



JONES LANG  
LASALLE®

*Real value in a changing world*

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Building **value** through  
sustainability

June 4, 2009



# Agenda

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



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# 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?



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# 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



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# Strategic Overview



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# A holistic approach—from strategy to execution



# JLL's leadership position in real estate industry

| Industry leading expertise  | Recognized leader   | Making an impact  |
|---|---|---|
| <ul style="list-style-type: none"> <li>• 70 FTEs (globally)</li> <li>• Over 400 LEED APs</li> <li>• 20 CEMs</li> <li>• Upstream</li> <li>• ECD</li> </ul> | <ul style="list-style-type: none"> <li>• 100 Best Corporate Citizens, CRO Magazine (2007)</li> <li>• Chairman's Award, Alliance to Save Energy (2007)</li> <li>• Partner of the Year, ENERGY STAR (2007)</li> <li>• Sustainable Cities Award, Financial Times and ULI (2008)</li> <li>• International Energy Engineer of the Year, Association of Energy Engineers (2008)</li> <li>• World's Most Ethical Companies, Ethisphere Institute (2008)</li> </ul> | <ul style="list-style-type: none"> <li>• Documented <b>\$95 M</b> in energy savings</li> <li>• Reduced <b>438,000 tons</b> of greenhouse gas emissions</li> <li>• Saved <b>790,000,000 kWh</b></li> <li>• Provided <b>20,000 facilities</b> with specialized energy services</li> <li>• Managed <b>73</b> LEED projects, totaling over <b>35 MSF</b></li> </ul> |



# 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...



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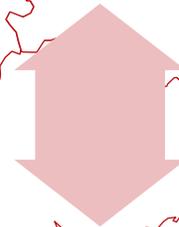
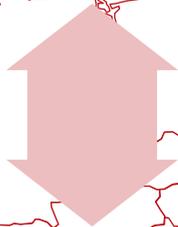
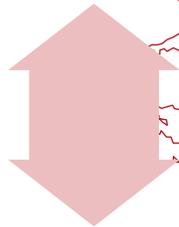
# Our Services

## Strategic Sustainability Services

Strategy & Management

Benchmarking

Communication & Reporting



## Delivery and Implementation

Investment

Development / Refurbishment

Management

Occupation



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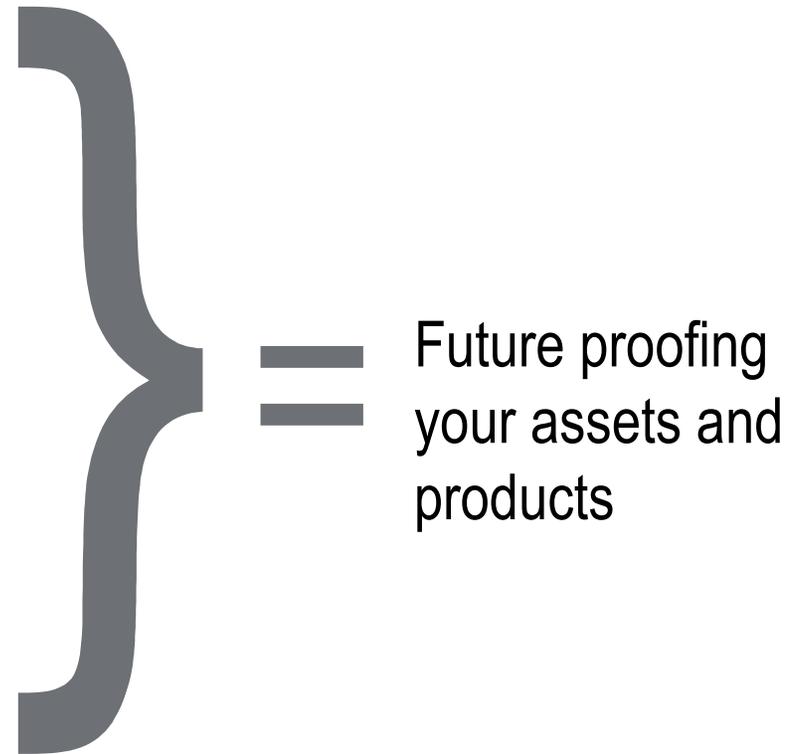


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# Why should sustainability be important to you?

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**



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# Proven results



## Bank of America Tower New York, NY

- Overseeing development of 2.1 million s.f 52-story, crystalline skyscraper that will be second tallest building in New York City
- Pursuing LEED® Platinum certification on core and shell
- Project will exceed \$2 million of lease building, infrastructure & tenant improvement investments
- Manage relocation of 4,000 bank employees to this site



## HSBC Corporate Headquarters Mettawa, IL

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



## Kendall Square Cambridge, MA

- Genzyme World headquarters
- Pursuing LEED® Certification
- Completed in 2005
- Multi-use bioscience office space
- 9,000 rsf retail space
- \$99 million total project cost including land and capitalized development costs
- \$170 per rsf construction cost

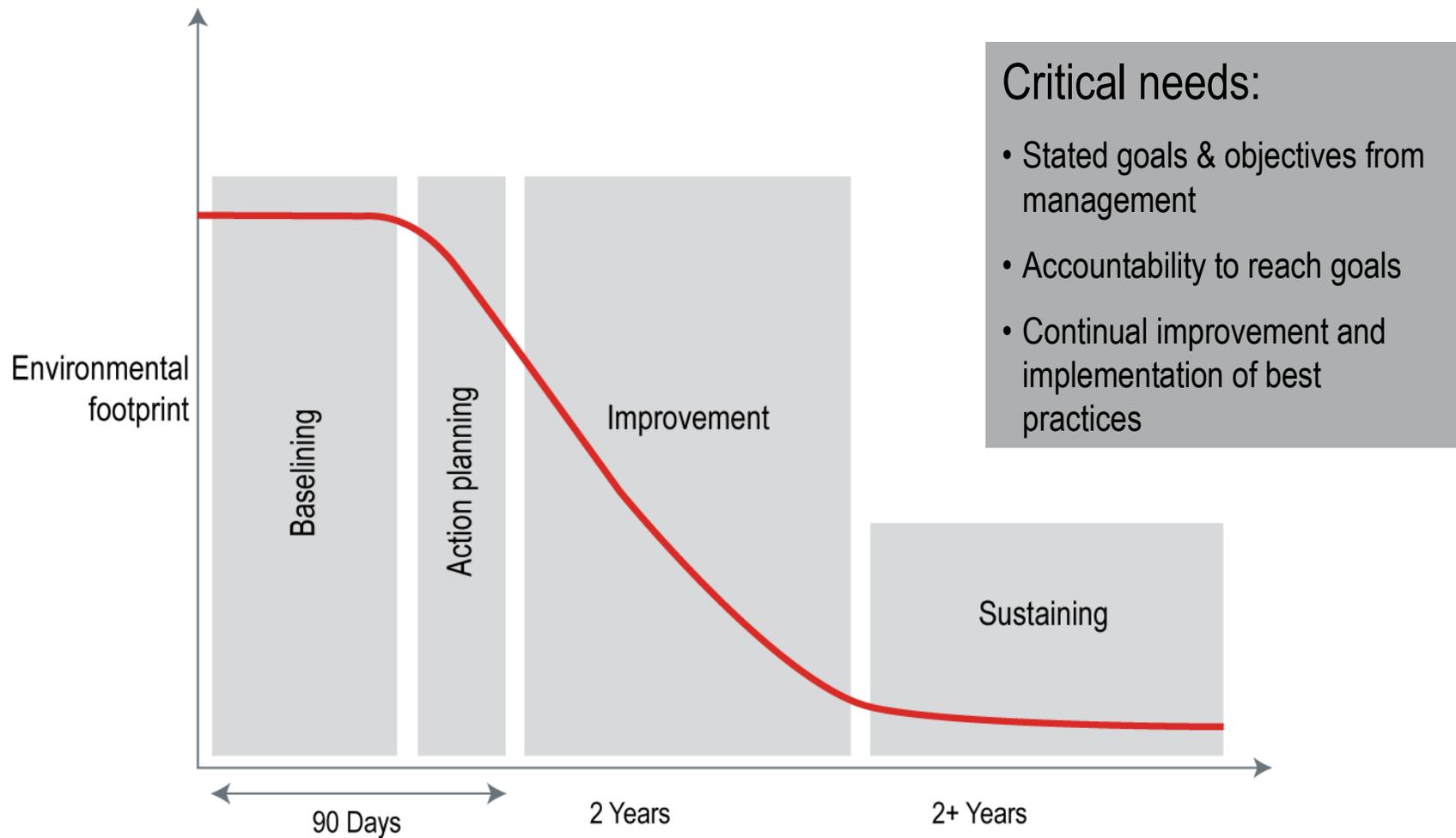
# Managing sustainability projects and programs for ...



