional features include support of games and a USB port for moving content. Handsets are moving toward high quality color with 18 or 24 bits per picture element (pixel) and resolution of at least 320 x 240. Examples of such phones are presented.
(IS-2008-67) Implementing Digital Advertising in Hardware
This paper from MultiMedia Intelligence explains the potential impact of new hardware technology on the delivery of advertising to digital devices containing displays. The technology supports interactivity with consumers, personalized databases, and personalized advertising. Consumers might opt-in to ads in exchange for a TV show. Opportunities for branding a display device and sources of hardware support are discussed. A USB plug-in could add advertising to a device.

(IS-2008-66) The Six Competitive Factors for Hot Spot Success
This paper from MultiMedia Intelligence surveys the availability of WiFi access to the Internet via public hotspots. There were about 180,000 hotspots worldwide by the end of 2007. There is a trend toward consolidation among providers, improvement in quality, location-based advertising, bundling hotspot access with mobile or broadband services, and marketing to consumers, not just to business travelers. WiMAX may pose a market threat to WiFi. A new market may be the support of WiFi phones.

(IS-2008-65) Internet Protocol (IP)-Enabled-Consumer Electronics: Semiconductors, Service Providers and Content Complete the Ecosystem
This paper from MultiMedia Intelligence explores the shift of digital video from personal computers to TVs. Examples of digital video are YouTube and MySpace, and will extend to IPTV (Internet TV). Set-top boxes will provide TVs access to digital video. By 2012 the largest segment of IP-enabled consumer electronics will be BlueRay DVD players and recorders. The semiconductor business to support IP-based consumer electronics will be $2.5 billion by 2012. IP content will be delivered predominantly via wired Ethernet and by power line carrier, coaxial cable, and WiFi. Consumer market awareness for digital video is limited now. Sales of 215 million units that support digital video are predicted by 2012.

(IS-2008-64) Advertising Goes Mobile
This paper from MultiMedia Intelligence explores the placement of ads on mobile devices when viewing TV as a way of subsidizing the cost of the mobile TV. A key motivator is the growth of digital video recorders (DVR) and the falling price of cell phone voice services. Mobile revenue is shifting to message and premium content. Half of the $400-billion market for TV, movies, etc. is funded by advertising. Mobile ads would be inserted in 1 to 5-minute intervals or prior to video-on-demand. Ads might be tailored to the time and location of the user.

(IS-2008-63) Advanced Controls for Demand Response and Energy Efficiency in Commercial Buildings - slides
This is a slide presentation of paper from the Lawrence Berkeley Labs paper of the same title, already reviewed.
(IS-2006-62) Advanced Controls and Communications for Demand Response and Energy Efficiency in Commercial Buildings
This paper from Lawrence Berkeley National Laboratory explores the potential of demand response strategies to reduce peak electricity demand from commercial buildings. These buildings account for 45% of the summer peak demand, which is estimated at 330GW nationally. Demand response may include limiting total usage (the demand) and load curtailment. These actions are motivated by time-of-use electricity rates, real time rates, or event notifications. A trial was described that achieved an average of 8% demand shedding with a peak of 56%. Demand response will not be a major driver for new building control systems but should be accommodated.

(IS-2008-61) White Paper on the Exhaust of Electronic Serial Numbers (ESNs) and Migration to Mobile Equipment Identifiers (MEIDs)
All cell phones contain a unique ID called the Electronic Serial Number (32 bits). Since 1997, the allocation of numbers has been managed by the TIA (Telecommunications Industry Association). Since the numbers are likely to be exhausted in 2008, an extended numbering scheme is planned called the Mobile Equipment Identifier (56 bits). Details are provided.

(IS-2008-60) The Promising but Plodding RFID Industry
According to the Security Industry Association (SIA), the growth of the RFID industry will not meet the expectation of investors. Inadequate standards, high costs, low reliability, and reluctance to adopt by end-users are limiting the industry. RFID tags and bar codes will co-exist. The authors maintain that manufacturers need to address privacy concerns about RFID tags and design privacy into the system. Active RFID tags (with batteries) and passive RFID tags are explained.

(IS-2008-59) Cable Component Material Innovations for Stringent Fire Safety and Environmental Compliance Requirements
This paper by David B. Kiddoo of AlphaGary Corporation discusses recent technological advances in the design of wires and cables to make commercial installations more fire resistant. Possible materials include fluoropolymers, PVCs, and halogen-free olefins. The properties of each are described. Conformance with European Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) is presented.
This document by the Quality Urban Energy Systems of Tomorrow consortium reports on a conference held in Canada last November to address the 50 per cent of total green house emissions due to homes, building, and transportation. Among the recommendations is pricing carbon appropriately and integrated urban energy systems. Examples of such communities in British Columbia and Ontario are described.

(IS-2008-57) How to improve the Performance of a Mesh Wireless Sensor Network?
This paper introduces the challenge of data communications in a mesh network intended for automatic meter reading (and other applications) and proposes a network architecture. The performance of a mesh network requires range and coverage, robustness to changes and RF interference, scalability, flexible power consumption, and ease of integration, use, and maintenance. A technology called flooding is described whereby a node sends messages to all nodes that can receive them. The timing of transmissions is controlled so not all nodes send at once. The network does not need a router.

(IS-2008-56) Addressing High Density Fiber Management Issues
The technical issues of managing fiber optics cable distribution for home services are discussed in this PennWell article. A particular challenge is terminate each fiber run as the number of homes passed increases. Terminating at the central office or at a dedicated remote facility is discussed.

(IS-2008-55) Are Consumers Ready for Quad-Play?
This report by Compete Inc. analyzes adding cell phone service to the marketing of a bundled package of TV, Internet, and telephone. More than 2500 customers were survey in March and April 2008. 43% of those surveyed are amenable to a package of all four services. 22% have purchased a bundle of services. 56% buy from multiple suppliers. They are willing to buy a bundle from a telephone or a cable company. The company first to market may have an advantage. The provider of high speed Internet has an edge. Consumer drivers are simplicity and price.

(IS-2008-54) Buildings and Climate Change
This report from the United Nations analyzes energy usage in buildings. The goal is to improve the energy efficiency especially in building operations to help achieve the carbon dioxide emission goals of the Kyoto Protocol. Methods for conserving energy in buildings are presented covering the life cycle of a building from the manufacture of the building components to the construction and operation of the building to the ultimate demolition and recycling of the building materials. China, Russia, and the U.S. are the large producers and consumers of energy. Zero-energy buildings that on average consume no energy are discussed.
Recommendations are presented for policies, benchmarking, regulations, economic tools, education, understanding human behavior, public sector applications, and technology transfer.

(IS-2008-53) Refreshed Accessibility Standards and Guidelines in Telecommunications and Electronic and Information Technology
This report for the US Government explores changes that may be needed to the laws that mandate accessibility for information and communications technology equipment. Examples of such equipment include audio and video players, web access, and authoring tools. The report proposes alternative technical approaches to balance against specific standards. Accessibility applies to persons with visual, hearing, physical, speech, cognitive, and other disabilities.

(IS-2008-52) Green Building Research Funding: An Assessment of Current Activity in the United States
This is a survey of funding sources for green building research compiled by the US Green Building Council. The sources for at least one-million-dollar projects include the US Federal government, states, and one professional organization. The topics receiving the largest funding are energy, materials, and resources. The sources and recipients of green building funding from 2002-2006 are included.

(IS-2008-51) A National Green Building Research Agenda
The research agenda of the US Green Building Council is presented. US buildings consume 71% of electricity generated and produce 38% of carbon dioxide emissions and 40% of non-industrial waste. 0.2% of US federal funding is for green buildings. Among the planned research topics are tools to improve building design, operations, and processes; building finances; and metrics to identify further improvements. Other topics include building envelope performance, lighting, HVAC control, materials life cycle assessment, water management, ecological issues, and indoor environment quality.

The study, commissioned by the US Green Building Council correlates the actual energy performance of buildings with expected performance for 121 buildings that were LEED certified. Measurements of energy use per square foot, Energy Star rating, and comparisons to baseline modeling were performed. The LEED buildings used 24 per cent less energy per square foot than the national average. They scored 68 per cent better with Energy Star than similar buildings. However, one-fourth of the LEED buildings were below 50 per cent. There was considerable variation between predicting and measure energy consumption. Details of the study are reported.
IS-2008-49: Slashing the TCO for IVR
This paper by DataMonitor reports on the technology transformation of speech recognition from Interactive Voice Recognition (IVR) to Voice-XML. Voice-XML is based on open standards that are replacing proprietary IVR systems. The costs born by carriers to migrate to IVR are discussed. The total cost of ownership of a Voice-XML system for a carrier with 40 million subscribers is about 41 per cent less than IVR over five years.

IS-2008-48: The Global Opportunities for Digital Health Applications
According to Parks Associates, care of chronic diseases affects 90 million Americans and accounts for two-thirds of healthcare expenditures. Similar corresponding figures apply to Canada and Europe. In-home systems can help with disease management to avoid crises. Telehealth via the Internet will become important. European makers are looking are telehealth via the cell phone. Expenditures on telehealth are "quite limited."

IS-2008-47: Europe: Home Network Update
This report from Parks Associates looks at the growth in home networking in Europe spurred by a competitive telephone marketplace. Telephone operators are offering services to manage home networks and provide services with set-top boxes and DVRs (Digital Video Recorders). Europe is leading the world in home network deployment with 40 million residential gateway predicted by 2012. New broadband services will include voice over Wi-Fi and hand-off between mobile and land-based networks.

IS-2008-46: Key Trends and Outlook for 2008
Parks Associates predicts trends for 2008 in this report issued in November 2007. IP Multimedia System will facilitate bundled services from telephone companies. Movies-on-demand burned onto disks at store kiosk will be introduced. Mobile Internet access will grow. Cable operators will add home networking. Parks predicts higher quality TV on the web with targeted advertising. Other areas discussed include gaming, wireless technologies, networked consumer electronics, media servers (moving into a mass market), ad insertion for TV and web video, in-car entertainment, the need for "digital home advisors," and personal health.

IS-2008-45: TV Services in Europe: Update and Outlook
Parks Associates looks at the competitive market in Europe for video services. Regulators in Europe have provided competitive access to the local telephone lines. Competitors and incumbent telephone companies are offering new services including home networking, on-demand and interactive programming, and mobile entertainment. Digital Terrestrial Television (DTT) is an important market in Europe despite cable, satellite, and telephone companies. Some telephone companies are offering DTT with pay-TV in set-top boxes. Cable
operators serve 36 per cent of the European market with 80 per cent analog transmission. Satellite operators are adding interactive TV by using telephone lines. IPTV (Internet TV) is growing in Europe.

The Consumer Electronics Association (CEA) has written a position paper on public policy to encourage the development of innovative wireless products and services for consumers. CEA argues for 200 MHz in additional spectrum for consumer products (shifted from Federal and low-use commercial allocations) and further deregulation. The paper explains the role of spectrum allocation is fostering the cell phone market. The evolution of cellphone data technologies from 1G up through 4G is summarized, as are applications of wireless technology to networks in the home and beyond.

**IS-2008-43: Broadband for all Americans**
This survey by the Consumer Electronics Association reports on broadband penetration in the US and the impact on the US economy. About 50 per cent of US households have broadband access to the Internet. The US ranks 15th among countries in broadband deployment with South Korea being number one. Issues discussed include uniform access to all Internet service (“net neutrality”) and municipal wireless access. Various services offering are summarized: VoIP (Voice over the Internet), telemedicine, and distance learning.

This report about the Home Gateway Initiative (HGI) consortium of telephone operators presents a view of the residential gateway. The primary purpose is to translate between a wide area network and a home network. In addition the HGI offers the opportunity to control home network to deliver management services and to control devices for “new services and competitive differentiation.” The role and history of the gateway are presented. The gateway might be a platform for service-provider applications, rather than loading such applications onto a home personal computer. The gateway might include a femtocell to relay cell calls into the home and possibly to include home automation and energy management services. The technology to support a gateway is described along with a list of manufacturers.

**IS-2008-41: Pay-TV and the American Consumer**
About 1,000 persons in the US were surveyed by ABI Research in December 2007 about TV viewing, service providers, technologies, programming, and price sensitivity. About 1/3 have media rooms and seven per cent have media servers. Although most have multiple TVs, advanced set-top boxes for premium services are used with only one TV. Cable providers are very susceptible to churn because customers are ready to switch for a better price. Prices for video services in the $100-150 range are a tipping point. Twenty per cent would like to
move content from a PC to a TV, and 18 per cent want to move content to a portable device. Thirty-one per cent
watch TV series online. Twenty-nine per cent have purchased pay-per-view services. However 37 per cent would
accept advertising in lieu of paying. Thirty-six per cent engage in time shifting with a DVR (Digital Video
Recorder). Forty per cent have HDTV, but of those only 43 per cent subscribe to an HDTV package. IPTV is being
incorporated in set-top boxes in Asia and is likely to spread to the US. Forty-two per cent have a home network.

IS-2008-40: Green Building in North America
This report addresses the imperative for green buildings in North America. It was written by the Commission for
Environmental Cooperation, a North American Free Trade Agreement agency located in Montreal. In the US
green buildings could reduce energy use by 30 per cent, carbon emissions by 35 per cent, water usage up to 50
per cent, and waste cost by up to 90 per cent. The Commission recommends a common vision for green buildings
among Canada, Mexico, and the US, targets for adopting green buildings, and strategies for supporting green
building efforts. Currently about two per cent of US buildings are green with an expected increase to about five to
ten per cent by 2010. Buildings in Canada consume 50 per cent of the natural resources in the country, while US
building use 68 per cent of electricity produced compared to 25 per cent in Mexico. Examples of buildings that
achieve some of the green goals are shown. Drivers and barriers to achieving green buildings are presented.

This paper introduces the National Building Information Modeling Standard (BIM) from the National Institute of
Building Sciences (a non-government organization in the United States). The BIM includes innovative information
technologies and business structures to reduce waste and inefficiencies in the building industry. This BIM
specifies machine-readable plans for all phases of a building design, construction, operation, and maintenance.
BIM is composed of the Information Delivery Manual (IDM) for accessing and presenting the data and the Model
View Definition (MVD) for the software interface. A key objective is to provide a uniform interface between
vendors and the building managers. The process for creating BIM and planned revisions are presented.

IS-2008-38: How Hollywood can Out-Apple Apple
This paper by Parks Associates examines emerging technologies for distributing video to portable devices such
as cell phones and MP3 players. The display technologies currently are inferior to conventional TV and the choice
of content is limited. The author presents opportunities for content producers (mostly located in Hollywood) to tie
portable video clips to the sale of theater tickets and DVDs. Free video clips will prepare a market for the sale of
portable video content.
This document is an overview of report on building performance. It evaluates the level of comfort offered by a heating, ventilation, and air-conditioning (HVAC) system versus cost based on a study of 300 buildings in 2007. The parameters measured were temperature variation and fluctuation from optimal set point and evidence of over-ventilation. Ninety-six per cent of the buildings examined had at least one parameter out of bounds. Possible energy saving may amount to 10 to 40 per cent of energy costs.

IS-2008-36: Asia-Pacific Partnership on Clean Development and Climate - Amanda Kramer
This presentation was delivered to the Buildings and Appliances Task Force of the Asia-Pacific Partnership on Clean Development and Climate on March 11, 2008 in Vancouver. The Building and Appliances Task Force addresses greenhouse gas emission in the residential and commercial sectors through improved appliances and buildings. Some of the topics covered include lighting, electric motors, high performance buildings, stand-by power for appliances, and building codes.

IS-2008-35: Asia-Pacific Partnership on Clean Development and Climate - Rob James
This presentation was delivered to the Buildings and Appliances Task Force of the Asia-Pacific Partnership on Clean Development and Climate on March 11, 2008 in Vancouver. The Partnership, founded in 2005, intends to develop clean technology through voluntary cooperation by government and the private sectors. Members include Australia, China, India, Japan, South Korea, and the USA. The current topics include renewable energy, buildings and appliances, fossil fuels, coal mining, cement, aluminum, steel, and power generation / transmission. This initiative is complementary to the United Nations climate change process. Funding is from the participating governments.

IS-2008-34: Asia-Pacific Partnership on Clean Development and Climate - Buildings and Appliances Task Force
This is a summary document of a meeting held March 11, 2008 in Vancouver by the Buildings and Appliances Task Force of the Asia-Pacific Partnership on Clean Development and Climate. Issues of funding, goals, and projects were discussed. Topics included alignment with industry, moving toward a net-zero-energy building, and participation on the Buildings and Appliances Task Force.

IS-2008-33: EPA Region 8 Headquarters Case Study
This case study by the National Institute of Building Sciences explains the choices made in the design and construction of a new building for the Denver office of the Environmental Protection Agency. The building includes
23 floors in two towers. The developer was required to achieve a minimum LEED Silver level and Energy Star Certification. The design process is explained. The roof accommodates plantings with four-inch deep plastic trays to create a "green roof." Also, 10kW of photovoltaic solar arrays are installed on the roof. A total energy savings of 35 per cent was achieved with efficient mechanical systems, use of free cooling, day-lighting, shading, and under-floor air system.

**IS-2008-32: IPD Environment Code**
This paper describes an analysis tool called the Environment Code from a company called IPD Occupiers (of London) for measuring the environment impact of a building. It can help achieve code compliance, reduce environmental impact, and allow comparison among properties. The global impact of climate change is estimated at five to 20 per cent of annual global GDP, while the cost of reducing greenhouse gases is about one per cent of annual global GDP. The IPD Code is a template for collection, measurement, and analysis of environmental information. Energy from renewable sources, water, and waste are key sets of quantitative measurements. The measurements are supplemented with qualitative measurements of transportation and travel, equipment and appliances, health and well-being, and adaptation to climate change.

**IS-2008-31: Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the U.S.**
This paper summarizes the procedure used by the American Council for an Energy-Efficient Economy to select programs as outstanding examples of energy efficiency. Ninety such projects were honored. These projects saved 2400 GWh of electricity, reduced peak demand by 400 MW, and saved 125 million therms of gas. The criteria for evaluating programs included energy savings, market transforming effects, quality of evaluation, qualitative assessment, innovation, and transferability.

**IS-2008-30: GridWise Interoperability Context Setting Framework**
This paper by the GridWise Architecture Council presents a context within which experts can discuss interoperability issues. An interoperability framework describes in high-level terms interactions among automation systems. It establishes a context in which to discuss alternatives. The application discussed is the integration of a utility system from generation to transmission and distribution to customer services. In abstract terms, solutions flow from designs, which flow from architectures, which flow from the framework. This report discusses interfaces between systems that are intended to collaborate. Examples based on residential and commercial electricity energy management are provided.
IS-2008-29: Utility Communications with BACnet Commercial Building for Peak Price Response
This presentation from the National Institute of Standards and Technology illustrates how a building automation system can interoperate with a utility communications network. The goal is to implement energy conservation through a program of demand response. BACnet messages to implement such interoperable communications are discussed.

IS-2008-28: GridWise Interoperability Workshop April 11-12, 2007 Proceedings Summary
This report by the GridWise Architecture Council summarizes a two-day workshop conducted by 45 experts in electric grid interoperability. The participants focused on reactions to a context-setting framework draft document. Improvements to this document were proposed. The technical, informational, and organizational aspects of interoperability were considered. A plan for enhancing the framework was developed. A follow-on Interoperability Symposium was proposed.

This paper by the GridWise Architecture Council explains the importance of interoperability in the system for generating, transmitting, distributing, and using electricity. Distinctions are made among Technical Interoperability (physical and communications connections), Informational Interoperability (data content and meaning), and Organizational Interoperability (business and legal relationships). Interoperability will improve reliability, market operations, and will lower grid capital costs. The authors urge that interoperability be factored into equipment design as the grid is upgraded. They propose a checklist to determine if a proposed upgrade facilitates interoperability.

This paper by the Security Industry Association describes the plans for security systems at the August 2008 Beijing, China Olympic Games. There are 31 Olympic venues. The businesses involved and coordination are described. Expenditures on security systems are estimated at $300 million for the Olympics. The equipment to be used and suppliers are listed.

IS-2008-25: ROADMs in Network Architectures
This document by Ciena explains the functions of Reconfigurable Optical Add/Drop Multiplexers (ROADMs) for enabling dynamic configuration of optical networks. ROADMs are designed to support Dense Wavelength Division Multiplexing (DWDM). DWDM supports multiple fiber optics channels of different wavelengths. ROADMs allows these channels to be added, removed, or modified automatically. The technology of ROADMs is explained.
IS-2008-24: Making the Case for Converged Ethernet Transport
This paper by Ciena explains that role of Ethernet for high-speed data transport outside of a local area network. Internet traffic is predicted to grow at a 35 per cent compound rate between 2006 and 2012. Ethernet Internet Protocol traffic is expected to surpass time division multiplexing traffic by 2009. Technologies for optical Ethernet switches are discussed. Applications include triple play, business data services, and wireless backhaul operations.

IS-2008-23: Evolution to the 100G Transport Network
The technologies to transport 100 Gbps Internet data are discussed in this report authored by Ciena. Applications include video-on-demand and IPTV. Client connections to the Internet backbone are now reaching 10 Gbps. The backbone operates at two to 10 times the highest-speed client. 100 Gbps is considered for data centers and metropolitan and wide area network connectivity. Technologies for implementing 100 Gpbs using fiber optics are discussed.

