

DOE Building Energy Asset Score

Overview and Deployment



U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

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Overview

National, free software tool for assessing the *physical and structural* energy efficiency of commercial and multifamily residential buildings

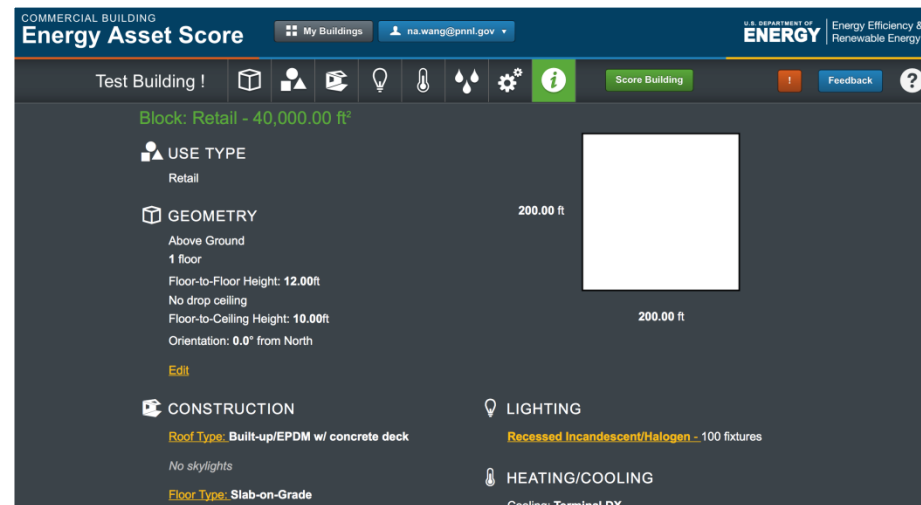
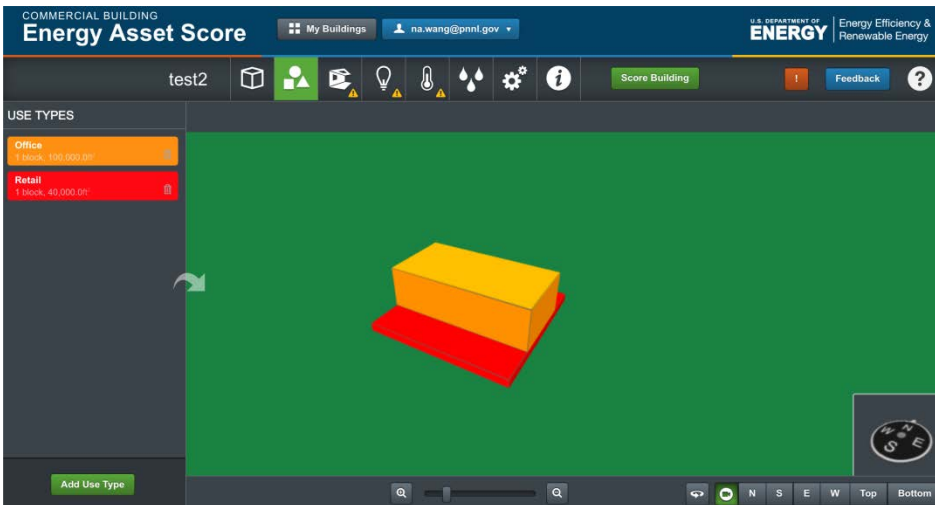
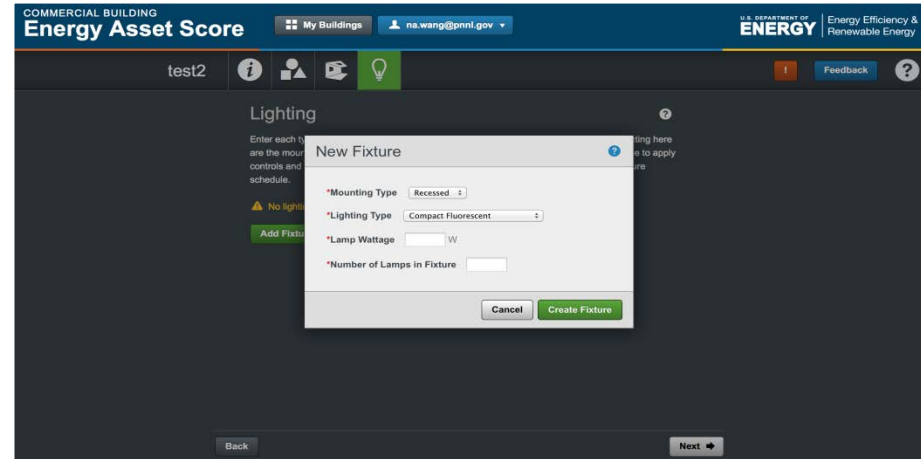
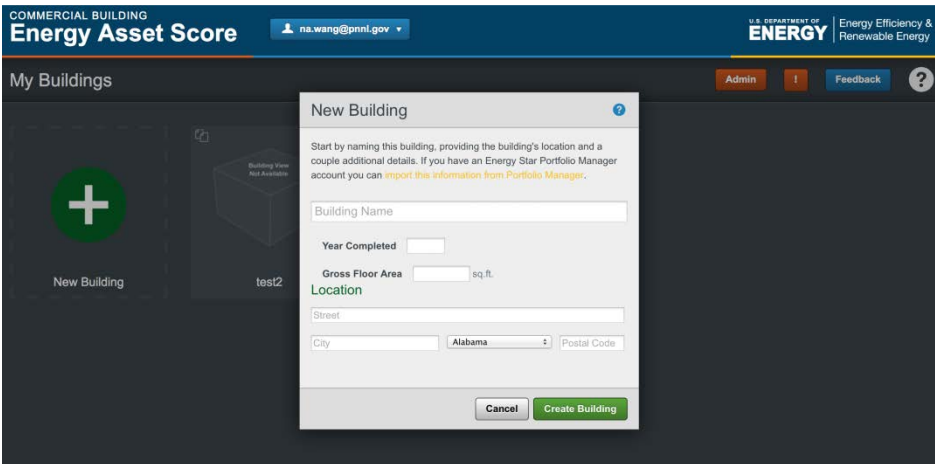
- Envelope (roof, walls, windows)
- Major systems and equipment (mechanical, electrical, service hot water)

