Mining Gold From the Green Building Revolution

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Green building is important for controlling CO₂ production

Green design/development is here to stay
- Growth for new buildings still +67% rate in 2009
- 1300 new LEED projects a month

Benefits are significant for all building types

Cost premium is 2% or less
Triple Bottom Line

Profit
- Financial return
- Marketing & PR
- Higher Productivity

Planet
- Less carbon, waste and energy and water use

People
- Job satisfaction
- Healthy work environment
Range of Proven Benefits

**Increased**
- Rental Rates
- Occupancy Rates
- Office Productivity
- Factory Productivity
- Retail Sales Per Square Foot
- Performance on School Tests

**Decreased**
- Absenteeism
- Carbon Emissions
- Energy Costs
- Hospital Stays
- Waste Management Costs
- Water Usage
Green Building Important for Carbon Reduction
Life-Cycle Positive Solution

Buildings are the only Life Cycle Cost-positive solution

25% of total carbon solution can come from buildings, including homes, stores, offices, hotels, institutional buildings and other structures
In the year 2035, 75% of the built environment will be either new or renovated, vs. 2005.

We can transform our energy consumption and CO$_2$ production by constructing and renovating all buildings to green standards.
Our Opportunity to Build Green

Current US building stock is approx. 300 billion sf.

Over the next 30 years:
- 52 billion sf will be demolished
- 150 billion sf will be remodeled
- 150 billion sf will be new construction

Starting 2005, by the year 2035, three-quarters of building stock will be new or renovated.
LEED Growth Accelerates!

- 2005 to 2006: +50% cumulative growth in new LEED registered projects
- 2006 to 2007: +75%
- 2007 to 2008: +80%
- 2009: +85%

New York City
LEED: Platinum
$1 billion
Green Building Statistics

USGBC: 20,000+ corporate members

25,000 LEED registered projects (Jan. 2010)

4,000 LEED certified projects (Jan. 2010)

140,000+ LEED Accredited Professionals

“In God We Trust; All Others Must Bring Data.”

-W. Edwards Deming
LEED Growth - Project Registrations

- LEED CS Registered
- LEED CI Registered
- LEED EBOM Registered
- LEED NC Registered

Years: 2003 to 2009

Registrations: 0 to 30,000
LEED Growth – Project Certifications

![LEED Growth Chart]

- LEED CS Certified
- LEED CI Certified
- LEED EBOM Certified
- LEED NC Certified

Cumulative LEED-NC Registrations

- 263% in 2002
- 167% in 2001
- 155% in 2003
- 114% in 2004
- 102% in 2005
- 70% in 2006
- 70% in 2007
- 57% in 2008
- 67% in 2009
Cumulative LEED-EBOM Registrations
LEED Rent Premium

Gross Rents
Office, 5 stories plus, 200,000 to 1 Million, Multi-tenant
Source: CoStar

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<th>LEED</th>
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Average Savings of Green Buildings

- Energy Use: 30-50%
- Carbon Emissions: 35%
- Water Use: 40%
- Solid Waste: 70%
14% reduction in CO₂, 2025 vs. 2005

NPV of green building: $650 billion in U.S.
  - 5x to 10x cost premium

2020 Prediction:
  - Green buildings 95% of new construction
  - Green retrofits are 75% of all retrofits
Green Buildings Make Money Sense
Business Case for Green

- Financial and Economic Return
- Risk management
- Marketing and public relations
- Productivity and health gains
- Recruitment and retention
- Sustainability concerns

Northfield Stapleton, Denver
LEED Silver
Green Rebranding

- LEED-EB ideal tool
- Older office/retail properties
- Save energy, water, waste costs
- O&M focus
- Payback possible within one year!
- Low-cost green option

51 Stores
LEED-EB
CoStar Study Results

Energy Star Buildings vs. Peers
- $2.40/sf rent premium
- 3.6% higher occupancy
- Selling for $6/sf more

LEED Certified Buildings vs. Peers
- $11.33/sf rent premium
- 4.1% higher occupancy
- Selling for $174/sf more!
LEED Direct Rental Rates vs. Peers

- LEED Properties
- LEED Peers

Year: 2006 1q to 2009 1q

Price Range: $23 to $53
RICS Study Results

2008 Data: 893 certified buildings, 10,000 non-certified within ¼ mile

Conclusions:
- Effective rent 6% higher
- Sales price 16% higher
- Green upgrade would add $5.5 million to average value
Most costs are "people costs"

Studies show 3-7% gain in workplace productivity

- A 1% gain in productivity pays all the energy bills
- A 10% gain in productivity pays for the entire building (or the technology)!
Green Cost Premium

- Green cost premium
- Current range: <2%
- One retail client: 1.5% - 2.0% for new LEED, slightly more to retrofit
- Compare with benefits
The Obvious Question

- If green buildings are such a good thing, why aren’t we seeing all buildings built/operated this way?