This paper is a report to the government of California about broadband Internet deployment in the state and policy proposals to increase availability. Benefits claimed include telecommuting, video conferencing, distant-learning, remote medical analysis, and increased civic discourse. Broadband is not widely available to rural locations where three million people live in California. It was noted that broadband costs are up to four times higher and one-tenth the speed than in other developed countries, such as Japan. The US ranks 16th in broadband adoption and California ranks 10th compared to developed countries. The report recommends that high-speed broadband be available to all Californians “with the lowest subsidy necessary” and with tax incentives.

IS-2008-21: Compendium of Champions: ACEEE; Commercial/Industrial Retrofit Programs
This report by American Council for an Energy-Efficient Economy (ASEEE) summarizes energy management programs instituted in six regions of the U.S. by electric utilities. Many of the programs include rate reductions. Also, the utilities offer subsidized consultants and contractors to assist enterprises to determine where energy could be saved and to implement retrofits to generate the savings. Four programs were cited as exemplary and two as honorable mention.

IS-2008-20: The Innovation Dilemma: How to Achieve High Performance through Superior R&D
This paper by Accenture summarizes a study of investments by large companies in innovation. About 37 per cent have outsourced product development in areas where other companies or universities offer more competence.
Some companies "in-source" by opening research centers in foreign locations. Others acquire companies with special expertise. About 44 per cent of those surveyed have a standardized process for conducting research.

**IS-2008-19: Case Study: Concordia University New Engineering Building, Montreal, Canada**
This document by A. Tzempelikos & A. K. Athienitis summarizes the energy savings in a building at Concordia University resulting from the use of motorized shading, lighting control, and improved glazing. The installation of these technologies in the 16-story building allowed a $45,000 reduction in the purchase cost of the atrium cooling system. The building payback for the motorized shades is expected to be 2.8 years.

**IS-2008-18: Integration of Dynamic Facades with other Building Systems**
This paper by A. Tzempelikos & A. K. Athienitis summarizes the benefits from designing a building façade with technology that allows the windows and shading to adjust automatically. The objective is to integrate façade control with lighting and HVAC systems to maximize daylight without glare, and to minimize the sun heat load. With proper systems design, the expected savings in a 10-15 story building are a 40 per cent reduction in the cooling energy consumption, a 60 per cent reduction in energy for lighting, and 20-40 per cent reduction in the peak cooling load.

**IS-2008-17: Enhanced Automation: Business Case Guidebook**
This guide was created by the California Energy Commission to provide information for businesses on the costs and benefits of building automation technologies. This guide is aimed at businesses with buildings consuming a peak of at least 200 kW for 20,000 square feet or more. The benefits are increased employee satisfaction, higher property values, and energy savings. Energy automation includes energy management systems, energy information systems, and HVAC and lighting controls. Improved information systems can pinpoint areas that need maintenance. A step-by-step assessment procedure is described. Included is a discussion about choosing an electricity tariff that could reduce the building power bill. About a 15 per cent reduction in energy costs on average is possible.

**IS-2008-16: There's No Place like Anywhere for the Holidays**
This paper from the Yankee Group surveys wireless devices that facilitate access to audio, video, Internet data, and GPS (location data). The objective is to achieve connectivity anywhere. The devices reviewed for features provided and omitted include the Apple iPod, HP MediaSmart TV, HP MediaSmart Home Server, the Apple iPhone, Xbox 360 Elite, TiVo HD, and Sony PSP. Device connectivity is a product differentiator. Manufacturers are challenged to educate customers directly and via retailers.
IS-2008-15: BACnet: Answers to Frequently Asked Questions
This paper contains an overview of BACnet, the Building Automation Control Network. BACnet defines the messages, signaling methods, and communications media for remote control of building automation devices. Each device, such as a temperature sensor, is represented as a collection of objects with a set of properties. BACnet messages can be encoded for a variety of network transmission methods. Systems not designed for BACnet can be adapted via a gateway translator. The conformance of a device to BACnet is described in a protocol implementation conformance statement (PICS). BACnet is now a U.S. and an international (ISO) standard.

Reed Construction Data discussed the prospects for the U.S. construction industry in 2008-2009. The collapse of the sub-prime market is affecting funds availability for commercial building construction. Very slow growth in the economy is predicted. Charts of the national economic condition are included. As of July 2007, the highest growth was in New England with Massachusetts leading the nation. Recovery predictions for the housing market are presented. Commercial construction is expected to have peaked in 2007.

IS-2008-13: Structured Cabling System (SCS)
This tutorial from the International Engineering Consortium discusses an organized cabling system for delivering building control services. A Structured Cabling System (SCS) can save up to 30% in initial construction costs. A building management system facilitated by an SCS can lead to savings of up to 60 per cent. All building control and data cables can be combined, with the possible exception of fire alarm wiring depending on local codes. There are now national and international standards for integrated wiring of buildings. A goal of SCS is to maintain the cabling as the connected systems change over time. Cabling is reduced when an SCS is organized for distribution via subsystems. Cost calculations and potential savings in labor are presented.

IS-2008-12: Taking Television to the Next Level: The Combination of HD and IPTV
This paper from ANT Software Limited maintains that HDTV will be enhanced when users have more TV options made available by IPTV (Internet TV). IPTV offers the possibility that the use can choose programming from a huge library and can control the viewing experience (such as pause, rewind, etc.). Key to success is a consistent user interface.

IS-2008-11: A future in content(ion): Can telecom providers win a share of the digital content market?
Telephone companies are facing competition from wireless and VoIP (Voice over IP) providers as revenues from traditional services fall. This study by IBM proposes that telephone companies generate revenue from content
distribution. The goal should be to deliver content anywhere, anytime, anywhere, to any device. There will be a shift from physical distribution of media (on disks) to on-line distribution. Do-it-yourself media production, such as blogs and podcasts, will be a significant factor. IBM predicts that households will need 20-Mbps Internet access for new multi-media services. Telecom operators are not likely to gain a significant base even with fiber-to-the-home. Therefore, they must become more consumer-centric by focusing on distribution services and embedded advertising.

**IS-2008-10: HomePlug AV White Paper**
This paper by the HomePlug Powerline Alliance presents an overview of the HomePlug AV power line carrier technology that supports broadband audio and video. HomePlug AV provides a 200-Mbps channel that delivers an effective data rate of about 150 Mbps. The channel supports a multi-access contention system plus time division multiplexing without contention, but with quality-of-service. Block diagrams are included. HomePlug includes a Central Coordinator to organize a HomePlug network and to isolate logically multiple networks sharing the same power line with unique encryption for each network.

**IS-2008-09: HomePlug & Service Providers**
This is a promotional piece for the use of HomePlug power line carrier technology and a survey of possible services that might be offered via the Internet and via a HomePlug home network. Possible services include entertainment, energy management, and appliance control. Some services being planned include VoIP (Voice over Internet Protocol), IPTV (TV via the Internet), firewall and virus protection, spam filtering, parental controls, content-on-demand, security, network management, and home health care.

**IS-2008-08: Conquering the WiMAX Test and Measurement Challenge**
Test and measurements to determine the performance on a WiMAX system are described in this Rohde & Schwarz white paper. WiMAX is one of the most complex wireless systems ever deployed. It is IP-based and incorporates multiple communications protocols. WiMAX includes techniques to overcome noise, fading, and interference. Of particular note is the use of multiple antennas to support a technique called MIMO (Multiple Input Multiple Output). Test equipment requirements are presented. Interspersed are advertisements for the products of the paper author.

**IS-2008-07: VoIP over WiMAX: Market drivers and vendor opportunities**
This paper by Rethink Research Associates is an executive summary of a survey to determine business prospects for voice transmission using Internet protocol (VoIP) via wireless WiMAX. About 400 service providers planning to offer WiMAX were surveyed for their intent to deploy VoIP. WiMAX will account for 75 per cent of the
broadband wireless market by 2010. About 65 per cent of WiMAX operators will offer VoIP by 2010. However, fewer than one-third of WiMAX vendors are considered strong in VoIP. Strategic alliances with VoIP partners will be pursued.

**IS-2008-06: Is Your AAA up to the WiMax Challenge?**
WiMAX is an emerging wireless technique for broadband voice and data communications over large areas. This paper by Bridgewater Systems discusses methods for user authentication to permit access, authorization of service levels, and accounting of service usage. Usage may be tracked according to flow-based accounting that determines how much of each type of service was used. Since WiMAX is an always-on system, authentication may occur frequently. Requirements for authentication, authorization, and accounting to support a high-growth WiMAX business are discussed.

**IS-2008-05: What ISN’T Going to Happen in 2008**
ABI Research presents predictions for 2008. Among technologies that will NOT blossom in 2008 are: mobile broadband, Palm (will lose market share), RFID (will not impact inventory management), navigation embedded in handsets, auto safety technology, Motorola mobile devices, mobile data traffic (until 2009), VoIP over WiFi in businesses, 802.11n (faster WiFi), improved network security, mobile WiMAX in China and 1 Gbps Internet access.

**IS-2008-04: Framework for energy market communications - Part 101: General guidelines**
This is a Technical Report published by the International Electrotechnical Commission (IEC), one of the three official worldwide standards organizations. This report provides an overview of XML-based database technology for e-business communications in the competitive energy market. The CABA document consists of the introduction, scope, and normative references, not the entire report (which is for sale by the IEC).

**IS-2008-03: Europe’s Home Networking Boom**
This paper by Parks Associates surveys the rapid growth of broadband penetration in Europe from 2004 to 2006. Europe has moved from behind Asia and America to on-par with America. The growth in broadband has led to a growth in home networks in order to reach multiple personal computers.

**IS-2008-02: IPTV in Europe: Digital TV in a Hyper-competitive Market**
According Parks Associates the market for digital TV in Europe is very competitive and "a test bed for the rest of the world." Telephone and broadband service connections to customers are unbundled in Europe, thus encouraging new entrants. Digital Terrestrial TV is a significant delivery method in Europe. Competition is leading
to new value-added services and increased support for customer-provided home networking via a utility-provided gateway. The utility ensures customer satisfaction with the value-added services at reasonable costs. IPTV is growing the fastest in Europe by offering a la carte TV programming. The author contends that convergence of multi-media, support, and billing is key to success.

IS-2008-01: Buildings as Networks: Danger, Opportunity, and Guiding Principles for Energy Efficiency
This presentation from the International Energy Agency introduces the need to address energy consumption and conservation when designing networked building automation systems. The authors are concerned that networked consumer electronics focus on features and conveniences, not on reducing the energy consumed by devices when they are not being used. Likewise, devices that are networked for building control of lighting, heating, etc. should be designed so energy consumption is reduced when the devices are quiescent. International standards are needed to specify techniques for networked devices to conserve energy.

IS-2007-80: Custom Mobile Advertising
Custom Mobile Advertising was a CABA Internet Home Alliance Research Council study that estimated the size of the maximum total addressable market for specific advertising concepts that could be offered via in-vehicle technology, mobile phone technology, and across both platforms. The goal of the study was to gauge interest in specific types of advertising content and advertising delivery mechanisms (such as voice and text). The study examined numerous consumer preferences for various features, including: connectivity options (wireless vs. wired); user interface (voice, text, on-screen menus); media and advertising storage and transfer options (mobile phone, PC, in-vehicle device, other); and user profile controls (computer, phone, in-vehicle).

IS-2007-79: ZigBee and Wireless Radio Frequency Coexistence
This paper by ZigBee Alliance explains how ZigBee and other unlicensed wireless technologies can co-exist without interference. ZigBee operates in 2.4-GHz band worldwide, in the 900-MHz band in North America and Australia, and in the 800-MHz band in Europe. Possible interference sources are WiFi, Bluetooth, portable telephones and microphones, WiMax, and microwave ovens. ZigBee avoids interfering by employing a frequency division multiple access (FDMA) communications protocol. Methods to avoid message collisions and to achieve successful reception are described. The benefit of a ZigBee mesh network is explained. Various tests supporting and criticizing ZigBee performance are presented.

This report by ZigBee Alliance explains the benefits of using wireless communications for implementing energy management. ZigBee is proposed as the wireless technology for the "last foot" connection. Energy management
initiatives worldwide are described. Applications of Zigbee for time-varying energy pricing and peak consumption management are explained.

**IS-2007-77: Green Specs/LEED Specs**
This report by Kalin Associates Inc. provides guidance to building specifiers on how to evaluate product claims about green attributes for incorporation into building designs. “By our definition, green products are those which maintain or improve the human environment while diminishing the impact of their use on the natural environment—in other words, sustainable.” Characteristics of green products include green manufacturing, recycled contents, recyclable, low toxicity, and biodegradable. Who selects green products (owners, architects, engineers, and contractors) and when in the design/construction timeframe are they selected are discussed. A detailed checklist is included.

**IS-2007-76: Cost of Green Revisited**
According to a study of 221 buildings, green buildings cost about the same as conventional buildings. Eighty-three of these buildings were designed with the intent of being sustainable. Some green features were present in the non-green buildings. A majority of the green buildings did not cost more because of the green features. Detailed costing methods are included. This study recommends that green should be included in building planning, not as an added requirement.

**IS-2007-75: Commercial Buildings - Eco-Efficiency**
The Sustainable Development Technology Canada foundation was formed by the Canadian government to develop and demonstrate clean technologies. These technologies apply in energy exploration and production, power generation, energy utilization, transportation, agriculture, forestry and wood products, and waste management. Recommendations are provided in the form of business cases. The methodology for determining where investments are warranted is explained. A case study of energy, water, and sold waste production for commercial office buildings in Canada (380,000 buildings in 2004) is presented. A goal for 2030 is to reduce the energy used in these buildings by 50 percent, the water by 65 per cent, and the solid waste by 85 per cent.

**IS-2007-74: LEED In Healthcare**
This paper explains how hospitals, nursing homes, and clinics can implement energy conservation and achieve LEED certification (Leadership in Energy and Environmental Design) even though LEED was developed for office buildings. Methods for water savings are presented, emphasizing substitutes for potable water in laboratory and cooling applications. Some LEED standards such as indoor-air-quality and temperature control are generally in-
place in healthcare facilities. The U.S. Green Building council is preparing “The LEED Application Guide for Healthcare.”

**IS-2007-73: FTTH/FTTP Update**

According to a market research study by RVA LLC, fiber optics for distribution of home services passed almost 10 million homes as of September 2007, is being marketed to about 8 million, and has been adopted by two million. About one million households receive video by fiber optics and 2 per cent of households get Internet access via fiber optics. The technology for fiber optics distribution varies by company. About 25 per cent of consumers who are offered fiber optics services adopt some. Customers with Internet access via fiber optics are more satisfied than those receiving Internet via cable or DSL (telephone lines). About half of fiber optics Internet access is at 5-10 Mbps for download and 1-2 Mbps for upload. The dominant supplier is Verizon. The writers claim that subscription to fiber optics services stimulates the purchase of various consumer electronics, increases home values, saves energy, and reduced pollution.

**IS-2007-72: Digital Content Unleashed: The Slow but Inevitable Race Toward a Friction-Free Media World**

This consumer survey from ABI Research reports on how consumers access audio and video (A/V) through retail purchases and downloads, and predicts access modalities in 2012. Impediment to the adoption of new A/V distribution and playback methods are difficulty in set-up, lack of content, and interoperability problems, all creating "friction" in A/V distribution. About 12 per cent of those surveyed bought on-line video in 2007 compared to less than 5 per cent in 2006. Now, most A/V is stored on CDs and DVDs. Over time, physical storage will migrate to network storage. This will facilitate place-shifting (alternate viewing locations) and time-shifting. Eventually, A/V will be stored on a home service and/or and Internet-based server. "Friction-free" access to A/V will benefit device manufacturers, software makers, content owners, and network operators.

**IS-2007-71: High-Speed Services for Internet Access: Status as of December 31, 2006**

The U.S. Congress has mandated that the Federal Communications Commission (FCC) encourage the deployment of advanced telecommunications. Therefore, the FCC reports annually on the adoption of Internet service access nationwide. This report for 2006 notes a 61 per cent increase in high-speed access from 51.2 million subscribers to 65.0 million. High-speed access is provided by cable modems for 38.9 per cent of customers and by ADSL for 30.8 per cent. Other high-speed access modes include fiber optics, satellite, broadband over power line (BPL), and terrestrial mobile. High speed is defined as faster than 200 kbps in at least one direction. 59.5 millions lines were faster than 200 kbps in both directions, of which 53.6 per cent were cable and 39.1 per cent were ADSL.
CompTIA investigates the IT costs for small and medium-sized businesses. Growth partners show companies moving from personal computers to Internet access and networks to virtual private networks and wide area network. Many of these companies depend on IT support from outside vendors and value-added resellers. Many companies are starting to make purchase decisions based on the total cost of ownership. They are seeking IT solutions that can scale as the company grows. Therefore, IT vendors should help companies evaluate the long-term benefits of various IT solutions.

IS-2007-69: Innovative Approaches to Win the US Bundled Pricing Game
This paper from Accenture discusses pricing strategies for bundled services including Internet, TV, and wired/wireless telephone. Accenture maintains that bundled prices are eroding due to competition even while customer retention is growing. They propose that cable and telephone companies price by "customer value segment" rather than uniformly. For example, packages tailored for families or young professionals or baby-boomers might be offered with higher prices because of the perceived value.

IS-2007-68: Towards a High-Bandwidth, Low-Carbon Future
This paper from Climate Risk Pty Ltd in Australia was commissioned by Telstra, a communications provider in Australia, to investigate the benefits of telecommunications in reducing carbon usage and the deleterious effects of greenhouse gas emissions. Examples of savings are described, such as telecommunications to control appliance energy usage in standby mode or when a user is not present. Telecommuting or commuting to a nearby regional office is another savings opportunity, as is teleconferencing. An overview of global warming is included. It was noted that telecommunications equipment contributes to greenhouse gasses by using power for operations and for cooling. On balance, telecommunications could reduce 4.9 per cent of greenhouse gas emissions in Australia.

This paper summarizes policy decisions by the State of California regarding energy. The goal is for energy in California to be "adequate, affordable, technologically advanced, and environmentally-sound." Policies are outlined, including plans for dynamic pricing of power and demand response to managing loads. The States plan to generate 20 per cent of electricity from renewable sources by 2010 and 33 per cent by 2020. The rate-setting process for the investor-owned utilities will be made more transparent. Alternative fuels for transportation will be investigated. California is seeking to reduce greenhouse gases to 1990 levels by 2020 and 80 per cent below these levels by 2050.
According to this article, an emphasis on evaluating whether a building is "green" and sustainable has been developing since 2000. Some green buildings have achieved 40 per cent energy reduction and 30 per cent water reduction over similar non-green buildings. Some green building employees are more productive because out-gassing from building materials is reduced. A green building is estimated to increase costs by 0.8 per cent. Green concepts must be integrated in building design for the greatest savings. For example, building orientation can reduce lighting needs and the cooling needed to remove heat generate by these lights. Older buildings need to be upgraded to be green in order not to lose value.

IS-2007-65: Value Proposition for Enterprise Interoperability
The European Commission reports on a strategic investigation of enterprise interoperability (EI): how businesses can benefit from exchange of information and communications technology (ICT) to create new product and services and to operate more efficiently. ICT and EI can help companies deal with change and value creation. The report concludes, "[t]he potential created by new offerings and new business models together reflects radically new opportunities to generate value with EI."

The purpose of this addendum is to revise ANSI/ASHRAE Standard 135-2004. The modifications in this addendum are the result of change proposals made pursuant to the ASHRAE continuous maintenance procedures and of deliberations within Standing Standard Project Committee 135. The addendum focuses on BACnet: a data communication protocol for building automation and control networks.

IS-2007-63: Service Providers Affirm the Strategic Value of Policy Management
The Yankee Group surveyed service providers for planned expenditures on the management of policies for network access and bandwidth management. Such policies can affect revenue, subscriber access, quality-of-service, network security from threats, and operational efficiency and costs. Bandwidth allocation will become important as subscribers access IPTV, video-on-demand, and enhanced video services. Policy management includes the placement of advertising adjacent and relevant to video-on-demand programming. Also, customers will be able to upgrade services automatically.

IS-2007-62: When Should I Use a Managed Ethernet Switch?
This white paper from Contemporary Controls describes the functions of an Ethernet switch. First the differences between a hub and an unmanaged switch are explained. Then the functions possible in a managed switch are
listed. A managed switch can control the data rate delivered to each port. Also, diagnostic tools are available using the Simple Network Management Protocol (SNMP).


The Association of Energy Engineers surveyed 456 association members on the state of the energy market to help determine a national energy policy and the benefits of energy management. Energy efficiency and management was judged most important. New generation sources are needed, global warming must addressed, and investment tax credits are beneficial. A slim majority thinks that mergers will hurt the energy industry. The best incentive for utilities to encourage energy management is through rebates. This survey is based on 49 questions. Detailed answers are provided.

**IS-2007-60: Technology Contracting: Designing Systems for Efficiency and Interoperability**

Johnson Controls reports on the benefits of centralizing responsibility for the management of building automation systems through technology contracting. Instead of subcontracting HVAC, lighting, security, IT networking, etc. to separate companies with separate responsibilities, an overall manager is assigned. This is particularly useful when the building systems are integrated. This approach saves time, reduces risk and blame, cuts capital costs, reduces construction costs, cuts operating costs, and enables system interoperability. The process for technology contracting is described with a few examples.