How it Works

Asset Score runs an *energy simulation* using a powerful building energy modeling engine (EnergyPlus)

- The simulation normalizes for building operations, occupancy and tenant behavior
- Users (owner, operator, service, provider, etc.) enter building information through an web interface
 - General information: # of floors, footprint dimension, orientation, use type
 - Envelope components: Roof, exterior wall, floor types, insulation levels
 - Fenestration: Skylights, windows, shading
 - Lighting: Fixture types, # of fixtures or % of served floor area, lighting controls
 - Mechanical components: Cooling/heating types, controls, equipment efficiency
 - Service water heating: Fuel type, distribution type, equipment efficiency

How it Works



Types of Buildings

Asset Score assesses the following *new and existing* building types:

- Multifamily (low/high-rise, 3+ units)
- Office
- Retail
- Assisted living
- City hall
- Community center
- Courthouse
- Educational (including K-12 schools)
- House of Worship
- Library
- Lodging
- Medical office
- Parking garage
- Police station
- Post office
- Senior center
- Warehouse (unrefrigerated)
- Mixed-Use (of the above types)

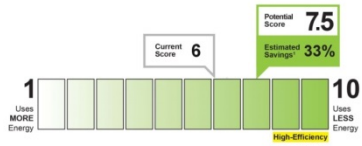
Asset Score Report

COMMERCIAL BUILDING ENERGY ASSET SCORE OVERALL BUILDING SCORE

BUILDING INFORMATION
 Example Building
 2000 N St,
 Chicago, IL 60601

Building Type: Office
 Gross Floor Area: 100,000 sq ft
 Year Built: 2005

Score Date: 02/21/2013
 Building ID #: XXXXX



Assumed Occupancy and Operating Conditions	Estimated Source Energy Use (ashut)	Energy Use Intensity by Fuel Type
Number of Assumed Occupants: 500	Current Building: 159	Site Energy Use (ashut): 141 kWh
Hours of Operation: 49 hrs/wk	Upgraded Building: 107	Source Energy Use (ashut): 113 kWh
Cooling Set Point: 75°F		Electricity: 75% Gas: 15% Fuel Oil: 10% District Heating: 0% District Cooling: 0%
Heating Set Point: 70°F		
Misc. Elec. Loads: 0.75 W/sq ft		

The Commercial Building Energy Asset Score is a national rating system developed by the U.S. Department of Energy. The Score reflects the energy efficiency of a commercial building based on the building's structure, heating, cooling, ventilation, and hot water system. The building's Structure and Systems are individually evaluated and ranked. The Opportunities page provides recommendations to how to improve the building's energy efficiency, increase the building's Asset Score, and save money.

