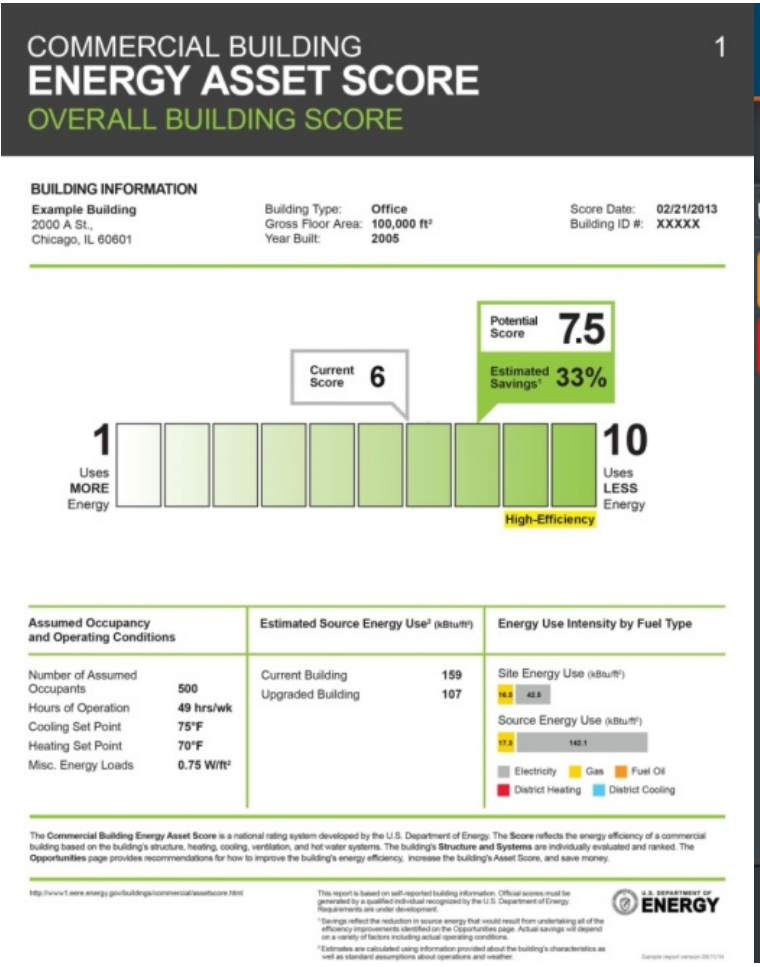
Building Energy Asset Score

2017 Building Technologies Office Peer Review


COMMERCIAL BUILDING
ENERGY ASSET SCORE
OVERALL BUILDING SCORE

1

BUILDING INFORMATION

Example Building
2000 A St.,
Chicago, IL 60601

Building Type: Office
Gross Floor Area: 100,000 ft²
Year Built: 2005

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

Potential Score 7.5
Current Score 6
Estimated Savings¹ 33%

1 Uses MORE Energy — 10 Uses LESS Energy
High-Efficiency

Assumed Occupancy and Operating Conditions		Estimated Source Energy Use² (kBtu/ft²)		Energy Use Intensity by Fuel Type
Number of Assumed Occupants	500	Current Building	159	Site Energy Use (kBtu/ft²)
Hours of Operation	49 hrs/wk	Upgraded Building	107	Source Energy Use (kBtu/ft²)
Cooling Set Point	75°F			Electricity, Gas, Fuel Oil, District Heating, District Cooling
Heating Set Point	70°F			
Misc. Energy Loads	0.75 W/ft²			

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 systems. The building's Structure and Systems are individually evaluated and ranked. The Opportunities page provides recommendations for how to improve the building's energy efficiency, increase the building's Asset Score, and save money.

http://www1.eere.energy.gov/buildings/commercial/assetscore.html

This report is based on self-reported building information. Official scores must be generated by a qualified individual recognized by the U.S. Department of Energy. Requirements are under development.

¹Savings reflect the reduction in source energy that would result from undertaking all of the efficiency improvements identified on the Opportunities page. Actual savings will depend on a variety of factors including actual operating conditions.

²Estimates are calculated using information provided about the building's characteristics as well as standard assumptions about operations and weather.

