# PRESERVATION GREEN LAB

NATIONAL TRUST FOR HISTORIC PRESERVATION®

# THANK YOU

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The Bullitt Foundation
The Kresge Foundation
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City of Seattle
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4Culture
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Ken Woodcock
NCPTT

Thank you to our project partners, the City of Seattle, including DPD and Jayson Antonoff, and New Buildings Institute (NBI)

# ENERGY PERFORMANCE AND EXISTING BUILDINGS

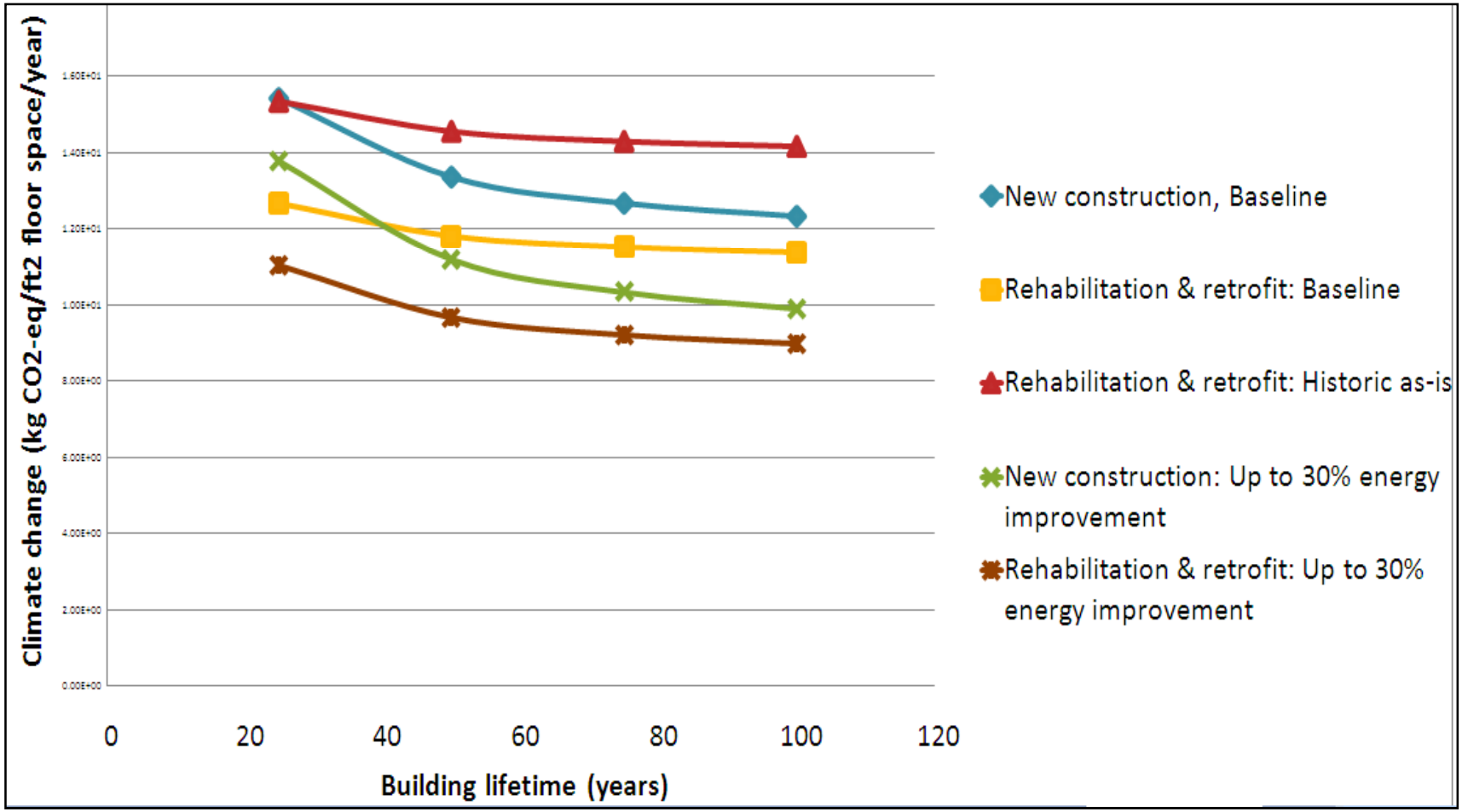

Source: Cliff Majersik,
Institute for Market Transformation

# QUANTIFYING THE ENVIRONMENTAL VALUE OF BUILDING REUSE

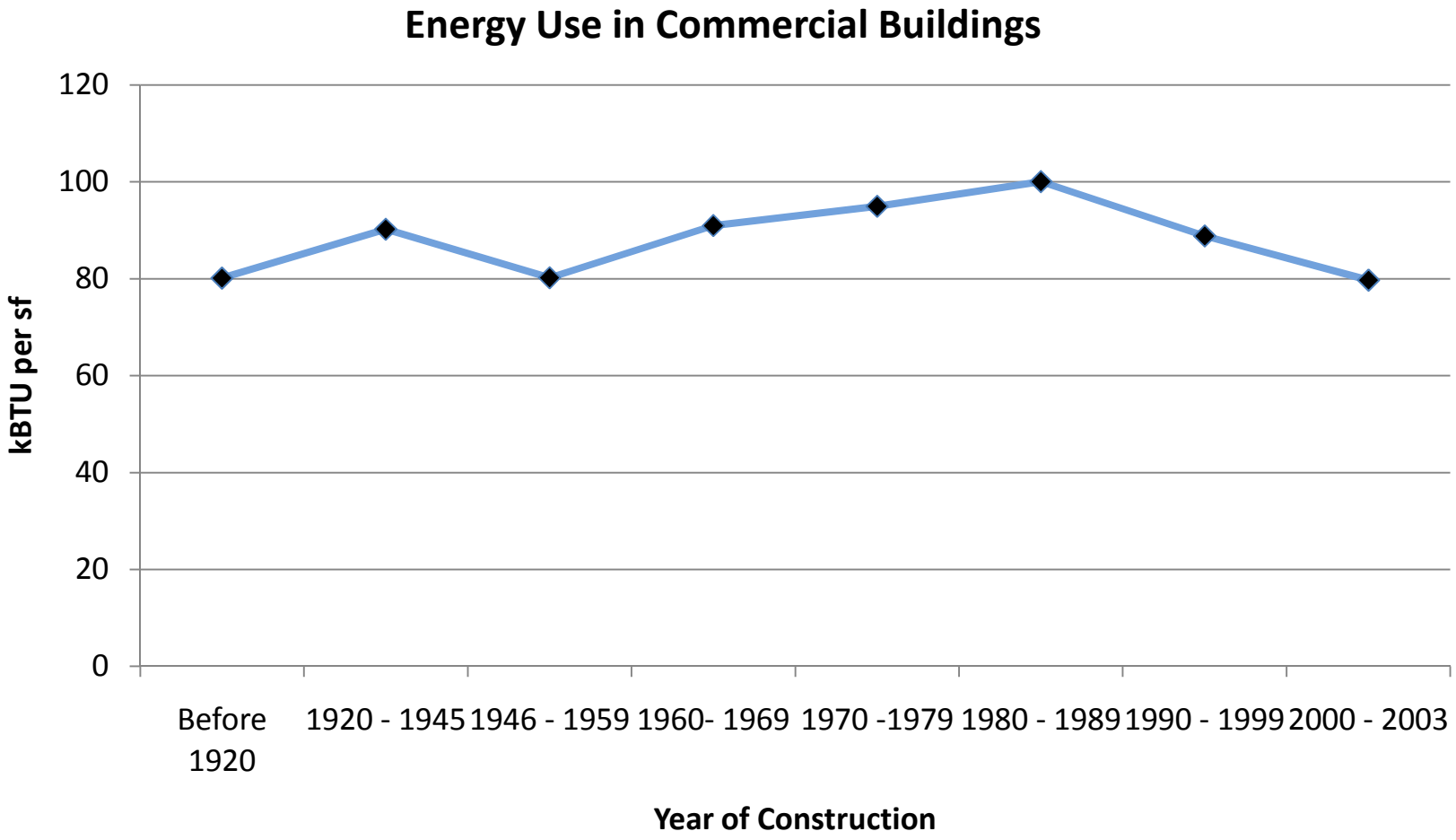
Monadnock Building, Chicago

Tinycomb.com

# QUANTIFYING THE ENVIRONMENTAL VALUE OF BUILDING REUSE



# Many older buildings perform better than we think…..




Source: U.S. Energy Information Administration, *2003 Commercial Building Energy Consumption Survey*