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COMMERCIAL BUILDING ENERGY ASSET SCORE UPGRADE OPPORTUNITIES

Building ID #: XXXXX Gross Floor Area: 100,000 sq ft

COST EFFECTIVE UPGRADE OPPORTUNITIES

Building Envelope	Energy Savings*	Cost†
• Add roof insulation in Office Learn More	Medium	\$5
• Upgrade windows in Office with high performance double pane windows Learn More	Medium	\$5
Interior Lighting		
• Upgrade fluorescent T8 lighting system in Office to compact fluorescent lighting system Learn More	High	\$
HVAC Systems		
• Upgrade cooling system in Office with high efficiency electric DX cooling system Learn More	High	\$55
• Add supply air temperature reset to HVAC system in Office Learn More	Low	\$
Hot Water Systems		
• Upgrade service hot water system in Office with electric heat pump water heater Learn More	Medium	\$5

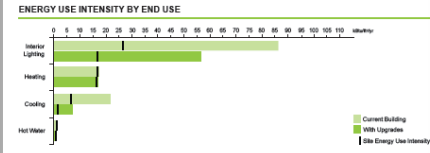
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COMMERCIAL BUILDING ENERGY ASSET SCORE STRUCTURE AND SYSTEMS

Building ID #: XXXXX Gross Floor Area: 100,000 sq ft

ABOUT THE BUILDING SYSTEMS ABOUT THE BUILDING ENVELOPE

Ranking†	Ranking‡
Interior Lighting: Fair	Roof U-Value, Non-MTC: Good
Heating: Good	Floor U-Value, Mass: Good
Cooling: Good	Walls U-Value, Framed: Good
Overall HVAC Systems: Good	Windows U-Value: Fair
Hot Water: Fair	Walls + Windows U-Value: Fair
	Window Solar Heat Gain Coefficient: Fair



