The Promise of Green: an Evolution

Melissa O’Mara
Solution Vice President, Green Buildings
2011
What is a green building?
What is a green building?

“The building is a citizen of the city and has an obligation to society”
—Xiaowei Xu, PhD., LEED AP, Chief Engineer, Shenzhen Institute of Building Research

“A high performance green building is designed for economic and environmental performance over its entire life cycle, considering unique local climate and cultural needs and providing for the health, safety and productivity of its occupants. With continuous care over its life cycle, it minimises energy use, CO₂ emissions, and total environmental impacts, and provides ongoing measurable value to building owners, occupants and society
— Schneider Electric

Does a green building have to be certified as green or is about optimizing performance?
A modern promise: green buildings…
…creating a sustainable future

Empowering economic & environmental sustainability

- Improved stock performance
- Increased occupancy and tenant retention rates
- Increased building value & rental rates
- Fewer sick days, improved well-being
- Improved occupant experience
- Higher talent retention rates, employee loyalty
- Lower energy use & CO₂ emissions
- Regulatory compliance
- Corporate Social Responsibility

Planet

People

Profit
Why do we need a green building promise?
The energy dilemma is here to stay

The facts

Energy demand
By 2050
Electricity by 2030

Source: IEA 2007

The need

CO₂ emissions to avoid dramatic climate changes by 2050

Source: IPCC 2007, figure (vs. 1990 level)
Energy costs are not just rising, they are accelerating

- Energy prices are increasing because of
  - Increased demand
  - Declining energy availability
  - Looming threat of energy legislation
- In the European Union, energy costs have increased 47%\(^1\) since 2003 and are projected to grow 30%\(^2\) in the next 5 years
- In the US, electricity costs have increased 20%\(^3\) since 1995 and are projected to grow 10%\(^4\) in the next year

---


\(^2\) 2009 Electric Market Forecasting Conference, Dr Stephan Sharma

\(^3\) Average cost per kWh in United States from Energy Management Systems for Commercial Buildings, Pike Research, 2009

\(^4\) Energy Information Administration
Energy is more than expense; it can be a liability.

- The power cuts - the worst in decades - come amid sweltering temperatures during the fasting month of Ramadan…. The Egyptian authorities are urging consumers not to waste electricity.¹

- There is huge wastage and overuse of electricity in Kuwait.³

- Middle East has one of the world highest per capita consumption rates of electricity.²

¹ British Broadcasting Corporation
² Arabian Business
³ Dr. Saad Akashah, an Advisor of Arab Fund for Economic and Social Development
Regulation in the European Union

20% × 2020 below 1990 levels
CO₂ reduction

20% × 2020 renewables

100% × 2020 are nearly net zero all new buildings

Energy Performance Certificates
Regulation in China

40% × 2020
CO₂ reduction per GDP below 2005 levels

15% × 2020
renewables

65% × 2020
ergy reduction in cities compared to 1980 levels
Making the business case
Payback improves as energy prices rise

Payback time has decreased 30% over 5 years due to increase in energy prices

Example based on a commercial building project
Eurostat
Being energy efficient is key to being competitive

- Energy costs in the UK account for as much as 1/5 of business expenditures, so investing in efficiency can lead to gains in competitive advantage.\(^1\)
- 72% of owners are driven most strongly by the competitive advantage gained from greening buildings.\(^2\)

Expected Benefits from Green Features
(According to Owners)

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased Operating Costs</td>
<td>93%</td>
</tr>
<tr>
<td>Attracting New Tenants</td>
<td>79%</td>
</tr>
<tr>
<td>Increased ROI</td>
<td>71%</td>
</tr>
<tr>
<td>Increased Building/Asset Value</td>
<td>64%</td>
</tr>
<tr>
<td>Higher Tenant Retention/Renewal</td>
<td>64%</td>
</tr>
</tbody>
</table>


\(^1\) Guardian Sustainable Business, N. Grant, February 2011
Green buildings return more

ROI improvements reported by owners of green projects in US:
- Return on investment improves 9.9% new construction and 19.2% existing building projects. \(^1\)

Office buildings with environmental ratings in Australia deliver better returns for owners in capital growth, rental yield.\(^2\)

---


\(^2\) Property Council of Australia/IPD Green Property Investment Index, March 2011
Cost benefits of green buildings

- Operating costs decrease 13.6% for new construction and 8.5% for existing building projects.
- Building value increases 10.9% new construction and 6.8% existing building projects.
- Occupancy increases 6.4% new construction and 2.5% existing building projects.
- Rent increases 6.1% new construction and 1% existing building projects.

### Commercial building owners
- Increased rental rates
- Attracting tenants
- Cost effective
- Competitive differentiation
- Risk mitigation

### Commercial building tenants
- Lower operating costs
- Healthier, cleaner indoor environmental quality
- Immediate and measurable results
- PR and community benefits
- Contribution to triple bottom line

Ethical companies perform better

\[1\] Ethispshere, 2011 World’s Most Ethical Companies
How are we doing?
We must consider building life cycles

Our integrated systems and comprehensive services reduce both capital and operational expenses.

*The CABA building lifecycle costs are based on U.S.A data. These figures vary by region.*
LEED certification today – too many broken promises?