# Assessment/Baselining



# Path to sustainability



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# Green Globes and LEED

| Green Globes   | LEED   |
|--|--|
| <ul style="list-style-type: none"><li>• Management tool</li><li>• Inexpensive and user-friendly</li><li>• Baseline &amp; benchmark your building</li><li>• Building or portfolios</li><li>• Certification optional</li><li>• ANSI standard (LCA approach)</li><li>• Focused on:<ul style="list-style-type: none"><li>• Environmental Management</li><li>• Site</li><li>• Energy &amp; Carbon</li><li>• Water</li><li>• Recycling &amp; Resource Management</li><li>• Emissions, effluents</li><li>• Indoor environment</li></ul></li></ul> | <ul style="list-style-type: none"><li>• Certification</li><li>• Costly and time intensive</li><li>• Stand alone</li><li>• Just building</li><li>• Certification based</li><li>• Consensus document</li><li>• Focused on:<ul style="list-style-type: none"><li>• Site</li><li>• Energy &amp; Atmosphere</li><li>• Water</li><li>• Resources</li><li>• Indoor environment</li><li>• Innovation</li></ul></li></ul> |



# 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



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# 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.

**Project List sorted by any field**

| Project Name                 | Address       | City   | State | Zip Code | Project Status |
|------------------------------|---------------|--------|-------|----------|----------------|
| Albany HQ                    | 1000 Park Ave | Albany | NY    | 12242    | Completed      |
| Albany HQ - Office (General) | 1000 Park Ave | Albany | NY    | 12242    | In Progress    |
| Albany HQ - Office (Special) | 1000 Park Ave | Albany | NY    | 12242    | Not Started    |

**Project Dashboard**

Project Progress: 100%

| Project Name                 | Phase   | Site | Design | Value | Revenue | Enabling | Actual | Target | As of |
|------------------------------|---------|------|--------|-------|---------|----------|--------|--------|-------|
| Albany HQ - Office (General) | Phase 1 | Site | Design | Value | Revenue | Enabling | Actual | Target | As of |

**View report**

**Question:** Modeling and simulation of building energy performance establishing an energy target. I have a preliminary building energy simulation been carried out on each of the concept options?  Yes  No

**Points:** 100

**Answer:**  Yes  No

**Points:** 100

**RECOMMENDATION:** Integrate water saving devices such as low-flow fixtures and water saving devices.

**Supplementary Information:** Contact your local water company for advice on water conservation and possibly low-flow fixtures.

# Sample questionnaire

| 0.0 BASIC INFORMATION |  |
|-----------------------|--|
| 0.1                   | What is the name of the building?<br><i>Tip: Please enter the name as you would like it to appear on the certificate if the building becomes certified.</i>  |
| 0.2                   | What is the street address?  |
| 0.3                   | When was the building constructed?<br><i>Tip: Specify year of construction OR choose an era.</i>   |
| 0.4                   | What is the gross floor area of the building (in square feet)?<br><i>Tip: The gross floor area for the purposes of the assessment is the total floor area within the perimeter of the exterior walls of the building, including common, mechanical and structural support areas, and excludes unheated parking garage areas.</i> |
| 0.5                   | How many storeys are there?  |
| 0.6                   | Is there underground parking?  |
| 0.7                   | The building is:   |
| 0.8                   | How many dwelling units (apartments) are there?  |
| 0.9                   | What is the approximate number of people living in the building?   |
| 0.10                  | Are there other tenancies such as:   |
| 0.11                  | Who is the owner of the building?  |
| 0.12                  | Who is the building manager?   |
| 0.13                  | How many years has the building manager been with the building?  |
| 0.14                  | Is the building manager stationed on-site or off-site?   |
| 0.15                  | Building description?  |

| 1.0 ENERGY                    |   |
|-------------------------------|---|
| <b>1.1 Energy Consumption</b> |   |
| 1.1.1                         | Please select the fuels or utilities used by the building, for which energy consumption figures will be entered.<br><i>Tip: Check each fuel for which consumption will be entered.</i><br><input type="checkbox"/> Gas <input type="checkbox"/> Electricity <input type="checkbox"/> Propane <input type="checkbox"/> Oil <input type="checkbox"/> Steam <input type="checkbox"/> Chilled Water |
| 1.1.2                         | Please specify the ending month of the 12 month period for which energy consumption figures are being entered.<br><i>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.</i>  |
| 1.1.3                         | What was the building's total energy bill for the 12 month period specified?  |
| 1.1.4                         | What was the total energy consumption for each non-renewable fuel type, in total or by month, for the 12 month period specified?  |
|                               | Gas month 1: cu.ft. Cost \$   |
|                               | Gas month 2: cu.ft. Cost \$   |
|                               | Gas month 3: cu.ft. Cost \$   |
|                               | Gas month 4: cu.ft. Cost \$   |
|                               | Gas month 5: cu.ft. Cost \$   |
|                               | Gas month 6: cu.ft. Cost \$   |
|                               | Gas month 7: cu.ft. Cost \$   |
|                               | Gas month 8: cu.ft. Cost \$   |
|                               | Gas month 9: cu.ft. Cost \$   |
|                               | Gas month 10: cu.ft. Cost \$  |
|                               | Gas month 11: cu.ft. Cost \$  |
|                               | Gas month 12: cu.ft. Cost \$  |
|                               | Electricity month 1: kWh. Cost \$   |
|                               | Electricity month 2: kWh. Cost \$   |
|                               | Electricity month 3: kWh. Cost \$   |
|                               | Electricity month 4: kWh. Cost \$   |
|                               | Electricity month 5: kWh. Cost \$   |
|                               | Electricity month 6: kWh. Cost \$   |
|                               | Electricity month 7: kWh. Cost \$   |
|                               | Electricity month 8: kWh. Cost \$   |
|                               | Electricity month 9: kWh. Cost \$   |
|                               | Electricity month 10: kWh. Cost \$  |
|                               | Electricity month 11: kWh. Cost \$  |
|                               | Electricity month 12: kWh. Cost \$  |

