CABA 30 YEARS

CABA Public Research Library (Updated: April 2, 2020)

The following reports are available to through the CABA Public Research Library:

(IS-2016-97) Encouraging Market Transformation Through Collaboration on Energy Efficiency Standards: A Federal-Provincial-Territorial Framework
This report was completed August 2016, following the Energy and Mines Minister's Conference held in Winnipeg, Manitoba. The report outlines the regulatory framework goals and implementation plans for industrial energy efficiency standards. These standards will encourage market transformation toward generating energy efficient products, while lowering energy and operating costs, and reducing greenhouse gas emissions.

(IS-2016-96) A New Look at Building Value - How building technology, people and processes improve business outcomes and create greater operational value
This white paper was completed in March 2015 by Siemens. It outlines the benefits of data-driven facilities (smart buildings) which are fully connected. The basics behind data-driven facilities, including: a strong BAS, use of big data, smart software, and software platforms, are detailed. Finally, several steps are given for managers to begin turning facilities into buildings with higher operational value, and turning their businesses into organizations with higher valuation.

(IS-2016-95) ICT Facts and Figures 2016
This report was completed June 2016 by the International Telecommunication Union. This report includes several graphs depicting global comparisons for ICT (information and communications technology) coverage and usage data from 2013-2016. These data indicate that while the majority of the world's population live in areas with network coverage, ICT services are not used by more than half of the population. Large differences in affordability, accessibility, broadband quality and speed still hinder usage.

(IS-2016-94) Beyond monoculture: How design eats strategy for breakfast
This paper is a collaboration between Boss Design and Insight, and was published in 2016. It argues that corporate strategy and design must go "hand in glove" in order for a corporate strategy or culture to survive. When developing workplace strategies, one needs to understand the the culture of the workplace, which could reject or shift the desired output of the strategy. The link between strategy and design is stronger now than ever since the time and place of working no longer ties employees to employers.

(IS-2016-93) Smart Cities in Europe - The Future of the built environment
This paper was released in 2016 by Osborne and Clarke. Different ways in which built environments can become smarter are discussed, along with things which might prevent them from improving. Two case studies are described where an area of a city was redeveloped to include smart technology, and their successes are outlined. Better use of data is one way to make a building smarter. The collaboration of all parties involved, including investors, real estate companies, construction companies, architects, tech companies, and more, is essential for the built environment to becomesmarter.

(IS-2016-92) Wireless in Buildings: What Building Professionals Think
CommScope & Coleman Parkes Research report exams the current performance, attitudes and insights of building managers, architects and facilities managers regarding access to In-Building Wireless (IBW) connectivity.

The study provides recommendations on how the industry can overcome the connectivity challenges and uncovers the value of IBW connectivity to property owners, managers and tenants.

(IS-2016-91) Winning and Retaining OTT Video Customers

This report explores the differences between online interactive and traditional TV. The paper looks at how to exploit these differences to attract, keep and monetize online video viewers.

(IS-2016-90) Prospects for Premium OTT in the USA

This report exams US emerging premium OTT services - subscription based film and TV services over the Internet. The topics discussed including: What is the 2018 outlook?, What are the prospects for growth, enablers and drivers?, Which categories of OTT service providers are most likely to succeed?

(IS-2016-89) The Study on the Effect of Color Temperature of LED Luminaries on Human Performance and Psychoemotional State

This report was completed September 2015 by Lighting Technologies. This study discusses the effect of different color temperatures of light. Indicators of performance, well-being and mood were measured and compared. Notable differences in performance and relaxation were observed in participants subjected to different color temperatures.

(IS-2016-88) The State of Open Office Research Study

This report was completed Q1 2016 by Haworth. This paper discusses the state of the open office and includes analysis, trends and opportunities for open office concepts. Survey participants include professionals from 20

fields across six continents. Insights, concerns and recommendations on introducing open office concepts are provided.

(IS-2016-87) Enabling the Organic Workspace: Emerging Technologies that Focus on People, Not Just Space

This report was completed Q1 2016 by Haworth. Business success requires quick pivoting to ensure company resources are aligned with business needs. This paper discusses Alternative Work Space programs that combine technology and flexible programs, provided through space planning guidelines linked with employment policies that, together, allowing employees greater selection in where, how, and when to work.

(IS-2016-86) What the Community Solar Customer Wants

This report was completed Q1 2016 by the Shelton Group. This report consists of two surveys, conducted in Dec 2015, of US residential consumers and US business decision makers. Consumers and businesses were polled to identify the audiences for community solar and find out what they want most from a community solar program. Attitudes, purchase intent, financing options and potential market size are reviewed.

(IS-2016-85) Cities Are Ready For 100% Clean Energy

This report was completed Spring, 2016 by the Sierra Club. This report examines ten US cities committed to 100% renewable power. Cities powered by 100% clean energy save taxpayer dollars, help their residents save money, create good jobs, and foster a better quality of life. They are catalysts for a new economy and clean energy future.

(IS-2016-84) The Future of Power Grids - 5 Trends and Their Effect on Utility Communications

This paper by RAD was published in 2016. This paper explores the driving factors behind the tomorrow's utility networks. The five driving factors are: Migration to next-gen comms, Distributed energy and renewables, Automation, remote sensing and intelligent control, Operational technology and IT integration, and finally Cyber security. These factors are closely related to the internet of things, and can be achieved with the help of communication solutions.

(IS-2016-83) Social Innovation and Public Safety: Safer, Smarter Cities through Integrated Intelligence

This report was published in 2015 by Frost and Sullivan. It describes the possible public safety features of Smart

Cities, notably, cities that use Hitachi's Visualization Platform to monitor and analyze data and video. Some of the major improvements brought about by integrated intelligence would benefit the response time and effectiveness of first responders, and improve road traffic and safety.

(IS-2016-82) Perfecting 4K Video Delivery - Best Practices to Mitigate Common

This paper was published by Elemental Technologies in 2016. It discusses five of the common pitfalls of 4K video, examines their root causes, and suggests solutions and best practices to mitigate these pitfalls so service providers can continue to offer high quality video. Visual defects are much easier to detect by the consumer in 4K video, therefore it is imperative that providers must offer the best settings that network configurations need for encoding, packaging and delivery.

(IS-2016-81) Demonstration and Evaluation of Lighting Technologies and Applications - Mogul Screw-Base LED Replacement Lamps for High Bay Environments

This report by the Lighting Research Center was published in May 2016. It discusses and compares traditional HID lights with new LED lights for "mogul" sockets. Some of the benefits of the LED replacements include energy savings, maintenance reductions and improved colour characteristics. A case study is described where the light distribution and cost was compared before and after replacement with LED lights.

(IS-2016-80) How Smart Grids Solve the Entire Global Energy Problem

This paper was completed June 2016 by Rethink Technology Research. This paper suggests the transformation of the distribution network will shift to one which embraces much more network-edge generation capacity, and less and less centralized electricity production or storage. Using current technology, examples are provided incorporating Energy Management Systems, demand management, blockchain & distributed generation and transportation, at both a home and city level, creating an interesting vision for the energy and the environment.

(IS-2016-79) Switch On To The Connected Home

This report was completed July 2016 by Deloitte. This survey examined UK consumer opinions on the connected home, identifying the following: consumers are more positive about the internet of things than expected; security, lighting and energy devices are likely areas of growth for the connected home; and, price, perception and replacement cycles are barriers to purchase which vary across age groups.

(IS-2016-78) Smart Home Security Report 2016

This report was completed in 2016 by the prpl Foundation. This survey examined consumer opinions gather in six counties. Key findings include: the smart home is already here with device adoption in certain cases already reaching a tipping point; the smart home is woefully insecure due to users' failure to follow best practices; and, consumers prefer security to usability and are prepared to take more responsibility if it means living in a safer home.

(IS-2016-77) The Current State of the Smart Home A Survey by Bosch and Twitter

This report was completed August, 2016 by Robert Bosch and Twitter. This survey examined consumer opinions gather in six counties. Survey topics included: thoughts on smart homes, current knowledge of known capabilities, desirable features, concerns, connectivity, relevance, and decision influencers. Attitudinal differences between men and women are also provided.

(IS-2016-76) Beyond the Meter - The Potential for a New Customer-Grid Dynamic

This report was completed July, 2016 by the Smart Electric Power Alliance. This report examines the impact and opportunities associated with distributed energy resources (DERs). Utilities are characterizing these resources not as threats, but as potential assets to the physical power grid, and a means to enhance financial sustainability. Power generation, peak demand management and customer engagement through DERs offer a new approach for utilities and customers to look "beyond the meter" in order to manage an increasingly decentralized grid.

(IS-2016-75) The Power of Light: How TLEDs have been revolutionizing the U.S. military since 2012

Tis paper by Energy Focus discusses Tubular Light-Emitting Diodes (TLEDs) and the best practices associated with

them. When compared to fluorescent lighting, TLEDs are up to 60% more efficient, and have up to 3 times the lifespan. The four different types of TLEDs are compared and defined. Important characteristics to consider when designers and engineers are specifying TLEDs are given along with the cost, energy and maintenance savings. Finally, the positive safety and health aspects are discussed.

(IS-2016-74) Why You Shouldn't Be Afraid of Implementing Fair Access Policies

This white paper by Incognito Software Systems Inc. was published in February 2016. It discusses what can be done to ensure the future of cable companies. The paper argues that usage-based pricing will allow companies to become more competitive, and increase their average revenue per use. Usage-based pricing would give users access to a variety of options, and allow providers to charge excessive users. Accurate bandwidth measurement, usage notifications, clear enforcement policies along with usage-based pricing could keep companies profitable without alienating customers.

(IS-2016-73) New Foundations - How will the UK real estate sector look in 20 years' time?

This report was completed by KPMG in 2016. It aims to predict the future of the UK real estate industry in the coming 20 years, and suggests some necessary responses that the real estate sector must make to the needs of citizens and companies of the future. Developers are urged to build flexibility into their spaces, as property moves to a service model rather than a space model, tech inside of buildings will be of great importance to the buyer, and there will be a shift in individuals' desires of property ownership to rentals.

(IS-2016-72) Mexico's Mobile Market: Regulatory Changes Set the Stage for Revenue Growth Over the Next Five Years

This paper by Pyramid Research was released in April 2016 and covers the topic of Mexico's growing mobile market. New regulations caused tariffs for Mexican telecom services to go down 12.4% in 2015, while revenue fell by 4.3% over two years. The new regulations, which are bringing about the elimination of roaming and long distance fees, are shaping a North America-wide mobile network. Pyramid Research predicts that Mexico's mobile market will grow very fast over the next 4 years due to 5 key factors.

(IS-2016-71) Green Building Economic Impact Study

This report was completed in 2016 by the U.S. Green Building Council. This study quantifies the economic value creation from green construction and Leadership in Energy and Environmental Design (LEED) building construction in gross domestic product (GDP), jobs, labor earnings, individual states'tax contributions,and environmental indicators at the national and state levels.

(IS-2016-70) akamai's [state of the internet] Q4 2015 report

This report was completed in 2015 by Akamai. This report provides a detailed and comprehensive reference on Internet connection speeds at a state, national, and international level.

(IS-2016-69) World Energy Perspectives 2016

This report was completed in 2016 by the World Energy Council. This report, the second in a series, investigates the risks of the energy-water-food nexus and examines the integrated coordination that is needed for financing resilience. The report methodology is based on contributions from experts in 92 countries. Case studies have been submitted to highlight the impact, obstacles and solutions that countries have taken to manage the impacts of the energy-water-food nexus.

(IS-2016-68) The Feasibility of LED Lighting for Commercial Use

This undergraduate thesis examines the market potential for LEDs in commercial buildings. It contains a lot of useful comparisons of various lighting technologies. Detailed cost analyses are included. The market growth predictions are based on data that are three years old in a market undergoing rapid growth.