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COMMERCIAL BUILDING ENERGY ASSET SCORE BUILDING ASSETS

Building ID #: XXXXX Gross Floor Area: 100,000 sq ft

BUILDING SYSTEM CHARACTERISTICS SUMMARY

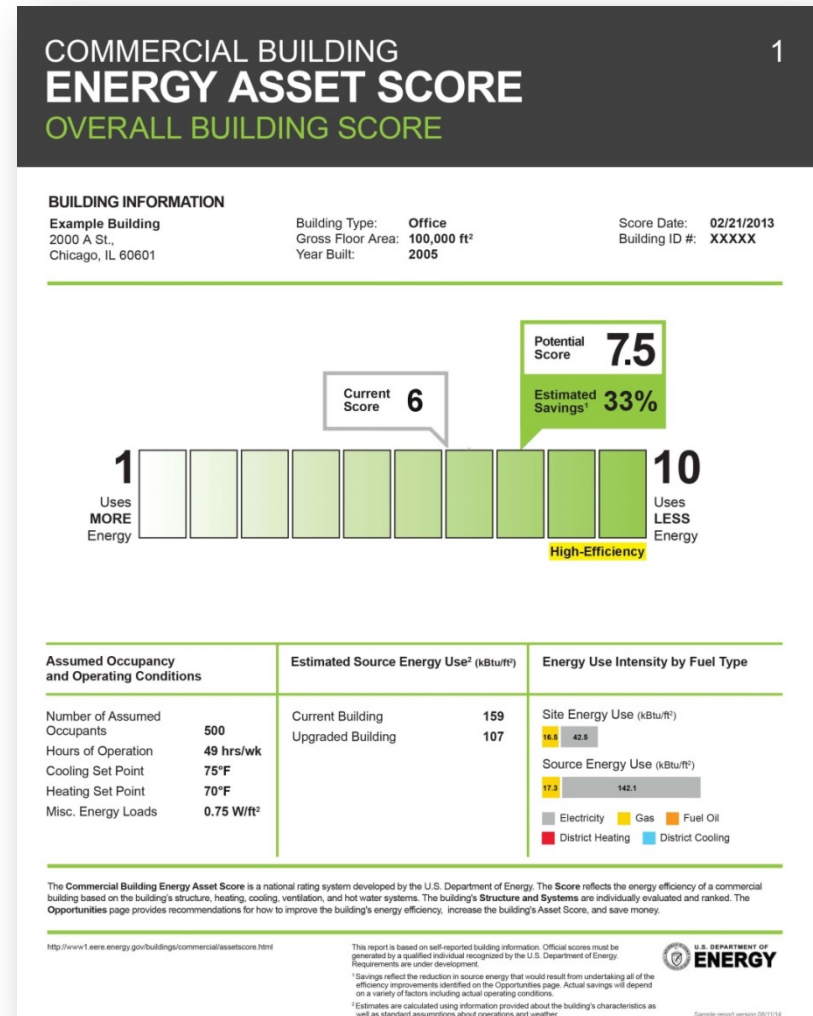
Geometry	Current Building
Above Ground: 2 floor	
Below Ground: 0 floor	
Floor-to-Floor Height: 14 ft	
Floor-to-Ceiling Height: 8 ft	
Orientation: S-0° Face South	
Use Type: Office	
Shading	
Exterior Shading Type: None	Exterior overhang: 0 ft
Height above Window: 0 ft	Height above Window: 2 ft
Projection: 0 ft	
Skylight	
Skylight Installed: No	
Indoor Lighting	
Lighting Type: T8	Recessed
Lighting Type: T5	Recessed
Percent of Total Floor Area Served: 100%	
Occupancy Controls: Yes	
Daylighting Controls: No	
Lighting Power Density: Estimate†	
Floor	
Floor Type: Slab-on-Grade	
Windows	
Window Frame Type: Metal	
Glaze Type: Single pane	
Gas Fill Type: None	
Window Aspect: Continuous	
Window to Wall Ratio: 0.4	
Window U-Value: U=0.88 (SI)U=4.75	
Window SHGC: 0.6	
Window VLT: Estimate†	

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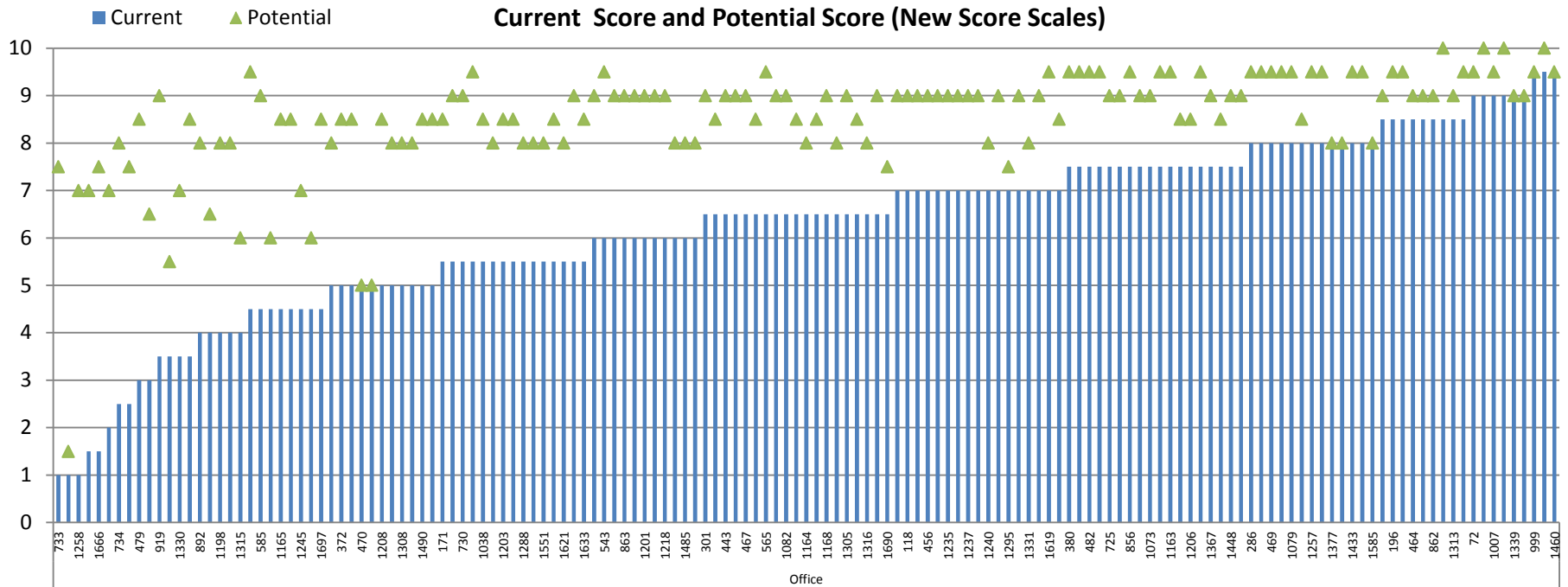
Asset Score Report