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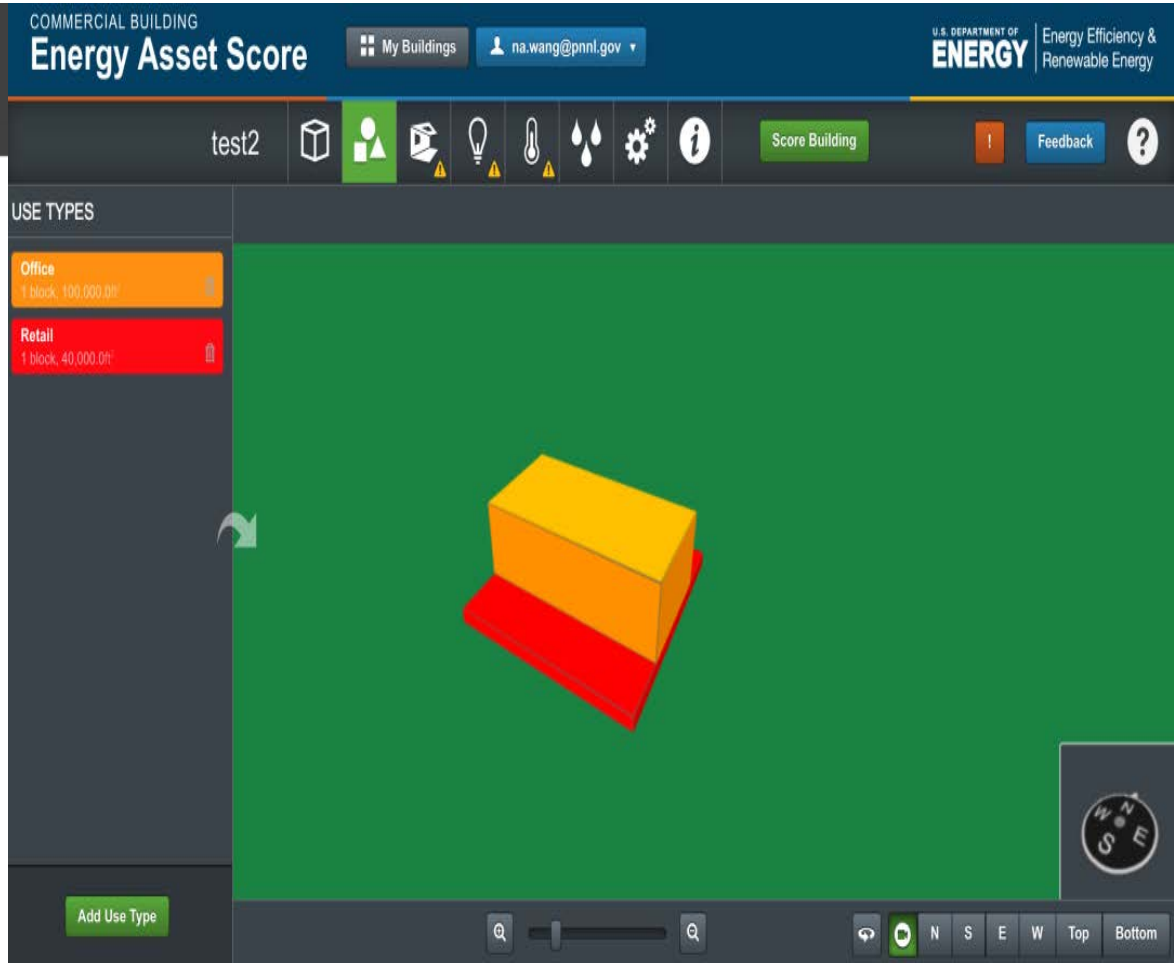

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Nora Wang, Nora.Wang@pnnl.gov
Pacific Northwest National Laboratory

Project Summary

Timeline:

Start Date: 04/01/2011

Planned End Date: Ongoing program

Key Milestones

1. Asset Score 2.0 with Preview (01/27/2016)
2. Building Data Reporting Platform (pilot) (01/31/2017)

Budget:

Total Project $ to Date:

- DOE: $9.35M
- Cost Share: $0

Total Project $:

- DOE: $TBD
- Cost Share: $0

Key Partners:

PSD (Help Desk Support)

Leadership Network (See Slide #10)

Project Outcome:

- A credible scoring system for commercial and multi-family buildings that can be used to inform retrofits and real estate transactions
- A streamlined process and tool to collect, manage, and report building data (asset, audit, retrofit, commissioning)

Purpose and Objectives: Problem Statement

- Even as more energy consumption data is being produced, stakeholders do not have a consistent way to determine how much of a building's energy performance the result of operational choices or the installed building systems.