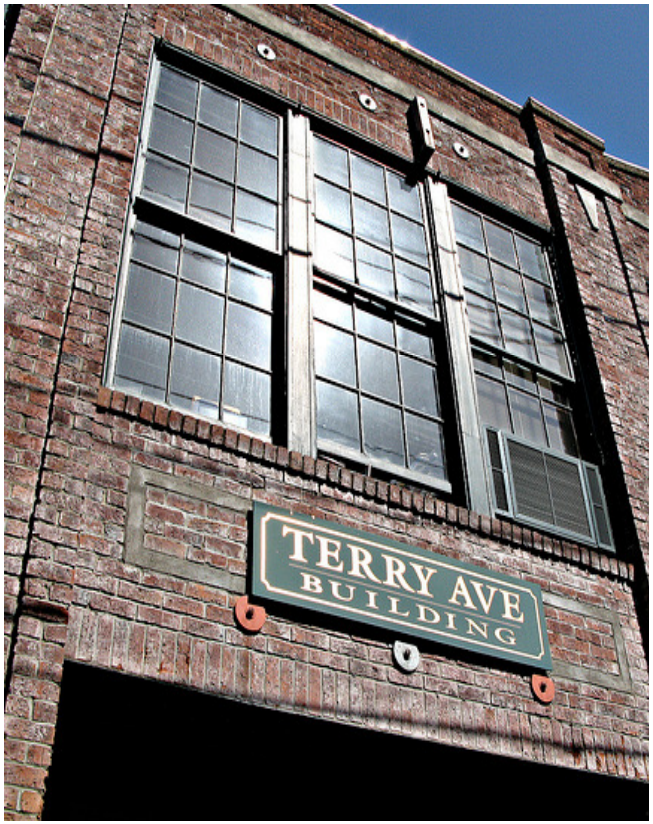
# … but more flexible policy solutions are needed for this potential to be realized

Vance Building, Seattle
Photo: William Wright Photography

# Architectural character = economic value

Each existing building has unique value in terms of its architectural character and its potential uses

Owners need flexibility to pursue better energy performance while preserving economic value




**Vulcan's Terry Avenue building**
**South Lake Union, Seattle**
**Photo: Josh Lackey**

# New solutions are needed for smaller, older buildings

73% of our existing commercial buildings are less than 10,000 square feet

*US Energy Information Administration, 2003*

Smaller, older buildings are uniquely challenged – both physically and financially - to meet aggressive carbon reduction goals