- A few answers:
  - Higher costs in a lowest-first-cost environment, particularly outside the CBD
  - Split incentives between tenant and landlord (in rental commercial space)
  - Competition for investment capital inside a corporation
  - Difficulty/risk of borrowing for new green buildings and green/energy upgrades
Solution: New Financing Approaches

- PACE (Property-Assessed Clean Energy)
  - Simple concept: public bonds or funds pay for energy upgrades; repaid over 20 years on property tax
    - Avoids giveaway debacles
  - Owner is “cash flow positive” from Day One
  - Cost of improvement is borne by property, not owner
    - 10-year paybacks are still valuable vs. 2-3 years otherwise
  - Tenants effectively pay (via operating cost recovery) for energy savings, avoiding “split incentive”
  - 12 states already; San Francisco issued $150 million bonds
Building Energy Performance Reports Needed

- **A**: 0-25
- **B**: 26-50
- **C**: 51-75
- **D**: 76-100
- **E**: 101-125
- **F**: 126-150
- **G**: OVER 150
Without Performance Reporting, We Know Nothing

- "What gets measured, gets managed"
- If building energy use is this important to our collective future, why not know what’s going on?
- Without reports, we are flying blind/can’t fix
- Why should governments put their faith in green building without performance reports?
Greening Existing Buildings: The Next Big Challenge

Over 4,100 buildings registered for LEED-EB
Requires performance reports

CBRE (50+ Buildings)
Chicago Merchandise Mart (360,000 m²)
Empire State Building
Empire State Building

Key Players:
- Jones Lang LaSalle
- Johnson Controls
- Clinton Climate Initiative

Completion: late 2010
38% expected energy savings
$4.4 Million Savings!
Goal: LEED-EB Gold
Learning from Lean Manufacturing

• Lean Themes
  – Boeing 767: $130 million ea.
    • Each plane performs identically
    • Compare with two 600,000-sq.ft. buildings
  – Reduce energy use/carbon footprint
  – Eliminate waste
  – Build in resiliency
  – Need to make champagne on a beer budget!
    • => Process change
  – Key issue: get green cost premium down to zero, using integrated design process
• Benefits are clear; need to overcome cost concerns
• Need to demonstrate cost-effectiveness in financial terms
  – ROI vs. Payback
  – Increase in Building Value
  – Risk Mitigation
  – Non-financial measures
• Increased concern over actual building performance
  – Stay connected to the project via Cx
  – Set up for LEED-EB certification
European Examples

- UK has mandated:
  - Energy labeling
  - All new social housing zero carbon by 2016
  - All new private housing zero carbon by 2018
  - All new building zero carbon by 2019
  - We talk about 80% reductions by 2050
Great Buildings – UCL London

School of Slavonic Studies, Univ. College London, Short & Assoc.
Great Buildings

- 50% less energy use
- 100% certified wood
- 0% PVC
- 9 winter gardens
- 100% rainwater recovery/reuse
- 100% daylight/views
- Quiet, comfortable, productive

Frankfurt Airport, Lufthansa HQ, Ingenhoven Architekten
European Examples

- Technology Innovations
  - High-performance building envelopes
  - Intelligent façades
  - Double-skin façades
  - Separate ventilation from space conditioning
  - Use radiant heating/cooling
  - On-site renewables with CHP/cogeneration plants
  - Integrated thermal mass
European Examples

- Radiant vs. convective space conditioning
  - Separate ventilation from space conditioning

- Underfloor Air Distribution

- Chilled beams/chilled ceilings
  - Integrated passive design
  - Allow for active or passive cooling but keep floor open
The Future is Green!

If you want to score, skate to where the puck is headed, not to where it is now.

Ask yourself: what will the built environment look like in 2012 to 2014?

Re-orient your business and skills for the New Normal

Sidney Crosby, Pittsburgh Penguins
2009 Stanley Cup Winners
2010 Winter Olympics Winners
“An invasion of armies can be resisted, but not an idea whose time has come”

- Victor Hugo, 19th century French writer