**IS-2007-59: Wireless Consumer and Business User Profiles**

ABI Research conducted a survey among 1,223 cell phone users across the U.S. Results of the survey are reported in the following categories: cell phone brands, monthly usage, cell phone features including multimedia, Bluetooth, and Wi-Fi access. Business users of cell phone voice services spend 19 per cent more on voice and 80 per cent more on data than consumers. Twenty-four per cent would like Internet access on their cell phones. Femtocells extend cell phone service via a broadband connection into buildings and homes where service might have been poor. Seventy-two per cent were not interested in this service. About one-third of business users would add a cellular modem to their laptop for Internet access via cell phone service.


The US Department of Energy and the Environmental Protection Agency organized a study on improving energy efficiency in homes, buildings, schools, governments, and industry. Recommendations were developed for utilities, regulators, and partner organizations. Demand for energy is expected to increase 30 to 40 per cent for electricity by 2030. Energy efficiency programs could eliminate the need for 40 new 500-MW plants over the next
10 to 12 years. Among the recommendations in this extensive report are policy changes through rate designs to move utilities towards energy efficiency.

**IS-2007-57: The Cost-Effectiveness of Commercial-Buildings Commissioning**
This research report issued by the Lawrence Berkeley National Laboratory describes a process of building commissioning to detect and remedy problems. Such problems include design flaws, construction defects, equipment problems, and needed maintenance. A methodology was developed based on analyzing 224 buildings. HVAC presented the most problems. New buildings have three times the defects of existing buildings. System-level interactions were tested. Problems were found in valves, filters, controls, etc. Non-energy benefits include improved equipment lifetime, productivity, and indoor-air quality. Detailed data and charts are included.

The impact of commercial buildings on the peak demand for energy is investigated by Lawrence Berkeley National Laboratory and the U.S. Department of Energy in this report. According to the report, US commercial buildings account for a significant portion of the summer peak demand. Methods of demand response are explained, including pricing incentives and load shedding. Communications methods for the utility to reach the building controls include a gateway and an Internet relay. Trials in California and New York are presented.

**IS-2007-55: Energy Use in Canada**
This paper by the Government of Canada addresses methods for government agencies to meet the need for energy in Canada through 2020 as population grows 11 per cent and GDP by 43 per cent. Methods and tools to improve energy efficiency and conservation are discussed. It was noted that large-appliance energy consumption has dropped, but consumers bought more small appliances where conservation is not regulated. On-site energy generation is discussed. Energy efficiency methods are included for buildings, industry, and transportation.

**IS-2007-54: Fluorescent Lamp and Ballast Options**
This paper, by Natural Resources Canada, constitutes a review of fluorescent lighting technology. The benefits of electronic ballasts in place of electromagnetic ballasts are discussed. The ballast is required to generate a high-voltage start-up surge. The advantage of the T-8 lamp over older models is summarized. Potential savings in an office building are included.
**IS-2007-53: Monitoring and Targeting Techniques in Buildings**
This paper, by Natural Resources Canada, presents a technique adopted from industry for managing energy consumption in buildings. It consists of data gathering, data analysis, and a resulting action plan. Specific factors that affect building energy consumption, such as occupancy, are measured. A regression analysis determines the relationship between the energy consumption and these factors. Examples are presented.

**IS-2007-52: Businesses Worldwide Plan to Increase Spending on Network Security Next Year by as Much as 20 Percent**
This Cisco Systems press release describes a study of IT security for mobile communications. A study of 700 IT personnel found that almost half expect IT security expenditures to increase 10 per cent, while almost 10 per cent think that there will be a 20 per cent increase. These outlays are motivated by regulatory compliance, increased mobility, and a growing labor force. Only nine per cent worldwide said security spending was because of loss or theft. However, 26 per cent in the U.S. said this is a motivation.

**IS-2007-51: Study Reveals Insight, Opportunity for IT to Protect Mobile Wireless Users**
This is a press release for a Cisco Systems study of methods to improve IT security for users of mobile communications. The study was conducted in North America, Europe, and Asia among 700 users. Most users did not pay attention to IT security. Recommended actions include educating and protecting employees' mobile communications practices. Some specific suggestions are included.

Cisco Systems surveyed 100 users of mobile service and 100 IT persons worldwide about security issues. Forty per cent of users do not following company security policies. More than 25 per cent are not concerned about security. Twenty per cent never protect data, mostly because they do not know how. IT persons say that viruses are the biggest threat. One-third of respondents back-up their data. Sixty per cent of companies encrypt transmitted and stored data. Spending on security is expected to grow 20 per cent next year because of lost mobile devices and new hires.

**IS-2007-49: Hiding in Plain Sight: Service Innovation, A New Priority for Chief Executives**
This paper from IBM describes opportunities to improve customer relations and generate revenue from providing after-sales service. IBM recommends focusing on service-innovation model, operations, and growth. Service may expand beyond traditional product support to advisory and financial services. Examples of successful service
offerings are the Best Buy Geek Squad and General Motors OnStar. Companies should devote as much discipline and rigor in creating service offerings as they do in creating new products.

Harbor Research surveyed manufacturers about investments in remote access to products in the field. Half of the respondents are already equipping products for remote maintenance and support. The links to the products include wired Ethernet, Wi-Fi, cellular, and satellite. The basic reason is to manage the cost of providing service. Nine vertical markets amenable to remote access were identified: buildings, consumer & home, industrial, healthcare & life sciences, energy, retail, transportation, public safety & defense, and IT networks. Remote access can also be used to optimize performance and upgrade products. Some companies charge separately for remote product management. Examples from various companies are presented.

**IS-2007-47: Workforce Demographics: Addressing an Aging Workforce in the Natural Gas Distribution Sector**
This paper by the Canadian Gas Association addresses challenges to finding labor in the Canadian natural gas industry as the general population ages. The industry supports increased immigration and employment of Canadian Aboriginal peoples. Information transfers between retirees and new labor is encouraged.

**IS-2007-46: Broadband Connectivity Competition Policy**
The US Federal Trade Commission held a workshop in February 2007 to solicit information from advocates and experts about broadband Internet access and net neutrality (uniform treatment of all data packets). The impact of enforcing net neutrality on consumer welfare is investigated. A key debate is about prioritizing Internet traffic and possibly blocking some content based on prior business arrangements. There is debate on just how competitive is the Internet market. Some claim it is a duopoly between the cable operators and the telephone companies. The applicability of anti-trust laws is considered. Also discussed is the impact on consumer privacy of Internet packet content examination.

**IS-2007-45: The Internet's Capacity To Handle Fast-Rising Demand for Bandwidth**
This article by the US Internet Industry Association explores business models that will support increasing demands for Internet bandwidth. The number of subscribers is not growing as fast as the increasing demands for bandwidth by the existing subscribers. Internet subscribers have reached 70 per cent of the population in many developed countries. Various schemes for charging for bandwidth are discussed. Examples of bandwidth-intensive applications include IPTV, peer-to-peer file sharing, and collaborative gaming.
The Deloitte ToucheTohmatsu Technology, Media & Telecommunications Industry Group predicts trends based on internal and external interviews. Key among these is the possibility that the Internet is reaching capacity because of video data. The need for Internet appliances other than the PC, such as specialized products for e-mail, music, or streaming radio, is discussed as a method to gain additional customers for Internet Service Providers. The added revenue would pay for expanding the capacity of the Internet. Mobile operators should not focus on TV, but on video capture and improved in-home and in-building reception by linking with wireless LANs. Also, the mobile phone could become the control element for home automation. IPTV should not be a clone of traditional TV. Some ISPs and telecommunications companies want to charge content providers for carrying the content.

IS-2007-43: Internet Service Providers in the 21st Century
According to this US Internet Industry Association report, the business environment for Internet Service Providers (ISPs) is changing with the advent of broadband. A dial-up Internet business required much less capital than a broadband business. The paper presents four business models for an ISP. The ISP provides customers with a link between transport methods (telephone, wireless, power line, etc.) and content. Guidelines for running a successful ISP are presented.

This paper, published by the Construction Specifications Institute (CSI) and Construction Specifications Canada (CSC) provides a candid, real-world assessment of conversion penetration to the MasterFormat 2004 Edition. The 2004 edition marked a significant change in the construction industry as a new 50-division organizational structure replaced the familiar 16-division MasterFormat structure that dated back to 1964.

IS-2007-41: e-Health and America's Broadband Network
This paper, originally published by the US Internet Industry Association, is an examination of how broadband services enhance health care in America. The paper argues that the emergence of “eHealth” has been shown to reduce the cost of healthcare and increase efficiency through better retention and retrieval of records, better management of chronic diseases, shared health professional staffing, reduced travel times, and fewer or shorter hospital stays. More directly, broadband helps to address three of the most critical complaints about the US health care system - high administrative costs, discrepancies in geographic coverage, and the high cost of delivery of services.
IS-2007-40: Monetizing Triple-Play and Value-Added Services: The Role of the Customer Experience
This white paper, by Parks Associates, provides context for the customer service and technical support issues that service providers must address as they increase the sophistication of services to the home and requisite hardware and associated software inside the home.

This white paper, by Parks Associates, notes that 2006 was a watershed year for the digital photo frame market. Sales in the first half of 2006 inherited the normal growth curve that most vendors saw over the previous two years: steady increase of 30 to 35 per cent on a year-over-year basis. But during the second half of 2006, especially the fourth quarter of 2006, sales skyrocketed to a record level, with most vendors reporting 200 to 300 per cent unit growth on a semi-annual basis.

IS-2007-38: Home Controls: Trends and Opportunities
This white paper, by Parks Associates, projects that the market for home control hardware and software will reach $3.5 billion in 2007 and grow to six billion by 2012. Intelligent controls (excluding security controllers) will grow from just less than $600 million in 2007 to $1.5 billion by 2012 led by rapid growth of advanced entertainment controllers. Universal remote controls are a billion-dollar market in the U.S., and will continue to grow in popularity, creating a nearly $2 billion market by 2012.

IS-2007-37: Digital Kitchen
The Digital Kitchen was a CABA Internet Home Alliance Research Council study that investigated consumer electronics and appliances in use in North American kitchens to determine which new products and services homeowners would like to see added to their kitchens in the future. The study examined how technology is connected and integrated into people’s lives through intuitive interfaces and culminated in a display at the 2007 Kitchen/Bath Industry Show (K/BIS). Whirlpool Corporation, Bell Canada, Cisco Systems, Inc., Direct Energy, HP, HomeCrest Cabinetry, Intel Corporation, Microsoft, The National Association of Home Builders (NAHB), and the National Kitchen and Bath Association (NKBA) led, funded and participated in this research.

IS-2007-36: Interactive Television & Advertising Study
The Interactive Television & Advertising Study, conducted by CABA’s Internet Home Alliance Research Council in early 2007, investigated the effectiveness of interactive TV advertising and product purchasing. The aim of the market study was to: learn about potential business models for using advanced television programming; explore new advertising potential and interactive capabilities for message delivery; and create parallel experiences to live
and recorded programming and interactive capabilities. AT&T, Cisco Systems, Campbell Ewald, Digitas and Tandberg TV led, funded and participated in this research.

**IS-2007-35: Microbusiness & Small Business Managed Services Needs Assessment Study**
The Microbusiness & Small Business Managed Services Needs Assessment Study, conducted by CABA's Internet Home Alliance Research Council in early 2007, was designed to assess the current state of the managed services market and to identify any potential areas for further development within the micro- and small business markets (where the former is defined as companies with fewer than 10 employees and the latter is defined as companies with between 11 and 100 employees). The key objectives were to profile target companies; assess the level of in-house IT/telco support; identify current and/or future managed services needs; and evaluate the incidence of current IT/telco change initiatives. AT&T, Cisco Systems, Costco Wholesale, Hewlett-Packard, Level Platforms and SupportSoft led, funded and participated in this research.

**IS-2007-34: The Forgotten Environment; Realities of Green Buildings**
This short paper, by S.D. Snyder and Assoc., poses the problem of indoor air pollution and proposes a solution. Indoor air pollution is aggravated by attempts to conserve energy in buildings by making builders tighter to prevent the escape of conditioned air. This traps pollutants including carbon dioxide generated by human breathing. The opposite extreme of mandating periodic air exchanges wastes energy. The writer argues for the deployment of indoor landscaping with plants to absorb the carbon dioxide. He recommends installing automated irrigation systems.

**IS-2007-33: Not Business as Usual: Changing Channels in Consumer Electronics**
This paper by IBM offers manufacturers strategies for improving margins in the consumer electronics sector by being more active in managing the sales channel and dealing with retailers. Manufacturers are advised to focus on customer-relations management. Also, they should improve the supply chain to large retailers. Other recommendations include global integration, managing small retailers, and enhanced branding.

**IS-2007-32: Custom Mobile Advertising Study**
Mobile communications technology now promises advertisers the ability to deliver targeted commercial messages to consumers when their behavior can be immediately influenced and converted into a sale. The question is: How open are consumers to receiving these messages- either on their cell phone, or on a device installed in their car? That is the central question addressed by the Custom Mobile Advertising Study, conducted in May 2007 by Zanthus, an independent research consulting firm for CABA's Internet Home Alliance Research Council. AT&T, Cisco Systems and General Motors led, funded and participated in this research.
Johnson Controls decided to conduct research within the North American business community to look at the impact of rising energy prices on organizations. For the first time, this survey of 1,250 executives examined what companies were doing in response to rising energy costs, what sort of payback they expected on investments in energy efficiency, to what extent they were motivated by concerns about the environment vs. purely economics, etc. Johnson Controls plans to repeat this survey annually.

IS-2007-30: Senior Living Research Study
CABA's Internet Home Alliance Research Council has conducted a study which identifies the solutions consumers over the age of 50 want most in a home to keep them safe, comfortable and living independently in their own homes as they grow older. The study was designed to help consumer product and service companies better understand - and develop products and services for - the mature market. Whirlpool Corporation, Aqua Glass Corporation, American Shower & Bath Corporation, AT&T, Delta Faucet Company, Echelon Corporation, KraftMaid Cabinetry, Merillat Industries, Milgard Windows & Doors and the National Association of Homebuilders led, funded and participated in this research.

IS-2007-29: Boomer Tech White Paper
Baby Boomers, like all generations, have come to view the PC and Internet as an essential tool in their daily lives. This white paper, commissioned by CABA's Internet Home Alliance Research Council in June 2007, notes that Baby Boomer households own desktops, laptops, and printers at the same rate as younger U.S. households.

IS-2007-28: Laundry Time Research Pilot
The Laundry Time Research Pilot, conducted by CABA's Internet Home Alliance Research Council in late 2006, examined how effective an "intelligent" laundry solution was at simplifying and saving time on laundry tasks while also uncovering consumer attitudes about remote access and control of laundry appliances. Whirlpool Corporation, HP, Microsoft, Panasonic, and Procter & Gamble led, funded and participated in this research.

IS-2007-27: Migrating to MPLS-based networks: Avoiding the mistakes your peers have made
This paper by Fluke Networks addresses problems that might arise as companies combine legacy data networks based on point-to-point communications into a private IP (Internet Protocol)-based network. An IP network carries packets over varying routes through a mesh network thereby making troubleshooting difficult. A methodology is provided for analyzing network performance and for setting application priorities.
IS-2007-26: Migrating to an MPLS-based/Private IP Network: Are You Ready?
This paper by Fluke Networks describes how to transform a data network within a business into a private IP (Internet Protocol) network using MPLS (Multi-Protocol Label Switching). The underlying networks may switch-based. An IP backbone interconnects the existing legacy networks (such as frame-relay and ATM). In a private network, priorities can be defined for various classes of service. Also, redundancies can be incorporated, a mesh network can be created, and bandwidth allocations can be optimized.

As businesses upgrade data networks to IP (Internet Protocol)-based networks, this paper by Fluke Networks argues that they need to determine qualitative and quantitative benefits. This upgrade can impact applications, operational costs, problem resolution, and bandwidth allocations. Examples are provided. Calculations of payback and return-on-investments are demonstrated.

This paper, by the Broadband Stakeholder Group, examines the potential impact of broadband Internet access on business in the United Kingdom. Business models to support increased bandwidth are uncertain. Therefore, public policy for high-speed access is considered, although immediate intervention is not recommended. The upper end of the market will demand 23 Mbps downstream and 14 Mbps upstream by 2012, requiring fiber optics. One study showed that broadband penetration to 90 per cent of the public could increase GDP by 1.6 per cent.

IS-2007-23: Natural Gas Markets Post-Heating Season Update
This paper, by the Canadian Gas Association, explains how the price for natural gas fluctuates. It describes the factors that influence gas prices by showing projections for Spring 2007 made in the Fall of 2006. Some of the factors include raw materials costs, weather, amount already in storage, and levels of exploration.

The paper, by Richard-Zeta Building Intelligence, Inc., describes a method for improving energy management in retail shopping malls. Energy management is achieved through remote meter reading, load shedding, and participation in demand response programs. The meters and energy management systems are integrated into a Meter Data Management System via a gateway. The meters use the Modbus protocol, while the Energy Management Systems use BACnet. The gateway is based on the Richard-Zeta Mediator Multi-Protocol Exchange platform. Meter data are encoded in XML.
IS-2007-21: Impact of ICT on Real Estate to Create a Total Branded Experience; Introduction to Community 2.0
According to a paper by Cisco Systems, new communities will combine residences and businesses to facilitate economic development. This integration uses IP-based services to create a "total branded experience" called Community 2.0. Communities and buildings need to adapt to humans.

IS-2007-20: CABA Intelligent Buildings Roadmap Executive Summary
The CABA Intelligent Buildings Roadmap is a collaborative industry-funded research project that explores the opportunities offered by emerging intelligent building technologies. The full report examines the challenges facing intelligent building implementation within North America and identifies the market developments and industry initiatives needed to support the wider adoption of these technologies.

IS-2007-19: Mastering the Metadata Menace
In this paper, published by The Diffusion Group, the functions and implementation methods for cable TV set-top boxes are explained. The set-top box stores the on-screen TV guide, manages video-on-demand (VOD), and may run a built-in personal video recorder (PVR). All these functions put stress on the data storage and processing requirements of the set-top box. Inconsistent implementation technologies and the variety of set-top boxes in the field are limiting growth in set-top applications, which is the future of the cable TV business.

IS-2007-18: FTTH in Asia: Japan Leads but China is a Sleeping Giant
According to this report, published by The Diffusion Group, the leading nations for FTTH are Japan and Korea, with China and India growing. Penetration was five million at the end of 2005 and is expected to reach 40 million by 2010. Korea has 80 per cent broadband penetration. China is surpassing the US in broadband users. The demand for broadband is fueled by IPTV and gaming. FTTH is more aggressively priced in Japan than in the US.

IS-2007-17: China's Path to Digital Multimedia - The Path Less Traveled
According to this report, published by The Diffusion Group, the Chinese are willing to spend more on cell phones and broadband than on IPTV (TV via the Internet). China will introduce digital TV as a hybrid of terrestrial broadcast, mobile, and broadband delivery methods.

IS-2007-16: Understanding the Shifting Demand for Home Networks
This paper, published by The Diffusion Group, maintains that the demand for home networking is declining. The market growth for broadband and home networking is "about to be exhausted." This market will be sustained by push campaigns.
IS-2007-15: The IPG Goes New Media: Trans-Platform Personal Entertainment Guides
According to this report, published by The Diffusion Group, the on-screen program guide, called the Interactive Program Guide, is evolving into a Personal Entertainment Guide (PEG). Such a guide must know the viewer, be available on multiple viewing media, and simplify entertainment viewing. The PEG is geared to individual viewers, not to households.

IS-2007-14: The Distribution of Profits in the Networked Digital Home
This paper, published by The Diffusion Group, claims that the market for integrated home systems will not become a mass market for five to 10 years. Products in the home are divided into four clusters: entertainment, productivity and data communications, voice communications, and home management. These clusters will be independent, centrally controlled, or distributed. The key issue is who will profit from owning the control points.

IS-2007-13: The Medium is the Message - New Media and Its Impact on Media Consumption
This paper, published by The Diffusion Group, wrestles with defining new media. It characterizes new media as computer-based and likely to use the Internet with digital imaging and a graphical user interface. Academic sources are cited.

IS-2007-12: Multimedia Phones as a Portable Game Console Replacement?
The paper, published by The Diffusion Group, argues that the cell phone is not and will not become a substitute for a portable gaming console. Most prefer to use cell phones for talking, playing music, and playing video (in that order). Cell phone makers would need to get established in the portable gaming console market for their cell phones to be used widely for gaming. Alternatively, a cell phone company might partner with a gaming company.

IS-2007-11: Mastering Content in the Mobile Video Market
This paper, published by The Diffusion Group, questions the market size for portable video players such as the iPod Video. Will consumers pay for the video programming? The author maintains that a multimedia cell phone is better suited for video. About one-third of cell phone users who were surveyed have an interest in video on cell phones and 14 per cent would pay for it. The favorite contents are news and sports. Likely content preferences by demographic segments are described.

IS-2007-10: The Emergence of Broadband Television
This paper, published by The Diffusion Group, introduces Internet-based TV (IPTV), applications ranging from short video presentations up to movies, and likely market developments. The delivery mechanism is broadband.
with an adapter to present the video on a television. About 160 million TVs will use or include such adapters by 2011.