Evolution of green buildings

Past
Focus on environmental impact of construction (green design)

Today
Focus on efficiency and operational performance over time (LEED EB:O&M)

Future

Time
Evolution of standards: BREEAM In-Use

Established in 2009, it is designed to:

- **Reduce** operational / running costs
- **Reduce carbon** and **improve** sustainability
- **Enhance** the value and marketability of property assets
- Give a **transparent platform** for negotiating building improvements with landlords and owners
- **Demonstrate compliance** with environmental legislation and standards, such as carbon labeling and ISO 14001
Evolution of standards: LEED

- LEED EB v2.0 2004
  Upgraded in 2009

- Existing buildings operations & maintenance

- Homes
- Neighborhood development
- Commercial interiors
- Core & shell
- New construction
- Schools, healthcare, retail

Building lifecycle
- Design
- Construction
- Operations

Source: U.S. Green Building Council
When green is not green enough

Source: green.blogs.nytimes.com; When green is not green enough, September 27, 2010
An evolution

Green
- Air & Energy
  - Reduced GHG emissions
  - Improve IAQ
  - Improve Energy Efficiency
- Water
  - Reduce wastewater discharge
  - Lower contamination release
- Waste & Remediation
  - Reuse and recycle products
  - Reduce Waste disposal
  - More brown fields instead of green fields
  - Green architecture

Bright Green
- Energy Management
- Asset management
- Space utilization
- Integrated design process
- Sustainability—easier to maintain and built to last
- Renewable energy
- Healthy and comfortable environment (IEQ)
- “Green” loans
- Higher resale or lease rates

Intelligent
- Converged Networks
  - Data collection, measurement & verification, diagnostics, sensors, control, monitoring, remote monitoring, etc.
- Integrated Controls
  - HVAC, lighting, energy, AV, security, fire & life safety, etc.
- Infrastructure
  - Structured cabling solution, wireless systems, unified communication system
- Water Management
  - Monitoring and metering

Source: Frost & Sullivan

Green buildings are becoming more intelligent, enabling high performance
Our green buildings promise:

We partner with our customers to deliver high performance green buildings that achieve sustained results over time.
We deliver smarter, converged solutions designed for high performance

**Efficient & Productive**
- Measure and control energy, automate, provide relevant diagnosis
- Manage processes
- Make all the utilities of any infrastructure more efficient

**Reliable**
- Prevent power outage and quality variance

**Safe**
- Protect people and assets
- Transform and distribute power safely

**Green**
- Make the connection of renewable energy sources easy, reliable and cost-effective
EcoStruxure: The right ecosystem to support the convergence of 5 key domains

EcoStruxure promise:
- Guaranteed compatibility / synergy / capability between the 5 domains of expertise
- Energy monitoring everywhere, with up to 30% energy efficiency
- Enabled by the right connecting technologies:
  - Seamless integration
  - IP as a common highway
  - Web services as a common language (SOA architectures)

Making energy safe, reliable, efficient, productive and green
Evolution of green buildings

Past

Focus on environmental impact of construction (green design)

Today

Use of BIM and IPD

smart and green come together to deliver “bright green” buildings

Focus on efficiency and operational performance over time (LEED EB:O&M)

Future

Time
Buildings are connected to man-made and natural ecosystems.

- Natural Habitats
- The Grid
- Weather Conditions
- People
- Neighborhoods
- Transportation
What is smart grid?

- Creates two-way communication between the grid and load (building)
- Allows two-way energy flow between the grid and load (building)
- Distributes energy intelligently across a region to manage the load better
Smart grid requires energy management

- **Centralised Generation**
- **Transmission**
- **Distribution**
- **Commercial & Industrial**
- **Residential**
- **Electric Vehicles & Energy Storage**
- **Industry**
- **Building**
- **Datacenter**
- **Renewable Energy Plants**

**Demand / supply mgt :**
- Active Energy Efficiency
- Energy visibility
- Energy control & optimisation

**Communication and software at all levels of the “Smart Grid”**

1. Centralised Generation
2. Communication and software at all levels of the “Smart Grid”
3. Electric Vehicles & Energy Storage
4. Renewable Energy Plants
Smart buildings can tap the power of a smart grid
Smart buildings can interact with the smart grid to bring value to owners & occupants.
Evolution of green buildings

Past

Focus on environmental impact of construction (green design)

Today

smart and green come together to deliver “bright green” buildings

Use of BIM and IPD

Focus on efficiency and operational performance over time (LEED EB:O&M)

Future

Net Zero Energy buildings

Use renewable energy

Connect to Electrical Vehicles

Carbon Neutral buildings, micro grids, eco-districts

Time
The future promise of green

- renewables
- net zero homes
- carbon neutral micro grids
- eco-districts
- carbon neutral buildings

The diagram illustrates the potential for a green future with renewable energy sources, net zero homes, carbon neutral micro grids, and eco-districts.
How do we deliver on the evolving promise of green?

- partnering
- innovating
- leading the transformation to a sustainable future
Make the most of your energy™

melissa.omara@schneider-electric.com
Find me on LinkedIn
Follow Green Buildings on Twitter: @Schneider_Green
Appendix
Green buildings in China

20–25 billion sq ft new construction per year

80 GBL 3 Star projects in China

300–400 LEED projects in China

600 LEED APs in China

3-Star Green Building Label quickly catching up with LEED
Green buildings in India

200–250 million sq ft new commercial construction per year

606 million sq ft existing LEED certified green buildings

110 million sq ft of green building expected in 3-4 years

75% of Green Building projects in India are LEED certified, but market share for other programs will grow
Green buildings in Australia

500+
Green Star certified or registered projects

Green Star rating required for new government buildings (5 stars) and existing buildings (4 stars)

2010
Mandatory Disclosure legislation requiring NABERS certificates for all transacting office buildings

GBCA is developing a new rating tool to assess the operational performance of existing buildings—95% of the market.
Green buildings in the US

10–15
billion US$ green retrofit market by 2014

26000
LEED certified or registered projects

5
billion sq ft certified or registered green building surface

6.4 billion $US has been saved by increased productivity of people working in green buildings