| 5.0 INDOOR AIR QUALITY        |   |
|-------------------------------|---|
| <b>5.1 Ventilation System</b> |   |
| 5.1.1                         | How is the building ventilated?<br><input type="checkbox"/> Natural ventilation<br><input type="checkbox"/> Corridor air exhaust system with suite or central exhaust<br><input type="checkbox"/> Central ventilation system to all dwelling units  |
| 5.1.2                         | Are air intakes located far from sources of pollution such as parking areas, bus stops, cooling towers or stagnant water? <input type="checkbox"/> Yes <input type="checkbox"/> No  |
| 5.1.3                         | Are air intakes located at least 30 ft. away from building exhaust outlets? <input type="checkbox"/> Yes <input type="checkbox"/> No  |
| 5.1.4                         | Are fresh air intakes checked regularly to ensure that the openings are protected and free from obstruction? <input type="checkbox"/> Yes <input type="checkbox"/> No   |
| 5.1.5                         | Is there free-standing water which cannot drain away in the condensate drip trays?<br><i>Tip: Verify that there is no free-standing water in the air-conditioning ductwork, particularly in the condensate drip trays of cooling coils, downstream from humidifiers, which can result in contamination of ducts by bacteria and fungi. If there is no air-conditioning, mark "non-applicable".</i>  |
| 5.1.6                         | Are there signs of corrosion, loose material (such as damaged filter bags) or sound attenuation material in the air-handling unit (AHU)?<br><i>Tip: Inspect the air-handling units (air-mixing chambers, coils and fan blades) and duct interiors including any crawlspaces, tunnels or other areas that are used as ducts or which may be in contact with the ventilation air stream. Investigate whether commissioning took place. If there are no air-handling units, mark "non-applicable".</i> |
| 5.1.7                         | 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? <input type="checkbox"/> Yes <input type="checkbox"/> No  |
| 5.1.8                         | Does every dwelling unit have an adequate supply of air with no blockages? <input type="checkbox"/> Yes <input type="checkbox"/> No   |
| 5.1.9                         | Are exhaust systems, particularly the bathroom and kitchen exhaust, operating effectively? <input type="checkbox"/> Yes <input type="checkbox"/> No   |
| <b>Filtration System</b>      |   |
| 5.1.10                        | Are filters rated at 10 Minimum Efficiency Reporting Value (MERV)? <input type="checkbox"/> Yes <input type="checkbox"/> No   |
| 5.1.11                        | Are manometers fitted to indicate when filters should be changed? <input type="checkbox"/> Yes <input type="checkbox"/> No  |
| 5.1.12                        | Is there easy access for cleaning and inspecting filters? <input type="checkbox"/> Yes <input type="checkbox"/> No  |
| 5.1.13                        | Do the filters fit snugly within the filter supports? <input type="checkbox"/> Yes <input type="checkbox"/> No  |
| <b>Humidification System</b>  |   |
| 5.1.14                        | What type of humidification system does the building use?<br><i>Tip: Because of the risk of microbial contamination associated with spray humidification, a preferred method is humidification by steam. If there is no</i><br><input type="checkbox"/> Steam <input type="checkbox"/> Spray <input type="checkbox"/> N/A   |



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# Online assessment with recommendations from data

HOME | WHY BUILD GREEN | GREEN RESOURCES | ABOUT GBI | COMMERCIAL | RESIDENTIAL | JOIN | NEWS

**1** GREEN BUILDING INITIATIVE

## Environmental Assessment for Existing Commercial Buildings

GREEN GLOBES

YOUR PROJECT LIST | INSTRUCTIONS | MANAGE MY ACCOUNT | LOGOUT

SELECT/ADD BUILDING | BUILDING DASHBOARD | SELECT SECTION | COMPLETE QUESTIONNAIRE | VIEW REPORT

100 Main Street, - Small Office

User: ustest

[Edit Basic Building Information](#)  
[Download Green Globes survey for](#)

Progress key:

What was the building's total water bill for the 12 month period specified? \$

What was the total water consumption, in total or by month, for the 12 months specified?

|                |         |         |
|----------------|---------|---------|
| Water month 1: | cu. ft. | Cost \$ |
| Water month 2: | cu. ft. | Cost \$ |
| Water month 3: | cu. ft. | Cost \$ |

Opportunities for improvement

Water Conserving Features

**4** RECOMMENDATION

| Recommendations   | Supplementary Information  |
|---|--|
| As water fixtures need replacing, or even earlier, consider installing:   |  |
| <b>Links to more information about this recommendation:</b>   |  |
| <ul style="list-style-type: none"> <li><a href="#">How to Conserve Water and Use it Effectively</a></li> <li><a href="#">Principles of water retrofitting and conservation</a></li> <li><a href="#">Water Conservation (WBDG)</a></li> <li><a href="#">Plumbing Fixtures (EPA)</a></li> </ul> |  |
| <ul style="list-style-type: none"> <li>low flow toilets that use less than 1.6 GPF</li> </ul>   | Low flush (1.6 GPF) toilets as per the EPAACT of 1992 can as much as \$75 USD/toilet/yr. For an estimated replacement of \$180/toilet, the simple payback is less than 3 years. Be sure to use 1.6 GPF/toilets to ensure proper performance. 1.6 GPF toilets should have the CSA International or Warnock Hersey label. Check refer to supplier where the same models have been used. This toilet has passed primary performance and maintenance tests |
| <b>Links to more information about this recommendation:</b>   |  |
| <ul style="list-style-type: none"> <li><a href="#">Dual-Flush Toilet Fixtures: Field Studies and Water Saving</a></li> <li><a href="#">Best Practices: Toilets and Urinals</a></li> <li><a href="#">Ultra-low flush Toilets</a></li> </ul>  |  |

**3** INTRODUCTION

Sample office is a 44,000 square foot building that was built in 1981. It has 3 stories.

Sample office is described as follows:

Sample office is a general office building.

The principal tenant is Global Corporation. The building is owned by Grand Properties and managed by J. Smith.

Percentage of points achieved by Sample office for each module:

**Summary of Your Achievement:** Sample office achieved an overall rating of 61%.

To find out how the performance of Sample office compares to other buildings that have been assessed, and to obtain certification, the data must be verified by a licensed assessor who has undergone the Green Globe training and certification.

**ENERGY** Rating Earned: 67%

Energy is an important operational cost as well as an environmental parameter because energy use relates directly to climate change and

**5** RESEARCH HIGHLIGHTS

### Dual-flush Toilet Testing

**Introduction**

CMHC, in partnership with 12 municipalities across Canada, conducted a pilot study to select a short flush (three litres) or long flush (six litres). See Figure 1

**Figure 1 & 2 : Dual-Flush Toilet & Flush Selection**

This study monitored water consumption, toilet performance and customer sat

# Green Arrow™ Report

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

➔
Green Arrow Report
Property Name |

The Green Arrow™ Report summarizes key initiatives and prioritizes recommended actions detailed in the Green Globes™ Report and Building Energy Estimator prepared for Ontario Free-way February, 2009. It provides a quick road map on the "right way" to make the property greener effectively and economically.

Recommendations are coded to reflect anticipated cost:

▲ No Cost

▲ Low Cost

▲ Moderate Cost

▲ High Cost

▲ Major Capital Investment

The Ontario Freeway achieved its potential being

### Energy

|     |  |
|-----|--|
| ▲▲  | Commission an in-depth "energy audit" including analysis of  |
| ▲   | Develop an "energy policy" that outlines principles and best |
| ▲▲▲ | <b>Lighting:</b>   |
|     | • Install compact fluorescents                               |
|     | • Install daylight sensors (time or for exterior lighting)   |
|     | • Install high intensity discharge (HID) fluorescents in all |
| ▲   | Implement temperature setback policy during unoccupied       |
| ▲▲  | Install building automation system                           |
| ▲▲▲ | Install high-speed loading dock doors to minimize air excha  |
| ▲   | Install energy training program to key energy procedur       |
| ▲▲▲ | Implement energy retrofit/commissioning program              |

### Water Conservation

|   |  |
|---|--|
| ▲ | Consider indigenous plant landscaping or eliminating plant landscaping entirely            |
| ▲ | Encourage (or substitute) tenants to install water-conservation fixtures                   |
| ▲ | Sub-meter major water uses to monitor consumption by area and over time                    |
| ▲ | Establish and communicate written water conservation policy and share metrics with tenants |