**IS-2007-09: IPTV’s Impact on the Business of Television and the Emergence of “Internet 3.0”**

According to this report, published by The Diffusion Group, IPTV is driven by the proliferation of broadband and the need for telephone operators to gain income from TV distribution. There will be competition from satellite companies, cable companies, broadcasters, and telephone companies. Hotel operators may benefit from IPTV. IPTV will succeed based on the programming offered. The author calls IPTV "Internet 3.0."

**IS-2007-08: Business Models for Managing the Digital Home**

This paper, prepared by Parks Associates, summarizes a survey of households with Internet access in the US and Canada on their willingness to pay for maintenance services. Such services might deal with security (viruses, spyware, spam), home networks, and software/hardware failures. Other potential services include on-line storage, installation and configuration management, and remote or on-site technical support.

**IS-2007-07: Digital Home Health - A Primer**

This paper, prepared by Parks Associates, examines what motivates the healthcare industry and consumers to adopt technology for supplementing care delivered by medical professionals. It notes consumers will take the lead with self-monitoring provided there is appropriate equipment, cooperation of caregivers, and insurance reimbursement. Geriatric monitoring of routine daily activities may be included. Long-term studies are needed to convince insurers to pay for these services. The market for home health technology was $461 million in 2005 with an expected growth rate of 74 per cent per year through 2010.

**IS-2007-06: Media Servers in the Digital Home**

This paper, prepared by Parks Associates, examines storage systems for homes, and categorizes them as network attached storage, multimedia PCs, set-top box media servers, and high-end media servers. Manufacturers of hard disks are drivers for this market. Some consumers are increasing multi-media storage capacities by 50 per cent per year. Media server shipments will total about 50 million in all categories by 2010.

**IS-2007-05: Broadband Europe: A Tale of Many Markets**

This paper, prepared by Parks Associates, examines broadband markets in Europe. It finds as of February 2007, the highest penetration of broadband in Europe is in Scandinavia. 82 per cent of broadband customers use DSL. Those countries encouraging competition have greater broadband penetration. This report includes a survey of services offered by incumbents and new competitors.
IS-2007-04: Digital Youth Study
The Digital Youth study, developed by the CABA Internet Home Alliance Research Council and released Feb. 15, 2007, examined youth influence on consumer technology purchase. It found that youth age 8-18 have influence on the purchase of products/services that are primarily used by youth and not by parents. They exert little influence on the purchase of: desktops, laptops, Media Center PCs, external hard drives, printers (color laser, all-in-one inkjet, standard inkjet, snapshot photo), broadband, digital cameras, satellite radio, HDTV, and DVRs. Cisco Systems and AT&T led, funded and participated in this research.

IS-2007-03: Home Networking Study
The Home Networking Study, developed by the CABA Internet Home Alliance Research Council and released Feb. 15, 2007, provides an up-to-date, comprehensive understanding of opportunities and barriers to home networking as they occur throughout the adoption cycle: from purchase through installation, use and maintenance. Of particular interest to project sponsors are factors affecting consumer interest in advanced network applications in areas such as entertainment and home control. Cisco Systems, AT&T, SupportSoft, and Whirlpool Corporation led, funded and participated in this research.

IS-2007-02: Russian Market for Building Automation Systems
This report is an executive summary of a market survey of heating, ventilation, and air-conditioning (HVAC) equipment installed in Russia, published by the Russian Association for Building Automation and "BIG-RU" Association BACnet Interest Group Russia. The methodology for gathering and costing the data is explained. HVAC equipment is categorized as control and control/monitoring systems. Controllers are divided into those with interfaces to sensors and valves, and network controllers without such connections.

IS-2007-01: Ceramifying Polymers for Advanced Fire Protection Coatings
This paper, published by the Co-operative Research Centre for Polymers at Monash University, describes a new fire retardant. It consists of ceramic polymer that can coat thermoplastics. The basis for the ceramifying polymer is a PVC material and a non-halogen ethylene-propylene diene rubber (EPDM). The fire retardant characteristic is due to a cellular structure that also provides a support structure. Tests are reported that demonstrate the fire retardant features.

IS-2006-79: Intelligent Home and Feng Shui
The ancient Chinese belief in Feng Shui asserts that the natural harmony of the earth is disturbed by building location and orientation. The art of Feng Shui provides guidelines for minimizing this disturbance. An intelligent
home may allow flexibility for adapting rooms to various living functions, for example, with an adjustable lighting system. Such adaptation would enable a house to be configured for maximum Feng Shui. The author, Dr. So of the Asian Institute of Intelligent Buildings notes that a skeptic might just have fun changing the functions of rooms every few years. He concludes that Feng Shui is one motivation for increasing the popularity of intelligent homes.

IS-2006-78: The Effect of Ramps in Temperature and Electric Light Level on Office Occupants
This paper by Guy Newsham, Cara Donnelly, Sandra Mancini, Roger Marchand, William Lei, Kate Charles, and Jennifer Veitch of the Institute for the Research in Construction at the National Research Council of Canada, reports on a controlled study to determine effective methods for load management in the workspace of an office building. The lighting and cooling were reduced using a gradual ramping of illumination and temperature to minimize detection by the occupants. A 20 per cent decrease in lighting and a 1.5 degree C increase in AC temperature were considered acceptable to most occupants.

IS-2006-77: Designing the Future: A Smart Grid Newsletter Case
This paper describes the methodical process pursued by Southern California Edison (SCE) to introduce automatic meter reading and ancillary services, such as remote turn on and off. SCE developed a three-phase plan to install an infrastructure that includes digital meters, a communications network to customers, and links to networked devices in the home, such as thermostats. The evaluation process included researching technology, developing use cases and requirements, evaluating products, specifying standards-based technology, and working with vendors.

IS-2006-76: Third Quarter 2006: High-Speed Access Report
IGI Consulting has released its third quarter 2006 report on high-speed broadband Internet access within North America. According to the report, a select number of major North American telecommunication firms deployed 4.2 million high-speed access lines in 2005, in comparison to 3.5 million high-speed access lines deployed by the cable companies. IGI Consulting predicts that telecom broadband deployment will over take cable broadband deployment by the end of 2006.

IS-2006-75: A Study on the Wireless Environment in Canada
The Wireless Environment in Canada is the most comprehensive analysis to date of the country's wireless telecommunications sector. The Canadian Wireless Telecommunication Association (CWTA) commissioned the report in June 2006 from Wall Communications, an independent economics research and analysis consulting firm, to assess six key aspects of the industry: the financial state of the industry; the state of competitiveness; current
wireless coverage; technology innovation and deployment; wireless penetration rates relative to other jurisdictions; and pricing.

**IS-2006-74: An Examination of Issues Raised in the Policy Review Concerning the Mobile Wireless Service Industry**
This report, commissioned by the Canadian Wireless Telecommunication Association (CWTA), examines and provides comment on statements made by the Telecommunications Policy Review Panel (TPRP) relating to the Canadian mobile wireless services industry as well as the TPRP’s recommendations relating to the wireless segment of the Canadian telecommunications services industry.

**IS-2006-73: Trends in Consumer Technology: Defining and Sizing the Market**
This white paper by Parks Associates attempts to provide a snapshot of the digital lifestyle landscape.

**IS-2006-72: Mobile TV in Europe**
This white paper by Parks Associates examines changing mobile TV standards in Europe.

**IS-2006-71: IGI Consulting First Quarter 2006 High Speed Access Report**
This report, provided by IGI Consulting, provides in-depth analysis on high speed access growth within the North American marketplace for the first quarter of 2006.

**IS-2006-70: Cisco Connected Real Estate**
This paper explores how Cisco Connected Real Estate is delivering huge financial and operational advantages not only to the construction, real estate and property service industries but also to their customers - such as hotel operations, multiplexed retail outlets, and corporate tenants - in sectors as diverse as hospitality, healthcare, education and retail finance.

**IS-2006-69: Chairman’s Roundtable: Sustaining Change Efforts**
Designed to surface, discuss and debate issues critical to advancing the home technology market, Internet Home Alliance’s Chairman’s Roundtables take place on a quarterly basis. Participants include members of the Alliance’s board of directors as well as other invited thought leaders. Post-event reports capturing the roundtable discussions are written and made available first to Alliance members and then to the public at large.
IS-2006-68: Chairman's Roundtable: Principals of Consumer Privacy
Designed to surface, discuss and debate issues critical to advancing the home technology market, Internet Home Alliance’s Chairman’s Roundtables take place on a quarterly basis. Participants include members of the Alliance’s board of directors as well as other invited thought leaders. Post-event reports capturing the roundtable discussions are written and made available first to Alliance members and then to the public at large.

IS-2006-67: Chairman's Roundtable: From Next to Now
Designed to surface, discuss and debate issues critical to advancing the home technology market, Internet Home Alliance’s Chairman’s Roundtables take place on a quarterly basis. Participants include members of the Alliance’s board of directors as well as other invited thought leaders. Post-event reports capturing the roundtable discussions are written and made available first to Alliance members and then to the public at large.

IS-2006-66: Chairman's Roundtable: Crossing the Zone of Discomfort
Designed to surface, discuss and debate issues critical to advancing the home technology market, Internet Home Alliance’s Chairman’s Roundtables take place on a quarterly basis. Participants include members of the Alliance’s board of directors as well as other invited thought leaders. Post-event reports capturing the roundtable discussions are written and made available first to Alliance members and then to the public at large.

IS-2006-65: Chairman's Roundtable: Connected Home Taxonomy
Designed to surface, discuss and debate issues critical to advancing the home technology market, Internet Home Alliance’s Chairman’s Roundtables take place on a quarterly basis. Participants include members of the Alliance’s board of directors as well as other invited thought leaders. Post-event reports capturing the roundtable discussions are written and made available first to Alliance members and then to the public at large.

IS-2006-64: Ecosystem Framework White Paper
A natural ecosystem is an ecological community, together with its environment, that functions as a unit. The connected home can be seen as an artificial ecosystem defined by its technological infrastructure and its residents. This paper describes the three distinct, but related ecosystems within the connected home the Alliance considers critical to the future of the market. We believe the thinking behind this concept will help companies identify new opportunities for profitable collaboration.
For the purposes of market analysis, Internet Home Alliance has adopted an ecosystem perspective on the connected home market, dividing the space into three separate, but related ecosystems: family, career and entertainment. In the fall of 2005, the Alliance sponsored a comprehensive Web survey. Approximately 1,800 online consumer panelists between 18 and 64 years of age participated across the U.S. The sample was divided equally into three separate lifestyle domain or ‘ecosystem’ tracks: Entertainment, Family and Career. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

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IS-2006-61: State of the Connected Home Market: Career
For the purposes of market analysis, Internet Home Alliance has adopted an ecosystem perspective on the connected home market, dividing the space into three separate, but related ecosystems: family, career and entertainment. In the fall of 2005, the Alliance sponsored a comprehensive Web survey. Approximately 1,800 online consumer panelists between 18 and 64 years of age participated across the U.S. The sample was divided equally into three separate lifestyle domain or ‘ecosystem’ tracks: Entertainment, Family and Career. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-60: Mobile Worker IHA Research Pilot
A public work space built specifically to meet the needs of mobile workers—workers who use a PC at least 15 percent of the time and have the freedom to work from home, the office or some ‘third place,’ is the latest project from Internet Home Alliance to provide real life research learnings. The results found that a mobile work environment was a viable business proposition, increasing the revenue of retailers in the area, prompting the pilot participants to keep the Plano, Texas, test site up and running indefinitely. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.
IS-2006-59: Mealtime IHA Research Pilot
According to the results of the Alliance’s Mealtime Pilot, an eight-month, real-world test of a connected kitchen solution led by members Whirlpool, Hewlett Packard, IBM, Icebox, Peapod by Stop & Shop and Sears, Roebuck & Co., having broadband Internet access in the kitchen has the effect of bringing family members together and actually increasing the amount and quality of time they spend with one another. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-58: Energy Management IHA Research Pilot
This pilot, which wrapped in November 2001, tested the market viability of a remote-controlled thermostat solution in over 300 homes. Users could monitor and control their home’s air-conditioning from any Web-enabled device, including PCs, cell phones and PDAs. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-57: Video Experience Point of Contact
Parks Associates completed eight focus groups, four in Dallas and four in Los Angeles for Internet Home Alliance in July 2003. These groups addressed consumer interest and reaction to the concept of home entertainment servers that will allow the networking of entertainment and PC equipment for the purpose of moving content (audio, video and still pictures) from one output/display device within a home to another. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-56: Subsidized Media and Location Based Advertising Study
Faced with declining consumption of traditional mass media such as newspapers and broadcast television fare, as well as advertising-skipping technologies like digital video recorders, advertisers are seeking new ways to deliver messages to their target audiences. At the same time, current trends in mobile telecommunications and digital media are opening up opportunities for advertisers to deliver custom-tailored messages to audiences in ways that consumers may find more relevant and compelling than advertising designed for the masses. This research effort was designed to yield insights into two such potential advertising formats, subsidized media and location-based advertising. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.
IS-2006-55: Safe, Secure and Comfortable Home
Safe, secure, and comfortable – these are words that describe an ideal home. In this research study, the Alliance evaluated a number of home automation concepts designed to deliver on this notion. Participants explored the unifying theme of a home information and control solution that will help home owners by managing and providing information about environment, energy consumption, safety, and security. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-54: Personal Media Storage
Internet Home Alliance commissioned this study with the Aberdeen Group to better understand the role of portable storage products, most notably memory cards, in achieving a fully networked and connected Internet lifestyle. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-53: Web-based Family Calendar User-interface
Web-based calendars provide a way for users to gather information about upcoming personal or business events and present them in calendar form. The main purpose of this project was to identify the relative strengths and weaknesses of three existing Web-based calendars: Yahoo!Calendar, Microsoft’s MSN Calendar (part of MSN 8.0), and SimpleDay’s prototype calendar. This qualitative research project produced detailed evaluations of these applications and recommendations for developing an ‘ideal’ product. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-52: Mobile & Remote Worker Needs Assessment
Balancing work and life (family and leisure time) is of paramount importance to consumers. This project will determine, in part, if corporate policies regarding mobile and remote work, along with supporting technologies, can help consumers achieve the kind of balance they desire. The results of this two-phase project will also help segment the market, determine popular drivers and barriers to mobile and remote working, and identify the technology, IT support and environments that would best suit mobile and remote workers. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-51: iPTV Demand Study
Based on an earlier Alliance-sponsored project, the Digital Entertainment Needs Assessment Study, we understood that a substantial percentage of online households want the type of functionality iPTV (Internet
Protocol television) can deliver, including time-shifted TV programming, multi-room viewing options, and the ability to surf the Web while watching broadcast programming. The main purpose of this project was to determine the most appealing features/functions of a hypothetical iPTV service. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

**IS-2006-50: Home Networking in a Box**
The number of networked homes in the United States is projected to grow to 32.3 million by the end of 2007 from 6.7 million in 2002. Increasing adoption of broadband, multiple PCs in the home, the introduction of connectivity hardware by broadband providers, and improvements in wireless networking performance are factors driving the trend. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

**IS-2006-49: Health & Wellness Web Portal Study**
It’s clear that controlling obesity and the chronic health conditions that come with it is vital to the nation as a whole, both in economic terms and quality-of-life terms. Previous research by Internet Home Alliance on the general health of U.S. families confirmed that many Americans are heavier than their ideal weight, and they chalk it up to three factors: lack of time to cook and eat healthy food, lack of time to exercise, and not enough discipline to exercise regularly. Based on these findings and the nationwide trends in health, Alliance members developed a concept called My Health Port, which combines a set of health data monitoring devices and access to a secure, personalized Web portal. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

**IS-2006-48: Health & Fitness Needs Assessment**
To assess the most salient consumer needs in the health and fitness area that could be addressed by products or services with a Web component, Internet Home Alliance sponsored a Web survey of 643 single-family, owner-occupied households with Internet access in the U.S. The sample included both primary and mass market consumers. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

**IS-2006-47: Digital Entertainment Needs Assessment**
As of the beginning of 2005, more than 16% of U.S. households had a broadband connection, multiple PCs and a home network. To the extent that these three components comprise the 'heart' of the connected home, the concept has reached an important milestone. Now, it seems industry players should focus on how to best capitalize on this burgeoning digital infrastructure. The recently completed Digital Entertainment Needs
Assessment study was designed primarily to help companies do just that. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

**IS-2006-46: Digital Entertainment Migration**
The main purpose of this project was to determine the degree to which digital entertainment enthusiasts have an interest in potential non-entertainment features or functions of the connected home. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

**IS-2006-45: Asset Management (RFID) Study**
In this study, Internet Home Alliance member companies were interested in investigating consumer response among early technology adopters of an RFID tagging solution for use in the home. Additionally, Alliance members sought to uncover specific needs regarding the use of RFID, and additional application possibilities. This report provides a synopsis of the full report available to CABA Internet Home Alliance Research Council members.

**IS-2006-44: Managing Serial Devices in a Networked Environment**
This paper, published by Lantronix, Inc., describes how remote management of a device can migrate from a dedicated serial connection to access via a local or wide area network running TCP/IP. Such devices are connected to the Internet or to an intranet via a Device Server. Remote terminals can access these devices via Redirector Software or by “tunneling” messages through the network.

**IS-2006-43: Web Enabling Non Networked Devices Using JAVA**
This paper, published by Lantronix, Inc., describes a method for access and control of remote devices. Such devices are intended for direct serial connection (RS-232 standard). A Device Server adapts the device to TCP/IP and allows access via HTML and JAVA applets.

**IS-2006-42: The Freedom of Wireless**
This paper, published by Lantronix, Inc., summarizes wireless technologies for local area networks. The IEEE standards for WLAN (Wireless Local Area Network) are presented and compared.

**IS-2006-41: Encryption and Its Importance to Device Networking**
This paper, published by Lantronix, Inc., presents an overview of cryptography applied to protecting device data while being transmitted on a communications network. The Advanced Encryption Standard (AES) offers the strongest commercial encryption as of 2004. Encryption for wireless transmission and for virtual private networks is discussed.
IS-2006-40: Enabling Business Intelligence with M2M: An Introduction to Device Networking Solutions
The topic of this paper, published by Lantronix, Inc., is networking devices via local area networks using Internet protocols. Such devices may be components of a building automation system. Applications include remote access, diagnosis, and repair, for example, for HVAC systems. A Device Server converts serial device data into Ethernet packets.

IS-2006-39: Intel Developer Forum (Digital Home) & iHollywood Forum Digital Living Room
This report originally published by Gary Saski of Digdia focuses on the Intel Digital Home Group, as presented at the Intel Developers Forum in 2005. Intel is developing chips for PC platforms that can process video including HDTV. Intel is also working with the Digital Living Network Alliance (DLNA) and promote enhanced DLNA features in their products. This report discusses challenges in sending video streams over a home Ethernet and wireless options. The Digital Living Room conference covered ease of distributing audio and video content. Options for purchasing versus subscribing to music are discussed.

IS-2006-38: CEDIA 2005
This paper originally published by Gary Saski of Digdia introduces the CEDIA trade show. CEDIA members serve the upper end of the market. They indicate the direction of digital home products. The 3000 CEDIA members focus on home theater, distributed audio, security, lighting, and HVAC. CEDIA members are moving toward networked applications. Customers of CEDIA installers are demanding the highest resolution HDTV available. Front projection TVs are popular among such customers.

IS-2006-37: A Multicriteria Lifespan Energy Efficiency Approach to Intelligent Building Assessment
This paper by University of Reading scholars presents a multicriteria decision-making model for lifespan energy efficiency assessment of intelligent buildings (IBs). The decision-making model called IBAssessor is developed using an analytic network process (ANP) method and a set of lifespan performance indicators for IBs selected by a new quantitative approach called energy–time consumption index (ETI). In order to improve the quality of decision-making, the authors of this paper make use of previous research achievements including a lifespan sustainable business model, the Asian IB Index, and a number of relevant publications. Practitioners can use the IBAssessor ANP model at different stages of an IB lifespan for either engineering or business oriented assessments. Finally, this paper presents an experimental case study to demonstrate how to use IBAssessor ANP model to solve real-world design tasks.
IS-2006-36: Intellectual Capital and Interoperability
This paper by Cyon Research argues that successful interoperability projects first require an understanding of the ultimate use of the data. They also require the use of capable software tools, sophisticated processes, careful validation, and, guidance from people with expertise and experience in interoperability. Interoperability is not a one-size-fits-all proposition. There are many common use scenarios which require that the product data be treated differently. There are also significant interoperability challenges, including continuing difficulties in translating basic geometric and topological information, complexities in translating semantic information, lack of information on common file formats, limited information content in some file formats, and uncertainty about the needs of the ultimate data user. These challenges can be better addressed by understanding the data.

IS-2006-35: CABA Connected Home Roadmap Summary Report
The Connected Home Roadmap project was initiated by the Continental Automated Buildings Association (CABA) in 2005 to stimulate the evolution of the Connected Home industry. The Roadmap is an assessment of the market today and of the probable short-term evolution of the Home industry. It is intended to provide a framework to support stakeholders and players in this arena as they navigate the complex and shifting dynamics of this emerging market.