(IS-2016-67) Security for the Internet of Things

This paper identifies the primary security concerns that are prevalent in the emerging Internet of Things. It provides an approach for addressing these concerns through an assessment of the security impact on the

113

customer environment; the application of multi-faceted security control measures; and to ensure that the entire system and its lifecycle are considered during the ongoing management.

(IS-2016-66) Accountability for Climate Action

This paper describes the results of a research study of how businesses are implementing climate change action. The analysis reveals what proportion of businesses have developed a strategy to address climate change and whether the focus is on energy efficiency measures, reduction of emissions, or the adoption of renewable energy sources. It highlights that energy efficiency is the leading approach but describes that supply chain assessment and internal carbon taxing is starting to gain traction.

(IS-2016-65) Succeeding in the changing Business of Things

This report captures the findings from an on-line business forum that explored the evolving business models and offerings that are enabled by the Internet of Things. It highlights key insights proposing that 'Things' need to exhibit cognitive intelligence to provide a stronger relationship with end users; that the complexity of the integrating 'Things' will require an open platform; and that businesses will need to evolve their organization to participate in the Business of Things.

(IS-2016-64) The Economy of Things

This report explores how the Internet of Things (IoT) may trigger transformations within various industries. It uses economic modeling to convey several disruptions including how asset marketplaces can unlock capacity; how credit risk can be digitally managed, and how greater efficiencies can be obtained through the use of IoT technologies.

(IS-2016-63) 2016 Is the Year Smart Home Technology Will be Mainstream

The report addresses the challenges and opportunities of low-income single-family homes Energy Efficiency programs. The report includes survey of the landscape, detail practices that program administrators are using to overcome challenges, strategies to incorporate underutilized technologies and measures into programs to realize greater savings.

(IS-2016-62) Building Better Energy Efficiency Programs for Low-Income Households

The report addresses the challenges and opportunities of low-income single-family homes Energy Efficiency programs. The report includes survey of the landscape, detail practices that program administrators are using to overcome challenges, strategies to incorporate underutilized technologies and measures into programs to realize greater savings.

(IS-2016-61) LED Lighting Sets the New Standard - Improving Sustainability, Performance, and Wellbeing

This paper compares artificial lighting from LED sources to fluorescent lamps. LEDs have a more uniform spectrum closer to sunlight and are more healthful because they emit no ultraviolet light. Also, the materials for LEDs are not dangerous compared to the mercury in Fluorescent lamps.

(IS-2016-60) LIVE 4K ULTRA HD TV - From Demonstration to Service Launch

This paper explores the market for streaming of 4K (3840 x 2160 pixels resolution) live events for TV viewing. The challenges of upgrading set-top boxes for 4K resolution, which doubles the bandwidth compared to current high-definition broadcasting. If the frame rate is also doubled, the total bandwidth requirement is tripled. The challenges of upgrading production, transmission, and decoding equipment are presented.

(IS-2016-59) Video on Demand - How worldwide viewing habits are changing in the evolving media lands

This paper reports on a survey of TV viewers in 61 countries about the sources of their TV content. Two-thirds of viewers use video-on-demand (VoD) with one-quarter of these paying for services such as Hulu and Netflix. One-third of those surveyed are considering canceling cable TV (with a skew toward younger ages). VoD is favored for choice and cost compared to cable TV. Demographic data supporting these statistics are provided.

(IS-2016-58) LED Lighting Sets the New Standard in Schools

This brochure extols the virtues of LED lighting over fluorescent lamps for school lighting. The dangers cited in

fluorescent lamps include mercury exposure if the lamp is broken, ultra-violet radiation leakage that may cause vision problems, and a color spectrum with spikes that may cause dyslexia and a host of other problems. LED lamps are more energy efficient, last longer, and are recyclable.

(IS-2016-57) 2016 Threats Predictions

This paper explores likely connected device vulnerabilities including attacks on integrity, working from home, payments, and wearables. More protection of hardware and firmware is needed as these become targets. Security challenges will be posed by network function virtualization and software-defined networks. Smart phones that control homes will become vectors for attacks. Some thieves will correlate database searches for value.

(IS-2016-56) Elevating the HVACR industry: Promoting exciting careers to diverse prospects can help

This paper examines remedies for filling employment positions in heating and air conditioning. Worker shortages result from poor visibility of the industry, incorrect reputation as low-skill positions, traditional domination by men, lack of ethnic diversity with foreign language skills, and lack of training in requisite skills. 35% of those being trained are second-career adults.

(IS-2016-55) LED Lighting Sets the New Standard in Healthcare

This brochure extols the virtues of LED lighting over fluorescent lamps for hospital lighting. The dangers cited in fluorescent lamps include mercury exposure if the lamp is broken, ultra-violet radiation leakage that may cause vision problems and degrade plastics, and a color spectrum with spikes that may cause dyslexia and psychological problems. LED lamps are more energy efficient, last longer, and are recyclable.

(IS-2016-54) Privacy and Information Sharing

This report from the Pew Research Center examines Americans attitude towards privacy issues in commercial settings. A study conducted by Pew Research, based on a survey of 461 U.S. adults and nine online focus groups of 80 people, found that there are a variety of circumstances under which many Americans would share personal information or permit surveillance in return for getting something of perceived value. Most Americans see privacy issues in commercial settings as "contingent and context-dependent".

(IS-2016-53) LED 101

This report from GE Lighting provides a brief overview of LED lighting technology and its application in commercial settings.

(IS-2016-52) Moving Forward: Findings and Recommendations from the Consultative Council

This report from the National Institute of Building Sciences presents the latest thinking from the building industry on the tools, technologies, resources and policies necessary to achieve the goals established by policymakers, the public and the industry itself. The report focuses on 3 themes: "resilience and a changing climate; aligning government and business to achieve a cost-effective, high-performance built environment; and the buildings-related workforce and productivity".

(IS-2016-51) Financing Energy-Efficiency and Renewable-Energy Projects

This report from the National Institute of Building Sciences examines the current and potential roles of three key equity investing structures (Real Estate Investment Trusts, Master Limited Partnerships, and Yieldcos) in capitalizing the sustainable and energy-efficient development and retrofit of investment-grade commercial buildings and renewable-energy production.

(IS-2016-50) Digital Inclusion and Meaningful Broadband Adoption Initiatives

This report from the Benton Foundation presents findings from a national study of digital inclusion organizations that help low-income individuals and families adopt high-speed Internet service. The goal of this report is to help key stakeholders gain a deeper understanding of how digital inclusion organizations and their community partners can be successful in their efforts to promote meaningful broadband adoption.

(IS-2016-49) Meeting of the Minds 2015

This report from the Urban Age Institute provides an overview of the 2015 "Meeting of the Minds" summit, which brought together 375 industry stakeholders to discuss the innovators and initiatives at the "intersection of urban sustainability and connectedtechnology".

(IS-2016-48) The American Middle Class is Losing Ground

This report from the Pew Research Center examines the changing size, demographic composition and economic fortunes of the American middleclass.

(IS-2016-47) Empowering the Edge - Practical Insights on a Decentralized Internet of Things

This paper is the second in a series following Saving the Future of the IoT by IBM in April of 2015. IBM partners with Samsung Electronics to build a proof of concept for Autonomous Decentralized Peer-to-Peer Telemetry (ADEPT). The objective is to test a fully decentralized model for IoT.

(IS-2016-46) Device Democracy - Saving the Future of the Internet of Things

This paper is written by IBM in July 2015 and discusses how the Internet of Things (IoT) is already in trouble by cost, sheer number of devices, and broken business models. It entertains ways that the IoT can be saved through a methodology that IBM calls the blockchain. It closes with attributes of winners and losers in an increasing digital world.

(IS-2016-45) 3rd Annual Grid Modernization Index

This paper was published in January 2016 by the Gridwise Alliance. It is the third annual ranking of states in the U.S. based on implementation of grid modernization measures. It focuses on the electric grid in each state and weights various factors such as state support, customer engagement, and grid operations. It also provides a year over year trending of which states areimproving.

(IS-2016-44) IAB Digital Shopping Report - Guide to Mobile Devices and Holiday Shopping

This report was written in November of 2015 and contains on analysis of US Adults and their usage of various technologies to make retail purchases. The technologies compared include mobile smart phones and tablets. The analysis highlights the best ways to reach consumers of different age groups across devices and media.

(IS-2016-43) Canadian Gas Association Annual Natural Gas Sector Report 2015

This report is done annually by the Canadian Gas Association and details natural gas use, demand, and consumption for the 2015 calendar year. It compares natural gas usage to oil as a result of differing prices in the market over the course of 2015. It also discusses reserves and storage of natural gas in the Canadian marketplace.

(IS-2016-42) Industrial Internet Insights Report

This report presents results from a survey on Industrial Internet and Big Data conducted by GE and Accenture in China, France, Germany, India, South Africa, UK, and USA, covering 9 industrial sectors: Aviation, Wind, Power Generation, Power Distribution, Oil and Gas, Rail, Manufacturing, Mining, and Healthcare.

(IS-2016-41) DataTrends - Energy Use

This is a series of data trends prepared by US EPA on energy use in bank branches, courthouses, distribution centers, residence halls/dormitories, financial offices, hospitals, hotels, K-12 schools, medical offices, non-refrigerated warehouses, offices, retail stores, senior care communities, supermarkets, wastewater treatment plants, and worshipfacilities.

(IS-2016-40) Results from an Expert Roundtable on Utilization of Public-Private Partnerships to Promote High-Performance Public Buildings in the United States

It reports results from an expert roundtable organized by the National Institute of Building Sciences (NIBS) and Royal Institution of Chartered Surveyors (RICS) on the utilization of Public-Private Partnerships (P3) in US. It discusses benefits and challenges, and then suggests next steps.

(IS-2016-39) The Energy Efficiency and Productivity Benefits of Smart Appliances and ICT-Enabled Networks: An Initial Assessment
This report presents initial assessment results on energy efficiency and productivity benefits of smart appliances and ICT-nnabled networks. It suggests that ICT-enabled networks and services might enhance overall economic activities by as much as $600 billion per year over the next several decades.

IS-2016-38) The Internet of Things: Security Research Study
This report was completed by the Veracode. The white paper examined the security of six internet connected, always on consumer devices in four different domains to determine the potential for real-world impact. All devices but one exhibited vulnerabilities across most categories putting consumers at risk for an attack or physical intrusion. There is a clear need to perform security reviews of device architecture and accompanying applications to minimize the risk to Internet-of-things users.

(IS-2016-37) Water Conservation and Water Resource Management in California's Green Buildings
This report was completed in 2015 by the US Green Building Council. The paper reviewed a decade of LEED project credit achievement data and identified trends in how LEED projects have conserved water. Opportunities for further improvements will increase participation rates, climate and energy impacts of water use in buildings require closer attention, and existing levers can effectively improve conservation.

(IS-2016-36) Why is the so-called Smart World still So Stupid
This white paper was completed in 2015 by GreenPeak Technologies. The paper describes the difference between connected homes and smart homes and suggests that consumers will better value smart homes once they provide more meaningful utility. An evolutionary comparison to the automotive industry is provided.

(IS-2016-35) Banking on Solar: An Analysis of Banking Opportunities in the US Distributed Photovoltaic Market
This report was completed in November 2014 by the National Renewable Energy Laboratory of the US Dept of Energy. The report provides a high level overview of the developing U.S. solar loan product landscape for both a market and economic perspective. Covered are current and potential solar lending institutions, loan products, program structures, lender risks/opportunities, and an economic analysis comparing third party-financed loan products.

