Building value through sustainability
Agenda

• Questions
• Strategic Overview
• Assessment/Baselining
• Delivery
• Results
Questions

• What are Beacon's motivations in pursuing sustainability for its investment buildings?

• What are Beacon's biggest concerns in implementing sustainability programs for its properties?

• What is the one thing that JLL could best do to help Beacon take advantage of the sustainability movement?
Questions

• What specific JLL capabilities or service products are of greatest interest to Beacon?

  - **Upstream**: Comprehensive environmental consulting for corporate-wide programs.
  - **PEERS**: Sophisticated energy management program based on detailed metrics
  - **Green Globes**: Portfolio or building specific sustainability assessment system
  - **LEED Gap Analyses**: First step in LEED certification process
  - **LEED Certification**: Management of the entire LEED process through actual certification
  - **LEED Design Charretts**: Management of team discussions on specific sustainability issues/problems
  - **Energy Star Management**: Directing Energy Star participation for single or multiple buildings
Strategic Overview
A holistic approach—from strategy to execution

Assessments
- Corporate goals & objectives
- Green Globes
- ENERGY STAR
- LEED gap assessments
- Regulatory Trends

Execution & management
- On-going energy management
- Day to day facilities management excellence
- Advisory LEED project management
- Measurement and Reporting
- Life Cycle Planning

Program development
- Holistic carbon reduction strategies
- Sustainable asset capital improvements
- Energy & consumption analyses & strategies
- Site strategies & sustainable occupancy
- Employee education & engagement

Cutting-edge technology
Six Sigma driven process
Industry-leading expertise
JLL’s leadership position in real estate industry

<table>
<thead>
<tr>
<th>Industry leading expertise</th>
<th>Recognized leader</th>
<th>Making an impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 70 FTEs (globally)</td>
<td>• 100 Best Corporate Citizens, CRO Magazine (2007)</td>
<td>• Documented $95 M in energy savings</td>
</tr>
<tr>
<td>• Over 400 LEED APs</td>
<td>• Chairman’s Award, Alliance to Save Energy (2007)</td>
<td>• Reduced 438,000 tons of greenhouse gas emissions</td>
</tr>
<tr>
<td>• 20 CEMs</td>
<td>• Partner of the Year, ENERGY STAR (2007)</td>
<td>• Saved 790,000,000 kWh</td>
</tr>
<tr>
<td>• Upstream</td>
<td>• Sustainable Cities Award, Financial Times and ULI (2008)</td>
<td>• Provided 20,000 facilities with specialized energy services</td>
</tr>
<tr>
<td>• ECD</td>
<td>• International Energy Engineer of the Year, Association of Energy Engineers (2008)</td>
<td>• Managed 73 LEED projects, totaling over 35 MSF</td>
</tr>
<tr>
<td></td>
<td>• World’s Most Ethical Companies, Ethisphere Institute (2008)</td>
<td></td>
</tr>
</tbody>
</table>
Upstream

- Established in 1997
- Acquired in November 2007 by Jones Lang LaSalle
- A team of 44 people
- Various backgrounds and disciplines: environmental science, law, geography, business, international development...
Our Services

Strategic Sustainability Services

- Strategy & Management
- Benchmarking
- Communication & Reporting

Delivery and Implementation

- Investment
- Development / Refurbishment
- Management
- Occupation
Why should sustainability be important to you?
Because sustainability is about ….

- Managing risk
- Reducing Costs
- Protecting and enhancing asset value
- Optimising the development process
- Ensuring good quality asset management
- Sustaining rental value
- Protecting and enhancing your reputation

= Future proofing your assets and products
## Proven results

<table>
<thead>
<tr>
<th>Project</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bank of America Tower</strong> New York, NY</td>
<td></td>
</tr>
<tr>
<td>• Overseeing development of 2.1 million s.f 52-story, crystalline skyscraper that will be second tallest building in New York City</td>
<td></td>
</tr>
<tr>
<td>• Pursuing LEED® Platinum certification on core and shell</td>
<td>• Project will exceed $2 million of lease building, infrastructure &amp; tenant improvement investments</td>
</tr>
<tr>
<td>• Manage relocation of 4,000 bank employees to this site</td>
<td></td>
</tr>
</tbody>
</table>

| **HSBC Corporate Headquarters** Mettawa, IL |                  |
| • Consolidate headquarters into a single, 560,000 s.f. facility | • Achieved LEED ® Silver certification by including abundant natural lighting, under-floor air distribution, rainwater capture, a green roof and other sustainable components |
| • The headquarters includes a full-service cafeteria, fitness center and recreation center for 3,000 employees | • Completed on time and under budget |

| **Kendall Square** Cambridge, MA |                  |
| • Genzyme World headquarters | • 9,000 rsf retail space |
| • Pursuing LEED® Certification | • $99 million total project cost including land and capitalized development costs |
| • Completed in 2005 | • $170 per rsf construction cost |
| • Multi-use bioscience office space |                  |
Managing sustainability projects and programs for …
Assessment/Baselining
Path to sustainability