10-point scale based on predicted EUI

- Recently transitioned from 100-point scale
- Current and Potential Scores
- “10” represents lowest expected energy usage using current EE technologies
- Weather normalized
- Scale moves in half-point increments

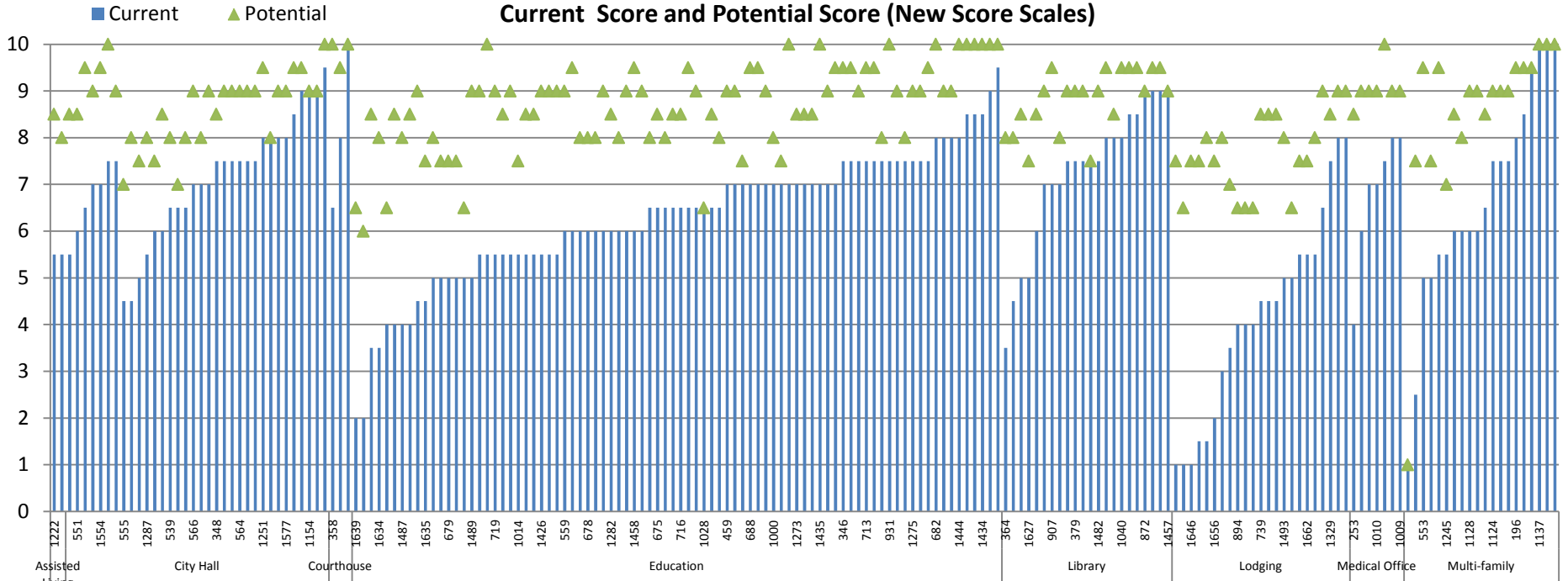


Score Distributions - Office



Score Distributions - Other

Current Score and Potential Score (New Score Scales)