(IS-2016-34) To Own or Lease Solar: Understanding Commercial Retailers' Decisions to Use Alternative Financing Models
This report was completed in December 2014 by the National Renewable Energy Laboratory of the US Dept of Energy. The report examines the tradeoffs among financing methods for businesses installing onsite photovoltaics. Costs and benefits of financing strategies are reviewed. Case studies comparing IKEA (ownership) to Staples (Power Purchase Agreement) are provided.

(IS-2016-32) 2015 State of Modern Motherhood: Mobile and Media in the Lives of Moms
Designed in February 2015, the Interactive Advertising Bureau conducted a global study to compare the purchasing habits of US millennial mothers. The study focuses on how parenthood influences the use of media devices, media habits, brand choices, and the likelihood of noticing advertising. The methodology consists of an in depth survey supported by third party sources from Comscore, the United States Census, and Pew Research Center.

(IS-2016-31) A Neuroscience Perspective: Assessing Visual Focus, Message Processing & the Ability to Strengthen Associations Through Mobile Native Advertising
Published in 2015, Sharethrough provides a neuroscience perspective summary of the effects of mobile advertising and reader attention. The reaction of human visual focus is explored for native ads and banner ads.

(IS-2016-30) The Aspect Consumer Experience Index: Millennial Research on Customer Service Expectations
This report from the Center for Generational Kinetics examines consumer attitudes, expectations, preferences

and customer service priorities by generation. The primary focus of this report is the behavior of Millennials, or "Generation Y", within the context of another generation to highlight similarities and differences.

(IS-2016-29) THE MARTINI REPORT: The Affluent Audience Online. Vol 1: Autos and the Elite
This report from Martini Media examines the role of the Internet in "Affluent lives" and "Affluent spending". This report is the first in a series of White Papers synthesizing findings from this research with data from a variety of sources in order to understand the online spending habits of high-income individuals.

(IS-2016-28) Smart Grid Today Exclusive Industry Report
This report from MMI examines the issues currently surrounding the renewable energy and smart grid industries around the world. The report not only outlines these issues (which range from the retrofitting of smart inverters to the economics of personal rooftop solar panels) but also provides the practical solutions that are currently being implemented.

(IS-2016-27) The WELL Building Standard
This report from the WELL Building Institute outlines overall strategies, performance targets, and certification and compliance steps required for projects to meet the "WELL Building Standard v1.0". This building standard focuses on occupant health and well-being, which is achieved by implementing strategies, programs and technologies designed to encourage healthier, more active lifestyles and reducing occupant exposure to harmful chemicals and pollutants.

(IS-2016-26) Natural Gas and the Canadian Industrial Sector 2014
This report from the Canadian Gas Association provides data on of the relative use and importance of natural gas in industry. Industries described in more detail include Food and Beverage, Wood Products, Pulp and Paper, Chemical Products, Cement and Lime, and the Primary Metals industries. Furthermore, using a simulation models, estimates were obtained on where natural gas is used in Canada.

(IS-2016-25) Supply Chain Risk Management Practices for Federal Information Systems and Organizations
This report from NIST provides guidance to federal agencies on identifying, assessing, and mitigating information and communications technology (ICT) supply chain risks at all levels of their organizations. The publication integrates ICT supply chain risk management (SCRM) into federal agency risk management activities by applying a multitiered, SCRM- specific approach, including guidance on assessing supply chain risk and applying mitigation activities.

(IS-2016-24) Rate Design for the Distribution Edge
This report from the Rocky Mountain Institute was prepared to support discussion and dialogue about next-generation retail electricity pricing approaches appropriate for a future with increasing quantities of distributed energy resources. It is intended to stimulate and advance discussion about the advantages and disadvantages of alternative pricing approaches.

(IS-2016-23) Lighting quality perceived in offices
This study from Zumtobel Research deals with the quality of office lighting as perceived by the user, and with the discrepancy between the actual situation and the users' preferences. It allows for specific design principles to be derived as a basis for effective lighting concepts that are adequate to users and activities, beyond existing standards and procedures.

(IS-2016-22) 2015 Data Breach Investigations Report
This report from Verizon examines data breaches in 2015 and analyzes the threats, vulnerabilities, and actions that lead to security incidents, as well as how they impact organizations suffering them. The report analyzes information from 70 different organizations in order to provide a detailed breakdown of 79,790 security incidents that led to 2,122 confirmed data breaches in 2015.

(IS-2016-21) Mogul Base LED Replacement Lamps
This report from the Lighting Research Center examines Mogul base LED replacement lamps, which are being marketed as equivalent replacements for incumbent HID lamps. Photometric and electrical testing was conducted

on 18 mogul base LED lamps. The study found that only 4 of the 18 lamps met the minimum tested DLC QPL criteria for retrofit kits when the lamps were placed in area lighting and roadway luminaires.

(IS-2016-20) 2014 Digital Storage for Media and Entertainment Report
This report by Coughlin Associates analyzes requirements and trends in worldwide data storage for entertainment content acquisition, editing, archiving and digital preservation, as well as digital cinema, broadcast, satellite, cable, network, internet and VOD distribution. Also discussed are capacity and performance trends, as well as media projections.

(IS-2016-19) 2014 Emerging Non-Volatile Memory & Storage Technologies and Manufacturing Report
This report from Coughin Associates looks at the efforts to develop new memory technologies. Most of these new technologies are non-volatile memories and can be used for long term storage or to provide a memory that does not lose information when power is not applied to the electronics. The memories addressed in this report include PRAM, RRAM, FRAM, MRAM, STT, MRAM and a variety of less mainstream technologies such as carbon nanotubes.

(IS-2016-18) Responding to - and Recovering From - Sophisticated Security Attacks
This white paper from IBM Global Technology Services discusses the four proactive steps that should be taken to keep an organization safe. The four steps discussed in detail are: Prioritizing your business objectives, protecting your organization, preparing your response to a sophisticated attack and promoting a culture of security awareness.

(IS-2016-17) The Self-Encrypting Drive Market and Technology Report
This report is based on a survey conducted by Coughlin Associates on the use of encryption to provide security in various types of electronic equipment that use storage devices. Those interviewed include storage device suppliers, systems OEMs, security software companies, storage control suppliers and others.

(IS-2016-16) European Wind Energy Operations & Maintenance Market Overview 2014/15
Wind Energy Update interviewed over 100 wind energy experts working in the European market and collated the results in this report, which contains the latest market data. This data gives insight into the latest challenges being faced and the potential growth for this expanding market.

(IS-2016-15) The Internet of Things: Can it Find a Foothold with Mainstream Audiences Today?
In this white paper, Nielsen uses the Internet of Things as a case study for understanding how to align new, disruptive offerings with mainstream consumer needs. Nielsen evaluated more than 4 million product concept alternatives for smart products by asking consumers to make choices about which concepts they preferred and these voices were used to shed light on key consumer preferences and barriers to mainstream adoption of smart products.

(IS-2016-14) Evening use of light-emitting eReaders negatively affects sleep, circadian timing, and next-morning alertness
This white paper compares the biological effects of reading an electronic book on a light-emitting device with reading a printed book in the hours before bedtime. In this report from PNAS, it examines the results that eBooks can have on sleep, including reduced evening sleepiness, reduced melatonin secretion, later timing of the circadian clock and reduced next-morning alertness.

(IS-2016-13) Financing Small Commercial Building Energy Performance Upgrades: Challenges and Opportunities
This paper focuses on the tremendous economic opportunity associated with small commercial buildings measuring 50,000 square feet or less. Insight is provided into where policy changes could have the greatest impact on increasing the pace of energy efficiency upgrades, while also strengthening small businesses, creating jobs and enhancing economic and environmental resiliency in the face of climate change.

(IS-2016-12) Benchmarking Utility Clean Energy Deployment: 2014
Renewable energy and energy efficiency have become increasingly important elements of the U.S. electricity system. This white paper by Ceres looks at how U.S. electric utilities rank in terms of deploying these clean

energy solutions. Data is assembled from more than 10 sources to show how 32 of the largest U.S. investor-owned electric utility holding companies stack up on renewable energy and energy efficiency.

(IS-2016-11) Multiple Benefits of Business-Sector Energy Efficiency
This white paper describes the current understanding of non-energy benefits that accrue to businesses. Data is collected from surveying experts and conducting literature searches and this report concludes that there is evidence that the inclusion of non-energy benefits can cut the payback time of some energy efficiency investments by 50%.

(IS-2016-10) Bright Green Buildings: The Convergence of Green and Intelligent Buildings
The intent of this research is to provide documented evidence and build tools that can be used to educate and influence end-users, building owners, architects, and contractors that a "greener building" can be achieved using intelligent technology, and will provide a tangible and significant return on investment. This concept – intelligent, green, and profitable – is what we call a bright green building. This research identifies the exciting developments taking place on the technology front and analyzes their implications for intelligent and green buildings, highlighting examples of "best in class" buildings employing green and intelligent technologies. These buildings are dynamic environments that respond to their occupants' changing needs and lifestyles.

(IS-2016-09) How safe are home security systems?
This report from HP examines home security systems for cloud and mobile interfaces. HP reviewed and performed security testing on ten off-the-shelf home security systems and found several authentication and authorization issues.

(IS-2016-08) 2013 data breach investigations report
This report from Verizon attempts to study and combat data breaches by examining over 7,000 reported security incidents and 621 confirmed data breaches from 2012. The report provides key findings and highlights trends (such as statistical breakdowns of who is victimized, who commits the breaches, how they occur and why) from the compiled incident reports.

(IS-2016-07) 2014 Getting to Zero Status Update
This report from NBI presents their findings on zero net energy buildings and "ultra-low2" energy buildings and districts across North America and builds on their previous report "Getting to Zero 2012 Status Update work by New Buildings Institute (NBI)".

(IS-2016-06) Building Our Capacity to Reliably Achieve Climate-Neutral Building Outcomes
This report from the World Sustainable Building Conference examines the capacity-building conditions and practices within the green building community, and sets forth necessary conditions for the consistent, successful, and cost-effective realization of building projects with high performance goals.

(IS-2016-05) SDG&E Smart Grid Development Plan 2014 Annual Report
This report from SDG&E provides stakeholders with an update on SDG&E's Smart Grid deployment in the San Diego region. This Annual Report provides a status update to SDG&E's Smart Grid metrics, deployment costs, and benefits for the Reporting Period.

(IS-2016-04) State of the Electric Utility
This report from Utility Dive provides the results of a survey on "the state of the electric utility going into 2015" which aims to analyze current market trends. The report focuses on smart distribution platforms and new energy services, claiming that they will be the foundations of the industry's future.

(IS-2016-03) Getting to Zero 2015: National Forum Event Report
This report, which is a result of a collaborated effort between the New Buildings Institute, the National Association of Energy Officials and the Rocky Mountain Institute, summarizes the findings and outcomes of the 2015 Getting to Zero National Forum. The event provided a platform for "thought leaders and early adopters could come together to share perspectives on the growth of zero energy buildings, learn about best practices for successful projects and collaborate on opportunities to drive zero energy performance in the built environment."

120

(IS-2016-02) Vision of Smart Home The Role of Mobile in the Home of the Future
This report from GSMA examines the potential role of mobile connectivity in future smart home systems. It is intended to provide insight on the capabilities of mobile connectivity as well as smart home market opportunities and the associated challenges for companies and regulatory bodies from both the mobile and the utilities industries.

(IS-2016-01) Real-Time energy management
This case study from the NRDC examines the energy management initiative implemented by The Tower Companies ("Tower"), in three large, multi-tenant office buildings it owns and operates in downtown Washington, D.C. Tower's initiative was designed to deliver its buildings operations team with better information about the energy use in each building to catch and correct operational stray, and to provide actionable recommendations to ptimize energy use.This case study provides building owners, tenants, efficiency programs, and others with a model of an energy managementinitiative.