### Resources

|   |   |
|---|---|
| ▲ | Conduct formal audit of waste stream, then create waste reduction goals                                     |
| ▲ | Arrange periodic collection of small volume waste items like toner cartridges, batteries, cell phones, etc. |
| ▲ | Make sure there are collection points for recycled materials: glass, paper, steel, aluminum cans            |

### Waste Reduction

|   |   |
|---|---|
| ▲ | Conduct formal audit of waste stream, then create waste reduction goals                                     |
| ▲ | Arrange periodic collection of small volume waste items like toner cartridges, batteries, cell phones, etc. |
| ▲ | Make sure there are collection points for recycled materials: glass, paper, steel, aluminum cans            |

### Emissions and Effluents

|    |   |
|----|---|
| ▲▲ | Review opportunities to reduce water flows from the property (e.g., porous pavement, rain-water capture systems)                                  |
| ▲  | Conduct substance survey to identify on-site hazardous materials and assure correct information and handling procedures are in place              |
| ▲  | Create a policy and documented procedures to minimize use of pesticides and petroleum-based landscaping materials (e.g., herbicides, fertilizers) |

### Indoor Environmental

|   |   |
|---|---|
| ▲ | Install zone ventilation system controls  |
| ▲ | Install air filters where possible with MERV 7 or higher rating   |
| ▲ | Review loading docks and develop measures to minimize intake of exhaust fumes (e.g., fast-closing doors, engine-off policies) |
| ▲ | Install carbon monoxide and carbon dioxide monitoring devices   |
| ▲ | Install a procedure for collecting documentation regarding indoor air quality   |
| ▲ | Maintain hot water temperatures between 120 and 130 degrees (F)   |
| ▲ | Ensure lighting levels meet IESNA guidelines  |
| ▲ | Ensure that tenants have programs to maintain lighting systems properly (e.g., cleaning, re-lamping and re-balloasting)       |



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# 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:

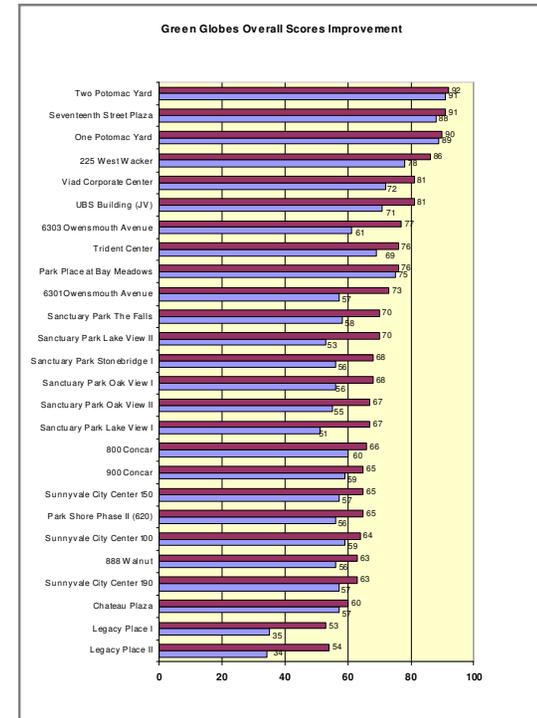
- A major financial institution needed a way to mitigate risk and increase asset values for a portfolio of investment properties.

## 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.



| Building                     | ENERGY EFFICIENCY FEATURES |                         |                                 |                     |                                    |                             |                           |                     |                          |               |              |                       |                  |                          |                          |                             |                          |                         |                              |                              |
|------------------------------|----------------------------|-------------------------|---------------------------------|---------------------|------------------------------------|-----------------------------|---------------------------|---------------------|--------------------------|---------------|--------------|-----------------------|------------------|--------------------------|--------------------------|-----------------------------|--------------------------|-------------------------|------------------------------|------------------------------|
|                              | Lighting controls          | High efficiency boilers | Automatic vent damper on boiler | Temperature setback | BAS (Full or Partial installation) | Efficient hot water heaters | Hot water saving fixtures | Water temp. 50-55°C | High efficiency chillers | Heat recovery | Cogeneration | Variable speed drives | Renewable energy | Energy efficient windows | Air seal top of building | Air seal bottom of building | Air seal vertical shafts | Shade to reduce cooling | Wall insulation meets MNIECB | Roof insulation meets MNIECB |
| Chateau Plaza                | ✓                          | N/A                     | N/A                             | ✓                   | Partial                            | ✓                           | ✓                         | ✓                   | X                        | X             | X            | X                     | X                | X                        | ✓                        | ✓                           | ✓                        | X                       | N/A                          | N/A                          |
| 888 Walnut                   | ✓                          | ✓                       | X                               | X                   | Full                               | X                           | X                         | ✓                   | ✓                        | X             | X            | X                     | X                | X                        | ✓                        | ✓                           | ✓                        | ✓                       | ✓                            | ✓                            |
| Park Shore Phase II (420)    | ✓                          | X                       | ✓                               | Full                | X                                  | X                           | X                         | N/A                 | ✓                        | X             | X            | X                     | X                | ✓                        | ✓                        | ✓                           | ✓                        | ✓                       | ✓                            | ✓                            |
| Sanctuary Park Lake View II  | X                          | N/A                     | N/A                             | ✓                   | Full                               | X                           | X                         | ✓                   | N/A                      | X             | X            | X                     | X                | ✓                        | ✓                        | ✓                           | ✓                        | ✓                       | X                            | ✓                            |
| Sanctuary Park Oak View I    | ✓                          | N/A                     | N/A                             | ✓                   | Full                               | X                           | X                         | ✓                   | ✓                        | X             | X            | X                     | X                | ✓                        | ✓                        | ✓                           | ✓                        | ✓                       | ✓                            | ✓                            |
| Sanctuary Park Oak View II   | ✓                          | N/A                     | N/A                             | ✓                   | Full                               | X                           | X                         | ✓                   | N/A                      | X             | X            | X                     | X                | ✓                        | ✓                        | ✓                           | ✓                        | ✓                       | X                            | ✓                            |
| Sanctuary Park Stonebridge I | ✓                          | N/A                     | N/A                             | ✓                   | Full                               | X                           | X                         | ✓                   | N/A                      | X             | X            | X                     | X                | ✓                        | ✓                        | ✓                           | ✓                        | ✓                       | ✓                            | ✓                            |
| Sanctuary Park Lake View I   | ✓                          | N/A                     | N/A                             | ✓                   | Full                               | X                           | X                         | ✓                   | N/A                      | X             | X            | X                     | X                | ✓                        | X                        | X                           | X                        | ✓                       | N/A                          | N/A                          |
| Legacy Place I               | X                          | N/A                     | N/A                             | ✓                   | Partial                            | X                           | X                         | ✓                   | N/A                      | X             | X            | X                     | X                | X                        | X                        | X                           | X                        | X                       | X                            | X                            |
| Legacy Place II              | X                          | N/A                     | N/A                             | X                   | Partial                            | X                           | X                         | ✓                   | N/A                      | X             | X            | X                     | X                | X                        | X                        | X                           | X                        | X                       | X                            | X                            |



# 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 for Existing Buildings: Operations & Maintenance Registered Project Checklist**