Asset Score Report

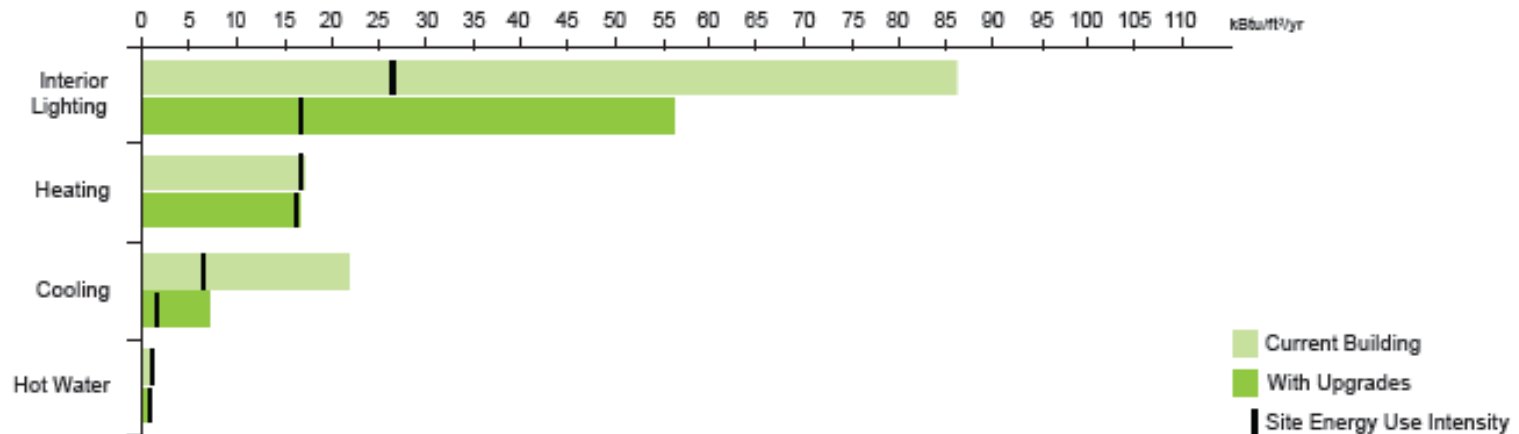
ABOUT THE BUILDING SYSTEMS

	Ranking ⁸
Interior Lighting	Fair
Heating	Good
Cooling	Good
Overall HVAC Systems	Good
Hot Water	Fair

ABOUT THE BUILDING ENVELOPE

	Ranking ⁸
Roof U-Value, Non-Attic (Btu/ft ² h °F)	Good
Floor U-Value, Mass (Btu/ft ² h °F)	Good
Walls U-Value, Framed (Btu/ft ² h °F)	Good
Windows U-Value (Btu/ft ² h °F)	Fair
Walls + Windows U-Value (Btu/ft ² h °F)	Fair
Window Solar Heat Gain Coefficient	Fair

ENERGY USE INTENSITY BY END USE



Asset Score Report

COST EFFECTIVE UPGRADE OPPORTUNITIES

	Energy Savings ⁴	Cost ⁵
Building Envelope		
<ul style="list-style-type: none">• Add roof insulation in Office Learn More	Medium	\$\$
<ul style="list-style-type: none">• Upgrade windows in Office with high performance double pane windows Learn More	Medium	\$\$
Interior Lighting		
<ul style="list-style-type: none">• Upgrade Fluorescent T8 lighting system in Office to compact fluorescent lighting system Learn More	High	\$
HVAC Systems		
<ul style="list-style-type: none">• Upgrade cooling system in Office with high efficiency electric DX cooling system Learn More	High	\$\$\$
<ul style="list-style-type: none">• Add supply air temperature reset to HVAC system in Office Learn More	Low	\$
Hot Water Systems		
<ul style="list-style-type: none">• Upgrade service hot water system in Office with electric heat pump water heater Learn More	Medium	\$\$

Value

Real estate owners and managers, designers, and government facilities managers can use the Asset Score to:

- Ensure the market recognizes EE capital investments
- Communicate the underlying energy efficiency of assets to tenants and investors
- Demonstrate national sustainability and CSR leadership
- Guide energy-related investment decisions and target further energy improvement actions
- For architects: add to your sustainability offerings
- For governments: Provide transparency to taxpayers

Call for Users

DOE Office of Energy Efficiency and Renewable Energy will recognize stakeholders that use, or commit to use, the Asset Score by May 2015

- Planned media release in late May 2015 recognizing current and committed users
- Technical assistance from Pacific NW National Lab will be made available
- Commitment does not require disclosure of any kind
- Further details TBD

CONTACT INFORMATION

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