IS-2006-34: Glossary of Abbreviation, Acronyms and Initialisms
The paper is a list of acronyms and initialisms with the appropriate descriptions as to the meaning. This reference document was provided by the International Centre for Facilities. It is a suggested use of shortened terms to increase communication efficiency and effectiveness. It is continuously being updated and appears on the ICF Web site at (http://www.icf-cebe.com/). ICF's mandate is to share such information and all recipients are encouraged to send ICF new items, which can be added to the document.

IS-2006-33: Closing the Loop for Full Service Life
The paper, provided by International Centre for Facilities, describes a "process of events", which breaks down each event in a step by step analysis for determining whether buildings or modification costs are (can be) justified well enough in the analysis stage, to confidently make the decision to go ahead with a project or not. It outlines a way to assemble the justification for or against the project necessity.
IS-2006-32: A Mobile Security Solution: Secure and Mobile Communications Across Any Wireless or Wired Network
This paper, provided by Secured Services, is a description of a solution that would eliminate the shortfalls of security, authentication, log-in, and establishing communications via the protocols and systems available at present. This solution would create a seamless, effortless communication vehicle to mobile computer users, whether individual or business.

IS-2006-31: Delivering High-Definition Digital Life-FTTH Community Owned Networks
The paper, provided by Plextal Corporation, is attempting to present an approaching horizon that will, in their perception, cause a panic among consumers when they realize the availability of the Internet information is limited by technology. It presents a solution for increased connectivity to information and entertainment, not as an alternative, but as a must have. The concept presented is sound, the reasoning logical, but the need will be decided by demand.

IS-2006-30: The Intelligence of Intelligent Buildings
This extremely large document is a doctoral thesis written at the Helsinki University of Technology on what constitute an intelligent building. The author defines the Building Intelligent Framework. The thesis reports on an investigation of whether an intelligent office building affects the working environment and the office building market. An encyclopedia-amount of background information is presented. The investigation showed a positive effect of intelligent buildings on the workplace.

IS-2006-29: Performance Based Building: Conceptual Framework
The European Union has funded a study of building design based on required performance, rather than on a prescription of how it is to be accomplished. Validation against desired performance is required. Even prescription-based approaches should include performance goals. US government buildings are required to use performance-based measures. Canadian building codes now include performance goals. Performance goals may extend to the building use, esthetics, and contribution to the environment.

IS-2006-28: Reaching the Unreachable Consumer: Advertising in the Digital Age
According to Parks Associates, advertising must become more relevant because consumers are becoming more likely to change stations to skip ads. Internet advertising is growing at 28 percent compared with 4.8 percent for TV and 1.8 percent for newspapers. Consumers consider Internet advertising more relevant than other media. TV advertising should switch to targeted ads, with user permission, using interactive technology.
IS-2006-27: Making TV Meaningful: Consumers and IPTV Applications
According to Parks Associates, IPTV delivers television programming via a high speed Internet transport. Telephone companies are installing fiber optics to deliver IPTV in order to prevent customers switching telephone services from traditional fixed lines. The author maintains that telephone operators must offer new services beyond price competition to keep customers. Such services include programming choices (such as sports packages) and video-on-demand. Telephone operators may have greater growth potential than cable companies. IPTV may reach 13 million subscribers by 2010.

IS-2006-26: Outlook for Home Management Systems
According to Parks Associates, the availability of installation services will stimulate the growth of home control systems. Such systems include lighting, safety, and comfort controls. The current home controls market is 1 percent of the potential. Home controls system sales are expected to grow at 8-9 percent from $2.2 billion in 2004 to $3.2 billion in 2009.

IS-2006-25: The Future of Gaming is Networked
This paper by Parks Associates describes a booming business in online gaming, including Massively-Multiplayer Online (MMO) games with up to 5 million players per game. The gaming population spans all ages and genders. Gaming is played via PC, game consoles, and cell phone. The future of gaming is predicted to be based on networking the players with revenues reaching $3.5 billion by 2009.

IS-2006-24: Indoor Air Quality and Thermal Comfort in Open-Plan Offices
The paper discusses methods for managing Indoor Air Quality (IAQ) in an open office plan. The purpose is to reduce employee health problems and fatigue. Recommended temperatures and levels of relative humidity are provided. Problems may result from drafts, air contaminants, and elevated levels of carbon dioxide. Personal ventilation systems are discussed.

IS-2006-23: Using Garden Roof Systems to Improve Performance
The benefits of roof garden for buildings in Ottawa, Canada were studied. The gardens can lower heat penetration into the building in the summer and thereby reduce cooling demands. Also, the garden absorbs rainwater, reducing the sudden load on drainage systems during a downpour.
IS-2006-22: BACnet: Not Just a Vision Anymore
BACnet is a communications protocol development for interconnecting building automation products from a variety of manufacturers. Applications include HVAC (Heating, Ventilation, and Air-Conditioning), lighting, security, and utility management. BACnet runs on multiple network types, although BACnet/IP over Ethernet is most widely used. Supporting BACnet are the BACnet Manufacturers Association, BACnet interest groups, and BACnet International. The BACnet Testing Laboratories run the BACnet Interoperability Workshop. Integration with enterprise operations is provided with BACnet web-based tools.

IS-2006-21: High Definition Audio-Video Network Alliance (HANA) White Paper
The HANA consortium has been formed to develop and promote a scheme for networking audio/video (A/V). The goal is to accommodate digital TV, including HDTV, and other digital A/V components. HANA is adopting user interface standards and transmission via an IEEE 1394 network.

IS-2006-20: Nortel Campus Mobile Workers
This paper presents examples of telecommunications services offered by Nortel to mobile workers via a wireless mesh network.

This is a marketing presentation for the Nortel approach to communications network security. The company applies security checks at multiple layers in the network with a strategy called Layered Defense. The techniques at each layer are described.

IS-2006-18: Nortel Enterprise Mobility Solutions
This marketing presentation describes the tools offered by Nortel for employees to access the company computer services when away from the office. The system is based on the SIP (Session Initiation Protocol) of the Internet.

IS-2006-17: Secure Multimedia Solution
The paper explains methods for ensure secure communications for users of mobile services when away from the office. The goals are to improve privacy, reliability, and to reduce theft of service and identity. The Nortel Unified Security Framework is described. It was noted that half of the threats originate inside the business.
IS-2006-16: Blueprint for Convergence
This white paper explains the benefit of integrating communications for voice, video, data, and applications. Benefits include cost reduction, improved productivity, and enhanced competitiveness. Step-by-step procedures for analyzing current operations and for planning a transition to a converged system are described.

IS-2006-15: P2P Makeover: Showtime for DRM?
The paper reviews methods by entertainment companies to limit consumers' abilities to copy content. Digital Rights Management (DRM) is discussed as a method to limit copying. It is noted that excessive restrictions can stifle market demand. Peer-to-peer files sharing is used by 20 per cent of online consumers. Plans for attaching DRM to peer-to-peer servers are discussed.

IS-2006-14: Home Builders: Key Channel for Consumer Electronics
Many homebuilders are including consumer electronics in addition to kitchen appliances in the sale of new homes. About 80 per cent of builders are offering products such as security systems, structured cabling, and control for HVAC and lighting systems. As well, 60 per cent of builders are offering multi-room audio systems. Most installations are done by electrical contractors.

IS-2006-13: Internet Protocol Television (IPTV): A Survival Strategy or Revenue Generator to Telcos?
The paper discusses business strategies for telephone companies using Internet delivery of television (IPTV). Telephone companies need to offer packages of programming, not just the communications pathway to the home. They need to offer video-on-demand services that surpass those of cable and satellite operators. The author has identified four market segments: Interact with Me, TV on my Terms, Converge Me, and Don’t Bother Me. Telephone companies can capitalize on the image of reliability.

IS-2006-12: Putting the Home Network to Work
As home networks proliferate for broadband access, multimedia, and other home applications, the need for network management, monitoring, and maintenance grows. Challenges facing consumers include viruses, spyware, computer performance, network configuration, and equipment sharing.
IS-2006-11: Wireless VoIP: A Trojan Horse
Voice over IP (VoIP) is lowering the cost for calls and threatening to erode the financial base of voice telephone companies. It will also affect cell phone operators. These operators are now preventing consumers from using the data services for VoIP by limiting the capabilities in the cell phone handset. However, if and when this changes, revenues for operators will fall.

IS-2006-10: Progress Report on Sustainability
This white paper reviews developments in the green-building movement, sustainability in hospitals, schools, and homes, and presents guidelines for state and local green-building laws. LEED (Leadership in Energy and Environmental Design) for existing buildings and commercial interiors are reviewed. A report is cited that shows LEED buildings cost almost the same as non-LEED buildings. Home construction (a $355 billion market for single family homes and $44 billion for multi-family dwelling) represents about 60 per cent of total building construction in the US. The Canadian Green Globes online auditing tools for buildings are discussed.

IS-2006-09: Workstation Design for Organizational Productivity
This paper reports a study by the Canadian government on improvement in employee productivity possible in an open office environment. The following factors were analyzed: acoustics, lighting, air quality and thermal comfort, and workstation design. A study found that 54 per cent of employees are bothered by noise. Giving employees some control of air flow and temperature is recommended.

IS-2006-08: Life Cycle Assessment and Sustainability
The Life Cycle Assessment (LCA) of building materials determines the impact on climate change of the building materials over the life of the building including product disposal. Such an assessment is more than the cost of ownership and operation over the life of the product. Product manufacturers are expected to perform LCA. LCA is more accepted in Europe than in the US. Various tool for computing the LCA of products and systems are presented. Standards are being developed to facilitate LCA. The relationship of LCA to the LEED building rating is discussed.

IS-2006-07: Guidance for Metering in Federal Buildings
The US Energy Policy Act of 2005 requires that advanced electric meters be installed in all federal buildings where feasible. The paper provides guideline for installation by 2012. Such meters must provide at least hourly reads to accommodate time-varying charges for electricity. Other benefits include sub-metering for each tenant,
energy usage monitoring for diagnosis, power quality, response to energy emergencies, and remote access via the Internet. This paper reviews choices for metering features, communications methods, and costing.

IS-2006-06: Living Intelligence in the Enterprise
This paper, by Harbor Research, describes the business benefits of exploiting the computing power in devices so these devices can communicate with each other. The writer calls this "living intelligence" for machine-to-machine communications. A system developed by BT in the United Kingdom for building security is described.

IS-2006-05: Growth Opportunities and Business Models for the Pervasive Internet
The author maintains that the ultimate impact of the Internet has not occurred yet. The "Pervasive Internet" will enable products to be connected to manufacturers who can add value through services over the life of the products. Examples include: the “Solutionist,” a company that provides a solution for the customer, not just a product. Concerning home automation, the Eaton Home Heartbeat is cited as such an example. This paper was provided from Harbor Research.

IS-2006-04: Smart Power: Pervasive Internet Technology in a Changing Energy
Smart Power, by Habor Research, explains how electric utilities will improve efficiencies through applications of networking technology. Networks will impact electric generation, transmission and distribution, and usage. These networks support distributed resources.

IS-2006-03: Home Awareness
In this white paper by Harbor Research, the concept and unique features of the Eaton Home Heartbeat product line are discussed. This category of product is a gadget for control. These gadgets use machine-to-machine low data-rate communications via an always-on Internet connection. A typical application is remote sensing of appliance on/off state, such as a space heater.

IS-2006-02: Designing the Future of Information
This white paper, by Harbor Research, introduces two projects that illustrate new uses of the Internet geared toward device-to-device communications. The “Information Commons” from MAYA Design (spin-off from Carnegie Mellon University) seeks to redesign the World Wide Web so data sets that are uniquely identified, can be accessed from multiple sources, rather than the typical single server. "Internet Zero" from the MIT Center for Bits and Atoms is exploring an Internet that accommodates millions of nodes that may be embedded in devices, not formal computers.
IS-2006-01: Four Strategies for the Age of Smart Services
The advent of sensors, microprocessors, communications networks, and the Internet is facilitating service offering to complement product sales. These services enable monitoring of products (typically large capital intensive products) for proper operation and for preventive maintenance needs. Examples of monitoring a commercial HVAC unit and home water sensors are presented. Data gather via a Zigbee network is mentioned. This paper was written by Glen Allmendinger and Ralph Lombreglia.

IS-2005-47: Intelligent Thermostats Save Energy and Give Improved Control Performance
This paper, Bertil Thomas and Mohsen Soleimani-Mohseni, reports on the study and laboratory testing of smart thermostats in controlling HVAC systems. The report concludes that smart thermostats result in energy savings and energy efficiency.

IS-2005-46: Feed-forward in Temperature Control of Buildings
The feed-forward control system is described as providing efficiency advantage over the general feedback control system, as it compensates more quickly to disturbances in small buildings. This report, by Bertil Thomas, Mohsen Soleimani-Mohseni, Per Fahle, provides a description of the lab test and its findings.

IS-2005-45: Leed is Broken ... Let's Fix It
This paper, by Auden Schendler and Randy Udall, reviews the original objectives of the LEED certification program, reports on its performance and concludes that improvement is required. One of the concerns focuses on the cost of certification or that going green is not expensive. The paper does suggest that the remarks are the ones of the authors and that a second opinion is recommended. Nevertheless, the report provides an insight on the value of certifying buildings.

IS-2005-44: Neural Network Models for Predictive Climate Control in Intelligent Buildings
This paper, by Mohsen Soleimani-Mohseni and Bertil Thomas, deals with the problem of identifying black-box prediction models for indoor climate control in intelligent buildings.

IS-2005-43: A Study of Demand-Controlled Ventilation and Constant Air Volume Systems
This paper, by Mohsen Soleimani-Mohseni and Bertil Thomas, deals with the study of the demand-controlled ventilation systems and the need for a constant volume of replacement air when purging in-building pollutants. The study shows that demand-controlled ventilation, using a feedback system, requires less integrated outdoor air flow in order to maintain an accepted air quality.
IS-2005-42: Neural Networks for Self-Tuning of PI- and PID-Controllers
This paper, by Mohsen Soleimani-Mohseni and Bertil Thomas, demonstrates how neural networks can be used to estimate parameters of PID-controllers for different classes of dynamic processes.

IS-2005-41: Insteon, The Details
The Insteon report, although product focused, suggests that the automation of homes will become a major industry in the years to come. From a technical viewpoint, the paper describes the networking, signaling requirements, radio frequency and Powerline carrier applications used in automated systems. The paper, originally published by Smarthome Technologies, enforces the need for simplicity of implementation and use. In addition, the paper suggests a future vision in automating the homes for entertainment, utilities and environment controls.

IS-2005-40: Modelling and Intelligent Climate Control of Buildings
The main purpose of this paper, a reprint of Mohsen Soleimani-Mohseni's doctoral thesis, is to examine the possibilities of different indoor climate control techniques, feed-forward control and demand-controlled ventilation, together with intelligent technology to improve the indoor climate and/or the energy efficiency of buildings. A large portion of the paper focuses on developing mathematical models for the prediction of the indoor operative temperature using linear models as well as non-linear artificial neural network (ANN) model. The different controllers used in indoor climate control are also investigated in this paper.

IS-2005-39: Green Value Report
The Green Value, Green Building, white paper draws the attention to the marketplace that intelligent (green) buildings are healthier places to work and live, in addition to using fewer non-renewable resources, produces less waste and air emissions and, cause less disturbance to site ecology.

IS-2005-38: Intelligent Building Index Version 2.0
The Intelligent Building Index Version 2.0 (IBI2.0), authored by Dr. Wong, Dr. So and Prof. Leung, provides a model for the rating of intelligent buildings. It summarizes the mathematical evaluation criteria and focuses on rating 10 elements, which are themselves sub-divided in numerous features and facilities with their individual rating weight. This paper is a detailed reference of a rating scheme and is a good reference to better understand the rating practices of an intelligent building.
IS-2005-37: Wireless Networks in Building Automation Systems
The Wireless Network in Building Automation Systems white paper by Siemens Building Technologies addresses the potential interference with IEEE 8012.15.4 devices in the presence of IEEE 802.11b. Since most of the wireless networks occupy the unlicensed 2.4GHz band, interference between them can occur while in close proximity. Avoidance procedures and testing methods are discussed.

This paper, published by Clasma Events Inc., covers the driving forces, trends, predictions on how our lives will change as the convergence of technology takes place in buildings globally. The paper highlights four aspect of technology with potential impact: i) the affects of introducing internet as a technology enabler, ii) the changes that convergence will bring to the stakeholders of the industry, iii) the changes to the marketing of building and, iv) the interaction of these forces and the possible consequences.

IS-2005-35: Global Optimizing Systems (GOS)
The Global Optimizing Systems (GOS) paper, by Shariar Makarechi of the Georgia Institute of Technology, focuses on the implementation of automation systems in buildings to derive financial benefits in related maintenance. The research paper supports the feasibility of real time monitoring of global automation systems and suggests that with the Web-based solutions at our disposal, cost saving technology, which has been evolving for the last 20 years, can now be easily implemented.

IS-2005-34: The Intelligent Home Index
The Intelligent Home Index paper, Version 1.0, originally published by the Asian Institute of Intelligent Buildings, focuses on the rating of an intelligent home and provides for the division of the elements into three levels: the building provisions, the building management and the user level. Each of these categories is then sub-divided in a multitude of supporting features and facilities with a rating weight relative to their importance.

IS-2005-33: On the Quantitative Assessment of Intelligent Buildings
This paper, by Albert T.P. So, and K.C. Wong, recommends a new approach to define intelligent buildings. It calls for a two-level strategy to define intelligent buildings. There are nine Quality Environment Modules (QEMs) and underneath each one, there are a number of elements. In addition, there are features or facilities to consider and these can be classified as functional requirements, functional space, and technology. Although the paper focuses on Asian definition, it suggests that the approach can be applied around the world.
IS-2005-32: A New Definition of Intelligent Buildings for Asia
This paper, by Albert T.P. So, Alvin C.W. Wong and K.C. Wong, attempts to create a definition of intelligent buildings for Asia. It provides a detailed explanation of the process required to define a building as intelligent as specified by the Asian Institute of Intelligent Buildings.

This document provides an overview of the process of determining life-cycle cost. It outlines techniques that simplify economic assessment of design alternatives including estimating procedures for project costs such as energy, maintenance, repair, and replacement. The report also provides a brief analysis of evaluating economic performance of investments. The following report was provided, under the IIBC Life-Cycle Cost (LCC) initiative, by Reed Construction Data/RSMeans as Phase I of the project.

This document summarizes the finding of a study to assess the incidence of highly integrated buildings in the U.S. and to determine typical life-cycle cost considerations when constructing fully integrated buildings. The report also provides the result of an extensive research of both new and existing projects to determine the level of integration in buildings. The following report was provided, under the IIBC Life-Cycle Cost (LCC) initiative, by Reed Construction Data/RSMeans as Phase I of the project.

IS-2005-29: Why are our Buildings so Dumb?
In this white paper, Tom Lohner, P.E. of Teng Solutions argues: "It's time to get our industry to step up to the plate and quit wining about how we are losing our edge to our foreign neighbors. This is not rocket science but the application of common sense and good design and construction practices - albeit - different than our current standard practices. We have found the need for a Chief Technology Officer (CTO) in our internal businesses; it is time to secure the services of a professional that can serve in this capacity for our buildings."

The Building Commissioning Guide, published by the U.S. General Services Administration, provides the overall framework and process for building commissioning from project planning through tenant occupancy, keys to success within each step and the ways that each team member supports the process of commissioning. The primary audience for this Building Commissioning Guide is GSA's project managers, their construction management agents, and the commissioning agent. The secondary audience for this Guide includes the many stakeholders in the commissioning process including customer agencies, the balance of the project team, other members of government, as well as GSA's partners.
This paper, published by Alloptic, explores the management challenges and opportunities associated with fiber-to-the-premise (FTTP) networks and the strategic role of related Element Management Systems.

IS-2005-26: Advanced Controls & Sensors Workshop Report
On June 11, 2003, representatives from universities, federal, and state government agencies, U.S. Department of Energy (DOE) national laboratories, and the private sector attended a one-day workshop in Washington, DC. The objective of the workshop was to obtain review and input of DOE's assessment of the market for advanced controls technology and potential R&D pathways to enhance the success of advanced controls in the buildings market place. This paper, originally published by the U.S. Dept. of Energy & Pacific Northwest National Laboratory (PNNL), provides a synopsis of the proceedings.

This document, originally published by the U.S. Dept. of Energy & Pacific Northwest National Laboratory (PNNL), provides a market assessment of existing building sensors and controls and presents a range of technology pathways (R&D options) for pursuing advanced sensors and building control strategies. This report is a synthesis of five white papers, each devoted to either the market assessment or the identification of R&D options to expand the market, and resultant energy savings, from advanced building controls and sensors.

IS-2005-24: Building Trust for Embedded Systems Starting at the Platform Foundation
Layer Security is becoming an essential requirement for all computing devices as we begin to trust and rely upon them to control our environments and protect our information, identity and ultimately our lives. This paper from Certicom discusses the importance of ensuring the reliable operation of devices that include computing features and firmware and/or software. The Trusted Computing Group (TCG) initiative is focusing on a secure computing framework. Techniques for establishing trust are discussed.