Project Name: \_\_\_\_\_  
 Project Address: \_\_\_\_\_

| Yes | ? | No | Project Totals (Pre-Certification Estimate) | 92 Points              |
|-----|---|----|---|------------------------|
|     |   |    | Certified: 34-42 points                     | Silver: 43-50 points   |
|     |   |    | Gold: 51-57 points                          | Platinum: 58-63 points |

| Yes | ? | No | Sustainable Sites   | 12 Points |
|-----|---|----|---|-----------|
|     |   |    | Credit 1 LEED Certified Design and Construction                         | 1         |
|     |   |    | Credit 2 Building Exterior and Hardscape Management Plan                | 1         |
|     |   |    | Credit 3 Integrated Pest Mgmt, Erosion Control, and Landscape Mgmt Plan | 1         |
|     |   |    | Credit 4 Alternative Commuting Transportation                           | 1 to 4    |
|     |   |    | Credit 4.1 17% Reduction  | 1         |
|     |   |    | Credit 4.2 25% Reduction  | 2         |
|     |   |    | Credit 4.3 50% Reduction  | 3         |
|     |   |    | Credit 4.4 75% Reduction in assets                                      | 4         |
|     |   |    | Credit 5 Reduce Site Disturbance, Protect or Restore Open Space         | 1         |
|     |   |    | Credit 6 Stormwater Management  | 1         |
|     |   |    | Credit 7.1 Heat Island Reduction, Non-Roof                              | 1         |
|     |   |    | Credit 7.2 Heat Island Reduction, Roof                                  | 1         |
|     |   |    | Credit 8 Light Pollution Reduction                                      | 1         |

11

**WATER EFFICIENCY**

**WEp1 Minimum Indoor Plumbing Fixture and Fitting Efficiency (prerequisite)**  
 CONFIDENCE LEVEL – YES  
 Intent: To reduce indoor fixture and fitting water use within buildings to reduce the burdens on potable water supply and wastewater systems.  
 Requirements: This prerequisite requires that the building achieves a defined level of potable water use reduction below baseline. A building's baseline is established by calculating 100% of the water usage that would result if all building plumbing fixtures were upgraded to meet the Uniform Plumbing Code (UPC) 2006 or International Plumbing Codes (IPC) 2006 fixture and fitting performance requirements. The percent of efficiency is set depending on the year of substantial completion of building's indoor plumbing system, either the year of construction or the last plumbing renovation resulting in a 100% retrofit of fixtures:  
 • For a plumbing system substantially completed in 1993 or later throughout the building, the baseline is 120% of the water usage that would result if all fixtures met the codes cited above.  
 • For a plumbing system substantially completed before 1993 throughout the building, the baseline is 150% of the water usage that would result if all fixtures met the codes cited above.  
 Documentation:  
 Provide documentation demonstrating that the baseline of potable water usage is equal to or below the LEED baseline for 100% of fixtures meeting UPC 2006, IPC2006. For post-1993 built use 120% of value, for pre-1993 built use 150% of LEED baseline.  
 Note: Current plumbing fixtures meet prerequisite requirements and compliance with codes. Low flow fixtures are already in place. Calculations need to be made to confirm baseline usage.



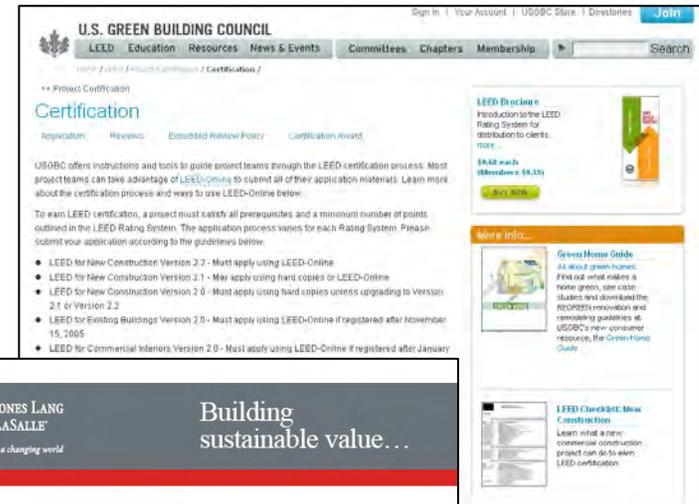
Current toilets, sinks, and urinals likely meet prerequisite requirements for GPP and GPM rates.

**WEc1.1 Water Performance Measurement, Whole Building Metering (1 point)**  
 CONFIDENCE LEVEL – YES  
 Intent: To measure building and subsystem water performance over time to understand consumption patterns and identify opportunities for additional water savings.

JONES LANG LASALLE [Project Building, City]

# 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.



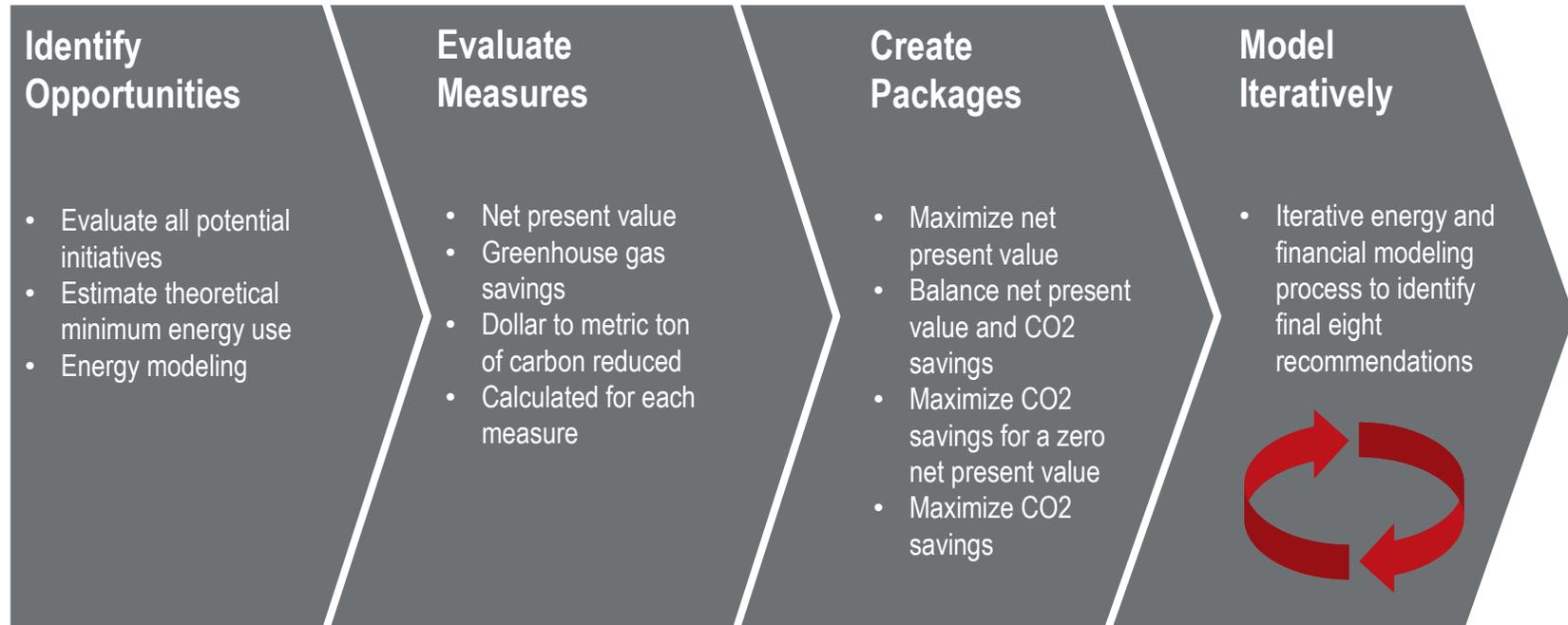
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# Delivery