Buildings in Denver's Historic District.
Photo by Wally Gobetz

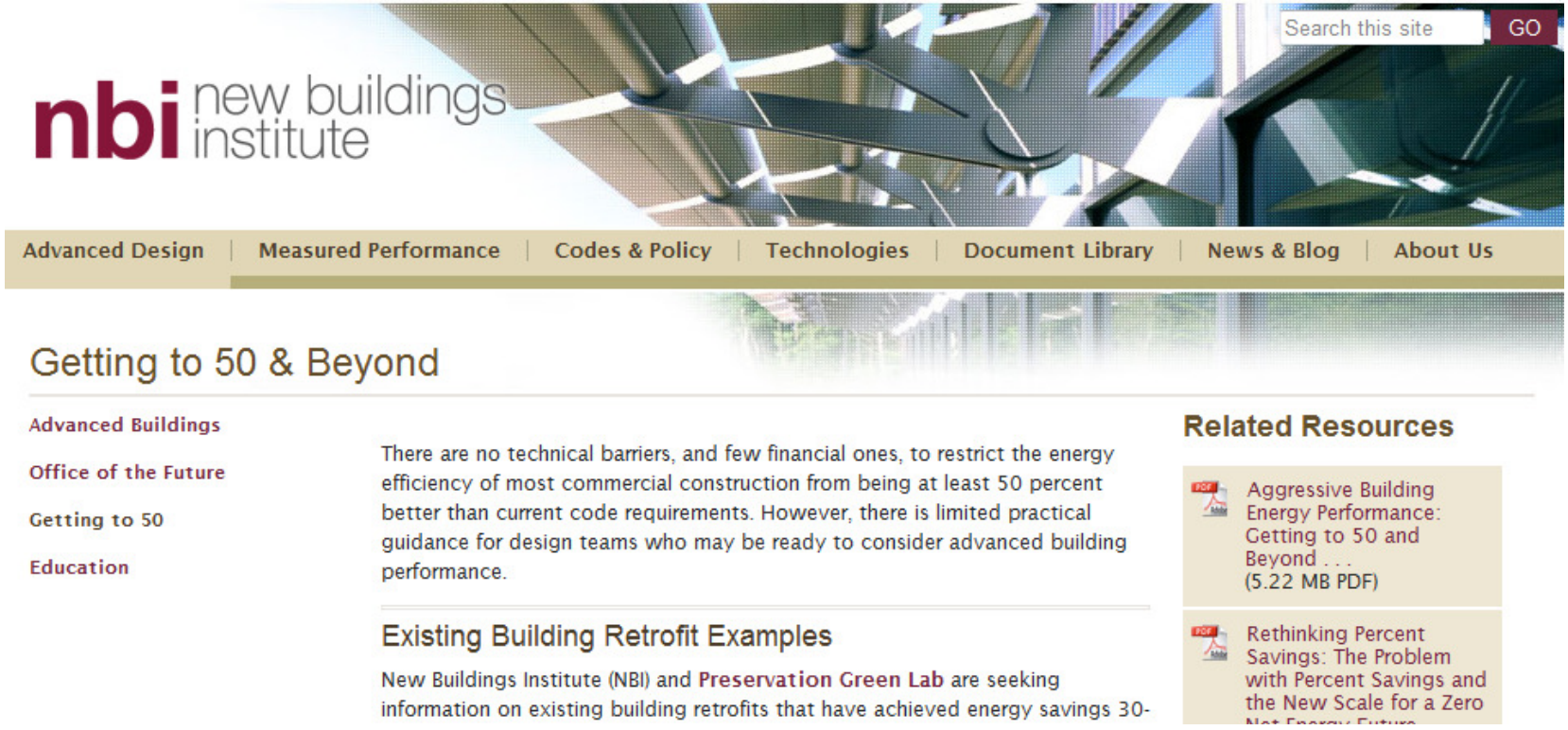
Financial Solutions

Technical Solutions

Regulatory Solutions

# MARKET DRIVEN SOLUTIONS:
# ‘GETTING TO 50’ MULTI MEASURE TOOL

NBI/PGL partnership, funded by the Doris Duke and Kresge Foundations, will create a suite of software tools that will provide customized retrofit strategies for individual buildings, within a number of existing building typologies



# OUTCOME BASED ENERGY CODES

NATIONAL TRUST FOR HISTORIC PRESERVATION®

nbi new buildings INSTITUTE


Objective: To create an alternate, more flexible, building energy efficiency code framework for existing and historic buildings

# OUTCOME-BASED CODE FRAMEWORK

Benefits for existing buildings:

1. based on accountability for achieving *performance outcomes* rather than following a mandated path
2. allows for *flexibility* in how to achieve targeted outcomes without compromising architectural integrity
3. drives *technical innovation* to develop solutions beyond those called out in current codes
4. capitalizes on the *inherent design strengths* and unique opportunities for improving each building
5. captures the impacts of *operations, plug loads and behavior*
6. allows owners and ESCos to follow an *optimized investment strategy to maximize ROI* for each building
7. allows for a community's *aggregate private and public investment* to focus on the most leveraged investments across a portfolio (or district) of buildings