Critical needs:
• Stated goals & objectives from management
• Accountability to reach goals
• Continual improvement and implementation of best practices
## Green Globes and LEED

<table>
<thead>
<tr>
<th>Green Globes</th>
<th>LEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Management tool</td>
<td>• Certification</td>
</tr>
<tr>
<td>• Inexpensive and user-friendly</td>
<td>• Costly and time intensive</td>
</tr>
<tr>
<td>• Baseline &amp; benchmark your building</td>
<td>• Stand alone</td>
</tr>
<tr>
<td>• Building or portfolios</td>
<td>• Just building</td>
</tr>
<tr>
<td>• Certification optional</td>
<td>• Certification based</td>
</tr>
<tr>
<td>• ANSI standard (LCA approach)</td>
<td>• Consensus document</td>
</tr>
<tr>
<td>• Focused on:</td>
<td></td>
</tr>
<tr>
<td>• Environmental Management</td>
<td>• Focused on:</td>
</tr>
<tr>
<td>• Site</td>
<td>• Site</td>
</tr>
<tr>
<td>• Energy &amp; Carbon</td>
<td>• Energy &amp; Atmosphere</td>
</tr>
<tr>
<td>• Water</td>
<td>• Water</td>
</tr>
<tr>
<td>• Recycling &amp; Resource Management</td>
<td>• Resources</td>
</tr>
<tr>
<td>• Emissions, effluents</td>
<td>• Indoor environment</td>
</tr>
<tr>
<td>• Indoor environment</td>
<td></td>
</tr>
</tbody>
</table>

*Focused on:*

- **Environmental Management**
- **Site**
- **Energy & Carbon**
- **Water**
- **Recycling & Resource Management**
- **Emissions, effluents**
- **Indoor environment**

<table>
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</tr>
<tr>
<td>• Resources</td>
</tr>
<tr>
<td>• Indoor environment</td>
</tr>
<tr>
<td>• Innovation</td>
</tr>
</tbody>
</table>
Green Globes background

- Online web tool
- Quick and easy questionnaire (completed by the property manager)
- Report immediately and automatically generated
- In the U.S., overseen and licensed by the Green Building Initiative (GBI)
- Green Globes standards will be kept independent from Jones Lang LaSalle and operated under the governance of the GBI in the US and BOMA Canada in Canada
Green Globes self-assessment

- On-line self analysis performed by the on-site building management team.
  - Takes about 1/2 day
- Developed in 2004 by the environmental consulting firm ECD in conjunction with the non-profit organization GBI (Green Building Initiative) and BOMA Canada.
- Can update information and track progress.
Table 1: Sample Questionnaire

### 0.0 BASIC INFORMATION

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the name of the building?</td>
<td></td>
</tr>
<tr>
<td>Tip: Please enter the name as you would like it to appear on the certificate for the building becomes certified.</td>
<td></td>
</tr>
<tr>
<td>What is the street address?</td>
<td></td>
</tr>
<tr>
<td>Tip: Specify year of construction OR choose an area.</td>
<td></td>
</tr>
<tr>
<td>When was the building constructed?</td>
<td></td>
</tr>
<tr>
<td>Tip: Specify year of construction OR choose an area.</td>
<td></td>
</tr>
<tr>
<td>What is the gross floor area of the building (in square feet)?</td>
<td></td>
</tr>
<tr>
<td>How many stories are there?</td>
<td></td>
</tr>
<tr>
<td>Is there underground parking?</td>
<td></td>
</tr>
<tr>
<td>The building is:</td>
<td></td>
</tr>
<tr>
<td>How many dwelling units (apartments) are there?</td>
<td></td>
</tr>
<tr>
<td>Are there other tenancies such as:</td>
<td></td>
</tr>
<tr>
<td>Who is the owner of the building?</td>
<td></td>
</tr>
<tr>
<td>Who is the building manager?</td>
<td></td>
</tr>
<tr>
<td>How many years has the building manager been with the building?</td>
<td></td>
</tr>
<tr>
<td>Is the building manager stationed on-site or off-site?</td>
<td></td>
</tr>
<tr>
<td>Building description?</td>
<td></td>
</tr>
</tbody>
</table>

### 1.0 ENERGY

**1.1 Energy Consumption**

- Please select the fuels or utilities used by the building, for which energy consumption figures will be entered.
  - Gas
  - Electricity
  - Propane
  - Oil
  - Steam
  - Chilled Water

- Please specify the ending month of the 12 month period for which energy consumption figures are being entered.
  - Tip: Please select the month and year corresponding to the last month of the 12 month period for which you will be entering energy consumption figures.