IS-2005-23: The Future Success of VoIP – It's All About Timing
This paper from Symmetricom presents a technical comparison of conventional circuit switched telephone service and packet switched voice telephony. The latter is now called Voice-over-IP (VoIP). Technical issues include timing errors due to transmission delays through the Internet and buffering at network routers. Methods for measuring time delays and establishing synchronization across the Internet are discussed.
In the context of this white paper from Informa Telecoms & Media, telematics, telemetry and machine-to-machine (M2M) communications and systems are all considered to form part of wireless automation. This paper addresses applications of wireless technologies for telemetry and machine-to-machine communications. This paper describes many of the new narrowband and wideband technologies and how each of them can be competitive and complementary, depending on needs and requirements of groups of end users. Each can be used alone or in combination with others to produce the desired end results, and each will offer special advantages in different circumstances.

IS-2005-21: Creating New Value with M2M Solutions
This paper, co-written by Harbor Research and e-principles discusses the business potential for machine-to-machine communications. Such communications are enabled by a combination of embedded intelligence in devices and pervasive networks to interconnect these devices. Three levels of applications are defined: remote device monitoring, automated device management, and enterprise-wise integration.

IS-2005-20: Optical Wireless: Secure High-Capacity Bridging
Today's economy depends on the transmission of data, voice and multimedia across telecommunication networks. Optical networks represent the ideal medium for high-bandwidth communications. There are two distinct types of optical communications: fiber optics and optical wireless based on Free-Space Optics (FSO) technology. This paper from LightPointe outlines how optical wireless complements fiber optics in metro networks and local area networks (LANs) to meet projected bandwidth needs with considerably less expense and faster deployment.

The Public Interest Energy Research (PIER) Program, managed by the California Energy Commission, commissioned Lawrence Berkeley National Laboratory to develop this report. LBNL conducted trials of technologies for businesses to reduce electricity consumption in response to automatically issued requests in the form of price signals from a utility. Results of the test are presented with recommendations for further research.

IS-2005-18: The American Digital Dream
The Internet Home Alliance commissioned market research among new home buyers to determine their interest in connected home technology, their sources of product information, and criteria for purchases. Technologies preferred by consumers were structured wiring, intercom systems, distributed audio, central vacuum cleaners,
and home security. The survey identified improvements needed in the selling process and recommended technology choices, financing options, and certified installers.

IS-2005-17: Understanding the Shifting Demand for Home Networks
The writer observes the demand for home networks is slowing. Only about 10 per cent of broadband households without network say they want one and 5 per cent are likely to install one. The initial surge in demand was generated by early adopters; future demand must be stimulated using a push marketing strategy through incentives and subsidies. This topic paper from The Diffusion Group discusses (1) why demand for home networking is declining, and (2) the implications of this decline to vendors and service providers.

IS-2005-16: The Digital Home: Is It Really Here? You're Kidding, Right?
The term "digital home," has become a seemingly boundless concept that has been expanded to include everything from Internet-connected refrigerators and talking Toasters to robots that wash windows on command. Before we can engage in a meaningful dialogue about the nature of the "digital home," we need to define our terms. This paper from The Diffusion Group offers a definition and it also demonstrates that the demand for the digital home is reaching critical mass. Some recommendations for vendors focused on the growing market are also included.

IS-2005-15: The Top Seven Intelligent Communities of 2005
Each year, the Intelligent Community Forum selects communities from around the world to appear on a list of the Top Seven Intelligent Communities of the Year. This paper describes the criteria for judging successful penetrations of Internet access in cities worldwide. The top seven communities for 2005 are named as outstanding for adoption of Internet access to serve citizens individual and community services.

This report from National Renewable Energy Laboratory (NREL) describes an analytical method for reducing whole house energy consumption 50% by 2010 and 90% by 2019. The benefits focus on the impact on housing and on peak energy demand. About 20% of energy savings is eventually expected to be derived from onsite power systems. The analysis involves a tradeoff between equipment costs amortized in a mortgage loan versus utility bills with the goal of minimizing total annual costs. Software is described for performing such tradeoff calculations using a sequential search among component choices.
Deregulation and demand for smart and efficient power have driven technology innovation in the power venue, particularly in distributed resources (DR) technology. This paper from Harbor Research outlines advantages for utilities in networking distributed resources. The author notes that many utilities will need to upgrade facilities soon and should include provisions for networking. Benefits to various utility functions ranging from generation to transmission and distribution to customer services are discussed.

IS-2005-12: Product Pedigree May Be the "Killerest" of Apps
Tracking the pedigree of product components is not a new idea. Traceability has been an essential part of quality assurance for a long time, and is built into the ISO 9000 family of quality standards. But even with the advent of vast desktop computing power, tracing product pedigree has remained a labor-intensive and error-prone process. That's all about to change as we enter the era of smart, connected products- the Pervasive Internet era. This paper from Harbor Research outlines an example of applying device-to-device communications to improve the tracking of processed food through the supply chain.

IS-2005-11: Home Awareness
The term "convergence" implies unification, but you wouldn't know it from today's home technology market - a fragmented landscape full of narrow point solutions, time-sink gadgetry, entertainment obsession, and software/platform incompatibility. In this paper from Harbor Research they present the HomeHeartbeat™ from Eaton as an example of an inexpensive, wireless, intuitive, and useful product with a different approach to the market.

IS-2005-10: Connecting To Your Future: The Networking of Every Manufactured Thing
This research study overview from Harbor Research describes their recent study focused on challenges faced by manufacturers as they move to adopt the next-generation technologies of the real-time enterprise. The study offers a portrayal of the adoption climate, technology issues, business models, and opportunities arising from the convergence of device networking, wireless sensors, machine-to-machine (M2M) communication, and the Internet. The author states that companies with network products will win in the marketplace.

IS-2005-09: Centralized Telecommunications Rooms Offer Economy, Security, Serviceability
Changes in the services delivered over cabling infrastructure in Multi Dwelling Units (MDUs) such as high-speed Internet access and digital High-Definition Television (HDTV) have led to changes in building design and construction. This paper from InfiniSys Inc. presents a proprietary technology, FTTA™ (Fiber to the Apartment) for
installing small-diameter conduits in apartment buildings. These conduits are then filled with fiber optic and CAT 5e cables for delivery of command and control, telephony, data, and video services.

**IS-2005-08: Caveat Emptor**
"Let the Buyer Beware" applies especially to Real Estate transactions. While most commercial are used to physical inspections, the information age presents new challenges that the inspector may overlook. This paper from InfiniSys Inc. presents methods for assessing the quality and usefulness of cabling systems installed in buildings. These techniques are intended to guide purchasers of multiple dwelling unit buildings. Issues that affect the installation are age, location of demarcation point between service provider and building owner, and accessibility of the cables. Building owners might add a "technology fee" to the rent for recovering upgrade costs.

**IS-2005-07: CA*net 4 Research Program Update -UCLP Roadmap**
CANARIE Inc. is a not-for-profit corporation supported by its members, project partners and the Federal Government. CANARIE's mission is to accelerate Canada's advanced Internet development and use by facilitating the widespread adoption of faster, more efficient networks and by enabling the next generation of advanced products, applications and services to run on them. This document describes how User Controlled LightPath (UCLP) software (developed for CANARIE to manage geographically distributed optical and SONET/SDH cross connects and switches) using web services and workflow can be incorporated with IP routed networks to provide more user control over data flows and queue management. The paper lays out requirements for new features and enhancements to the current implementations.

**IS-2005-06: Intelligent Building Operating Technologies**
The prevalent practice in the building industry is to spend the minimum on operation and maintenance. The result of this approach is that most buildings have problems that are unknown to the operator and there is no easy way to identify them. This leads to the vicious cycle where building operators are not aware of problems that waste energy, consequently nothing is done to correct them. This paper, developed by CANMET Energy Technology Centre - Varennes, Quebec, a department of Natural Resources Canada, proposes an efficient solution to break this vicious cycle: the use of Intelligent Building Operating Technologies to continuously diagnose equipment problems, provide performance reports and allow the operator to optimize the operation of the building.

**IS-2005-05: Open Systems for Homes and Buildings: Comparing LonWorks and KNX**
This white paper from i&i Limited traces the origins of LonWorks from Echelon Corporation and European Installation Bus (EIB) - now the mainstay of Konnex (KNX) - originally developed by Siemens. The paper examines their impact in one particular market: home and building electronic systems. Both systems support
communications over twisted-pair wiring and power line carrier, but with different data rates. The scope of the study is limited to the application area of KNX: LonWorks is used in a much wider range of applications. The standards and trade association activities of both groups are discussed.

**IS-2005-04: ABC's of Home Networking**
In its new report, "Worldwide Home Networking 2004-2008 Forecast and Analysis," IDC expects home network households to grow 25 percent to 111 million by 2008. And according to DLNA (Digital Living Network Alliance), research predicts that 52 percent of online households in America will have home networks by 2008. This guide from DSL Forum focuses on explaining the basic components users will need for this home networking explosion, and highlights the various services and applications that users will enjoy with a home network. Applications described include printer and file sharing, telecommuting, multi-player gaming, entertainment, and home automation.

**IS-2005-03: A Full House (FTTH) Beats HFC Every Time**
The paper by Michael Bowers of Icon Broadband Technologies presents introductory material about fiber optics to the home (FTTH) and hybrid fiber/coax (HFC) distribution. The capacity of fiber optics is generally limited by the electronics at the ends of the fiber. Video is generally frequency modulated when carried on fiber, although some new systems are carrying video as IP packets. FTTH costs are now comparable to HFC, while FTTH offer greater capacity. FTTH will gradually supercede HFC.

**IS-2005-02: If You Build It… Will They Come?**
An important cost factor in FTTH is the number of homes connected to the fiber and the number of customers who buy services. The customer "take rate" depends on competition and marketing. This paper from Michael Render, President of Render. Vanderslice and Associates presents the case for incumbent telephone companies to install FTTH to offer video services or risk losing customers to other service providers. Successful efforts to influence, measure, model, and forecast FTTH take rates will have a profound impact on the speed at which FTTH proliferates.

**IS-2005-01: Solving the “Messy Network” Problem**
The M2M industry is predicted by Harbor Research to reach $650 billion in revenue by 2010. This paper from nPhase focuses on the data communications component of M2M describing the challenges of machine-to-machine communications via wireless transmission utilizing cellular telephone networks. Issues include security, routing, and packet format. The paper recommends a particular commercial solution.
IS-2004-56: Focused Solutions to Complex Wired Community Transaction Issues
This paper outlines the business opportunity and legal challenges of pre-wiring a residential communication with fiber optics to each home. Important issues and challenges include mandatory subscription, competitor access, capital structure and return on asset, entity structure, service quality and carrier performance, default and remedies, and implementation. The author, Lawrence Freedman of Fleischman and Walsh, L.L.P, states that this market offers "tremendous potential for growth."

IS-2004-55: Defining 10-Foot Gaming Requirements for the Entertainment PC
The Entertainment PC is intended for use at a TV distance of 10 feet. This paper, submitted by Intel Corporation provides guidelines to developers of services, such as gaming, intending to use the Entertainment PC. The target display device may be a new digital TV or a traditional analog TV with lower resolution. Some technical issues include image size, aspect ratio, range of colors, contrast, viewable screen area, remote control unit, audio playback, and CD vs. DVD distribution. Developers are encouraged to create the same gaming software that run on both traditional PCs and Entertainment PCs.

IS-2004-54: VLAN Best Practices
This technical paper, intended for installers and managers of Virtual Local Area Networks (VLANs) was provided by Fluke Corporation. A VLAN allows devices distributed throughout a building to appear logically as if they were located on one LAN. Devices in a particular VLAN are identified by using a particular IP port number, a particular communications protocol, or by MAC address. IEEE-802.1Q is a standard that supports VLANs.

IS-2004-53: Designing Smart Environments: A Paradigm Based on Learning and Prediction
This paper presents an overview of the potential of home automation. It also introduces the MavHome (Managing an Adaptable Versatile Home), a research project at the University of Texas at Arlington. Sensor data is collected and processed by intelligent agents (computer algorithms). These agents can deduce the occupant’s movement within the house, and deliver services where appropriate, thereby saving energy.

IS-2004-52: Learning to Control a Smart Home Environment
A future home run by computer-based agents is envisioned. These agents collect and process data from sensors throughout the house looking for meaningful patterns. The researchers simulated sensor data generation to test the algorithms. Trials of MavHome (Managing an Adaptable Versatile Home) are being run in a laboratory (MavLab) and in an apartment (MavPad) at the University of Texas at Arlington.
IS-2004-51: Smart Homes
First in a series of papers from the Department of Computer Science and Engineering at the University of Texas at Arlington, this paper introduces the MavHome (Managing an Adaptable Versatile Home) research project. An intelligent home uses inputs from sensors to operate home automation systems in order to create a comfortable and efficient environment. The intelligent system is based on physical devices, communications networks, data collection, and automatic decision-making. The decision algorithms seek patterns from the sensor inputs.

This report from the University of Southern California “explores how the Internet influences the social, political, and economic behavior of users and non-users.” About 75 percent of those surveyed used the Internet for an average of 12.5 hours per week in 2004. Email and Web surfing were the top uses. Sixty percent of those who have stopped using the Internet say they do not miss it. There is growing skepticism of the reliability of information gleaned from the Internet. There has been a slight increase in on-line shopping over four years. Seventy-five percent of parents are not concerned about the time spent by children on line. Almost two-thirds of those surveyed accessed health information via the Internet. Eighty-eight percent are concerned about on-line privacy.

This paper, provided by Nortel Networks discusses deployment of PON (Passive Optical Networks). Local telephone companies are considering methods for offering “triple-play” services (voice, Internet access, and video services). The latter is a challenge because telephone companies do not have broadband capabilities comparable to cable. They are planning to overcome this with PON. Multiple PON technologies such as Broadband PON (BPON), Gigabit PON (GPON), and Ethernet PON (EPON) currently exist or are near standardization, and multiple deployment models are possible. The paper describes many of the decision criteria that must be considered when deploying PONs such as time to market, technology maturity, system availability, operational considerations, video compression performance, service requirements, engineering rules, and business impacts.

IS-2004-48: Consumer Broadband: The Path to Growth and Profitability
This paper, provided by the Internet Business Solutions Group (IBSG) of Cisco Systems, Inc discusses the business opportunities associated with providing broadband services. The paper surveys the state and growth prospects for broadband-based communications. Broadband customers were found to use more services, some of which could be sold as value-added services (services beyond flat monthly rate for connection). Some providers are bundling multiple services to reduce customer churn. Broadband voice communications (VoIP) will drive out switched networks. The paper concludes that communications companies should not offer content, but rather a range of communications services: voice, video, and Internet access.
This white paper provided by the Communications Futures Program of the Massachusetts Institute of Technology discusses opportunities for municipalities to foster a market in fiber optics to homes. Municipalities accounted for 32% of FTTH installations in 2003. While telcos will be installing FTTH in some areas, municipalities will remain important market drivers for Fiber-to-the-Home (FTTH) deployment. Municipalities that operate utilities are likely candidates. State laws that burden municipal entry into communications are effective at discouraging it, suggesting that the March 2004 Supreme Court ruling (Nixon vs. Missouri Municipal League) will constrain growth in the FTTH market.

The purpose of this paper, submitted by the Internet Home Alliance is to provide a clear overview of the home technology integrator channel and to recommend steps industry players can take to improve it. Fifteen organizations were studied as providers of certification for integrators. Currently, there are approximately one million integrators in the U.S. only with one percent certified.

IS-2004-45: TEAHA Market Background Document
This market background document was produced by Homega Research in the framework of the TEAHA (The European Application Home Alliance) Project and was funded by the European Commission (IST Programme). It encompasses a marketing survey of past, present, and future connected home applications. This paper provides a foundation for a market analysis of the connected home. Three factors influencing this market are the environment (technological, economic, and public policy), product and services offerings, and customer demand including price sensitivity.

IS-2004-44: Big Broadband: Public Infrastructure or Private Monopolies
Wayne Caswell recently returned from an Economic Summit in Loudoun, VA, where he was invited because of a paper he wrote earlier this year: “Reviving the FORGOTTEN Information Superhighway.” The summit expanded his thinking about the role of government in telecommunications policy and led to an invitation to speak at Austin InnoTech, a regional conference and exhibition with focus on the mutual relationship between technologies and innovation. This newer paper summarizes and expands on that presentation, which was called “Fiber, Wireless and Bandwidth for TeleWork.”
IS-2004-43: Are You Ready for the Audience of One?
Home media networks (HMNs) are poised for explosive growth and will radically alter the home entertainment market, making the consumer an “audience of one” for on-demand digital multimedia content. This paper, from Booz Allen Hamilton Inc. discusses the business prospects for home media networks supporting video, audio, digital photography, and gaming. Distributed media centers, including storage outside the house are presented.Advertisers will be challenged by consumers spending time viewing digital photos and listening to music rather than watching TV with commercials.

IS-2004-42: The Case for Broadband Wireless Connectivity
This white paper from Proxim Corporation, explores the options open to executives and networking professionals in public and private enterprises who seek high-speed building-to-building connectivity solutions for their campuses and remote locations, but who are also constrained by real-world budgets. It reviews the most popular leased line options including DSL, T1/E1 and fiber optic cable, as well as wireless LANs. And it delineates the advantages of broadband wireless connectivity, a solution that is finding greater acceptance due to its high capacity, ease of installation, and low cost.

IS-2004-41: Voice Over Wi-Fi Capacity Planning
As voice-over-Wi-Fi emerges as a productivity-enhancing wireless application in the enterprise, the requirements placed on Wi-Fi infrastructure deployment planning increase from simple coverage and throughput considerations to detailed capacity planning. This paper from Proxim Corporation proves that the number of non-overlapping channels in a wireless network is the key determinant of the total capacity of a network that carries voice traffic.

IS-2004-40: The Smart, Affordable Way to Build Network Redundancy
Most medium to large-scale businesses, and virtually all large organizations, have some sort of disaster recovery plan. For many, that plan begins and ends with data backup; for others, it includes remote failover servers. But, fewer businesses have plans in place to protect their network connectivity. This is a mistake that can result in hundreds of hours of downtime with unacceptable real-dollar costs. This paper from Proxim Corporation presents a case for using broadband wireless technology as a backup for a wired link to support a business.

The National Association of Industrial and Office Properties (NAIOP), the Forum for commercial real estate, developed this document of terms and definitions as a standardization project that would define selected office
real estate terms commonly used by owners, brokers, and others in their day to day business operations. The general perception within the industry is that a standardization of terms and the resulting transparency of information may contribute significantly to increased capital flow, improved liquidity and enhanced credibility for the industry at large.

IS-2004-38: Monitoring your WAN - When, What and How
This paper from Fluke Networks makes the case for a network manager to measure the performance of a wide area network delivering network access to a company. Network managers often assume that the network vendor is supplying the promised service. The paper will help calculate the value of link monitoring as well as help you calculate the total cost of downtime.

IS-2004-37: Connecting Devices with Web Services
Digital devices are moving from the domain of the tech-savvy to the hands, purses and pockets, homes, and cars of mainstream consumers and knowledge workers. This paper from Microsoft discusses how Web services, the cornerstone to overcoming the challenge of software and business integration, provide a consistent way to exchange information within home networks, corporate intranets and across the Internet, spanning heterogeneous environments.

IS-2004-36: Converged Applications and Enhanced Services Market Study
Converged applications, in the form of products and services, unite telephony and voice over IP (VoIP) networks with data products and services, like email, database, and customer relationship management (CRM) applications. This paper from CompTIA explores customer knowledge and acceptance of converged services. The motivation is primarily cost saving and network integration. Most companies expect to purchase converged services from a "value-added solutions provider."

IS-2004-35: Internet-Based Video Services
Cable companies, telephone companies, and others are seeking revenue from the delivery of movies to consumers. One option is packet delivery via the Internet. This paper from Parks Associates describes key issues and impediments to growth including bandwidth limitations, especially of DSL, and licensing restrictions imposed by content producers.

IS-2004-34: Electronic Signage Networks (ESN) as Killer App
An Electronic Signage Network (ESN) provides the means for real time environmental monitoring and information display that are critical elements of Homeland Security. With the growing commercial capacities of electronic
displays, Wi-Fi, narrowcasting, kiosks, satellite transmission and mobile display devices, ESNs that comprise these elements are key to public safety and community information infrastructure. This paper from Apogee Partners describes how public safety and commercial success can be achieved through Electronic Signage Networks and kiosk systems.

**IS-2004-33: An Introduction to Wireless Mesh Networking**
Wireless networks provide unprecedented freedom and mobility for a growing number of laptop and PDA users who no longer need wires to stay connected with their workplace and the Internet. This paper from Firetide, Inc., describes how wireless mesh networks can offer a breakthrough approach that enables making the leap from localized HotSpots to fully wireless HotZones with building-wide or campus-wide coverage and even HotRegions that span an entire metropolitan area.

We have gone from a product-driven business model to a customer-driven corporate structure. This paper, written by Paul Greenburg and provided by Indus Corporate Marketing explains the Enterprise Value Chain (EVP) as the basis for a services-delivery model. EVP includes collaboration among employees, partners, and suppliers. An Integrated Service Delivery model enhances customer relationships by focusing on service delivery, rather than service shipment. Revenue is generated through terms in Service Level Agreements.

**IS-2004-31: Ultra-Wideband (UWB) Technology: Enabling High-Speed Wireless Personal Area Networks**
Wireless connectivity has enabled a new mobile lifestyle filled with conveniences for mobile computing users. Consumers will soon demand the same conveniences throughout their digital home, connecting their PCs and other digital electronic in a wireless personal area network (WPAN) in the home. This paper from Intel Corporation describes how Ultra-wideband (UWB) technology offers a solution for the bandwidth, cost, power consumption, and physical size requirements of next-generation consumer electronic devices.