# Current energy codes are not tuned to the challenges of existing buildings

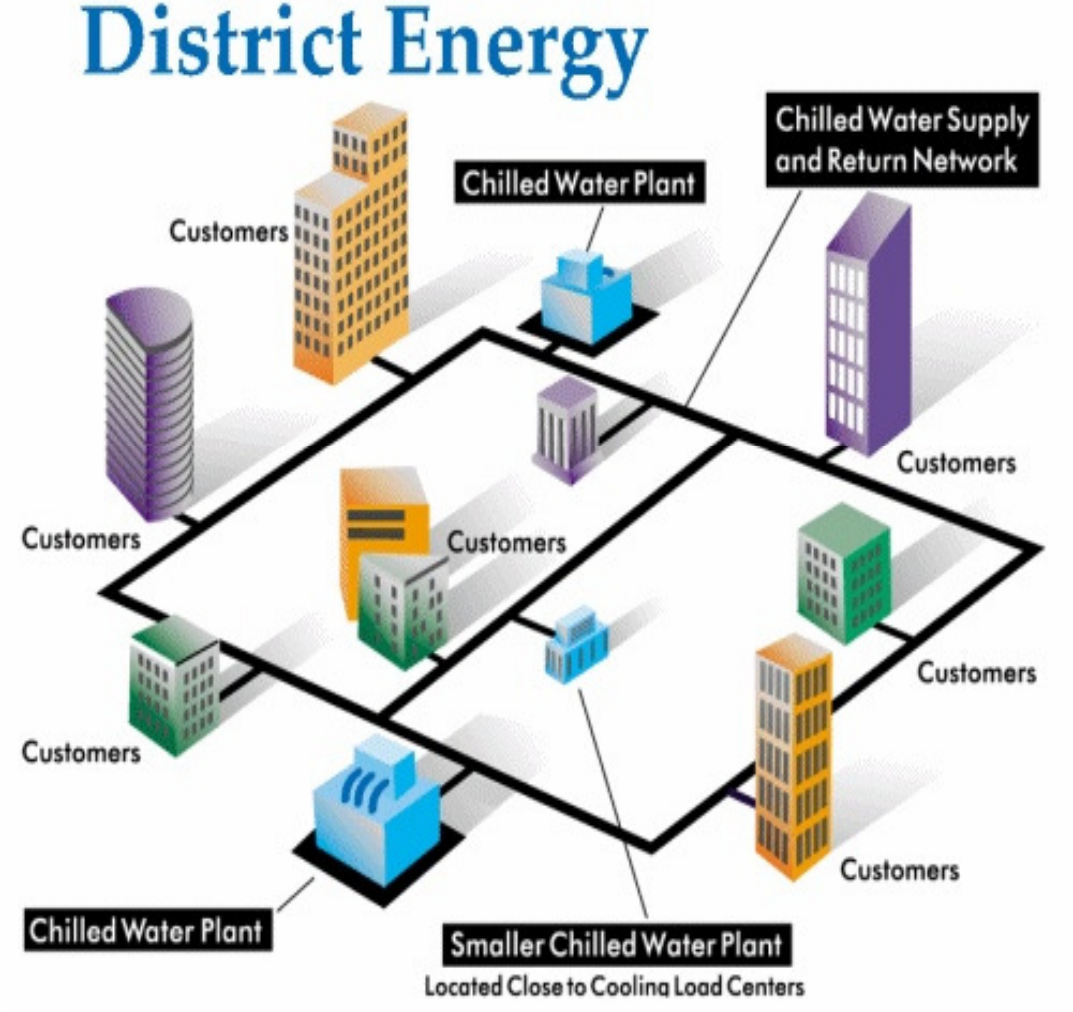
Each existing building presents a unique, and pre-determined, set of strengths and opportunities:

- Thermal mass, day-lighting, siting, shading, adjacencies, passive features

Current codes focus investment on measures that may not yield the highest ROI (in terms of carbon impacts or $$ savings)

1510 Melrose Avenue, Seattle
Image: Graham Baba Architects

# SCALING UP: DISTRICT ENERGY



# City of Seattle Outcome-Based Energy Code Policy Roadmap

- ✓ Research and development
- ✓ Regional working groups
- ✓ Performance disclosure and benchmarking
- ✓ Mandatory sub-metering
- ▪ Demonstration projects
- ▪ Demonstration ordinance
  - Hand-selected projects
  - Tied to 2030 District
- ▪ Influencing State Energy Code Revisions (2012)
- ▪ Seattle Energy Code:
  - Alternate, voluntary path