### 5.0 INDOOR AIR QUALITY

#### 5.1 Ventilation System

- How is the building ventilated?
  - Natural ventilation
  - Corridor air exhaust system with suite or central exhaust
  - Central ventilation system to all dwelling units

- Are air intakes located far from sources of pollution such as parking areas, bus stops, cooling towers or stagnant water?
  - Yes
  - No

- Are air intakes located at least 30 ft. away from building exhaust outlets?
  - Yes
  - No

- Are fresh air intakes checked regularly to ensure that the openings are protected and free from obstruction?
  - Yes
  - No

- Is there free-standing water which cannot drain away in the condensate drip trays?
  - Yes
  - No
  - N/A

- Are there signs of corrosion, loose material (such as damaged filter bags) or sound attenuation material in the air-handling unit (AHU)?
  - Yes
  - No
  - N/A

- Is there at least one openable window provided for all habitable rooms, except for water-closet rooms or bathrooms and kitchens, and is their size, placement and operation likely to result in reasonably effective ventilation?
  - Yes
  - No

- Does every dwelling unit have an adequate supply of air with no blockages?
  - Yes
  - No

- Are exhaust systems, particularly the bathroom and kitchen exhaust, operating effectively?
  - Yes
  - No

### Filtration System

- Are filters rated at 10 Minimum Efficiency Reporting Value (MERV)?
  - Yes
  - No

- Are manometers fitted to indicate when filters should be changed?
  - Yes
  - No

- Is there easy access for cleaning and inspecting filters?
  - Yes
  - No

### Humidification System

- What type of humidification system does the building use?
  - Steam
  - Spray
  - N/A

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*Sample questionnaire by Jones Lang LaSalle*
Online assessment with recommendations from data
Green Arrow™ Report

- Quick Start Guide
- Highlight key recommendations
- Categorizes costs
- Creates property level game plan
Property portfolio assessment

- An environmental assessment of all properties in a client portfolio
- Uses Green Globes as initial assessment tool
- Uses “Sustainability Tracker” for tracking progress for each property
- Results presented in a consolidated report
- Can be applied to office, retail, industrial, multi-family and mixed-use properties
Portfolio sustainability program

Issue:
- A major financial institution needed a way to mitigate risk and increase asset values for a portfolio of investment properties.

Solution:
- JLL brought on as program developer and manager in a year-long program to baseline buildings in the portfolio by using Green Globes, devise building-level and portfolio-level strategies and action plans, implement the action plans and measure results.

Results to date:
- With three quarters of the program completed, all of the buildings in the portfolio have been baselined with building level actions identified and quick-wins beginning. The portfolio-level report was developed with opportunities for improvement being identified and prioritized.
LEED gap assessment

- Formal process conducted by Jones Lang LaSalle LEED® APs, taking the building through the full LEED® Checklist
  - Provides an initial score and recommendations for addressing issues to allow the building to become LEED® Certified.
  - Takes up to 60 days
  - Cost is $5,000 to $10,000, depending on building size
- The LEED® Assessment uses the US Green Building Council checklist
- The Certification Roadmap provides an actionable set of recommendations estimating timing and cost for achieving certification most efficiently and economically.
LEED certification management

• If a building decides to register and work to LEED® Certification, Jones Lang LaSalle consultants are available to guide the entire process.

• Includes working with the property management team to analyze all prerequisites and credits, strategize ways to address each, and assembling all needed supporting documents.

• Generally takes between 6 and 24 months

• Typically costs over $40,000, depending on building size and complexity.
Delivery
Design Charrettes

Help identify the most cost effective initiatives with the greatest impact

<table>
<thead>
<tr>
<th>Identify Opportunities</th>
<th>Evaluate Measures</th>
<th>Create Packages</th>
<th>Model Iteratively</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaluate all potential initiatives</td>
<td>Net present value</td>
<td>Maximize net present value</td>
<td>Iterative energy and financial modeling process to identify final eight recommendations</td>
</tr>
<tr>
<td>Estimate theoretical minimum energy use</td>
<td>Greenhouse gas savings</td>
<td>Balance net present value and CO2 savings</td>
<td></td>
</tr>
<tr>
<td>Energy modeling</td>
<td>Dollar to metric ton of carbon reduced</td>
<td>Maximize CO2 savings for a zero net present value</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calculated for each measure</td>
<td>Maximize CO2 savings</td>
<td></td>
</tr>
</tbody>
</table>
A solution that balances CO\textsubscript{2} reductions and financial returns is in this range. There are diminishing (and expensive) returns for greater efficiency.
PEERS: Portfolio Energy and Environmental Reporting System