The Universal Serial Bus (USB), with one billion units in the installed base, is the most successful interface in PC history. Wireless USB will build on the success of wired USB, bringing USB technology into the wireless future. This paper, written by Intel Corporation, describes the Wireless USB specification that is being defined as a high-speed host-to-device connection including the targeted audience, the technology and future plans.

This report from the Electronic Systems Industry Consortium presents the results of analysis performed on information available from both primary research and from secondary public data sources. The focus of this analysis was the Electronic Systems Technician occupation, a fast-growing and rapidly-evolving job category of interest and importance to a large number of U.S. employers and training institutions. The technicians provide cabling infrastructure for homes and or commercial buildings, signaling devices, signal controllers, and devices for mechanical and electrical control.

**IS-2004-28: Games-on-Demand: the Reality and Future**
As of 2003 there were about 110,000 customers for PC games and two million by the end of 2007. This paper written by Yuanzhe (Michael) Cai, Analyst for Parks Associates categorizes PC games as online browser-based, online non-browser-based, sales via downloads of the complete games, partial download + online play. 50% of the core gamers are interested in games-on-demand. Some retailers don’t want competition for downloads of games upon initial market release. Game console makers have little motivation to use the web for software distribution.

**IS-2004-27: Judo Lessons for Wireless ISPs**
Parks Associates anticipates that by 2008, more than 2 million U.S. households will be using services based on unlicensed broadband wireless (UBW) technologies, including Wi-Fi, proprietary technologies, and the upcoming WiMAX standard. Such an accomplishment, however, is contingent on the Wireless Internet Service Providers (WISPs) ability to create and execute successful competitive strategies. This paper written by Yuanzhe (Michael) Cai, Analyst for Parks Associates proposes business strategies for WISPs to gain market share of broadband Internet access without incurring crushing competition from telephone and cable companies.

This paper written by Edward Steinfeld, Embedded Computing market Consultant, presents an overview of the UPnP Audio Visual (AV) specification and unique functions, followed by a description of the UPnP functions and protocols. The UPnP AV specifications define a set of UPnP device and service templates that specifically target home environments with consumer electronic (CE) equipment such as TVs, VCRs, DVD players, stereo systems, MP3 players, and PCs. The key elements are a media server, a media player (also called a renderer), and a control point for selecting the content and managing the networked devices.

Adoption of Web Services technology promises potentially great benefits, but like most new technology adoption, there are also serious questions about new information security risks. This paper, written by John Sebes of
Integral Security Consulting, presents methods for protecting data that is encoded in a database using XML, and transmitted using SOAP via the Internet. Recommendations are provided for data encryption, user authentication, validated code packets, and checking queries into a database.

**IS-2004-24: GridWise Standards Mapping Overview**

“GridWise™ is a concept of how advanced communications, information and controls technology can transform the nation’s energy system—across the spectrum of large scale, central generation to common consumer appliances and equipment—into a collaborative network, rich in the exchange of decision making information and an abundance of market-based opportunities” (Widgren and Bosquet 2003). To support this effort, Pacific Northwest National Laboratory, developers of the GridWise concept, has surveyed relevant official standards and specifications developed by consortia in the fields of home and building systems, information technology, market trading and economics, energy, and industrial systems that could ultimately contribute significantly to advancements toward the GridWise vision.

**IS-2004-23: XML Web Service in Utility Automation**

Software vendors and IT departments in the “business” community have adopted the Simple Object Access Protocol (SOAP) and XML Web Services paradigm as the de facto standard for loosely integrating computing systems. Utility company automation system managers, managers charged with the task of maintaining a reliable power grid, are beginning to recognize the benefits of loosely coupled system integration. In this paper, originally published in the March/April 2004 edition of Electric Energy T&D Magazine, Gridlogix describe how XML Web Services, a standards-based integration technology, will allow system managers to leverage existing monitoring and control systems and rapidly integrate them with new automation technologies and external business applications.

**IS-2004-22: Content Control for Wireless Data**

Content Control presents yet another opportunity to Service Providers to drive new revenue streams, as subscribers are now demanding content for their wireless devices. It also presents an opportunity to provide value-added services that will help reduce churn and build customer loyalty. In this document, Bridgewater Systems discusses Content Control for wireless data services, content opportunities that exist for Service Providers, and how Content Control is achieved.

**IS-2004-21: Reliable Wireless Networks for Industrial Systems**

This paper from Ember Corporation details both theory and case studies for mesh networks, focusing on several important issues including: weaknesses of point-to-point wireless systems that can be addressed by adopting an
Internet-like distributed messaging model, why networks for "smart devices" must be able to configure themselves, and why wireless mesh systems actually become more reliable as the number of nodes is increased. The paper also includes a Case study of a wireless mesh installation at a water treatment plant.

**IS-2004-20: Life Cycle Costing of Automation Controls for Intelligent and Integrated Facilities**

The purpose of this report, written by Thomas Keel of Georgia Institute of Technology for CABA's Intelligent & Integrated Buildings Council, is to demonstrate, by using life cycle costing methodology that owners receive the best value, as defined by total cost of ownership over the life of new building construction or substantial renovation, by implementing intelligent & integrated building technologies. Many sources provided data, both objective and subjective, for this research. Current literature on the subject suggests that intelligent buildings with integrated controls can maximize energy saving control strategies, and more readily abide with federal guidelines for building construction. This research and data analyses can be tailored to, and is applicable for, any commercial office building.

**IS-2004-19: Zen and the Art of Content Protection**

Despite years of research on content protection, a 14 year old with a smart ripper and a basic PC can start distributing high quality copies of a DVD within minutes of release. This paper from The SVP Alliance starts with a short description of how digital content distribution works and concludes with four foundations of secure content distribution.


Employees need to access sensitive data while using portable computers, PDAs, and cell phones. But increased mobility also means increased risk. In this paper Credant Technologies present a management checklist of methods for improving the security of data exchanged between the enterprise and mobile equipment.

**IS-2004-17: A Standard Approach to Content Protection**

This paper, provided by The SVP Alliance describes Secure Video Processor (SVP) - a standard secure method for digital content protection providing new opportunities for content delivery while ensuring protection for content owners, and low cost and ease of use for consumers.

**IS-2004-16: “New” Ultra-Wideband Technology**

The U.S. Federal Communications Commission is allowing unlicensed communications in the 5GHz range with modulation schemes occupying 500 MHz. This paper from Staccato Communications introduces multi-band signaling methods that comply with this specification while using well known principles of wireless
communications. These multi-band technologies maintain many of the while utilizing the UWB unlicensed spectrum.


The Middleware white paper was developed by a Task force of CABA's Intelligent and Integrated Buildings Council (IIBC) - http://www.caba.org/aboutus/com_intelli.html to promote and orchestrate awareness of the capabilities and benefits of middleware to the commercial building industry; To enhance the relationship between key commercial building stakeholders (ie: architects, contractors, systems integrators and owners/operators) and the community of CABA members that produce building automation middleware; and to improve the business environment for middleware solutions in the commercial building market. The paper defines middleware and describes a number of case studies where middleware has provided a solution to integrate new intelligent building technology implementations with legacy systems.

**IS-2004-14: Prepaid Wireless Data Services**

Mobile voice services are maturing and most Service Providers are finding that market growth is slowing, requiring that they implement new services to maintain revenues. In addition to marketing to existing subscribers, though, Service Providers also need to add new subscribers. Bridgewater Systems suggest that one market segment that provides immediate revenue opportunities is Prepaid Data Services.

**IS-2004-13: Why Is Government Subsidizing the Old Networks When 'Big Broadband' Convergence is Inevitable and Optimal?**

At a recent forum former, former FCC Chairman Reed Hundt described the benefits -- and inevitability -- of digital convergence, and called on federal government and the FCC to replace today's old networks with a universal Big Broadband network capable of spurring innovation and U.S. telecom sector growth into the twenty-first century. In this paper published by the New American Foundation, Hundt presents the benefits of U.S. government rewriting communications regulation to encourage the creation of a public network that delivers 10-100 Mbps to residences and 1-10 Mbps to business for voice and video Internet-based services.


This paper written by Pacific Northwest National Laboratory for the U.S. Department of Energy discusses energy management in a competitive environment. The paper describes how the demand for electricity can be controlled to avoid supply peaks and excess reserves through load management. Load management can be achieved
through the installation of “smart devices” such as appliances that react to a varying price for electricity or “smart gateways” in buildings.

The combination of market deregulation, the growth in electricity demand and the normal “boom and bust” cycle all add up to a looming crisis in the industry. The increased availability of energy information technologies can play an important role in addressing these issues. The collective application of these information-based technologies to the U.S. power grid is becoming known as the GridWise™ vision or concept. This paper written by Pacific Northwest National Laboratory for the U.S. Department of Energy presents a preliminary scoping assessment conducted to envision the general magnitude of several selected benefits the GridWise concept could offer when applied nationally.

The capability and use of information technology (IT) and the internet in the form of web-based energy control systems continues to grow at a rapid rate, and it is imperative that facility managers, maintenance managers, and energy managers become ready to work with current and future applications of internet-based control technologies in their facilities. This paper, published first in the Strategic Planning for Energy and the Environment Journal of The Association of Energy Engineers is intended to help prepare energy managers to understand some of the fundamental concepts of web-based building automation systems (BAS). We thoroughly examine each component of a BAS in today’s BAS technology and what a BAS might look like in the future.

**IS-2004-09: Sound Solutions for Wireless Woes**
Several new technologies will improve the range and speed of wireless networks, with a combined effect of 10,000 times the capacity of dialup 56 Kbps modems. With such advancements, networks that use radio signals for communication could replace most of the network cabling we now use. How real is this promise? When will we see it? And what will it mean for equipment manufacturers, service providers, homebuilders, and homeowners? This paper from Wayne Caswell provides a survey of the present and emerging radio-based LAN standards including 802.11x, 802.15x, 802.16, 802.20, 3G, mesh networks, and smart antennas.

**IS-2004-08: Sum Total - determining the true cost of development for embedded security**
Embedded security has become a prerequisite: manufacturers must embed security in their devices to meet market demands. This paper from Certicom explores the issues surrounding development costs for embedded
applications — and particularly embedded security — and concludes with a method for calculating the total cost of development.

**IS-2004-07: Operations support system (OSS) requirements and solutions for carrier-grade Wireless LAN Services**
One of the major challenges in offering carrier-grade public Wi-Fi service is choosing and deploying an effective OSS infrastructure. This paper from Pronto Networks discusses the OSS requirements for end-users, service providers, network operators, and venue owners, in addition to providing recommendations for service providers and network operators evaluating different OSS options. Some issues discussed include quick user access, roaming among networks, optional charging for services, network security, network brand identification, and location information for local ad insertion.

**IS-2004-06: MMS Business Models**
The Mobile Message Standard enhances cellular telephone text messaging with graphics, photos, and sound. Charles Lafage of Juniper research describes the Peer-to-Peer and Server-to-Mobile Business models for delivering MMS-based services. He also describes new relationships that will be required in the Server-to-Mobile model that will result from revenue sharing required as content is delivered from alternative sources.

**IS-2004-05: Infotainment Essentials**
One of the most interesting fields within the mobile entertainment space is that of 'infotainment': the combined worlds of information and entertainment as well as related services. Paul Skeldon of Juniper Research describes the applications and services that will comprise this market and the extraordinary growth forecast. He also touches on some of the hurdles including security and whether people will pay for this type of service.

**IS-2004-04: WiFi - The Opportunity**
This paper provides a short overview of a research paper by Juniper Research, a UK based provider of business intelligence. The excerpted data forecasts the opportunity as well as the access technology choices, device choices and location variables for the nomadic user. Worldwide opportunity forecasts are included.

**IS-2004-03: SAFE: A Security Blueprint for Enterprise Networks**
The principle goal of Cisco's secure blueprint for enterprise networks (SAFE) is to provide best practice information to interested parties on designing and implementing secure networks. This document focuses heavily on threats encountered in enterprise environments. Network designers who understand these threats can better
decide where and how to deploy mitigation technologies. By taking the threat-mitigation approach, this document should provide network designers with information for making sound network security choices.

**IS-2004-02: The Strategic and Financial Justification for IP Communications**

Today's economic climate has made it more crucial than ever for decision makers to consider what type of return their organizations can expect from prospective investments. The intent of this white paper from Cisco Systems is to provide senior managers with the necessary strategic and financial justifications to make effective decisions regarding investments in IP Communications. It explains why a combined network for carrying data, voice, and video is less expensive for a company to maintain and more useful for employees to access e-mail, voice mail, faxes, etc. whether inside the building, at home, or traveling. Issues of quality and reliability are also discussed.

**IS-2004-01: Extending the Enterprise - A bottom-line look at extending network access to mobile workers**

Throughout history, corporations have continually honed their workflow processes to improve productivity, lower operations costs, and maximize profitability. The latest opportunity for business-process improvement lies in extending network access to mainstream employees who are often away from their desks. This paper contributed by Cisco Systems encourages companies to use wireless networks, IP communications, and teleworking as the technology enablers to allow professionals to conduct business away from their desks.

**IS-2003-37: Creative Ways to Build Broadband Networks And Underground Power Cables Through Strategic Partnerships Among Utilities**

This paper, submitted by Dr. Jeyapalan & Associates, LLC advocates inserting fiber optic cables into existing water and sewer pipes to reach customers and avoid pole-mounted wiring. He proposes that the U.S. Federal Government pay for such projects to stimulate broadband service deployment. The fiber network could be used to monitor the performance of power distribution grids.

**IS-2003-36: Welcome to the Real World – embedded security in action**

This paper is the third in Certicom’s “Got Security?” White Paper series. It describes how to determine the right security model for a given device and set of user needs and addresses the challenges of providing security for data stored in resource-constrained devices and for data transmitted between devices. Hardware and software techniques are discussed. A checklist of security features that may be embedded in devices is included.
IS-2003-35: Broadband Video over Twisted Pair Cabling
This NORDX/CDT paper explains the benefits of high performance twisted pair cable for one of the most demanding applications on the market today – broadband video. It compares the signal-to-noise performance of various categories of twisted-pair wiring including CAT 5, CAT 6, and enhanced higher quality CAT 6.

IS-2003-34: Is China Alpha or Omega For The Rest of The World?
This paper, provided by Instat/MDR describes the changes in Chinese policies in the past few years toward encouraging investments in semiconductor fabrication and providing 50% of outsourced materials for the world market. It also examines the negative impact and the positive opportunity this economic growth presents to the rest of the world.

IS-2003-33: Think Smart, Think Connected White Paper
This Harbor Research White Paper (in conjunction with Spinnaker Venture Partners, LLC) highlights the findings of an Executive Summit on European Union adoption of Internet-enabled device networking/M2M to maintain a competitive advantage in an open, connected landscape. Devices from multiple companies will be interconnected via the Internet. Open systems for interconnection will lead to new business opportunities that will not accrue to companies with closed systems. Interconnection requires alliances among companies and a shift from a product-centric to a services-centric business model.

IS-2003-32: The Economic and Social Benefits of Broadband Deployment
This Telecommunications Industry Association (TIA) paper offers an examination of various applications broadband can enable, including in particular the economic and social benefits of using broadband for those applications. The TIA includes some regulatory context and explains their policy views including their argument that incumbent telephone companies should not be required to open their local-loops (“last mile”) through unbundling to competitive suppliers so that the incumbents will be encouraged to invest in broadband.

IS-2003-31: Digital Home White Paper
This white paper is an introduction to the mission of the Digital Home Working Group, an industry organization whose goal is to make the digital home vision a reality. Their digital home vision integrates the Internet, mobile, and broadcast islands currently existing in the home through a seamless, interoperable network which will provide a unique opportunity for manufacturers and consumers alike. Strategies for achieving interoperability among consumer electronics, personal computers, and mobile devices are discussed. Such devices are classified as Digital Home Servers and Digital Home Renderers.
IS-2003-30: Many Happy Returns - The ROI of Security
For manufacturers of communication devices and developers of applications, security has become an unavoidable imperative. More than ever, their customers — enterprises and network operators — require sophisticated security features. This paper from Certicom includes charts and fill-in tables for determining the cost and value for a company to invest in data security. Four business situations for investing in security are identified: Process Improvement, New Business, Renewal, and Transformation.

Security has become an undeniable requirement for wireless and other constrained devices. Fast on the heels of consumer uptake, corporations and government organizations are making wireless technology part of their daily lives — using it to handle private and sometimes sensitive information. This paper, the first in a series of 3 wireless security white papers from Certicom presents reasons why security should be embedded in the hardware design of wireless devices, rather than added on to existing devices. Standard security protocols are preferred over proprietary methods.

IS-2003-28: Digital Home Implementation Plan For Realizing Digital Life in South Korea
The government of South Korea is planning to make high-speed Internet access available to 10 million Korean homes by 2007 using fiber-to-the-home. Applications include learning, entertainment, safety, and home services such as shopping and energy management. The following article, provided by Information Gatekeepers Inc. is an excerpt of a translated version of the Korean Policy Statement and it details their vision to bring broadband not only to the home but also inside the home.

At present the vast majority of revenues in the home networking industry are very much centered on the data networking, and we are not likely to see mass-market revenues generated by multimedia network solutions over the short-term (the next 18 months, for example). This is the basic premise of this white paper submitted by Parks Associates which describes in some detail the reasons that their research has shown that consumers aren’t adopting digital home technologies as quickly as the industry would like.

IS-2003-26: Public Hot Spots: One Truth and Two Myths
Public WiFi networks are being offered by new companies and by incumbent telephone companies. Yuanzhe (Michael) Cai of Parks Associates describes survey results from a forthcoming report called Public Hot Spots: Moving beyond Road Warriors which indicates that pricing, security, and quality-of-service are not fulfilling consumer needs.
IS-2003-25: Disconnected: Consumers and the Mobile Phone Industry
John Barrett of Parks Associates writes that despite an investment of tens of billions of dollars in mobile phone services and equipment, the average revenue per customer is not growing. He concludes that the industry has not presented the technologies to consumers in a meaningful, attractive package. Instead they have offered unwieldy products that provide ill-defined services at an uncertain price. In short, it is no surprise consumers are not buying.

IS-2003-24: Core Networks: Can they Escape the Commodityization Spiral?
In this paper, Harbor Research make the argument that public network service providers have shrinking profits in long distance and Internet services. Future profits will come from providing a registry and warehouse to manage data originating from devices in the home. The network provider will aggregate information from similar devices in their customers' homes for delivery to a service provider, acting as an infotributor.

IS-2003-23: Let the Circle Be Unbroken: How the Pervasive Internet Will Automate the Global Enterprise
By the year 2010, the Internet will have trillions of users it doesn’t have today. Most of them will not be human beings. This paper, written and submitted by Harbor Research describes how the transmission, harvesting and interpretation of this device-based information as a basis for strategy and action will make every form of business dramatically more efficient and profitable than ever before.

IS-2003-22: Going the extra mile to bring carrier-class management to Ethernet in the first mile
The IEEE is finalizing a standard for applying Ethernet technology in the “first mile” (aka last mile, local loop, metro access and subscriber access network) outside buildings to link the building LAN to a WAN operated by common carrier. This paper argues that this Ethernet standard resolves “the mismatch” between customer needs and current solutions such as DSL, ISDN, cable TV, T1/E1 or T3/E3 lines with their shortcomings, ranging from performance bottlenecks, fixed bandwidth increments, limited scalability, lack of flexibility and provisioning complexity to quality of service issues and a high cost structure.

IS-2003-21: Standards and Technology Strategy
The author discusses the importance of standards and how standards are developed. He explains that he prefers private consortia to write standards instead of going through the formal ratification processes defined by entities like the ITU, IETF, ISO, and National Bodies because of the time to market. He also describes in detail some of the risks and challenges inherent in the development of standards as part of a consortium.
Fiber to the home (and business) will fill the speed gap between Gbps servers and PCs. Drivers for high bandwidth are video conferencing, interactive games, telecommuting, and file transfers (video on demand, video and still-image email attachments, program sharing and downloading, e.g. of entire books). When fiber delivers Internet, telephone, and cable TV services, the cost of the equipment will become economical for the four U.S. incumbent telephone companies and will enable these companies to regain the lead over cable companies for delivery of broadband services.

IS-2003-19: Information Technology and Electric Power Systems
The Finnish National Technology Agency (TEKES) has been funding a five-year program (called TESLA) of research in information technology for electric power distribution and sale. This government-sponsored work is being migrated to industrial applications. This large report (81 pages) summarizes the TESLA projects.

IS-2003-18: Connected Solutions: Landscape and Supply Side Analysis
This market analysis projects the growth rates of broadband access networks and home distribution networks (wires, wireless, power line carrier, and telephone lines). The initial motivation is data distribution, then multimedia. The paper includes information about OSGi, UPnP, HomePlug, WiMedia, and ZigBee and interviews with representatives of each of the organizations.

IS-2003-17: Extending Energy Management to the Enterprise
Businesses are being given the opportunity to aggregate energy purchases across multiple locations of a distributed enterprise. To make economical energy decisions, they need to collect data from multiple sources in a common format based on XML Web services. The enterprise data will be integrated with supplier information about energy prices and demand-management programs available via the web.