# ENERGY PERFORMANCE DISCLOSURE

Allow an informed market to drive energy efficiency improvements

- Benchmarking
- Disclosure
- Annual reporting

OMB No. 2060-0347

ENERGY STAR

**STATEMENT OF ENERGY PERFORMANCE**
**Sample Office Building**

**Building ID:** 2648530
**For 12-month Period Ending:** April 30, 2011[1]
**Date SEP becomes ineligible:** N/A
**Date SEP Generated:** May 23, 2011

**Facility**
Sample Office Building
100 Efficiency St.
Seattle, WA 98103

**Facility Owner**
Building Owner, LLC
1000 Benchmark St.
Seattle, WA 98103

**Primary Contact for this Facility**
Facility Manager
2000 Energy St.
Seattle, WA 98103

**Year Built:** 1970
**Gross Floor Area (ft²):** 98,630

**Energy Performance Rating**[2] (1-100) 77

| **Site Energy Use Summary**[3] | |
|---|---|
| Electricity - Grid Purchase(kBtu) | 5,888,452 |
| Natural Gas (kBtu)[4] | 568,548 |
| Total Energy (kBtu) | 6,457,000 |

| **Energy Intensity**[5] | |
|---|---|
| Site (kBtu/ft²/yr) | 65 |
| Source (kBtu/ft²/yr) | 205 |

| **Emissions** (based on site energy use) | |
|---|---|
| Greenhouse Gas Emissions ($MtCO_2e$/year) | 706 |

**Electric Distribution Utility**
Seattle City Light

| **National Average Comparison** | |
|---|---|
| National Average Site EUI | 92 |
| National Average Source EUI | 288 |
| % Difference from National Average Source EUI | -29% |
| Building Type | Office |

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

| **Meets Industry Standards**[6] **for Indoor Environmental Conditions:** | |
|---|---|
| Ventilation for Acceptable Indoor Air Quality | **N/A** |
| Acceptable Thermal Environmental Conditions | **N/A** |
| Adequate Illumination | **N/A** |

**Certifying Professional**
Licensed Professional
3000 Conservation St.
Seattle, WA 98103

Notes:
1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Values represent energy intensity, annualized to a 12-month period.
5. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

# SUB-METERING

For all buildings with a gross conditioned floor area of 20,000 sf or larger:

- HVAC system
- Lighting
- Plug loads
- Process loads
- Miscellaneous loads

# Role of Demonstration Projects

The City of Seattle and the Preservation Green Lab will partner on bricks and mortar projects to:

- Test target setting methodology
- Evaluate permitting process
- Develop enforcement mechanism