Proprietary platform to Track:
- Emissions & carbon footprint metrics
- Energy costs and consumption
- LEED, ENERGY STAR and Green Globes
- Calculate and project savings
- Real Time Improvements
- Multiple Views:
  - Portfolio
  - Regional
  - Building
- Capital investment prioritization
EPA Energy Star Expertise

The rating system overlays a 1 to 100 scale over national census data, which gives relative meaning to energy use.
Retro-commissioning services

Pro actively Optimize building performance

• In-depth equipment and systems analysis to identify operational short-falls
• Compare actual performance vs. related operational, financial and sustainable goals
• Present recommendation for maximizing efficiency including re-engineering, capital improvements and training
• Typical savings of 5-20%
Results
A landmark sustainability project for the Empire State Building
The new gold standard is green

The Empire State Building, an iconic, pre-war trophy office building, can catalyze change by cost-effectively reducing greenhouse gas emissions while attracting world class tenants.

- Recognized throughout the world
- 3.8 million visitors per year
- 102 stories and 2.8 million square feet
- CO₂ emissions of 24,000 tons per yr
- $11 million in annual energy costs
- Peak office building demand of 9.5 MW
- 88 kBtu per SF per yr for the office building
A groundbreaking energy and sustainability program

Setting a new standard

When the Empire State Building Company decided to make the building one of the greenest in New York City, it turned to Jones Lang LaSalle and a team of experts to develop an innovative sustainability and energy retrofit strategy that would dramatically reduce energy consumption and result in a positive ROI.

Innovative, collaborative process

As the program manager, Jones Lang LaSalle developed the process and served as the owner’s representative. We guided the team through a rigorous cost-benefit analysis, helping ensure alignment with key business objectives. Eight key initiatives were identified from more than sixty potential strategies including infrastructure projects, green design concepts and a tenant energy management program. Jones Lang LaSalle is now overseeing the implementation.

“I chose Ray Quartararo and Jones Lang LaSalle because of our successful history together taking on and figuring out difficult projects and the company’s deep sustainability expertise and track record.”

--Anthony E. Malkin
Building Owner
Empire State Building Company
As program manager, Jones Lang LaSalle...

• Served as the owner’s representative ensuring program aligned with business objectives

• Led a team of diverse consultants, built consensus and accelerated progress

• Managed development of broad and complex strategy delivering an actionable, result-driven plan in 8 months

• Applied best practices from industry-leading projects from around the world (Bank of America Tower in Bryant Park, HSBC Tower in Mexico City and Shanghai)
The motivation

“Buildings in New York City create 65 to 70 percent of the city's entire carbon footprint. Constructing new green buildings won't move the needle in mitigating this problem. It is far more important to address the existing building stock.”

Tony Malkin, Metro Green + Business, June 2008

• Buildings contribute to nearly 40 percent of U.S. greenhouse gas emissions, 99 percent of building stock is existing buildings

• Building owners can gain competitive advantage from sustainability programs by reducing costs, providing superior environments, and capturing higher potential rents

• No cost-effective, value-driven method existed for greening older buildings
Unique methodology

- Assemble a collaborative team of world-class sustainability and energy specialists
- Develop an optimal solution through a four phase iterative process and rigorous cost-benefit analysis
- Leverage industry leading tools and standards, and develop new ones:
  - LEED
  - Energy Star
  - Green Globes
  - eQUEST
  - Energy Modeling Tool
  - Sustainability Metrics Tool (GHG/CO2)
  - Financial Modeling Tool
World-class energy and sustainability specialists

ESBC/W&M
Tony Malkin
Richard Heller

Clinton Climate Initiative

Empire State Building
James Connors (ESB)
Wendy Fok (Jones Lang LaSalle)
Raymond Quartararo (Jones Lang LaSalle)

Jones Lang LaSalle
Project Manager/Owner’s Representative

Project Development Services
Dana Robbins Schneider

Energy & Sustainability Services
John Schinter
Diane Vrkic
Jiri Skopec

Strategic Consulting
Michael Jordan

Rocky Mountain Institute
Design Partner and Peer Reviewer

Johnson Controls
Energy Service Company (ESCO)