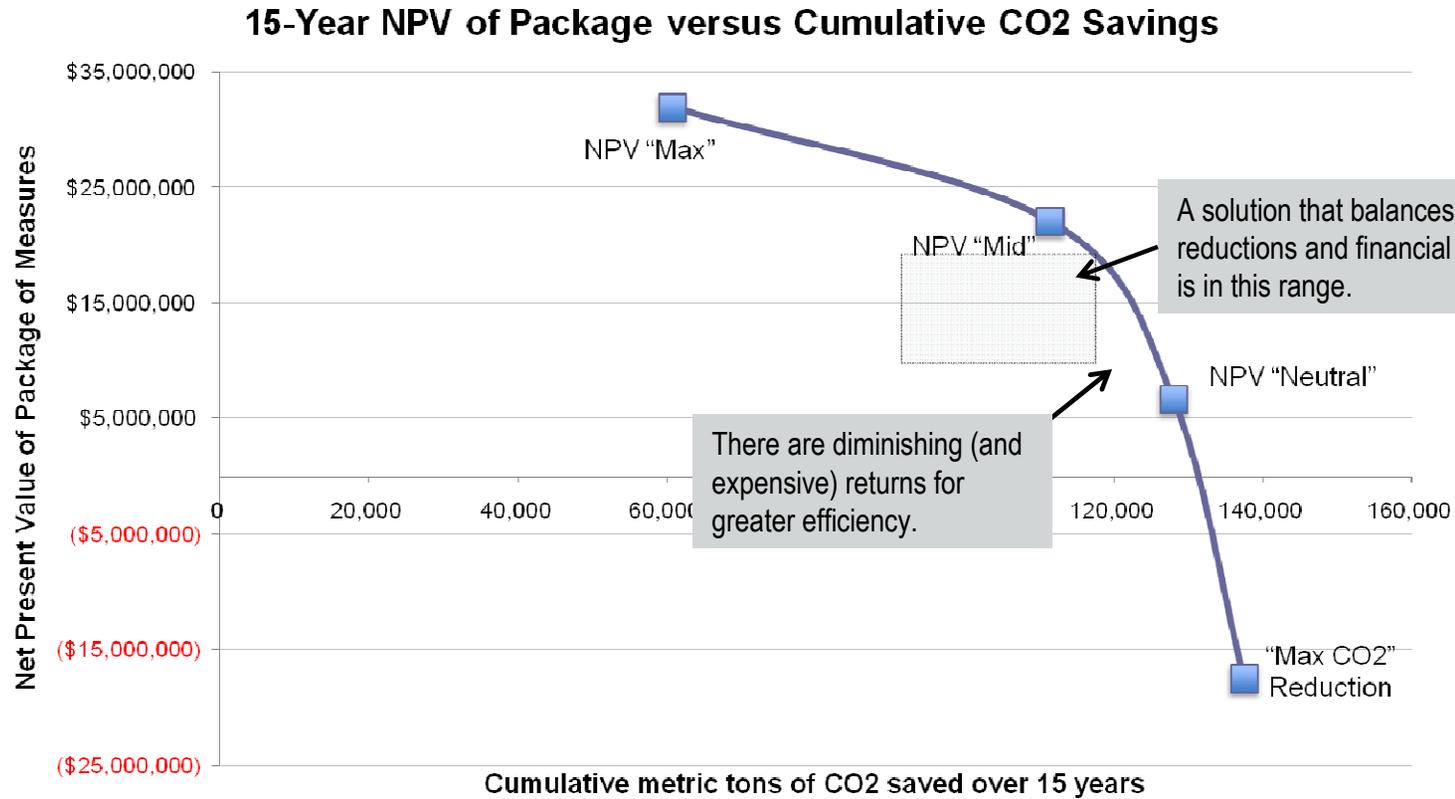


# Design Charrettes

Help identify the most cost effective initiatives with the greatest impact



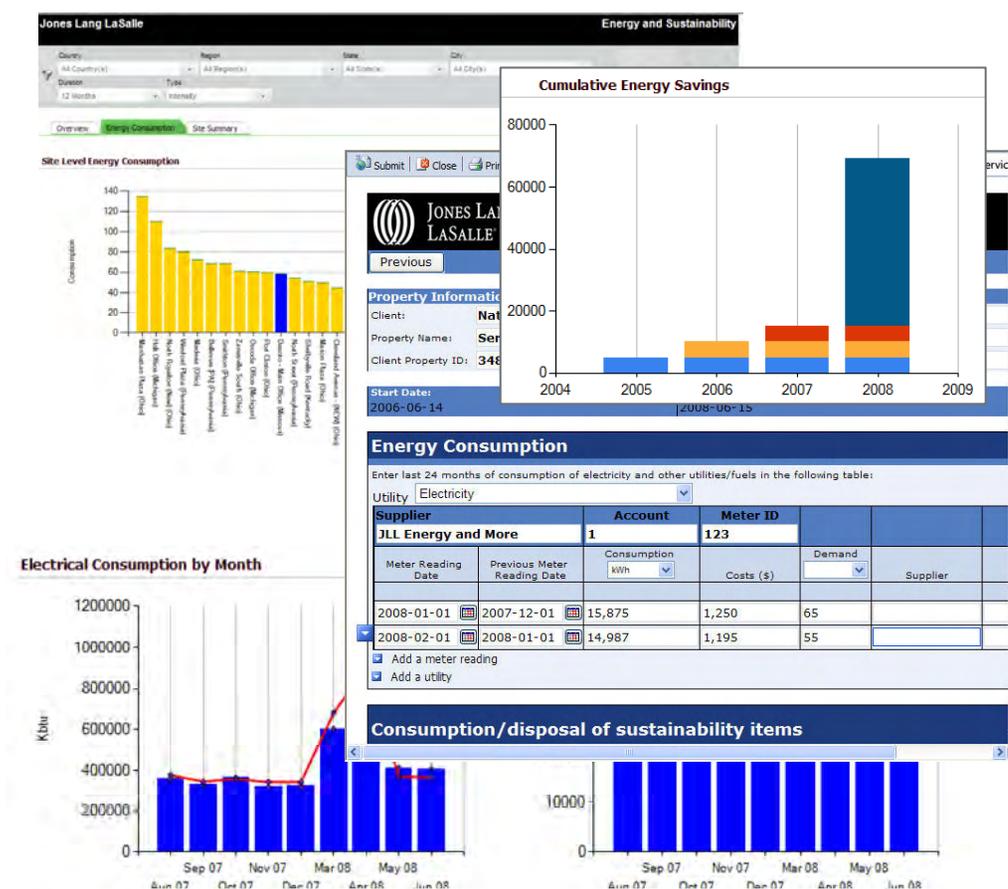
# Design Charretts - Financial results



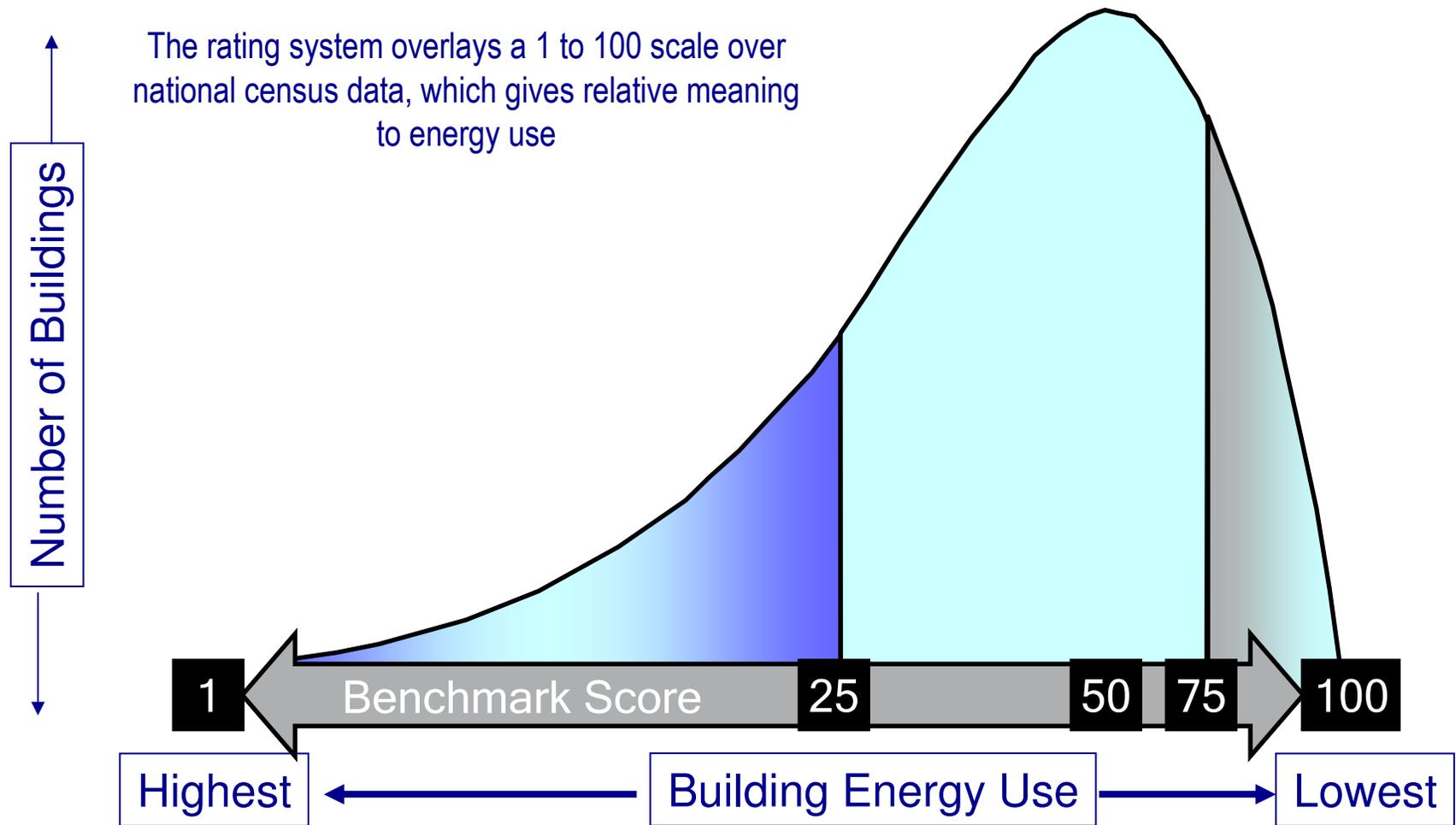
# PEERS: Portfolio Energy and Environmental Reporting System

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



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# 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%



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# Results



A landmark sustainability  
project for the  
Empire State Building



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# 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

CO<sub>2</sub> 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