Seattle's King Street Station

# DEMONSTRATION PROJECTS

## Supply Laundry Building

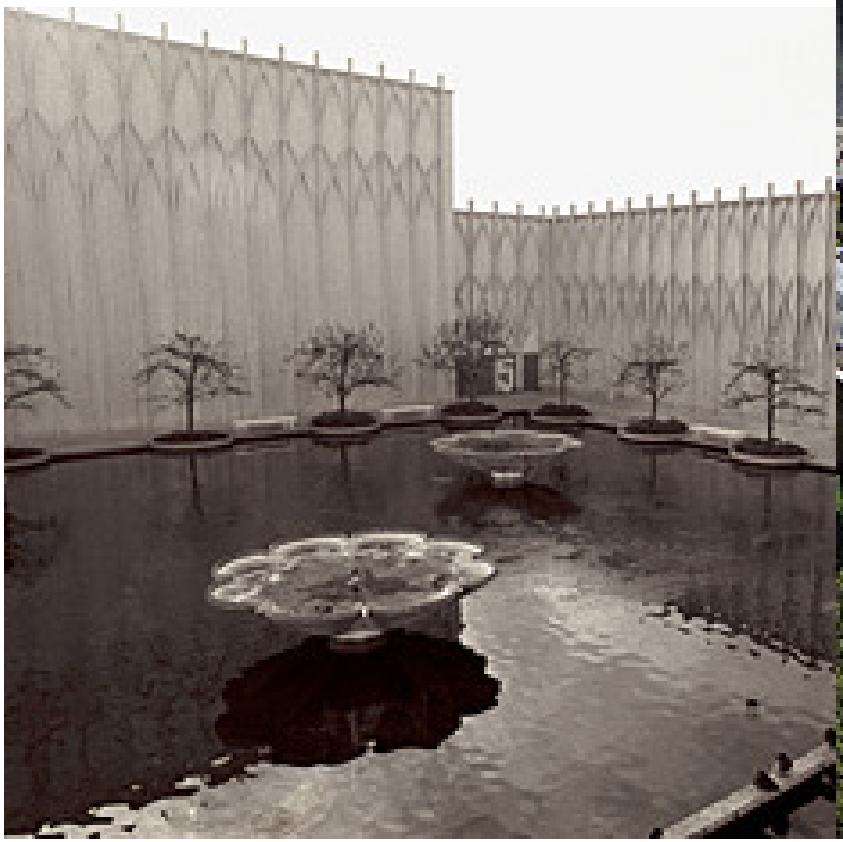
- Vulcan, Inc.
- Ecotope

The Supply Laundry Building


# DEMONSTRATION PROJECTS

## Pacific Science Center

- McKinstry



Pacific Science Center

# DEMONSTRATION PROJECTS

Frye Apartments

- LIHI
- Rushing Co.

Frye Apartments

# DEMONSTRATION PROJECTS

Washington Athletic Club

- MacDonald Miller

Washington Athletic Club

# CASE STUDIES

## King Street Station

- SDOT
- Arup

King Street Station, Seattle
Department of Transportation


# OUTREACH STRATEGY

Media push starting NOW to highlight:

- leadership role of the demonstration project owners and engineers
- outcome-based code concept, and how it links to benchmarking and disclosure
- City of Seattle's leadership role nationally
- PGL's role and mission in serving smaller older buildings

# DEMONSTRATION ORDINANCE

- Extend outcome-based energy code to a broader range of buildings
  - Non-historic
  - Multifamily (if possible)
- Selective
- Further vetting of code framework
- Application of enforcement mechanisms
- Timeline: 2012-2013

# New Enforcement Model

- Enforcement options
  - Pre-contracted energy rates
  - Compliance bonds
  - Financial penalties
  - Temporary Certificate of Occupancy

- Compliance is determined 1 to 2 years after occupancy
- Owners will be given a chance to work with tenants to identify and mitigate issues

# WA State Energy Code

- We are going to hit a wall in terms of our ability to innovate

- 2012 code adoption cycle
  - Comments due by March 2012
  - Politically challenging environment
  - Goal:  legal authority for Seattle to permit projects under Outcome Based code model

- 2015 code adoption cycle
  - Goal: adoption of Outcome Based Energy Code as an alternative compliance path

# WHY IS THIS IMPORTANT FOR SEATTLE?

- Over the long term, shifts more responsibility to the private sector
- Supports reinvestment in the vast portion of building stock that is home to small entrepreneurial businesses
- Broad retrofit creates local jobs
- Regulatory innovation in the form of customized, voluntary toolboxes vs. grinding code cycles (e.g. PGL/NBI Getting to 50 tool)
- Positions Seattle as a national leader and aligns with multiple other initiatives

# STRATEGIC ALIGNMENT

Outcome-based energy codes are supportive of and essential to other City initiatives:

- Mandatory Benchmarking and Disclosure
- Community Power Works
- Seattle 2030 District
- Carbon Neutral Seattle
- District Energy roadmap

Code enforcement process should help, not hinder, new programs

# THE CITY'S ROLE

- Provide operational support to demonstration projects and development of demonstration ordinance
- Assist with State Building Code Council negotiations
- Provide regional leadership and facilitate relationships with regional stakeholders
- Help promote Seattle's leadership role in national movement toward outcome-based regulatory model

# FOR MORE INFORMATION...

www.preservationnation.org/green
http://blogs.nationaltrust.org/preservationnation/

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