- Building owners and investors lack a reliable source of information to account for the efficiency of a building's underlying assets and a low-cost means to identify opportunities for cost-effective improvements.

- Without an understanding of the underlying asset itself, there is a diminished ability to drive targeted investments toward more efficient technologies.

Purpose and Objectives: Target Market and Impact

Target Market and Audience:

Market: Commercial and multi-family buildings; commercial sector accounts for 19% of total energy consumption in the U.S., totaling 18,021 TBtu*

Audience: Building owners/operators, state and local governments, federal agencies, service providers, utilities

Impact of Project:

- **Near-term (Integration):** Integrate Asset Score with existing building energy data tools to support EE programs and drive data-driven decision making for EE investments.
- **Mid-term (Adoption):** Valuate 5% of total commercial space** (4,350 million ft^2) and identify 180 TBtu primary energy use savings (assuming 20% on average***) and $1,780 million cost savings*
- **Long-term (Transformation):** Asset Score serves as a proxy for EE in real estate transactions by easing the due diligence process and driving capital investment in high efficiency building technologies and materials.

*According to EIA Annual Energy Review 2011. The total energy consumption in the commercial sector estimates fro18,021 TBtu in 2011 (p.40). The total consumer expenditure estimates for energy in the commercial sector is $178,128 million in 2010 (p.79).

**According to CBECS 2012, the total commercial floor space is 87,043 million sq.ft.

***Based on the analysis of buildings that have been valuated in Asset Score.

Approach and Key Issues

Approach:

- Create a free Asset Scoring Tool application with simplified data requirements using the EnergyPlus building modeling engine (via OpenStudio)
- Develop a quick and easy way to help unsophisticated building owners or mangers to initiate an energy efficiency analysis and provide flexible entry points
- Provide a standardized report to disaggregate building energy information and identify energy improvement opportunities

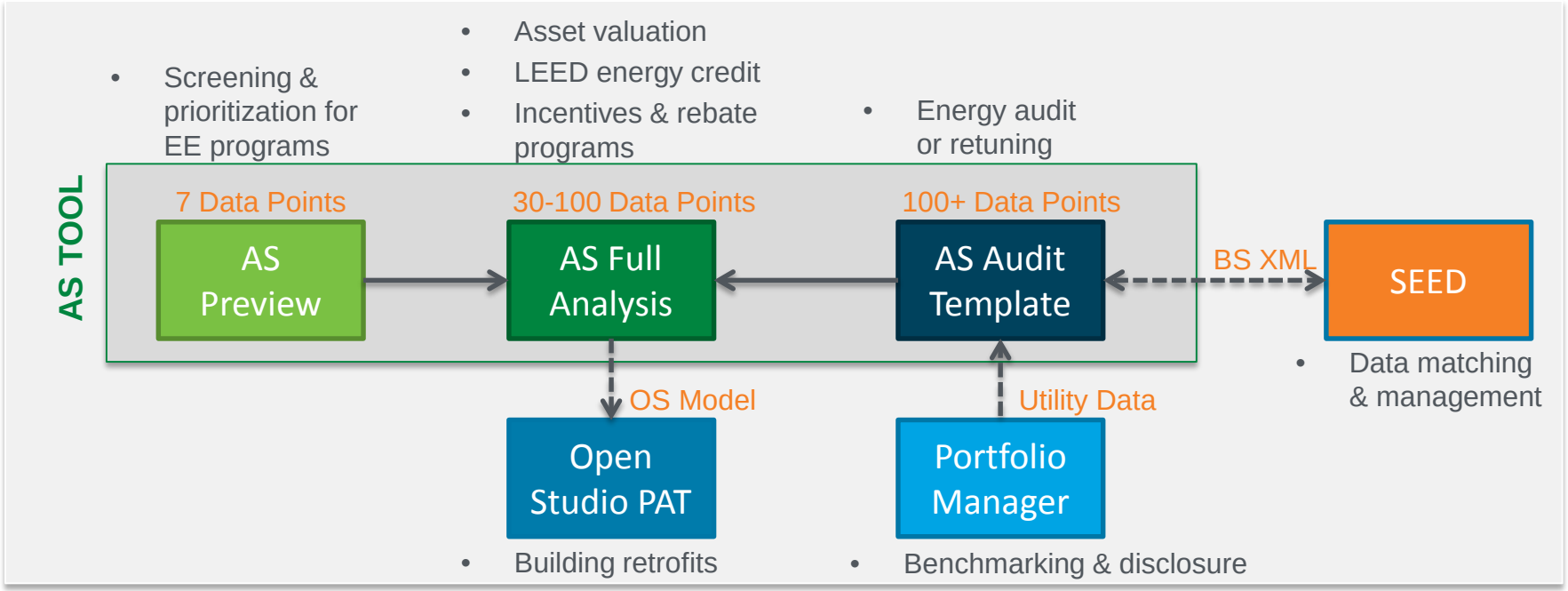
Key Issues:

- Determine the appropriate level of data inputs for an accurate assessment while minimizing data collection burden
- Provide useful information and actionable strategies to help building owners make informed decisions on building upgrades
- Create a streamlined, flexible mechanism to integrate (1) portfolio screening and prioritization, (2) energy audit and reporting, and (3) building simulation and valuation

Approach: Distinctive Characteristics

Distinctive Characteristics:

- Position the tool upstream to the real estate owners by working with architects and professional service providers
- Create self-sustaining deployment channels by building user base in EE services, engineering, design, and program administration sectors
- Invest in lateral "capabilities" with potential to vastly expand market penetration



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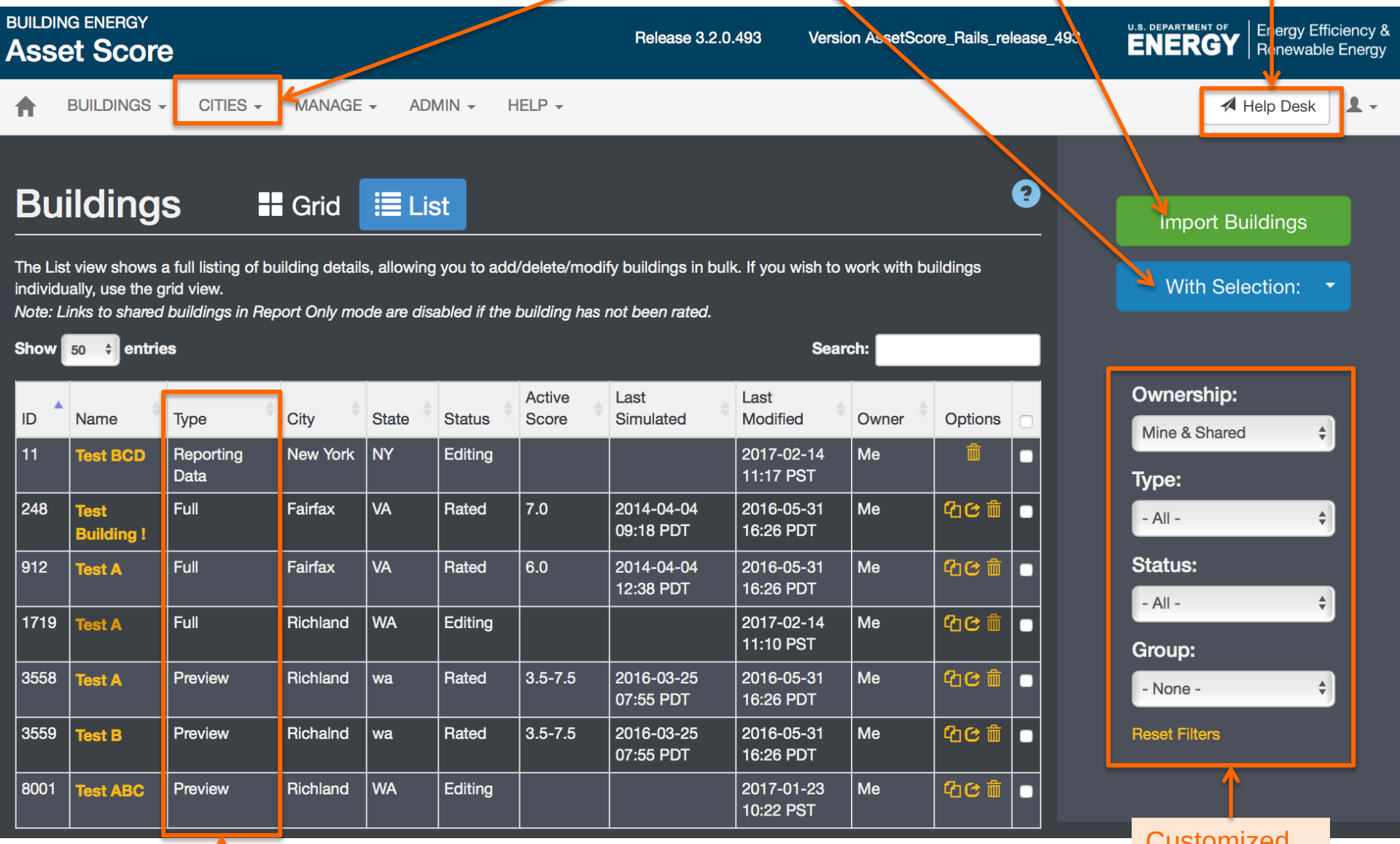
Asset Score Tool