(IS-2015-150) Expanding the Energy Efficiency Pie: Serving More Customers, Saving More Energy Through High Program Participation
Currently there is a need for utility programs to increase energy savings as a way to save money for all utility customers, to reduce emissions, and to improve reliability. Achieving higher energy savings through energy efficiency programs generally requires higher customer participation. This report looks at the ways that customer participation can be improved.

(IS-2015-149) Building IQ's Meter Processing Flow
Meter data collection from buildings is highly variable in terms of source, format, and quality. BuildingIQ is able to receive, load, and process any data stream, whether from third-party vendors, through file transfer, or through email. This report looks at Building IQ's meter processing from collecting data to analyzing it.

(IS-2015-148) Wearing and Disrupting the In-Vehicle Experience
OEMs go to great lengths creating connected-car environments to replicate the burgeoning digital lifestyle of their customers. Enter wearables, which present a multitude of possibilities—and problems. This white paper looks at what it will take to make wearables work seamlessly and enhance the auto experience.

(IS-2015-147) 2015 Strategic Directions: Smart Utility Report
The Black & Veatch 2015 Strategic Directions: Smart Utility report is a compilation of data and analysis from an industry-wide survey. Topics addressed include devices, telecommunications networks and automation technologies used to meet new service requirements and provide greater integration with smart city programs.

(IS-2015-146) Internet of Things: Privacy and Security in a Connected World
The FTC hosted a workshop on November 19, 2013 titled, The Internet of Things: Privacy and Security in a Connected World. This report summarizes the workshop and provides staff's recommendations in this area. The discussions in this report are focused on IoT devices that are sold to or used by consumers.

(IS-2015-145) Predictive Grid Quarterly Report: Building a Predictive Grid for the Motor City
In June of 2014, Tollgrade partnered with DTE Energy to work together on a Clinton Global Initiative (CGI) Commitment to Action for a comprehensive grid modernization project in the Detroit metropolitan area. This report aims to provide a new industry benchmark to show how U.S. utilities can better detect and respond proactively to power outages, a well as new methods in the battle to prevent outages.

(IS-2015-144) Threat Landscape and Good Practice Guide for Smart Home and Converged Media
This report provides an overview of the current state of cyber security in the smart home domain. In particular it identifies commonly used assets, exposure of these assets to cyber threats, threat agents, vulnerabilities and risks, as well as available good practices in the field.

(IS-2015-143) Natural Gas Utilities: Driving Canadian Energy Efficiency and Innovation

This report highlights the historical achievements of natural gas utility energy efficiency programs, as well as provides recommendations that will help the industry respond to the ongoing efficiency interests of Canadian natural gas consumers.

(IS-2015-142) Gamified Energy Efficiency Programs

Turning something into a game—using the features of games to accomplish a real-world objective—is called gamification. Evidence suggests that games can encourage positive behavior change. Most notably for this report, a number of games have been developed that motivate consumers to save energy. This report describes and analyzes 22 game-based solutions that either are or could be part of an energy efficiency program.

(IS-2015-141) Cyber Security: Points That Need to be Part of the Conversation

Cyber security has emerged as the number one priority and it is a fact that cyber threats are continuing to increase. This report looks at cyber security in the workplace, prevention and protection.

(IS-2015-140) Webinsure Medical: Automating Medicare

This report looks at the increase in Medicare Advantage enrollments despite the changes to the Affordable Care Act (ACA). The problems and challenged associated with Medicare Advantage are discussed, as well as the solution, which is WebinsureMedicare.

(IS-2015-139) Assessing the Impacts of FERC 745

FERC Order 745 was revoked after the U.S. Court of Appeals announced that FERC had overstepped its boundaries in initially issuing the order in 2012. FERC Order 745 states that grid operators are required to pay the full market price ($/kWh) to economic load curtailments. This report looks at the short term and long term impact of FERC 745.

(IS-2015-138) Smart Grid: 10 Trends to Watch in 2015 and Beyond

Smart grid technology is a fast-moving industry with technological breakthroughs and innovations emerging all the time. Navigant Research has prepared this white paper to provide current and interested stakeholders in the smart grid market, including technology companies, service providers, utilities, investors, and policymakers, with an overview of 10 key trends that will affect the smart grid market during 2015 and beyond.

(IS-2015-137) IEEE CS 2022 Report

This report surveys 23 innovative technologies that could change the industry by the year 2022. The goal of this report is to help researchers understand the future impact of various technologies and help a general audience understand where technology is evolving and the implications for human society.

(IS-2015-136) Transform Every Customer into a Demand Response Resource: How Utilities Can Unlock the Full Potential of Residential Demand Response

More and more, utilities are choosing demand response (DR) as a way to balance grid operations, lower energy prices for consumers, and integrate renewable resources like solar power. This white paper looks at how utilities can unlock DR's full potential by analyzing three key areas: Unlocking the base through behaviour, keeping dynamic pricing simple and deepening customer relationships.

(IS-2015-135) How Much Energy Do Building Energy Codes Really Save? Evidence from California

This report looks at how effective the building codes enacted by California in 1978 have been in reducing residential energy use and associated pollution over time. Three key areas to measure the effect of building codes are examined in this report: Selection, behavioral response and policy endogeneity.

(IS-2015-134) How Can Utilities Survive Energy Demand Disruption?

Through extensive scenario modeling and analysis, as well as in-depth interviews with utilities executives, Accenture provides a view of the likely impact of technology adoption and specific insights to help utilities identify a path to a more digitally enabled grid.

(IS-2015-133) Forging a Path Toward a Digital Grid: Global Perspectives on Smart Grid Opportunities

This paper will provide a review of the challenges driving the uptake of smart grid solutions and consider how the variations in challenges for each nation could result in diverging priorities for smart grid investment. Following on from the national challenges, the paper focuses on the tasks required to determine and execute the appropriate smart grid strategies for utilities.

(IS-2015-132) How the Connected Consumer is Shaping Retailers' Omnichannel Strategy

A whopping 87% of smartphone owners use their phones for shopping purposes. This phenomenon has changed the role of the store associate and the physical store. This report looks at the changing landscape of the brick-and-mortar store and explores a few digital tools that retailers can use today to transform their stores and augment the in-store experience.

(IS-2015-131) Role of Natural Gas for Power Generation

This report reviews Canada's current electricity system and examines how it may evolve. It highlights the role of clean and affordable natural gas in today's system, and the role the commodity – and natural gas infrastructure – can play in the model as it evolves.

(IS-2015-130) Zero Net Energy Building Controls: Characteristics, Energy Impacts and Lessons

The Continental Automated Buildings Association (CABA) commissioned New Buildings Institute (NBI) to conduct research on controls in Zero Net Energy commercial buildings. ZNE buildings are an emerging trend in response to energy efficiency and carbon reduction policies, as well as market interest in 'green and sustainable' environments. NBI's last decade of work in building performance outcomes and ZNE buildings identified a gap in information concerning the control systems applied in these leading edge buildings. The outcomes of this collaborative research project can help fill that gap and enable a better understanding for CABA, its members, and the building and energy industry.

(IS-2015-129) ISS 2020 Vision: Scenarios for the future of the Global Facility Management Industry

The objective of the ISS 2020 Vision study is to develop a set of global scenarios for the future of the FM and services industry and to bring awareness about future trends, uncertainties and opportunities that could have the greatest impact on the industry.

(IS-2015-128) Government Works: Federal Agency Actions on Energy Efficiency

This paper looks at potential savings from four key sets of federal agency actions related to energy efficiency: Appliance and equipment efficiency standards, vehicle fuel economy standards, power plant greenhouse gas emissions standards and select housing efficiency standards and financing policies.

(IS-2015-127) Energy-Efficient Lighting Explained

This report aims to help commercial enterprises understand their options, including the benefits, costs and savings offered through the installation of high-efficiency lighting. This report also describes the various kinds of lighting and lighting controls and their pluses and minuses. In addition, audio interviews with leaders in the field about energy efficient lighting and how to best take advantage of the different options are provided.

(IS-2015-126) Smart Meter Controls White Paper

The paper aims to identify assets, threats and mitigating controls for smart metering using the OCTAVE Alle-gro risk assessment method. The result is a collection of 43 controls, which apply to any smart meter environment. Although the analysis is tailored to the analysis of the wireless M-Bus, the listed controls provide a good basis for metering companies, utilities or meter manufacturers to verify their meters protection level.

(IS-2015-125) Early Evidence Suggests Gigabit Broadband Drives GDP

This report examines the relationship between the availability of gigabit broadband services and economic activity at the community level. The study outlined in this report suggests that communities where gigabit broadband is widely available enjoyed higher GDP, relative to similar communities where gigabit broadband was not widely available.

(IS-2015-124) Using the HP Vertica Analytics Platform to Manage Massive Volumes of Smart Meter Data
This white paper presents a smart metering use case for a large electric utility with 40 million customers. The results show how the HP Vertica Analytics Platform delivers consistent, cutting-edge performance month after month, ultimately storing more than a decade of data on a cluster of eight HP generation 8 servers.

(IS-2015-123) Meeting the 4K HEVC and Multiscreen Challenge: Cost Effective Deployment of High-Quality Video Processing for Broadcast Using Off-the-Shelf Technology
This white paper outlines the trends driving the need for high-quality video transcoding and encoding and offers an alternative to conventional host media processing. Using a PCI Express video accelerator and embedded broadcast video processing firmware, this approach offers dramatically improved performance, taking up less space, consuming less power and costing less.

(IS-2015-122) The Fuel Cell and Hydrogen Industries: 10 Trends to Watch
This white paper looks at some of the major trends that Navigant Research sees happening over the next 12 months. The trends were generated from Navigant Research's analysis of the fuel cell and hydrogen industries, as well as research into the sectors in which fuel cells compete, including combined heat and power (CHP) generation, energy storage, and electric transportation.

(IS-2015-121) Digital Home Entertainment to Exceed Physical by 2016, Study Finds
This report looks at the steady increase of box office and digital revenue over the next five years and the decrease in the rentals and sales of DVDs and other discs. Due to these statistics, this report presents the idea that the future will be streamed and downloaded and that electronic home video revenue will exceed that of physical home video in 2016.

(IS-2015-120) Guide to Energy, Carbon and Sustainability Software
This Guide to energy, carbon and sustainability software presents the main drivers for companies to invest in sustainability software. The guide describes the biggest challenges, identifies key software features to look for and offers recommendations for selecting sustainability software.

(IS-2015-119) American Society for Healthcare Engineering Code Summary Report
This report from the American Society for Healthcare Engineering provides standard building codes for new and existing healthcare buildings.

(IS-2015-118) Addressing the health IT interoperability challenge through public-private partnerships
This report from TM Forum explores how the convergence of the telecommunications industry, digital service providers and healthcare institutions can "create more robust health standards and processes to promote the rapid adoption of sustainable digital ecosystems that can deliver cost savings and improvements in the quality of care." The report emphasizes the importance of establishing public and private partnerships (P3s) in order to formalize and promote cross-industry dialog and, as a result, to assist in designing end-to-end solutions for sharing data.

(IS-2015-117) How to Calculate and Present Deep Retrofit Value
This report from RMI is a guide for owner-occupants (although it can be applied, with adjustment, to residential spaces and other property types) on how to calculate and present deep retrofit value. This practice guide details how to calculate and present the value of a property-specific deep retrofit for owner-occupants, and it breaks down the non-energy cost aspects of deep retrofit value into nine discrete value elements, and then offers a sample report showing how to synthesize and present such an analysis.

(IS-2015-116) Research and analysis about determining constructive and project factors in domotic housing
This report from the World Congress on Housing examines the current relationship between smart buildings and the architectural process. The report determines that all home automation factors relevant to architects and designers should be standardized in order to allow buildings to be designed with a "domotic pre-installation" and thus improve home automated technologies.