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# 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."*

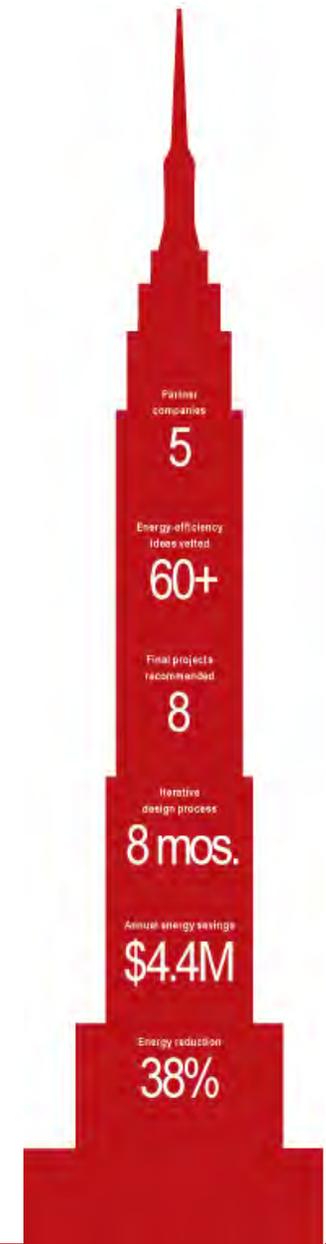
--Anthony E. Malkin  
Building Owner  
Empire State Building  
Company



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## 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)



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# The motivation

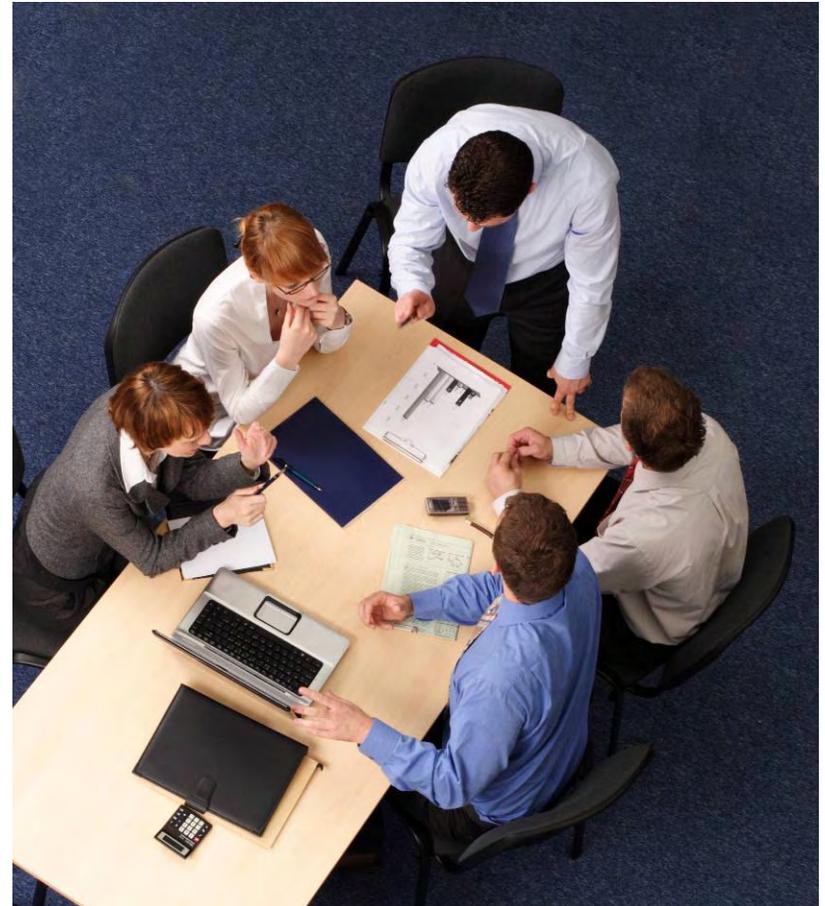
***“Buildings in New York City create 65 to 70 percent of the city's entire carbon footprint. Constructing new green buildings won't move the needle in mitigating this problem. It is far more important to address the existing building stock.”***

Tony Malkin, Metro Green + Business, June 2008

- Buildings contribute to nearly 40 percent of U.S. green house 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