City Dashboard

Various Reports Download

Batch Analysis for Preview

Professional User Service

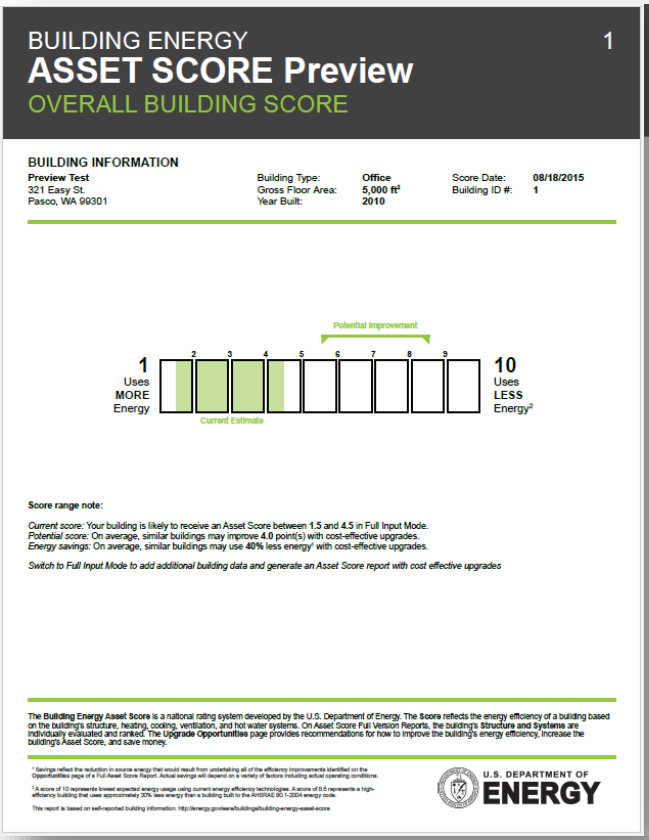


ID	Name	Type	City	State	Status	Active Score	Last Simulated	Last Modified	Owner	Options
11	Test BCD	Reporting Data	New York	NY	Editing			2017-02-14 11:17 PST	Me	
248	Test Building !	Full	Fairfax	VA	Rated	7.0	2014-04-04 09:18 PDT	2016-05-31 16:26 PDT	Me	
912	Test A	Full	Fairfax	VA	Rated	6.0	2014-04-04 12:38 PDT	2016-05-31 16:26 PDT	Me	
1719	Test A	Full	Richland	WA	Editing			2017-02-14 11:10 PST	Me	
3558	Test A	Preview	Richland	wa	Rated	3.5-7.5	2016-03-25 07:55 PDT	2016-05-31 16:26 PDT	Me	
3559	Test B	Preview	Richalnd	wa	Rated	3.5-7.5	2016-03-25 07:55 PDT	2016-05-31 16:26 PDT	Me	
8001	Test ABC	Preview	Richland	WA	Editing			2017-01-23 10:22 PST	Me	