IS-2003-16: Facility Lifecycle Management For Process Industries
Massy Mehdipour, Chief Executive Officer of Skire, Inc. describes why the process industry has different building automation requirements than other industries. Since the requirements for product and process development are continually changing - due to technology changes and market dynamics - process facilities undergo constant renovation and retrofit almost immediately after the facility construction is completed. Suitable data-management technology can reduce renovation and retrofit requirements and can take months off of the schedule. More importantly, it allows owner/operators to incorporate provisions for future changes into the installation, without jeopardizing quality, cost, or schedule. This paper was prepared in the first quarter of the year 2003.
IS-2003-15: Reviving the FORGOTTEN Information Superhighway
Wayne Caswell, CAZITech Consulting Services, has developed this paper to promote the need for a national broadband policy. In Wayne’s forward he states "Debate still lingers over government’s role in building an Information Superhighway and whether our lack of a national broadband policy means the concept is forgotten. Broadband – the ‘always on’ network connection that receives and transmits digital content and services at high speeds – was supposed to change the way we live, work and play … as well as how we learn, shop, make things, entertain ourselves, and interact with others. It was supposed to give us remote access to libraries, museums, medical care, jobs, and government – resources that are available only to people living nearby. But since that aging vision is coming slower than expected, this paper, written in May 2003, aims to revive the initiative."

IS-2003-14: Why Intelligent Agents can reduce Energy Cost better than Building Management Systems or Human Experts
Dr. Dirk Mahling, Chief Technology Officer at WebGen Systems, Inc. wrote this paper April 17, 2002. This white paper maintains that an expert system using artificial intelligence for energy management in a building can save more money and provide more comfort than a skilled operator. These systems manage energy, dynamically based on changing data and algorithms using intelligent agents and neural networks that access numerous device parameters. The scenarios discussed highlight the major differences between knowledge-based energy management and conventional, schedule-driven energy management.

IS-2003-13: Managed Wireless LAN Services – A User Perspective
This paper, written March 7, 2003, sponsored by Bridgewater Systems and written by TeleChoice discusses business opportunities for telecommunications providers to offer management services for wireless LAN operations in manufacturing and service companies. The paper concludes, based on a survey of healthcare, manufacturing, and financial services companies, that there is a market for telecommunications companies to manage wireless LANs. The outside providers most favorably considered are ISPs and incumbent telephone companies.

IS-2003-12: A Network for Customizable + Reconfigurable Housing
This paper, written by Kent Larson, Tyson Lawrence, Thomas J. McLeish, Deva Seetharam and H. Shrikumar of MIT Media Lab, presents the initial implementation of a building network protocol consisting of three layers named Get, Set, and Go (GSG). The current housing development process discourages innovation and produces, mostly low-grade, generic commodities that cannot respond to the unique requirements of individual occupants. This paper, written in April 2003, proposes the decoupling of the base building design, approval and construction process from the customization of individual components, and to make customization practical.
IS-2003-11: The Top Ten Drivers of the Converged Home Network
Written by Mike Wolf, In-Stat/MDR, this paper describes the top ten drivers that will bring mass acceptance to the market of home networking as it evolves to a Converged Home Network. This paper, written in April 2003, focuses on broadband growth and sharing, emerging technologies, gaming, digital audio, home security and the drive for broadband services by service providers for the networking home.

IS 2003-10: CONVERGENCE: WHAT IS IT, WHAT WILL IT MEAN, AND WHEN WILL IT HAPPEN?
This paper was contributed by Tom Hartman, P.E., Principal, The Hartman Company and Contributing Editor, AutomatedBuildings.com. CABA would like to thank Engineered Systems and AutomatedBuildings.com for allowing us to adapt this paper from their “Controlling Convergence” article. The author discusses the significance of the trend for building control systems to be based on Internet technologies. This transforms building controls into an information technology discipline. Also, the building controls technology will migrate from proprietary hardware to software based on standards. Building control hardware may become commodities and threaten the business models of building control manufacturers.

IS 2003-09: Productivity and Energy Conservation are NOT Mutually Exclusive Objectives
This paper was contributed by David Dougan, President, EBTRON, Inc. and Len Damiano, Vice President - Sales & Marketing & National Accounts Manager, EBTRON, Inc. and Contributing Editor, AutomatedBuildings.com. HEALTH and PRODUCTIVITY are the “Two Big Carrots” that should provide more than sufficient motivation to building owners to insist on exceptional indoor environments. This paper, written in March 2003, presents quantitative justification for expenditures that improve indoor air-quality (IAQ) in office buildings. Calculations show that the cost of IAQ is less than the loss of worker productivity measured in cumulative salaries. Also, improved IAQ may reduce tenant turnover.

IS 2003-08: VOD Everywhere! Considerations in Transport Methods for Scalable VOD/SVOD Deployment
This paper, contributed by Scientific-Atlanta, Inc. written in October, 2002, discusses the issues involved with engineering a cable TV distribution network to accommodate the new “Everything-on-Demand” (EOD) model. EOD is a fairly new acronym that provides a catch-all phrase to include all video content transmissions. Existing Broadband Hybrid-Fiber Coax networks are challenged by this new model. This requires re-engineering the cable distribution network for the increased traffic.
IS 2003-07: A Vision of Green Building Economics for the Private Sector
This paper, contributed by David Gottfried, President of Worldbuild Technologies Inc. and founder of the US and World Green Building Councils and describes the economic benefits of designing a building with minimum impact on the environment as measured by the LEED Green Building Rating System. The U.S. Green Building Council has developed the LEED rating system for measuring the “Green” features of a building. The paper describes the advances of green building technologies and points out the practical steps towards a green building and how to make profit out of the use of the concept in buildings.

IS 2003-06: Integrating Security Into Intelligent Buildings
This was booklet developed by Peter Manolescue, Sales & Marketing Director, security XML Limited and published in January, 2003. It features and discusses building security systems now and in the future. The paper presents an overview of current security systems for fire detection, intrusion detection, access control, and closed-circuit TV. The market structure of security system distribution and technological features are discussed. New Internet-based technology, using the XML language, is proposed for integrating security system functions with each other and with other building automation systems.

IS 2003-05: Road Map to 802.11 Services
This paper, provided by Bridgewater Systems Corporation, is subtitled as “A Business Opportunity for Service Providers on the 802.11 Wireless Local Area Network Standard”. The document discusses the current standard of 802.11 wireless Internet offerings, suggests some 802.11 business models for Service Providers, and suggests steps that will need to be taken so that Service Providers can capitalize on this market potential. This paper was prepared in January 2003.

IS 2003-04: The Continuing Evolution of the Wireless LAN Hotspots and the Banias Effect
Nick Hunn of TDK Systems discusses how Wi-Fi computer network penetration in business is limited because of security and standards concerns. Residential growth is now greater than the business market. Also, hotspots providing public Wi-Fi access are proliferating. This paper, written in November 2002, discusses how Intel’s Banias chip could change the ownership of the market and describes different revenue models for hotspots.

IS 2003-03: Bluetooth and Wi-Fi: The Market Status
This paper was written by Nick Hunn of TDK Systems in March 2002, and discusses the growth of Bluetooth and Wi-Fi Wireless LANs. Mr. Hunn discusses the adoption and growth potential of Bluetooth and Wi-Fi and explains discrepancies in some recent publications and projects relative growth rates based on sales of integrated chip
sets and applications. He concludes that both are success stories and it is time for proponents of each to stop arguing about supremacy, but start working to turn the two respective technologies into applications for users.

**IS-2003-02: ADSL2 and ADSL2+ The New ADSL Standards**
This paper, written by Aware, Inc. explains the new ADSL2 Standards which provides for several improvements over the first generation ADSL Technology. Such improvements include improvement in data rate, in transmission reach, enhanced diagnostic and trouble shooting, reduced cross talk and a host of other improvements. The paper also covers the ADSL2+ Standards that are currently under development, which doubles the downstream bandwidth of the ADSL2 Standards.

**IS-2003-01: Building Control Network**
Communications protocols are simply a means by which different systems may communicate. They are the message formats and procedures used to transfer information, in an understandable form, from one device, or array of devices, to another. They permit products from different vendors to communicate with each other and interact to produce intelligent integrated building systems and manage and interface with these products as if the same vendor supplied them all. This paper, prepared by CABA’s Intelligent & Integrated Buildings Council Building Protocol Task Group explores four of the most common protocols used today and compares a number of the parameters that “Assist the large building industry to understand the strengths and overall features of the building control communication protocols that are available for use in designing and implementing an “Intelligent Building”.

**IS-2002-32: The Benefits of Energy Efficiency Investment**
This paper describes the impact of improving the energy efficiency of the residential, commercial and industrial sectors on the economy. Resulting from a study by the Canadian Energy Efficiency Alliance, it provides evidence that the impact will be overall positive and that the negative aspects will be more than compensated for by the positive ones. It focuses on the benefits of energy efficiency and shows how energy efficiency can be married to other initiatives such as renewable energy to build a stronger economy and meet the various goals associated with greenhouse gas (GHG) emissions reductions.

**IS-2002-31: Home Gateway**
Home Gateway The ubiquity of broadband connectivity and the advancements in home networking technologies introduces a new breed of consumer premises equipment termed as home gateways or residential gateways. This paper, written by Satish Gupta of Wipro Technologies describes what a home gateway is and some of the alternatives. The architecture of residential gateways spans a gamut of products. Not all products in this category
have equivalent functionality. The white paper contains tables that compare gateway types, functions, and typical commercial products.

**IS-2002-30: Trends and Outlook for Wireless Home Networks**

Trends and Outlook for Wireless Home Networks This market overview, written by Kurt Scherf, Vice President of Research for Parks Associates describes the projected growth of wireless home networks over the next four years. Although the market growth for home systems has been slower than projected, networks for linking PCs and laptops will increase about three-fold by 2006. Wireless technology for such networks will dominate consumer choices.

**IS-2002-29: The Emergence and Growth of Entertainment-Centric Home Networks**

The Emergence and Growth of Entertainment-Centric Home Networks In the traditional sense, home entertainment networks have allowed consumers to route audio or video throughout the house to different receivers (primarily TVs and stereo receivers/speakers). This paper written by Kurt Scherf, Vice President of Research for Parks Associates describes the shift in home entertainment networking to include the PC and other home automation devices. Projections for the growth of different classifications described in the paper are provided to 2006.


This guide, authored by Kenneth P. Wacks, Ph.D., builds upon the Technology Roadmap for Intelligent Building Technology. This paper consists of criteria by which intelligent building technologies can be evaluated. The topics in this guide are important for various audiences, such as building owners and managers, intelligent building designers, installers.

**IS-2002-27: VLSI Implementation of OFDM Modem**

Orthogonal Frequency Division Multiplexing (OFDM) is a multi-carrier system where bits are encoded to multiple sub-carriers and sent simultaneously in time. This technical paper provided by Wipro Technologies lists various approaches to implementing an OFDM system and then describes the Very Large-Scale Implementation (VLSI) of OFDM in detail.

**IS-2002-26: Art and Style of Designing Home Control Systems**

This paper, authored by Mr. Bill Wimsatt of CorAccess Systems describes some of the design considerations when developing home control systems. Mr. Wimsatt discusses the universal remote controls available today and the complexity involved with these multi-button devices. He then explains why the sophisticated automation
systems available for today's homes that can encompass many subsystems within the home, must use re-designed control interfaces blending physical and digital design to provide a useable human interface.

**IS-2002-25: Ensuring HomePNA Devices Work in the Home Environment**
This paper provided by Spirent Technologies focuses on the impact of wireline loops and noise egress as two primary issues affecting the performance of gateway access equipment. It describes some of the key factors affecting the performance of broadband systems networked by phone lines in a Small Office/Home Office environment and describes testing models that should be implemented to ensure that maximum performance and reliability within the home will be provided by the installed equipment.

**IS-2002-24: Building a Positive, Competitive Broadband Agenda**
Broadband Internet access is available to a majority of American households, yet consumers are hesitant to use it. Is the problem cost, service or content? The Information Technology Association of America (ITAA) has launched the Positively Broadband campaign to shift public attitude about broadband. This paper is the campaign’s first call to action – a call to create a positive competitive broadband agenda.

**IS-2002-23: Energy Management Pilot Research Results**
In November 2001, The Internet Home Alliance concluded its research into a uniquely powerful energy management pilot designed specifically to answer the question: How can energy utilities leverage the Internet and other advance communications technologies most effectively? This paper from the Internet Home Alliance reports on the results of this research.

**IS-2002-22: Any Time, Any Place, Anywhere: Broadband and the Changing Face of Work**
This white paper, part of the Positively Broadband campaign of The Information Technology Association of America (ITAA), explores the impact of broadband on e-workers, e-work managers, and e-work organizations. The paper explores how broadband changes the face of work, and the impact these changes may have on the economy as a whole. While broadband enabled e-work poses many opportunities and benefits, it comes with an associated set of practical, technical and organizational challenges; these are likewise addressed.

**IS-2002-21: In Home Wiring Testing to ITU-T GT.996.1 Standard**
This paper, provided by Spirent Technologies, describes the four home networking implementations (Home Phoneline, Powerline, Wireless and New Wires) and the important factors when making an implementation decision. It also defines a number of home networking applications and discusses the advantages of Home
Phoneline implementations and, it explains the importance for manufactures to do proper testing and simulation of their products to ensure reliable home networking.

**IS-2002-20: Category 6, Questions and Answers**
In his most recent white paper, Paul Kish, NORDX/CDT's Director of IBDN Systems and Standards and vice-chair of the TIA TR-42 committee examines what the newly published Category 6 cabling standards mean for the telecommunications marketplace. In addition, he addresses several important questions about Category 6 standards and why a Category 6 installation offers an optimum performance solution.

This paper explores the options open to executives and networking professionals in public and private enterprises who seek high-speed building-to-building connectivity solutions for their campuses and remote locations, but who are also constrained by real-world budgets. It reviews the most popular leased line options including DSL, T1/E1 and fiber optic cable as well as wireless LANs. And it delineates the advantages of fixed wireless connectivity, a solution that is finding greater acceptance due to its high capacity, ease of installation, and low cost.

**IS-2002-18: Why DSL Still Matters**
Looking at the press about Digital Subscriber Line (DSL), it may appear to be a failure, but the technology is being deployed - and successfully deployed - by service providers worldwide. So why the bad press for DSL? This paper explores some growing pains service providers have experienced deploying DSL and how these miscues have blunted the potential of the technology to date. It also explores how the technology has matured and how growing competition from outside forces (like cable companies) has made DSL even more vital to the ongoing success of telcos.

**IS-2002-17: The Market for Control Systems Integrators**
This paper, prepared for The Control Systems Integrators Association by Walt Boyes of Spitzer and Boyes, LLC, attempts to clearly define what a professional Control System Integrator is and what the market potential for Control System Integration is worldwide. It discusses the current size of the market as well as forecasting the growth based on market and industry trends.

**IS-2002-16: Home Networking - from WiPro Technologies**
Author Satish Gupta defines Home Networking as the collection of elements that process, manage, transport and store information, enabling the connection and integration of multiple computing, control, monitoring and communication devices. He discusses how the need for simple, flexible, and reliable home networks is greatly
increasing as the proliferation of multi-PC homes, increasing Internet usage, advances in telecommunications technology and progress in smart devices increasingly emphasizes the need for in-home networking.

**IS-2002-15: Development of fire detection systems in the intelligent building**
The paper, from The Institute for Research in Construction, reviews the current state of development of fire detection and alarm systems in intelligent buildings. It covers new technologies and concepts such as advanced multi-function sensors (chemical, occupancy, and imaging), computer vision systems and wireless sensors and addresses issues related to real-time control via the Internet and integrated building service systems. It concludes that although intelligent building technologies have a strong potential to improve fire safety, care should be taken to avoid creating completely new risks such as ensuring the security of these systems, as well as the possible risk of data overloading the communication systems in case of emergencies.

**IS-2002-14: Total Building Integration Cabling for Commercial Buildings**
Total Building Integration Cabling [TBIC] is a program developed by the Siemon Company for integrating commercial building systems utilizing structured cabling. This document, prepared by Bill Fortin of Integrated Building Systems, Inc., is a detailed description of TBIC that can be used to support any multi-product, multi-vendor environment. This document is also closely aligned with the newly released TIA 862 Building Automation Systems Cabling Standard for Commercial Buildings.

**IS-2002-13: Selecting and Specifying a Web-Accessible Controls System (WACS)**
Web Accessible Control Systems (WACS) present building information in the form of Web pages that can be viewed through a standard Web browser such as Netscape Navigator or Microsoft Internet Explorer. This paper, from Automated Logic Corporation, describes the benefits of WACS technology and the considerations when specifying and implementing a WACS.

**IS-2002-12: Information Model: The Key to Integrating BAS with Other Enterprise Applications**
The key to the successful integration of Building Automation Systems with other enterprise applications lies not in the protocol, but in the information model that it represents. This paper, from Automated Logic Corporation, describes the history of BAS and how the industry has evolved from "not enough" to "too-many" protocols and how there has been a parallel evolution in the Information Technology realm. The paper then describes how Web services developed by the IT industry can be applied to BAS to integrate the enterprise.
IS-2002-11: Wireless Market Confusion
Kelly Kanellakis of Enterasys Networks feels that he is spending too much time trying to keep ahead of the plethora of competing technologies in the wireless field. In this paper, aimed at the enterprise network environment, Kelly describes some of the factors that cause this concern, ranging from security to lack of interoperability between the 802.11x products to incompatibilities within developing technologies. His conclusion - "learn from history."

IS-2002-10: The WLAN Market Place
This paper, prepared by Signa Services, describes the main wireless technologies in the marketplace with emphasis on 802.11b and 802.11a. It describes the differences between the protocols and some of the interoperability and security issues. As well, It provides a brief history of the WLAN market, some adoption/deployment information and a market outlook for wireless LANs.

IS-2002-09: Industrial Ethernet: An Emerging Growth Market
This paper, written by FTM Consulting, discusses the expected growth of Ethernet in the industrial sector over the next few years. While Ethernet has become the pervasive network in the commercial LAN office marketplace, it has not had a significant impact on the factory floor. As the need to interface to the in-place LAN infrastructures in the enterprise's office increases, Ethernet provides an ideal solution for the automation control systems. Many elements are coming into place at the current time to make this possible. These developments are described in this white paper including the market forecasts over the next five years.

IS-2002-08: Auto-Configuration for basic Internet (IP-based) Services
This technical paper, provided by The DSL Forum, describes current best practices for providing access to most Internet (IP-based) services using standard network technologies. Consumer Internet Access has evolved from dial-up modem access to broadband connections and service providers want to extend their existing sophisticated infrastructure to their new high-speed customers with few or no changes.

IS-2002-07: A Machine-Crafted Home of the Future
"A Machine-Crafted Home of the Future" was written by Kent Larson, the director of the MIT Home of the Future. It provides an interesting view of the future process of selecting and constructing a house with parallels to high-tech consumer products. If it seems farfetched, Mr. Larson believes that is only because the housing industry is years behind others in transitioning to the information economy. But the rules have recently changed in the housing industry, creating risks for companies stuck in the old ways and extraordinary opportunities for those who
know the new game. This paper describes how the Internet, demographic changes and new technologies are
combing to force the housing industry to join the 21st century.

**IS-2002-06: UCLA Internet Reports: Surveying the Digital Future**
The UCLA Internet Report 2001, Surveying the Digital Future Year Two, presents data on more than 100 major
issues. Most of this 2001 data is compared with findings from 2000. The 2001 UCLA Internet Project leaves little
doubt that the Internet is now a mainstream activity in American life that continues to spread across all age
groups, education levels and incomes. The report focuses on five major areas, such as: Who is online? Who is
not? What are users doing online?: Media Use and Trust; Consumer Behavior; Communication Patterns; and
Social and Psychological Effects.

**IS-2002-05: Transforming the Appliance Industry - Switching on revenue streams in services**
As with the automotive industry, white goods manufacturers have started to integrate Internet based services with
their products transforming them into platforms for service delivery. This paper outlines this transformation of the
industry to the future Networked appliance market describing new revenue streams and marketing opportunities.
It provides a good overview of the technology required to implement the program strategy.

**IS-2002-04: Drivers for Home Networking**
This document provided by Kurt Scherf of Parks Associates is a market analysis of the home networking market
in the U.S. and its key driving factors as a base for a strategic projection of its future. It describes how
entertainment, control and communications technologies come together to drive the growth of home networks.

**IS-2002-03: Understanding High Performance Structured Cabling Systems**
This paper provides a good overview of what structured cabling is all about and for the layperson gives an insight
into the parameters and limitations of the media and connectors used for Cat 5, Cat 5e and Cat 6. It is easy to
read and understandable for the customer who wished to install a structured cabling system around the office or
Small Office Home Office environment.

**IS-2002-02: Intellectual Property Rights, Innovation and Standardization: Friends or Foe?**
Tim Schoechle of the International Center for Standards Research at the University of Colorado, Boulder,
examines Intellectual Property Rights (IPR) from a historical perspective, providing a good argument for why our
historical understanding of IPR doesn’t meet the requirements of today’s digital world. Mr. Schoechle argues that
we need to re-think our ideas of IPR in order to move digital content forward, and standards can play a role in the
release of IPR into the public domain.