Building a Greener Future: Greening of Industry and the Evolving scope of the Green Buildings Market

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Agenda

- Greening of Industries – Why now & What we have accomplished?
- Why consider going “Green”?
- Being “Green” Inside and Out
- Towards a Greener Future – A Building Technologies Perspective
- Environmental “Best Practices” & CSR recognitions
- Concluding Remarks
Greening of Industries – Global Perspective
The Greening of Industry: A Timeline

**Past**
- Environmental Regulations Established
- Companies Deal With Regulations

**Present**
- Industry more positive about the Environment, but expects financial outlay to outweigh income benefits
- Companies Anticipate Regulations

**Future**
- Industry realizes that being Green is no longer a fad— from both a good corporate citizen, and a good business standpoint
- “Being Green” Becomes a Strategic Advantage

**Push/Pull between Environmentalists, Government & Industry**

**Time**
Building a Greener Future

Being Green “Inside and Out”

Air & Energy
- Reduce GHG emissions
  - Improve indoor air quality
  - Improve energy efficiency
  - Waste to energy

Water
- Reduce quantity of wastewater discharged
- Lower concentration of contaminants released

Waste & Remediation
- Reuse and recycle products
- Reduce hazardous waste disposal
- Assess product lifecycle
- Use more of Brown fields instead of Green fields

Being Green Inside
Lowering your Footprint Internally

Being Green Outside
Lowering your Footprint Through your Green Technologies, Products And Services

- Air pollution control
  - Indoor air quality

- Water reuse & recycling
  - Commercial water solutions
  - Desalination
  - Watershed management

- Green Buildings
  - Energy Management
  - Lighting control
  - BAS controls
  - Intelligent Buildings
  - Green architecture
The Greening of Industry: Comparative Positions of Key Companies

High Level of Environmental Sustainability

Recently Established Goals

GE

Tyson Foods

Wal-Mart

Low Level of Environmental Sustainability

Long Established Goals

Alcoa

Interface

UTC

Toyota

Baxter

Herman Miller

Siemens

3M

BP

Wal-Mart

Recent Established Goals

Alcoa

Interface

UTC

Toyota

Baxter

Herman Miller

Siemens

3M

BP

Wal-Mart

Long Established Goals

Alcoa

Interface

UTC

Toyota

Baxter

Herman Miller

Siemens

3M

BP

Wal-Mart
Towards a Greener Future
A Building Technologies Perspective
Setting the landscape

- **LEED benchmark** for building performance and resource efficiency
  - Endorsed in nearly 41 countries, including Canada, Brazil, Mexico and India
  - Increased initiatives to encompass markets other than commercial buildings

- **Collaboration among agencies** - USGBC, ASHRAE and IESNA to develop Standard 189

- **Development of LEED v3.0** encompass major advancements in building science and technology - LifeCycle Assessment and bioregional weighting

- **Bringing the residential market under LEED purview** - LEED-for-Homes (pilot, 366 certified)

- **Private sector’s "business case"** for green buildings gaining momentum

- **Evolving implications** on scope of green buildings and associated markets – paramount shift in dynamics – add-on to necessity

- **US** - 1,100 commercial projects certified as of Sept 2007, each averaging about 10,000-sq.m.

- **Canada** - commercial registrations grew from 55 (2005) to 183 in 06
**Building a Greener Future**

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**Key Components in Defining Scope**

- **Energy management** – using green power alternatives such as wind, solar, biomass and ground source
  - Green Building use 30 percent less energy and the renovations and retrofits have five- to seven-year payback

- **Water management** - include water, wastewater treatment, and stormwater management

- **Facilities management** - building siting, janitorial services, cleaning solutions, automation controls, occupancy facilitation, parking and transit accessibility

- **Building materials** - solar panels, high-performance windows and insulation, and recycled and renewable building materials

- **Performance contracting** - equipment sales, operations and maintenance, and financing
  - Non-Performance-based markets include equipment sales, energy/water/facilities consulting, and related building construction

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**Emerging Determinants**

Zone Controls, Fire & Security, Day light harvesting, IAQ, BAS Protocols, Green HVAC equipments & Services
Opportunity Assessment