(IS-2015-115) Smart Cities: Business Models, Technologies & Existing Projects
This report from IHS Technology examines the use of technology in smart city solutions. The main smart city applications covered in this report are mobility and transport, energy and sustainability, physical infrastructure, governance, and safety and security. Within each section, IHS provides specific examples of what types of solutions smart technology can provide to a 'smart city'.

(IS-2015-114) Department of Energy: Rules and Regulations
This report from the U.S. Department of Energy contains regulatory documents for the Green Building Certification Systems for Federal Buildings. These regulations update the Federal energy efficiency standards by adding criteria that green building rating systems must meet. Federal agencies are not required to use a green building rating system, but if they choose to do so, the systems must meet these criteria.

(IS-2015-113) Turning Title 24 Regulations into Smart Savings
This report from Daintree Networks argues that it is important for California businesses to invest in building-wide energy management solutions due to the recent update of the California Energy Commission's "Title 24 Energy Efficiency standards", which requires businesses to implement technologies that enable highly efficient and zero-net-energy buildings with systems that are integrated with advanced communications capabilities.

(IS-2015-112) Essential Guide to Lighting Retrofits & Upgrades
This report from Daintree Networks explains the benefits for businesses to implement energy efficiency technologies and provides information for managers on how to choose the most effective solutions for reducing energy use.

(IS-2015-111) Background and Approach to a Definition of Smart Buildings
This report from Pennsylvania State University (PSU) and the U.S. Department of Energy attempts to create an intentional definition of the term "Smart Building" separate from the ostensive definitions that are currently used. The report claims that the ambiguity of the term "Smart Building" may be cause for society to reject new automated services. A proper definition will also limit the scope of research in the field.

(IS-2015-110) 10 Policy Principles for Unlocking the Potential of the Internet of Things
Created in 2014, the 10 Ten Policy Principles for Unlocking the Potential of the Internet of Things highlights important policy tools to consider and apply for the advancement of the Internet of Things. This white paper is designed to help policymakers establish viable programs and services driven through an IofT framework. The Center for Data Innovation is a think tank based in Washington D.C. specializing in the intersection of public policy and data driven technology.

(IS-2015-109) Smart Cities Open Data Guide: Advice, Best Practice and Tools for Creating a Data-Driven City
The Smart Cities Open Data Guide: Advice, Best Practices and Tools for Creating a Data-Driven City provides a global overview of successful and challenging open data usage within metropolitan areas. This white paper also outlines a general framework to assist in the creation and promotion of new open data projects at the local government level.

(IS-2015-108) Development and Growth of the Solar Sector in Asia
This 13 page Ebook provides a brief general overview of growth and development within the Asian Solar Sector. Contributors include Thierry Lepercq, Robert Haendel, Mohd Azhar Abdul Rahman, and Dr. Thomas Reindl. The "Development and Growth of the Solar Sector in Asia" would be more suited for exploratory research and/ or new entrants considering entering the market.

(IS-2015-107) The Economics of Load Defection

This report was completed in April 2015 by the Rocky Mountain Institute. This report explores the economic impact of grid defections using various combinations of power supplied by the grid, solar power and batteries in five sample cities for both residential and commercial markets to 2050. As solar plus battery combinations become cost effective, the grid will be evolve to a role of backup power supply. Impacts of this shift on the various stakeholders are discussed.

(IS-2015-106) UPnP The Discovery and Service Layer for the Internet of Things

This white paper was completed in April, 2015 by the UPnP Forum. Based on the successful implementation of UPnP technology, this white paper proposes using the UPnP+ as the future standard to enable the Internet of Things beyond the home into mobile, work and industry. UPnP+ incorporates capabilities such as access to cloud and web services, sensor bridging for any device regardless or power profile or network, a flexible and easily expandable data model and a robust security layer to create a future-proofed standard built to enable the Internet of Things to reach its full potential.

(IS-2015-105) The Robust and Resilient Smart Grid: Many Applications, One Powerful Platform

This report by Trilliant was completed in 2014. It outlines some of the Smart Grid network requirements the should be evaluated, including; cost, coverage, capabilities, bandwidth and latency. Choosing the right Smart Grid Communications Platform is essential for being able to support many different applications today and in the future.

(IS-2015-104) 2015 Cost of Data Breack Study: Global Analysis

This report was created May 2015 by the Pnemon Institute, sponsored by IBM. The report outlines the cost of data breaches, surveying 350 companies in 11 countries. The document outlines the increasing impact of data breaches, statistics and causes including two focus areas impacting the financial consequences: 1) executive involvement and 20 cyber insurance. This report covers variance by country, time to report and cause of data breach and impacted cost.

(IS-2015-103) Acquity Group 2013 B2C Omnichannel eCommerce Study

This report was completed on November 26th, 2013 by the Acquity Group. It summarizes, explains and expands upon the results of a survey taken by 1526 smartphone users on the subject of their shopping habits and preferences. The end results showed clear consumer preferences in shopping behaviour and found that consumers prefer retailers that provide a seamless omnichannel experience.

(IS-2015-102) Innovative Connections - Where the Cloud Meets Fiber to Drive Business Growth and Opportunity

This report was completed in September, 2014 by Forbes Insight in association with Comcast Business. It gives several examples of redevelopments which are being given modern infrastructure including fast broadband connections. These new high bandwidth areas are one way to attract and keep entrepreneurs. This report was written based off of interviews with senior executives, business owners and innovation center founders.

(IS-2015-101) Project Shine (Shodan Intelligence Extraction) Findings Report

Project SHINE was created because of the large volume of infrastructure security professionals who wonder as to what extent critical systems are exposed to the Internet. This report highlights the details of this project, including the results and lessons learned.

(IS-2015-100) CES 2015 - Insights, Perspectives and Assessments after the Show

This white paper was completed in 2015 by IHS Technology. This white paper examines the insights, perspectives, assessments and trends gleaned from the 2015 Consumers Electronics Show. Advancements in semiconductors has driven a number of new opportunities and products, drones being of not. The show's most

prominent segments included: automotive, consumer electronics & smart homes, displays, Internet-of-Things, mobile and wearables.

(IS-2015-99) Leveraging UPnP+ The Next Generation Of Universal Interoperability

This white paper was completed in April 2015 by the UPnP Forum. This white paper compares UPnP with UPnP+, the technical differences between the two, and the certification process requirements. UPnP+ is the next generation of UPnP, and provides a standards framework to extend the Internet of Things into mobile, work and industry.

(IS-2015-98) The Complete UHD Guidebook – A Reference Tool for Next-Generation Video

This report was completed in 2015 by The Diffusion Group. This report provides and appraisal of the future of Ultra-High-Definition video, and includes the challenges and opportunities that creatives, network operators, and service providers will encounter as the TV ecosystem transitions from HD to UHD. Included are discussions regarding key technical issues, market analysis and strategic recommendations for industry stakeholders.

(IS-2015-97) Addressing Transparency Expectations in the Metals and Mining Sector

This article was published by PE International in 2014. It addresses the issue of supplier transparency in the metals and mining sector. The three approaches being used to address the transparency expectations of manufacturers, customers and regulators are explained in this article. In the future, suppliers who do not have proof of responsibly sourced material or Environmental Product Declarations (EPDs) will not be considered when comparing to other material suppliers who do have these data.

(IS-2015-96) Tracking and Hacking- Security and Privacy Gaps Put American Drivers at Risk

This report was completed February 2O15 by the staff of Senator Ed Markey (Massachusetts). The report addresses security and privacy issues specific to increased technology in automobiles. The document outlines the response to surveys sent to the major car manufacturers requesting data on vehicle security and privacy practices. The report summarized eight key tindings and suggests a necessity for standards to address automobile manufacturer security and privacypractices.

(IS-2015-95) New Channel Effectiveness in Restaurant Marketing Mix - A Study of Daily Deal Marketing Success

This report was completed in July, 2013 by Ipsos in collaboration with the National Restaurant Association and Groupon. Restaurant owners now have many technological promotional opportunities, including daily deals advertising. This paper evaluates how to be successful with daily deal marketing, and compares the unsuccessful users with the successful ones. A list of best practices for running daily deals promotions is also given.

(IS-2015-94) Directive on energy, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC

This is a paper from the Official Journal of the European Union. It focuses on directives with regards to energy efficiency and amending previousdirectives.

(IS-2015-93) IEEE CS 2022 Report

This report covers 23 innovative technologies that could change the industry by 2022. These technologies, tied into a scenario this report deems "seamless intelligence," presents a view of the future. For each of the technologies, there is a description of it, the challenges and disruptions.

(IS-2015-92) 4 Critical Trends in Electronics for 2014 and Beyond

This report by IHS Technology looks at four critical trends in the electronics industry for 2014. The four trends explored surround the issues of growth patterns, the impact of Cloud computing, the electronic supply chain and product life cycle.

(IS-2015-90) Internet Protocol for Smart Objects (IPSO) Alliance Technical Guide

An IPSO Smart Object is a specified collection of reusable resources that have a well-known object ID and which represent a particular type of physical sensor, actuator, connected object or other data source. This technical guide describes 18 Smart Object types, representing a variety of use case domains. This guide provides an example of how IPSO Smart Objects can be built to address some application specific use cases.

(IS-2015-89) Energy Efficient County Buildings: Realizing Money and Energy-Saving Opportunities
This report provides a summary of the data counties have provided to NACo through Portfolio Manager, a tool for monitoring utility costs and benchmarking facilities against their counterparts across the country. This Portfolio Manager analysis spans 21 states and totals more than 62 million square feet. This report contains a detailed discussion on benchmarking, energy efficiencies and future challenges and opportunities related to energy savings.

(IS-2015-88) Pacific Gas and Electric Company: Smart Grid Annual Report 2013
As on of the earliest and largest adopters of Advanced Metering Infrastructure (AMI) in North America, Pacific Gas and Electric Company is now leveraging this technology platform to prudently and methodically build the next generation Smart Grid to meet the 21st century needs of its electric and gas customers. This report looks at its Smart Grid Deployment Plan in great detail and highlights its development, benefits and risks.

(IS-2015-87) 2014 GRESB Report
GRESB reporting has become standard practice for most of the world's property companies and fund managers. GRESB's mission is to enhance and protect shareholder value by evaluating and improving sustainability best practices in the global real estate sector. This report looks at GRESB process, global results and future trends.

(IS-2015-86) Design Guidelines for the Visual Environment
With the increasing emphasis on accommodation of people with low vision within the built environment, this report is intended for use in obtaining guidelines in new construction and alterations of public accommodations and commercial facilities required to be accessible by the ADA and ABA.

(IS-2015-85) European Innovation Partnership on Smart Cities and Communities: Operational Implementation Plan: First Public Draft
This Operational Implementation Plan (OIP) is a companion document to the Strategic Implementation Plan of the European Innovation Partnership on Smart Cities and Communities. This OIP outlines eleven priority areas, which are discussed in great deal. It also highlights recommendations for starting points and examples intended to inspire interested parties.

(IS-2015-84) European Innovation Partnership on Smart Cities and Communities: Strategic Implementation Plan
This report is written by the European Innovation Partnership on Smart Cities & Communities. They seek to accelerate the industrial-scale roll out of smart city solutions integrating technologies from energy, transport, information and communications technologies, where the most untapped innovation potential is found This report outlines the strategic plan to implement this roll out of smart city solutions.

(IS-2015-83) Impact of Work Styles on Knowledge Worker Productivity: Finding of the TELUS-Ivey Study
From February 2013 to February 2014, TELUS and Ivey undertook to study the impact of the Work Styles program on the productivity of knowledge workers. They gathered data from focus groups of both knowledge workers and their leaders to develop the Knowledge Worker Productivity Measure. This Measure was validated and used to compare resident, home and mobile knowledge users. The findings of the study are outlined in this report.