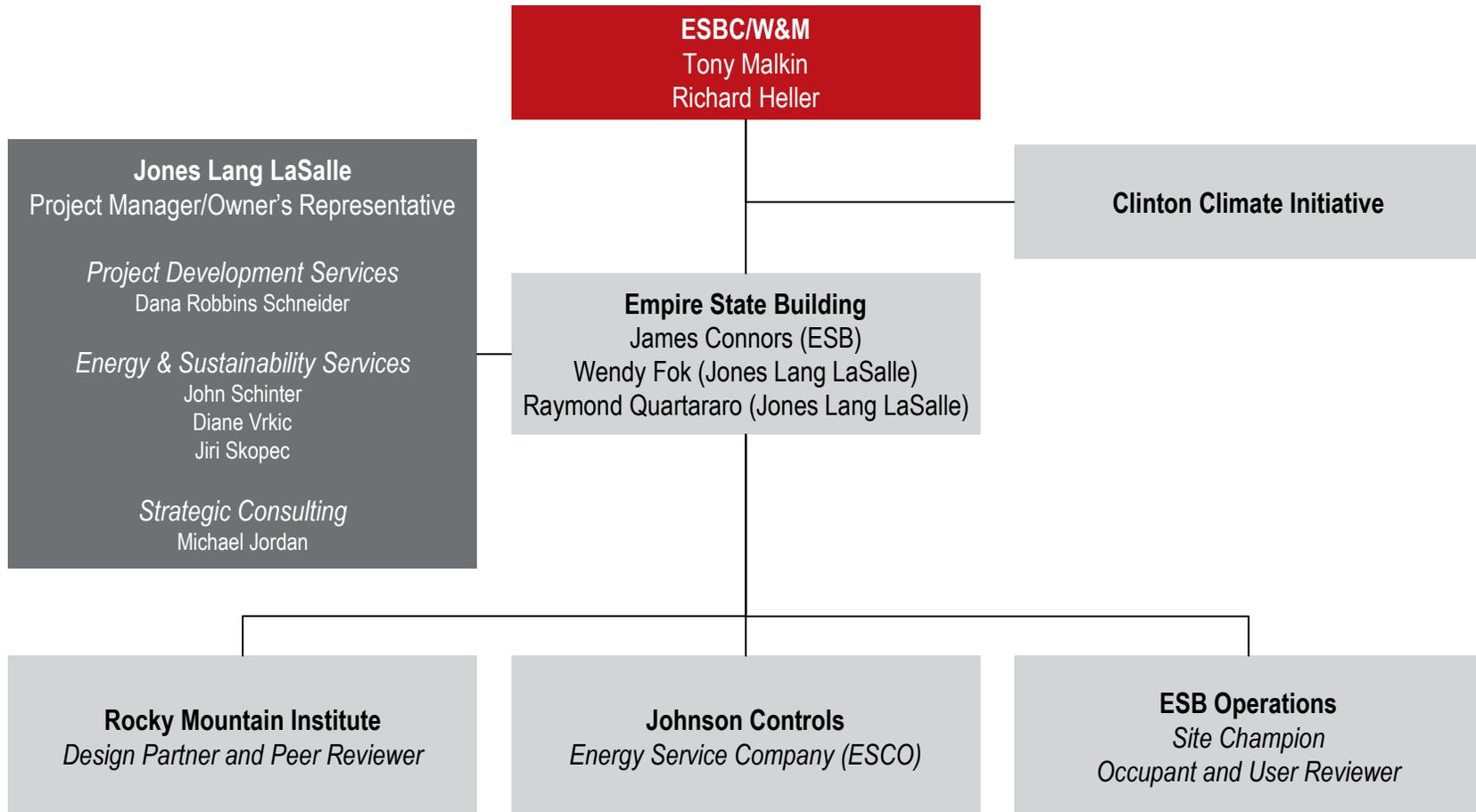


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# World-class energy and sustainability specialists



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# Methodology

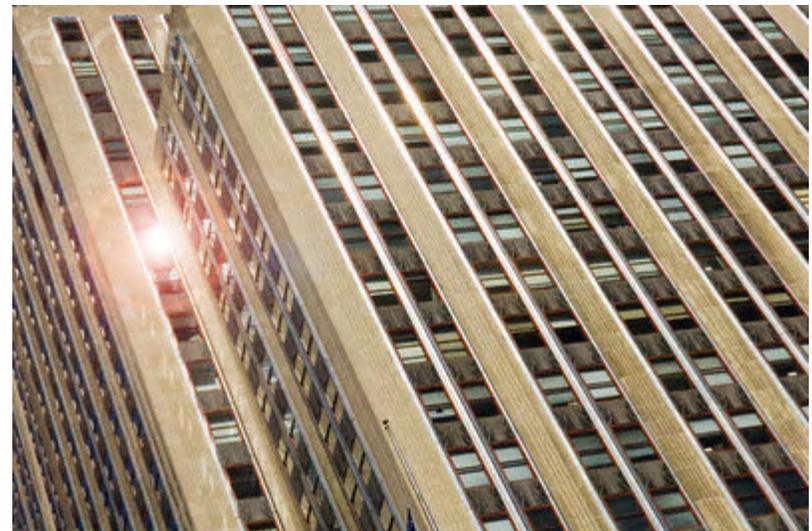


## Key Outputs:

|  |  |   |  |
|--|--|---|--|
| <ul style="list-style-type: none"><li>• Baseline Capital Projects Report: \$244</li><li>• Projected JCI performance contract budget: \$27m</li></ul> | <ul style="list-style-type: none"><li>• Baseline Energy Benchmark Report (\$11.3m annual energy cost without broadcasting)</li></ul> | <ul style="list-style-type: none"><li>• Tenant Initiatives (pre-builts, design guidelines, energy management) Report</li><li>• Tuned eQUEST model</li></ul> | <ul style="list-style-type: none"><li>• Model (eQUEST, financial, GHG) outputs</li><li>• Integrated Sustainability Master Plan Report (including Energy Master Plan)</li></ul> |
|--|--|---|--|

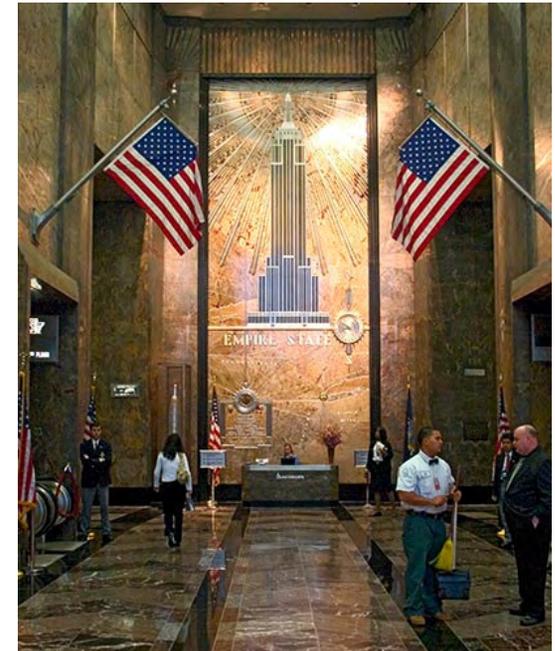
# Eight select improvements for the greatest impact

- **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 an 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



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# 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.

\*Source: Grossman, B. Sustainable Ink. [CoStar Study Finds LEED, Energy Star Bldgs. Outperform Peers](#). April 17, 2008.

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”.

\*Source: State Environmental Resource Center. [Green Building Policy Issues Package](#). September 14, 2004.

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

\*Source: Broughton, Jim. Environmental Design + Construction and Marketer magazines. [Green Building Costs, Savings and Value](#). July 2006.

# 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.**

\*Source: State Environmental Resource Center. Green Building Policy Issues Package. September 14, 2004.

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

\*Source: Broughton, Jim. Environmental Design + Construction and Marketer magazines. Green Building Costs, Savings and Value. July 2006.

| LEED Buildings' Water and Energy Savings |                  |                   |                   |
|--|------------------|-------------------|-------------------|
| LEED Rating                              | No. of Buildings | Average % Savings |                   |
|  |                  | Water Efficiency  | Energy Efficiency |
| Certified                                | 64               | 30.1%             | 29.4%             |
| Silver                                   | 49               | 30.4%             | 33.3%             |
| Gold                                     | 46               | 32.5%             | 40.0%             |
| Platinum                                 | 9                | 34.4%             | 55.0%             |
| Total Number of Buildings: 168           |                  |                   |                   |

\* 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.

\*Source: Broughton, Jim. Environmental Design + Construction and Marketer magazines. Green Building Costs, Savings and Value. July 2006.



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# 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



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*Real value in a changing world*

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Thank you