Size & Prospect

- U.S. market in green building products and services nearing $12 billion in 2007 ($7 billion in 2004 – approx. 20% y-o-y growth)
- USGBC’s LEED certification goals - 100,000 commercial projects and 1,000,000 homes by 2010 (represents certifiable base – Source USGBC)
- CaGBC goals - 100,000 buildings & 1 million homes certified by 2015 (represents certifiable base – Source CAGBC)
- Considerable driver for supplier markets to cash in

Key Challenges

- Capital funds benefiting operational savings
- First cost barriers to entry
- Developing industry awareness among the noise
- Ongoing development of criteria for building labeling & certification to match technological innovations

Green buildings that use the LEED rating system cost about 2 to 4 percent more to build, but can save as much as $50 to $75 per square foot over a 20-year period
Opportunities Defining Market Trends

**Performance Contracting**
- $6.8 billion in 2006, to reach $12 billion by 2010 at 20% CAGR
- HVAC equipment, Building control systems, Water meters, energy audits, PMC
- Potential cost saving – energy-50%; maintenance-20%; avoidance –30%

**FM Market**
- 18,069.6 million – 2006; CAGR-10.2%
- Building O&M has a dominant share, followed by janitorial, PMS, IT/Telecom, ENV
- Technical services outsourcing; energy concerns; building systems complexity

**BAS Market**
- BAS Systems $2750 million approx. at 7% (2006) – EMCS; FM; CCMS
- BAS Controls market - $ 400 million approx. At 7% (2006)
- BAS Protocols market - $ 1015 million approx. at 5% (2006) – BACNet; Lonworks; TCP/IP

**Zone Control Market**
- $76.7 - 2006, to reach $110.6 million, at a CAGR of 5.4% by 2013
- Wireless zoning products to gain widespread acceptance as intelligent building gain popularity
- Energy-saving benefits increases appeal to the energy-conscious user
Opportunities Defining Market Trends

**Water Market**

- Water management is gaining tremendous attention. Not only has water reuse and recycling practices increased momentum in municipal and industrial segments ($676 Million & CAGR of 9.5%) but also in commercial areas.

- In Jan of 2007, American Water's Applied Water Management Group received New York City Department of Health certification for a state-of-the-art system that recycles wastewater at Tribeca Green, a 24-story apartment building in Battery Park City at the southern tip of Manhattan. The company also has four other "green" water recycling projects in Battery Park City, including a fully operational system at the Solaire apartment building that is generating 25,000 gallons of useable water daily. The Solaire project is the first of its kind in the nation to receive a Gold LEED rating from the U.S. Green Building Council.

**Energy Management Market**

- $33,608 million approx. At 6% (2006) – Utility affiliated ESCOs; EMS; Equipment ESCOs

- Escalating back-up power demand; load management; energy efficiency; constrained budgets – key influencers

- Capital-inefficient peak load assets with T&D upgrades increases capital exposure for Utilities – making EMS participation critical and responsive
Opportunities Defining Market Trends

Emerging Markets

- Fire & Security – 2,084 million in OEM alone (detection, suppression, alarm, enunciation); 5% CAGR average
  - Environmentally friendly products and retrofits are key drivers – flouroketone products (zero GHG and ODP)
  - First cost issues; no differential LEED incentive
- HVAC equipments - $ 8 billion approx. at 6% (2006); account 40% energy usage currently
- IAQ – changing air filters and purifiers to retrofitting entire HVAC systems
  - Americans spend over 90% time indoors; insurance issue (SBS)
  - IAQ and energy efficiency in a building are not mutually exclusive – driver for materials market
  - IAQ products and services considered largest growth area for AC contractors and consultants (60% inquiries result in remediation)
  - $ 470 million approx. at 5% (2006)
  - WHO - 30% of all commercial buildings have significant IAQ problems – only 5% address them
- Day light harvesting - more sunlight means less bulb light ; worker productivity (7-8%)
  - Construction markets gaining momentum; Developer differentiation – fast off-take
  - High cost a misnomer compared to long term benefits
Technology Trends

- **Compact fluorescent lamps** - utilize 25 percent of the energy while generating 90 percent less heat

- **HVAC energy recovery systems** - substantially mitigates energy needs for HVAC requirements, example Ford Truck Assembly Plant