(IS-2015-82) ISS 2020 Vision: New Ways of Working - The Workplace of the Future
The report aims to help customers create better workplace strategies. This report is divided into two parts: Part 1 describes the context in which future organizations will operate and provides a framework for discussing these

challenges and Part 2 focuses on providing a structure though which customers can define the role to be played in shaping the workplace towards 2020.

(IS-2015-81) Digital Services: Assembling the Business Blocks of Success
This report looks at how to be a successful service provider in the new digital ecosystem. Section 1 of this report looks at the critical role of developing a strategy. Section 2 examines recent, in-depth research from service providers to present a snapshot of what kinds of digital services they have to offer. Finally, Section 3 examines the building blocks that are needed to be put in place to be successful in an open digital ecosystem.

(IS-2015-80) Broadband Technology Opportunities Program Evaluation Study: Case Study Report Round 2
In 2010, the National Telecommunications and Information Administration awarded the C.K. Blandin Foundation with a Broadband Technology Opportunities Program Sustainable Broadband Adoption grant to implement the Minnesota Intelligent Rural Communities project. This case study looks at how the BTOP investment was maximized, successful strategies and techniques from this project and best practices utilized.

(IS-2015-79) Understanding the FTTH Landscape to Enable Better Business Decisions
This presentation was featured at the FTTH 2014 Conference & Expo and focuses on Fiber to the Home (FTTH). It discusses better FTTH planning including the drivers for FTTH and directions of FTTH. The presentation also highlights better FTTH positioning and messaging, as well as better marketing strategies.

(IS-2015-78) Managing Cyber Risks in an Interconnected World
This report was completed September 30, 2014 by PWC. This report outlines the global information security trends. Analyzed, surveyed, and consolidated by PWC, CIO, and CSO the global report includes data from 9700 corporate surveys conducted in 2014. The report explores industry cybersecurity topics including security spend, new threats, industry financial spend, losses due to breach, and hacker and vulnerability profiles.

(IS-2015-77) Guidelines for Smart Grid Cybersecurity
The report was completed September 2014 by the NIST Smart Grid Interoperability Panel- Smart Grid Cybersecurity Committee. This report details a framework for organizations to develop effective smart grid cybersecurity strategies. The set of guidelines are intended for individuals and organizations responsible for addressing cybersecurity for smart grid systems; including vendors of energy information and management services, equipment manufacturers, utilities, and system operators.

(IS-2015-76) MAKING THE SMART HOME SMARTER WITH UPnP® TECHNOLOGIES
This white paper provides a brief introduction to UPnP (Universal Plug and Play) technologies, UPnP Forum and its services on testing and certification.

(IS-2015-75) IHS Ranks the Top 10 Technologies That are Transforming the World
This report by IHS Technology ranks and briefly describes the top 10 technologies that are changing the world, including Internet of Everything (Things), Cloud Computing and Big Data.

(IS-2015-74) Innovators in the Internet of Things
IoT Nexus pioneered an industry-wide survey, collecting opinions from more than 300 decision makers working across the Internet of Things industry. From this survey, several companies were highlighted for their astounding innovative work, and IoT Nexus set out to gain further insights from the brightest prospects in IoT, as decided by the industry itself. Within this free paper you'll find interviews with key personnel from the most innovative SMEs and Start-Ups in IoT.

(IS-2015-73) 2015 Internet of Things (IoT) Survey

This brief report presents a summary of survey results on five questions related to Internet of Things (IoT) in smart buildings. The survey was done by Daintree Networks, involving 242 building owners, managers and other industry professionals, in order to gain insight into the awareness around IoT and building automation technologies for smart buildings.

(IS-2015-72) MANAGING MEDIA IN THE TV EVERYWHERE ECOSYSTEM

This paper addresses the challenges of making content (movies and TV shows) available on a variety of platforms ranging from large-format TVs to smart phones. The platform capabilities, quality (especially during Internet streaming), and economics are examined. For now, the largest market share and revenue for content comes from TV, not from the Internet. Service providers are encouraged to obtain high-resolution source material and to scale it for the various transmission methods and displays.

(IS-2015-71) Home Energy Management: Products & Trends

This paper examines the market for home energy management systems. These systems can reduce energy consumption 4-12%, but adoption has been slow. Products are categorized as control devices, user interfaces, and enabling technologies. Residential energy consumption is 22% of the US total energy produced. Better consumer feedback of energy consumption is recommended. Energy management may be combined with utility demand-response programs. Product success depends on human factors.

(IS-2015-70) Sentrollers, and the World of Small Data

This paper examines the role of data collection in the Internet-of-Things (IoT). Small amounts of data (termed "Small Data") will be collected from many sources such as sensors and thermostats located throughout the house. Collectively, the author calls sensors, actuators, and controllers "sentrollers" and predicts a synergy between small data and big data creating the Internet of Everything. Data collection may be supported by advertising.

(IS-2015-69) VIDEO-ON-DEMAND and the Consumer Advertising Experience

A consortium of media operators and advertisers examined the effectiveness of advertising in video-on-demand (VoD) television. They found that consumers tolerate ads and accept more and longer-format commercials in VoD than in conventional TV (called "linear TV"). This is because consumers are more engaged with programs they have selected through VoD.

(IS-2015-68) Smart TV Alliance Technical Specifications, Version 4.0

This report contains technical details for developing apps to run on Smart TV devices. Smart TV devices include a TV equipped with Internet access managed by the software in the TV. It also includes devices connected to the Smart TV such as a Blu-ray player and a set-top box. Examples of Smart TV applications include video-on-demand such as movie rental, catch-up TV, and 3D services; social networking; games; and news applications. A companion document for the Smart Home includes methods to discover, monitor, and control smart home appliances.

(IS-2015-67) THE SOCIAL CONSUMER STUDY

This paper examines consumer motivations for brand selection among products. It focuses on the impact of human and social values of the manufacturer on consumer preferences. The researchers found that women are twice as likely as men (31% versus 15%) to use social networks for brand selections. Corporate Social Responsibility (CSR) does not motivate decisions significantly unless there is negative news about the company. Customer loyalty to a brand is based on quality, customer service, and price.

(IS-2015-66) THE INTERNET OF THINGS - CAN IT FIND A FOOTHOLD WITH MAINSTREAM AUDIENCES TODAY?

Market research is reported on consumer understanding and desire for products based on the concept of the Internet-of-Things. For now consumers think this is a gimmick and show no strong product preferences. However, they assume that within 20 years such products will be common place. They are concerned about loss

of control if such products automatically make re-order decisions to buy consumables. Also, privacy and high costs are concerns.

(IS-2015-65) Connected Home Roadmap 2010

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's research quantified current business levels and identified the key players within the connected home space across multiple segments. Additionally, the project identified and prioritized consumer needs in the connected home space by pulling together past connected home research and converging it with new research to develop a concise vision where all the segments are headed.

(IS-2015-64) Aging in the Connected Home

The broad purpose of this CABA study was to identify a potential new market space by helping seniors remain longer in their home. Areas of consideration involve understanding the various inputs and outcomes of specific jobs within the home that affect the aging adult as they move about the home and take care of basic necessities. This research project will help organizations understand the opportunities for value creation amongst different groups within this population. It should also help companies identify key targets of opportunity for short-term innovation and long-term strategic planning.

(IS-2015-63) CABA North American Intelligent Buildings Roadmap 2011

CABA's Intelligent & Integrated Buildings Council undertook a collaborative North American Intelligent Buildings Roadmap research project to further strengthen the existing industry knowledge base and further perspectives on intelligent and integrated buildings.

(IS-2015-62) Connected Home User Interface Study

CABA members sponsored a consumer research project titled 'Connected Home User Interface Study' that helped defined the specific attributes or baseline criteria of a 'connected home user interface' for consumers when managing the connected home. In essence, the study explored and addressed some of the following questions (not limited to) through broad concept testing of various features that may be potentially incorporated into a whole home user interface.

(IS-2015-61) Intelligent and Integrated Buildings Technologies: Market Size in North America 2010

This CABA 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.

(IS-2015-60) Unlocking your business value: Leveraging Java on devices

The Internet of Things (IoT) will change everything. It will feature intelligent devices at the edge of the network. Business value would come from using the large amounts of resulting data and acting on it quickly and as closely and as automatically as possible to create new services and to convert data to information and to business value. According to the article, Java is perfectly suited for helping achieving this vision. Java can provide local device intelligence, portability and flexibility, all within a secure environment.

(IS-2015-59) The Next Generation of Asset Management

Smart meters, Digital sensors, Data Analytic, Cloud Computing, M-to-M realtime communication, and IoT are key enablers for Intelligent Asset Management. Asset management is increasingly about feeding information from across the utility into asset management systems, and using that in a real-time, predictive manner to improve financial and operational performance. The paper summarizes the key findings, identifies the opportunities, and formulate the recommendations for utilities owner.

(IS-2015-58) Measurement and Verification Functionality of the BuildingIQ System

The paper describes IPMVP (International Performance Measurement and Verification Protocol) and how M&V software calculates energy savings before and after implementation. BuildingIQ software continuously monitors inputs including weather forecast, occupancy, energy prices and demand response events. It makes small

changes in HVAC settings that result in large financial gains without impacting occupant comfort.

(IS-2015-57) Mainstream Green: Moving sustainability from niche to normal
The Green Gap project identifies the gap between consumer's green intentions and green actions; the why and way to close the gap. While consumers are aware of the importance of sustainable behaviors and practices, many companies are unable to convert this belief into actionable business opportunities. This research paper enables marketers to: (1) create products and services that better meet consumer needs; (2) change consumers' perceptions of the value of green products and inspire them to take action; (3) target communication more effectively; (4)establish their leadership in the sustainable world.

(IS-2015-56) Determination of the influence of specific building regulations in smart buildings
'Smart or Digital Home' is a residence that uses a centralized control to integrate the various home automation systems including but not limited to control environmental systems such as heating and lighting, any electrical component within the house to provide a comfortable and safe environment in which to relax, learn, communicate, socialize and entertain. When designing a home automation system, it is necessary to know the requirements and applicable regulations. This research paper highlites the influence of regulations in promoting the implementation of specific home automation solutions.

(IS-2015-55) BuildingIQ Security
The paper discusses the 3 clusters of BMS and IT systems security components: (1) Front-end browser-based user interface, (2) On-site vendor's (BuildingIQ Site Agent) proprietary HW/SW solution, and (3) Cloud computing infrastructure. It outlines information and infrastructure security policy, including but not limited to the safe use of the Internet, working from remote locations, as well as identification and handling of sensitive information.

(IS-2015-54) Watts in a Drop of Water: Savings at the Water-Energy Nexus
This report from the American Council for an Energy-Efficient Economy (ACEEE) examines the relationship between water and energy conservation. Water is need to produce electricity; electricity is need to treat (up to 16 MWh/MG), transport (up to 14 MWh/MG), and heat water (up to 258 MWh/MG). Waste-water treatment may consume as much as 4.7 MWh/MG. Maximum efficiency measures could result in a 50%-savings of indoor water consumption (where 70% of all residential water is used). More empirical data are needed "to encourage more utilities to work together to save both water and energy, increase efficiency, and reduce consumption."

(IS-2015-53) Smart Material House; Smart is Green
This report from IBA_Hamburg explores the possibility of energy conservation by installing materials on building facades to adapt to environmental changes. A project to build this concept into an apartment house for thermal conservation is presented. The architecture and materials for each side of the building were chosen according to the sun exposure. Phase-change materials were installed for thermal storage. Some of these materials are embedded in window curtains. These materials store district heat (community-based heating) if needed. Part of the façade includes photo-voltaic cells that generate four times more power than needed by the building. Vertical handing gardens provide evaporative cooling. Issues encountered during construction are presented.