ESB Operations
Site Champion
Occupant and User Reviewer

JONES LANG LASALLE
ENERGY STAR
PARTNER OF THE YEAR

BEACON CAPITAL
PARTNERS
Methodology

Phase I: Inventory & Programming
Phase II: Design Development
Phase III: Design Documentation
Phase IV: Final Documentation

Key Outputs:

- Baseline Capital Projects Report: $244
- Projected JCI performance contract budget: $27m
- Baseline Energy Benchmark Report ($11.3m annual energy cost without broadcasting)
- Tenant Initiatives (pre-built, design guidelines, energy management) Report
- Tuned eQUEST model
- Model (eQUEST, financial, GHG) outputs
- Integrated Sustainability Master Plan Report (including Energy Master Plan)

Baseline Energy Benchmark Report ($11.3m annual energy cost without broadcasting)
Eight select improvements for the greatest impact

- **Window Retrofit**: refurbishment of approximately 6,500 thermopane glass windows, using existing glass and sashes to create triple-glazed insulated panels.

- **Radiator Insulation Retrofit**: introduction of insulation behind radiators to reduce heat loss and more efficiently heat the building perimeter.

- **Tenant Lighting, Daylighting and Plug Upgrades**: improved lighting designs, daylighting controls, and plug load occupancy sensors in common areas.

- **Air Handler Replacements**: replacement of air handling units with variable frequency drive fans.
Eight select improvements for the greatest impact

• **Chiller Plant Retrofit:** Reuse of existing chiller shells while removing and replacing “guts” to improve chiller efficiency and controllability, including new variable frequency drives.

• **Building Control System Upgrade:** Upgrade of existing building control system to optimize HVAC operation and more detailed sub-metering information.

• **Ventilation Control Upgrade:** Introduction of demand control ventilation in occupied spaces.

• **Tenant Energy Management Systems:** Individualized, web-based power usage systems for each tenant.
Bottomline

The $20M plan is projected to:

- Reduce energy use by 38 percent, an annual savings of $4.4M
- Reduce carbon emissions by 105,000 metric tons over the next 15 years
- Be funded through energy and operational savings
- Be complete within two years
- Serve as a model for owners of existing buildings
Innovations

• Right steps in the right order – holistically approach all building systems
• Utilize existing tools and create new ones
• Transparently demonstrate how a retrofit can cost-effectively achieve 38 percent energy savings to serve as a model for existing buildings
• Design a pre-built office suite to showcase the link between base-building and tenant space improvements in accelerating a building’s progress towards sustainability goals
Benefits for the owner/investor

**LEED** certified buildings on average have rent premiums of $11.24/SF and have 3.8% higher occupancy rates on average than their non-LEED counterparts.

*Source: Burr, Andrew. USGBC. USGBC in the News Details. March 26, 2008.*

**Energy Star** buildings command a rent premium of $2.38/SF and on average 3.6% higher average occupancy rates than their comparable non-Energy Star counterparts.

*Source: Burr, Andrew. USGBC. USGBC in the News Details. March 26, 2008.*

**Energy Star** buildings are selling for an average $61/SF than non-Energy Star buildings.


Many states are awarding tax credits to LEED buildings that usually depends on the size of the building and the extent that the building is “green”.


A recent study of 33 LEED new construction projects reported an average cost premium of only 1.84% over non-LEED projects.

Utility savings for ‘green’ buildings

**LEED** certified buildings use on average **30%** less energy than their non-green counterparts, resulting in an average annual savings of **$.60/SF**.


**LEED** buildings typically have water savings of **20-30%**.


<table>
<thead>
<tr>
<th>LEED Rating</th>
<th>No. of Buildings</th>
<th>Water Efficiency</th>
<th>Energy Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified</td>
<td>64</td>
<td>30.1%</td>
<td>29.4%</td>
</tr>
<tr>
<td>Silver</td>
<td>49</td>
<td>30.4%</td>
<td>33.3%</td>
</tr>
<tr>
<td>Gold</td>
<td>46</td>
<td>32.5%</td>
<td>40.0%</td>
</tr>
<tr>
<td>Platinum</td>
<td>9</td>
<td>34.4%</td>
<td>55.0%</td>
</tr>
</tbody>
</table>

* Environmental Design + Construction and Marketer Magazine 2006

The average cost for utilities for non-LEED buildings ranges from **$1.40 to $2.50** per SF. By becoming **LEED certified**, savings of **$0.50 to $1.40** per SF can be achieved.

Economic ‘rules of thumb’

According to McGraw-Hill Smart Market Report, a ‘green building’ generates:

- 3.5% higher occupancy rates
- 3% higher rental rates
- 7.5% greater building values
- 6.6% higher ROI
Thank you