- **Flouroketone replacements for traditional HFC** – will results in zero GHG emissions and OD potential

- **Alternate energy resources** – geothermal, solar, wind power to generate fulfill energy needs in buildings

- **Innovative solutions** – free cooling, zone controls, intelligent monitoring and control systems

- **Chilled beam systems** - cool buildings via installations in ceilings

- **Green roofs** – highly recognized for its energy conservation, examples Ford Motor and Chicago Municipal buildings

- **Deep lake water cooling** – saves energy and mitigates vast quantities of greenhouse gas emissions, example Lake Ontario, Toronto
Challenges Determining Adoption

- Existing Building comprise bulk of inefficiencies, yet rating procedures not streamlined to address this market
- Protocols are less flexible and responsive to new innovations
- Periodic Revisions lacking
- Challenges in their integration into the green buildings market – cost & awareness

- Certification targets points towards a sizeable market opportunity
- Huge installed base of older buildings – enhanced capital project management
- Energy inefficiency (commercial buildings-17% energy consumption)
- Ability to lower energy and operational costs impact demand
- Substantial Potential for Green Suppliers
# Tracking Best Practices and CSR

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| **Dow Jones Sustainability Index**  
[http://www.sustainability-index.com/](http://www.sustainability-index.com/) | Launched in 1999, the Dow Jones Sustainability Indexes are the first global indexes tracking the financial performance of the **leading sustainability-driven companies** and portfolios worldwide. |
| **Frost & Sullivan's Green Excellence Awards**  
Best Practices Research & Recognition  
[http://www.frost.com/](http://www.frost.com/) | Instituted in 2007 as an integral part of the Environment & Building Technologies Practice of Frost & Sullivan, Green Excellence Awards are presented to companies that have excelled in green product and technology innovation, corporate leadership, global leadership, service portfolio and environmental activism. These awards recognize ground-breaking ideation and innovation across a multitude of disciplines that originated from a firm sense of environmental responsibility. Corporate Leadership Matrix being developed. |
| **CERES**  
[http://ceres.org/](http://ceres.org/) | Ceres is a national network of investment funds, environmental organizations and other public interest groups working to advance environmental stewardship on the part of businesses. |
| **Roberts Environmental Index**  
[http://www.roberts.cmc.edu/](http://www.roberts.cmc.edu/) | Students and Faculty at the Roberts Environmental Center analyze years of voluntary environmental and sustainability reports published by large corporations, that the company takes environmental and social matters seriously and acts responsibly. |
| **Ethibel Sustainability Index**  
[http://www.ethibel.org/subs_e/4_index/main.html](http://www.ethibel.org/subs_e/4_index/main.html) | The Ethibel Sustainability Index (ESI) provides a comprehensive perspective on the financial performance of the world's leading companies in terms of sustainability for institutional investors, asset managers, banks & retail investors. |
Road Map to a Greener Future

- **Utilize performance contracting** - bypass the capital cost barriers for greening
- **Education and quantification matters** - data supporting the value of green buildings
- **Expand focus to existing buildings** - exponential growth resides in the EB sector due to the relative industry size
- **Deliver comprehensive solutions** - incorporate distributed or onsite energy and performance contracting as well as non-performance-contracting fee-based activities
- **Increase green differentiation** - to serve market expansion as sales of green product lines will increase over traditional ones
- **Being Green inside and out is crucial** - in demonstrating one’s commitment to sustainable development - demonstrating the ROI within one’s company in embracing green solutions and leading by example
Frost & Sullivan’s Building Technologies Research – Upcoming topics

LEED and Future Trends
A Green Roofs Markets
BAS Controls Market
NA BAS Protocols Market
Refrigerated Display Cabinets Markets
NA Residential Humidity Control Equipment Markets
NA Mass Notification Systems
North American BAS Installation and Services Markets
NA Green lighting solutions - Energy efficient options
Growth Opportunities in the North American I-FM Market
Half yearly update on BAS market
Customized company deliverables for BAS market
NA Portable Fire Extinguishers Markets
NA Green HVAC Solutions
Characteristics and benchmarking of successful I-FM companies in NA
NA Factory Mounted Controls Trends
BAS Wireless Networks Markets
NA Data Center Cooling
Remote Monitoring Services
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