IS-2015-52) THE CONNECTED-HOME REPORT: Forecasts And Growth Trends For The Leading 'Internet Of Things' Market
This report from Business Insider projects an increased growth rate for sales of connected home devices. A unit growth rate of 67% through 2019 is predicted reaching 1.8 billion units. Sales in 2014 were $61 billion growing to $450 billion by 2019. The most likely purchasers are the millennial generation (20s and young 30s). Price and interoperability are barriers. Likely purchases are smart thermostats, smoke detectors, and temperature sensors. Second are security devices. The slowest growth will be in smart appliances (28% growth). Connected home devices are about one-quarter of the Internet-of-Things market

(IS-2015-51) Update on preparations for smart metering
This report from the U.K. Parliament examines the installation of smart electric and gas meters for 53 million households and small businesses. Parliament is concerned about of the cost of the meters and technology

obsolescence. The smart meters are expected to save consumers about 2% (3% by 2030) and to cost about 0.8% of the bill per month. These meters are to be linked to in-home displays via radio signals. However, about 5% of these signals will not reach the displays because of blockage by building materials. Parliament wants to be sure that prepayment customers benefit from smart meters.

(IS-2015-50) Verifying Environmental Sustainability in the Electronics Marketplace
This white paper was published in 2014 by Underwriters Laboratory and provides details on the sustainability verification options available to electronics manufacturers. Beginning with an overview of the market for sustainable electronic products, the paper identifies the spectrum of product sustainability concerns. Various verification pathways available to manufacturers and the role of sustainability standards in that process are discussed.

(IS-2015-49) Unlocking ROI – Understanding the Complete Return on Smart Building Investments
This paper was provided by Daintree Networks. This paper suggests ROI measurement should include impacts on productivity, employee comfort, operating efficiencies, risk reductions and utility/tax incentives. Several examples are provided to illustrate this points. While the examples are company specific, this paper identifies a number of things to consider when searching for a BEMS provider.

(IS-2015-48) Connected Home Report: Forecasts and Growth Trends for the Leading IoT Market
This paper was completed on September 29, 2014 by Business Intelligence. Smart home management, particularly with security and energy, will increasingly become "mainstream". Connected home device shipments will grow at a compounded rate of 67% over the next five years to 1.8 billion units shipped annually in 2019, accounting for 27% of the broader Internet of Things device category. Pricing and coding standards continue to be barriers for consumers and vendors, and industry consolidation will continue.

(IS-2015-47) Smart Grid Interoperability Report
This paper was completed on June 2014. This report focuses on the shift of the energy value chain from a centrally focused to a more dynamic, distributed system where the major challenges will be observed closest to the consumer. Developing standards and imposing market regulation /defining harmonization of market models, roles and responsibilities for market players will increase the speed and enhance the value of adoption. Outlined in the paper is a balanced perspective on this topic, and a suggested framework to provide for further discussion.

(IS-2015-46) Market Resources Alternatives: An Examination of New Technologies in the Electric Transmission Planning Process
Wire Group's 2014 report examines an important aspect of North America's evolving electric power infrastructure called "market resource alternatives" or MRAs. This report is designed to provide an analysis and observations about how developments like MRAs affect the need for, and planning of, high voltage electric transmission.

(IS-2015-45) Smart Cities and the Energy Cloud: Reshaping the Energy Landscape
This 2014 white paper looks at the smart city concept which, has developed in response to the rapid changes happening in cities around the world. Navigant Research examines some of the critical issues facing smart cities and utilities as they develop the energy policies needed in the century of this city.

(IS-2015-44) New Energy Retrofit Concept: "Renovation Trains" for Mass Housing
Building Research & Information's 2014 report looks at the large scale operation required to make millions of homes in Europe more energy efficient. They examine a pilot project in the Netherlands that used a standardized process to retrofit homes and how this "renovation train" can be used to scale up the process from 100 to 10,000 renovations a year.

(IS-2015-43) Digital Services: Building Trust Through the Value Fabric
This 2014 report, written by TM Forum, examines the security and privacy challenges that digital ecosystem partners and end users are facing, with a particular focus on security from the customer's perspective.

(IS-2015-42) Energy Efficiency Playbook: Replacements vs. Investments

This paper by Noesis gives guidelines on how to sell energy efficient equipment as an investment to facilities. Replacements and investments are compared and the approach that should be taken for each of them is given. Investment sales need to be sold in terms of cash flows rather than energy terms and you need to present the opportunity directly to the CFO.

(IS-2015-41) Creating Healthier Furniture and Building Materials by Minimizing Chemical Emissions

This paper was published in 2014 by UL. In it, the increasing importance of indoor air quality (IAQ) is addressed, causes of poor IAQ are explored and strategies for improving IAQ are examined. One solution includes using products that have been designed and constructed to be low emitters of volatile organic compounds. Finally, information is given on how to certify products that are designed for indoor use. The GREENGUARD Certification Program is given as an example of a method of certification.

(IS-2015-40) Driving Performance and Transparency in Green Building Products and Materials

This white paper by UL outlines and reviews some of the methods used to demonstrate that building products are compliant with green building certification programs and codes. It then discusses some of the tools available to compare and select green products, such as "environmental product certifications, lifecycle assessments (LCAs) and environmental product declarations (EPDs), as well as the specific functions of each."

(IS-2015-39) 14 Strategies to Save Up to 70% in Energy Costs Using the Latest in Warehouse Lighting ...and More

This white paper was published by Daintree Networks in 2014. 14 different lighting control strategies are examined along with the associated technology that is required to implement them.

(IS-2015-38) Pre-Heating Season Update

This paper, published by the Canadian Gas Association in October 2014, examines the natural gas market in Canada for the winter 2014-15 season. The paper lists the advantages of natural gas for heating, outlines the state of the North American natural gas market after the long 2013-14 winter heating season, and explains what has been done in terms of storage and delivery systems to better prepare for a potential long 2014-15 winter.

(IS-2015-37) The benefits of the Z-Wave Installation and Maintenance Application

This report from Sigma Designs discusses the Z-Wave Installation and Maintenance Application, or IMA, which is currently the most widely used protocol for smart home and home security technology. Also discussed are the benefits of the Z-Wave such as low power consumption, secure communications and automatic mesh networking.

(IS-2015-36) Preparing Millennials to Lead in Cyberspace

Raytheon and the National Cyber Security Alliance (NCSA) commissioned a survey to understand U.S. millennials' career interests, level of career preparedness and their online attitudes and behaviours. This report outlines and discusses the findings of this survey and focuses on the need to prevent and combat incidents of online security breaches by strengthening the cybersecurity workforce.

(IS-2015-35) Health, Wellbeing & Productivity in the Office: The Next Chapter for Green Building

This report shares the latest information on the building design features that are known to have positive impacts on the health, wellbeing and productivity of office occupants. This report also provides a high-level framework for building owners, occupiers and their advisors to start tracking the impacts of buildings on employee health, wellbeing and productivity in order to use the information in financial decision making.

(IS-2015-34) Technology, Media & Telecommunications Predictions 2014

This report is the 2014 edition of Deloitte's predictions for the technology, media and telecommunications (TMT) sectors. The objective of this report is to identify critical inflection points that should inform industry strategic thinking, and to explain how these will manifest over the next 12-18 months.

(IS-2015-33) Open Standards-Driven Wireless Building Energy Management

Introduction of LG LED/Daintree wireless mesh network light fixtures that can be used as a cost-effective solution for providing addressable light fixtures. According to this white paper, the solution can save up to 85% in labour and equipment costs and up to 90% in energy efficiency.

(IS-2015-32) Facilitating Success (Why is A Facilities Management System Needed?) White paper advocating for use of Facilities Management Systems. A short description of FMS is included. The article includes also a checklist to help decide if a FMS is required/appropriate and shows the benefits of using a FMS.
This is a second article in a series.

(IS-2015-31) The 12 Things You Need to Know about Monitoring-Based Commissioning (MBCx)

This article discusses the needs for monitoring-based (or continuous) building commissioning (MBCx). Twelve reasons for implementing MBCx are listed.
A good article worth reading for anyone involved in "Smart Buildings", "Intelligent Buildings", "fault detection and diagnosis", commissioning etc.

(IS-2015-30) China's digital transformation: The Internet's impact on productivity and growth

This June 2014 report completed by McKinsey Global Institute examines how the Internet will have a positive affect on China's economic growth and productivity as Small &Medium Enterprises (SME's) start to adopt the 'cloud' and the potential cost savings in hardware and support. The report specifically looks at the Internet's growing impact in the consumer electronics, automotive, and chemical sectors and how this will positively affect the in finance, real estate, and health care industries acting as a possible counter-balance to the slowdown in the retail and manufacturing industries.

(IS-2015-29) More of What We Want - The Cross Platform Report

This Nielsen report completed in June of 2014 examines how consumers viewing habits are changing with the introduction of more connected devices (smart phones & tablets) and increased viewing options such as; video-on-demand, time shifting & subscription services (Netflix). This report is focused on the U.S. market.

(IS-2015-28) The State of the Art of mHealth App Publishing

This paper completed in May 2014 by Guidance2Research examines the mHealth App market and future trends. This is a global study that looks at the growth of the app market and who the major players and adopters are and who is behind the increasing number of medical and health & fitness apps and their objectives. The study notes the growth of the industry, driven by end user demand and the increase of wearable technology and the barriers to adoption such as a lack of data security and the failure of the traditional healthcare (hospitals and Pharmaceuticals) players to adopt and produce mHealth apps.

(IS-2015-27) Maximizing Mobile Operator Opportunities in M2M

This paper was completed in Q1 of 2010 by ABI Research and sponsored by Cisco. It looks at the growing M2M market and the drivers behind it (Telematics/telemetry as sources of greater operational efficiency). It also explores the effects the growing demand for the M2M market has on Mobile Network Operators, Mobile Virtual Network Operators and Application Service Providers and the overall effect on the 'Internet of Things'.

(IS-2015-26) Telecom Analytics: Actionable Intelligence - Technology and Applications

Big data poses a challenge for telecom service providers to figure out how to leverage the amounts and types of dating pouring in. This whitepaper focuses on the need for the automation of big data applications and issues surrounding mobile marketing.

(IS-2015-25) Green Multifamily and Single Family Homes: Growth in a Recovering Market

The whitepaper discusses the evolution of green building for single family homes from boom to bust to recover through comparisons of studies from 2006 to 2011. It also looks at the addition of multifamily housing and the ways in which multifamily firms differ from those doing single family housing in terms of their drivers, marketing efforts and general approach to green building.

(IS-2015-24) Doing Well by Doing Good

This whitepaper looks at corporate responsibility and how this influences the consumers and their consumption patterns. Topics addressed include how passionate consumers are about sustainable practices when it comes to purchase considerations and which social issues and causes that are affecting the most concern.

(IS-2015-23) From Risky Business to Smart, Successful Connectivity

This whitepaper provides insight into the importance of assured reliability connecting devices. It outlines how to increase performance and reliability of the functionality in connected devices. This whitepaper also discusses the huge growth in connected devices and the opportunities and hazards that go along with this growth.

(IS-2015-22) Running OSS/BSS and NMS Applications on Cloud

Cloud computing is widely known for the advantage that it brings to the users. This paper discusses the various aspects of deploying OSS (Operating Support Systems), BSS (Business Support Systems) and NMS solutions on cloud. The scope of this paper is limited to only OSS/BSS applications, the advantages, disadvantages and therefore perspectives may differ from other applications.

(IS-2015-21) Benchmarking Utility Clean Energy Deployment: 2014

Renewable energy and energy efficiencies have become increasingly important elements of the U.S. electricity system. This report by Ceres and Clean Edge assembles data from more than ten sources to demonstrate how 32 of the largest U.S. investor-owned electric utility holding companies stack up on renewable energy and energy efficiency.

(IS-2015-20) Custora E-Commerce Pulse Mobile Report

This report explores mobile computing and how it is impacting the way people shop online. It takes an in-depth look at mobile e-commerce, email marketing, Apple's domination of mobile purchases and the future of cross-device shopping.

(IS-2015-19) Clinical Innovation + Technology: Leadership to Transform Healthcare Vol 3. No. 7

This is the July/August magazine for Clinical Innovation + Technology. It features articles covering the area of technology and healthcare. The cover story is regarding health IT and its impact on the workflow of nurses.

(IS-2015-18) Building Resilience in Boston: "Best Practices" for Climate Change Adaptation and Resilience for Existing Buildings

This reports includes a review of national and international research, publication and planning documents to identify best practices related to the improvement of existing buildings to better withstand climate change impacts. This report is focused on the city of Boston and its specific geologic, population, cultural and natural environment context.

(IS-2015-17) Connected Consumer Roadmap: Driven by the Internet of Things (Executive Summary) Using a two-phase research approach, including both an extensive consumer survey and in-depth industry interviews, IHS & CABA examined a vast ecosystem, much wider than the connected home. This unique landmark research study leveraged an "Internet of Things" perspective; taking into account a consumer focused view, from both inside and outside of the home, of Health and Wellness, Entertainment, Mobility, Transportation, Security, etc. This research study assessed consumer expectations around the enabled devices they use every day to live in a fully connected world, and also provides insight into key industry topics, ranging from cybersecurity to privacy. Importantly this research explores and identifies new opportunities and solutions within ecosystems and across ecosystems.

(IS-2015-16) CABA Intelligent Buildings and Big Data 2015 Report (Executive Summary)

CABA, a leading industry association that promotes advanced technologies in homes and buildings in North America, has completed its collaborative "Intelligent Buildings and Big Data" research study. This landmark research study was a major initiative of the CABA Research Program, which offers a range of opt-in technical and advisory research services designed to provide industry stakeholders with collaborative research and R&D opportunities. The study focused on how "Big Data" translates into the intelligent building context and whether Big

Data analytics will help keep businesses competitive. A combination of different types of primary research examined market perspectives on Big Data in order to project near and mid-term opportunities in intelligent buildings. The findings present a new understanding of customer behaviors, competition and market trends that will shape the adoption of Big Data solutions.

(IS-2015-15) CABA Intelligent Buildings Market Sizing North America 2015 Report (Executive Summary)
This research provides an update to the CABA Research Report entitled "Intelligent and Integrated Buildings Technologies: Market Size in North America 2010". The 2010 report provided an in-depth analysis of the growing North American market for integrated and converged intelligent building control systems including: environmental control technologies, fire detection, security, lighting systems and IT convergence. This updated research will also include a market review of the threats to the building automation and control systems (BACS) business, including: new DX AC entrants, increasing sophistication of AC and heating controls, VRF systems equipped with own controls and energy management functionality, new developments in smart homes and communicating room controllers.

(IS-2015-14) The Internet of Things: The Future of Consumer Adoption
This white paper provides an in-depth look into consumer behaviour across a variety of areas related to connected technology, including current and future adoption plans and potential barriers to mass consumer penetration. For B2B and B2C companies, the research provides a picture into how consumers view IoT technology and the growth potential of this market in both short and long term.

(IS-2015-13) Internet of Things - More (and less) Than You May Think
The ebook by FierceWireless takes an in-depth look at the security risks associated with the Internet of Things. Other topics explored in this ebook include the wearable opportunity and the latest developments in connected healthcare.

(IS-2015-12) The State of Broadband 2014: Broadband for All
This report seeks to enhance understanding of the importance of broadband networks, services, and applications to guide international broadband policy discussions and support the expansion of broadband. There is also a focus on the importance of integrating ICT skills into education to ensure that the next generation is able to compete in the digital economy.

(IS-2015-11) A High Accuracy Standard for Electricity Meters
Accuracy is perhaps the most important attribute of high-end metering. This white paper explores ANSI C12 metering standards, which has proven invaluable to the technical buyer for evaluating new metering technologies as they emerge. On the other hand, this white paper also discusses the future amendments to ANSI C12 in order to keep pace with technology and remain relevant to the end user.

(IS-2015-10) Property Assessed Clean Energy Financing
This paper was completed January 8th, 2014, and revised April 29th, 2014 by Consortium for Building Energy Innovation. This paper explores the implementation, opportunities, progress and the future of Property Assessed Clean Energy financing. PACE restructures the financing of costs associated with energy efficiency improvements by smoothing them over a multi-year period.

(IS-2015-09) Blackouts - How a utility cured an Ibuprofen plant's biggest headache
This case study completed in 2014 by Utility Dive (in cooperation with Siemens) describes the power outages experienced by Albemarle Corporation's Ibuprofen plant in Orangeburg, S.C. and the solution they found with the help of Siemens Smart Grid Division. The solution they found was a "fast bus transfer system that can handle more than two sources" in terms of distribution automation.

(IS-2015-08) Benchmarking Utility Clean Energy Deployment: 2014
This paper benchmarks the largest utilities in the U.S. based on renewable energy deployments by year. It segments the utilities in several ways such as total renewable energy sales versus renewable energy as a percentage of total output. It also gives recommendations to Federal and State agencies how to classify and

report renewable energy in the future so as to make it easier to benchmark the utilities.

(IS-2015-07) Stimulating Innovation on Behalf of Canada's Electricity and Natural Gas Consumers
This discussion paper was completed on August 21, 2014 by Concentric Energy Advisors for the Canadian Gas Association and the Canadian Electricity Association. It examines the roles that Canada's utilities and regulators can play to promote innovation in the industry. It makes recommendations for an optimal approach for Canada that includes utilities, regulators, and governments.

(IS-2015-06) Regional Briefing: Renewable Energy in Latin America and the Caribbean
This white paper discusses the issues and opportunities in the Latin American and the Caribbean (LAC) region renewable energy markets. Present energy issues in the region have the potential to be addressed and fixed by moving towards renewable energy. However, financial, policy and market solutions need to be created in order to facilitate the renewable energy growth in the LAC region.

(IS-2015-05) Sentrollers, and the World of Small Data
This white paper describes the broader perspective of the Internet of Things in light of the terms Cloud and Big Data. It also brings up a new term – Small Data – which is the trillions and zillions of small bits and pieces of information that will be coming from every environment. Lastly, the white paper explains the role of GreenPeak Technologies and their focus on Small Data application systems.

(IS-2015-04) UPnP Enabling Standard IoT: Future-proofing device communications
This white paper discusses how UPnP is focusing on expanding the uniform connectivity platform they provide for consumer electronics and computing devices. UPnP is taking the concept of "allowing devices to talk to each other" and expanding it toward a new paradigm of total interconnectivity and limitless functionality.

(IS-2015-03) Network Transformation: Get Smart With Your Data
Communications service providers (CSPs) are entering an era of unprecedented change. This white paper examines the face of this transformation, along with the challenges and how to overcome them. Also discussed in this white paper is the impact of data transformation on network transformation, the role Neustar plays and the services they provide in the face of this communications transformation.

(IS-2015-02) High-Quality Multimedia Distribution in Commercial Buildings
This CABA White Paper examines the increasing need for high-quality multimedia in commercial buildings and the options for a distribution infrastructure. The paper notes that building industry has adopted standards for a building data infrastructure that can be extended to multimedia. The paper demonstrates that there is a solution using HDBaseT technology that overcomes the limitations of HDMI, while carrying HDMI signals. The solution is cost-effective and suitable for content-protected audio and video, and can be integrated with a building data network using established installation skills andtools.

(IS-2015-01) Connected Car White Paper
CABA recently published a white paper on the connected car market. An increasing number of vehicles are coming to market with the capability to support communications of various sorts. In 2013 more than one billion sensors were sold to the auto industry, more than doubling the 2009 levels. While tethered and integrated solutions have dominated car connectivity to date, embedded connectivity solutions began appearing in 2014 with the number of such vehicles increasing in 2015 and beyond.

(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.

(IS-2014-198) The Essential Guide to Energy Efficiency Financing

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 us, 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

140

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 ofVoIP 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)."

(IS-2014-181) VoCamp "Energy Data Models for Urban Planning"

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: Reimaging 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."

(IS-2014-178) Building Industry Vision 2021: A View into the Future: A case study of the building industry in 2021

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

141

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.

(IS-2014-172) Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2014
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.

(IS-2014-168) Commissioning: An Essential Part of a Comprehensive Energy Strategy
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 increasing 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.

(IS-2014-163) Residential Electricity Use Feedback: A Research Synthesis and Economic Framework 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

145

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.

(IS-2014-141) The Future of the Utility Industry and the Role of Energy Efficiency

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.

(IS-2014-138) Dell Survey: Midmarket Companies Aggressively Embrace Big Data Projects

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.

147

(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 reports 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.

(IS-2014-129) The 2014 International Energy Efficiency Scorecard

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. 31policy 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) Reseach 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.

(IS-2014-119) The State of Competition in Canada's Telecommunications Industry 2014

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. 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

150

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.

(IS-2014-105) Cyber-security and the North American Electric Grid

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 Cyber-security, 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

152

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 is 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.

(IS-2014-91) Green Building Report for the District of Columbia 2012

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. 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.

(IS-2014-85) Smart Metering Implementation Programme: Second Annual Report on the Roll-out of Smart Meters

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.

155

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.

(IS-2014-79) How the Department of Defense Leverages Private Resources to Enhance Energy Security and Save Money on U.S. Military Bases

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.

(IS-2014-75) 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.

(IS-2014-74) 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.

(IS-2014-73) 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%.

(IS-2014-72) 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.

(IS-2014-70) The Changing Face of Smart Buildings: The Op-Ex Advantage
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.

(IS-2014-68) 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."

(IS-2014-67) 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 common- place. 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.

(IS-2014-66) 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).

(IS-2014-65) 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.

(IS-2014-61) Why The Cloud for Collaborating – White Paper

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.

(IS-2014-59) 2012 Fuel Cell Technologies Market Report

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.

(IS-2014-57) The Business Case for Fuel Cells 2013 Reliability, Resiliency & Savings

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.

(IS-2014-56) On-Bill Financing for Energy Efficiency Improvements: A Review of Current Program Challenges, Opportunities and Best Practices

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.

(IS-2014-52) Deep Energy Savings Research in Existing Commercial Buildings

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 trans- form 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.

(IS-2014-47) Examining the Net Savings Issue: A National Survey of State Policies and Practices in the Evaluation of Ratepayer- Funded Energy Efficiency Programs

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 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.

(IS-2014-45) A Method for Evaluating Diagnostics Protocols for Packaged Air Conditioning Equipment

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.

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.

(IS-2014-44) Rooftop HVAC Fault Detection and Diagnostics: Technology and Market Review Energy and Demand Savings Estimates

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.

(IS-2014-39) Air Source Heat Pump for Preheating of Emergency Diesel Backup Generators

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.

(IS-2014-34) Is CO2 an Indoor Pollutant? Direct Effects of Low-to-Moderate CO2 Concentrations on Human

Decision-Making Performance

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 CO_2 levels: 600ppm, 1000ppm and 2500ppm. The data showed that there was a clear relationship between the scores in the tests and the CO_2 levels for 7 of the 9 tests. 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. 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.

(IS-2014-32) AAL Catalogue 2013 Final

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.

(IS-2014-31) ACEEE Field Guide to Utility-Run Behavior Programs

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.

(IS-2014-30) Smart Utilities: 10 Trends to Watch in 2014 and Beyond

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.

(IS-2014-29) 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. 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.

(IS-2014-27) Commercial Energy Code Voting Guidance for the 2015 IECC-Comm

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.

(IS-2014-20) 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 States2. 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.

(IS-2014-19) 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."

(IS-2014-18) 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.

(IS-2014-17) 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.