Integrated Preview, Full AS, & Audit Data Reporting

Customized Building Filters

Asset Score Reports


BUILDING ENERGY 1
ASSET SCORE Preview
OVERALL BUILDING SCORE

BUILDING INFORMATION

Preview Test
321 Easy St.
Pasco, WA 99301

Building Type: Office
Gross Floor Area: 5,000 ft²
Year Built: 2010

Score Date: 08/18/2015
Building ID #: 1

Potential Improvement
1 Uses MORE Energy
10 Uses LESS Energy²
Current Estimate

Score range note:

Current score: Your building is likely to receive an Asset Score between 1.5 and 4.5 in Full Input Mode.
Potential score: On average, similar buildings may improve 4.0 point(s) with cost-effective upgrades.
Energy savings: On average, similar buildings may use 40% less energy¹ with cost-effective upgrades.

Switch to Full Input Mode to add additional building data and generate an Asset Score report with cost effective upgrades

The **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 building based on the building's structure, heating, cooling, ventilation, and hot water systems. On Asset Score Full Version Reports, the building's **Structure and Systems** are individually evaluated and ranked. The **Upgrade Opportunities** page provides recommendations for how to improve the building's energy efficiency, increase the building's Asset Score, and save money.

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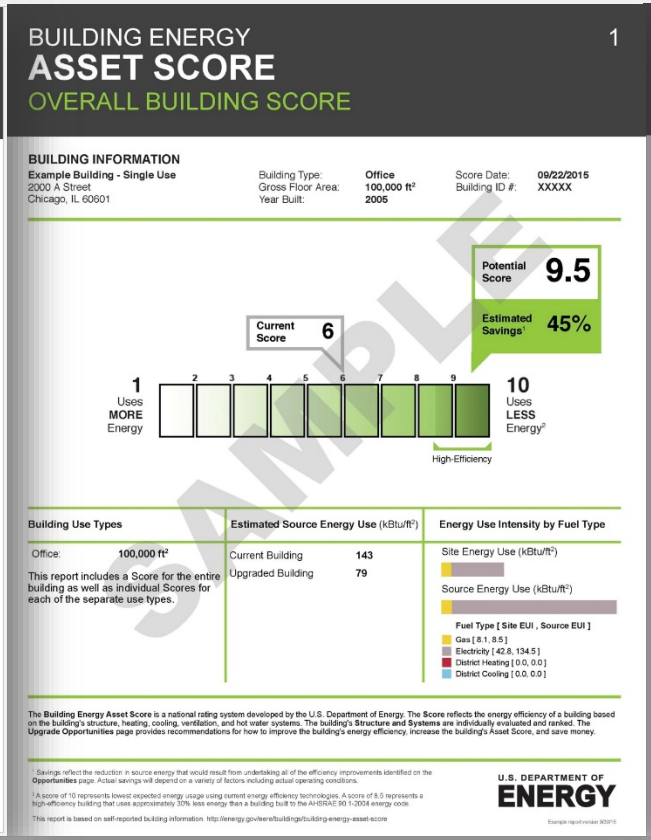
BUILDING ENERGY 1
ASSET SCORE
OVERALL BUILDING SCORE

BUILDING INFORMATION

Example Building - Single Use
2000 A Street
Chicago, IL 60601

Building Type: Office
Gross Floor Area: 100,000 ft²
Year Built: 2005

Score Date: 09/22/2015
Building ID #: XXXXX

Potential Score 9.5
Estimated Savings¹ 45%
Current Score 6
1 Uses MORE Energy
10 Uses LESS Energy²
High-Efficiency

SAMPLE

Building Use Types	Estimated Source Energy Use (kBtu/ft²)	Energy Use Intensity by Fuel Type
Office: 100,000 ft²	Current Building 143	Site Energy Use (kBtu/ft²)
This report includes a Score for the entire building as well as individual Scores for each of the separate use types.	Upgraded Building 79	Source Energy Use (kBtu/ft²)
		Fuel Type [Site EUI , Source EUI]
		Gas [8.1, 8.5]
		Electricity [42.8, 134.5]
		District Heating [0.0, 0.0]
		District Cooling [0.0, 0.0]

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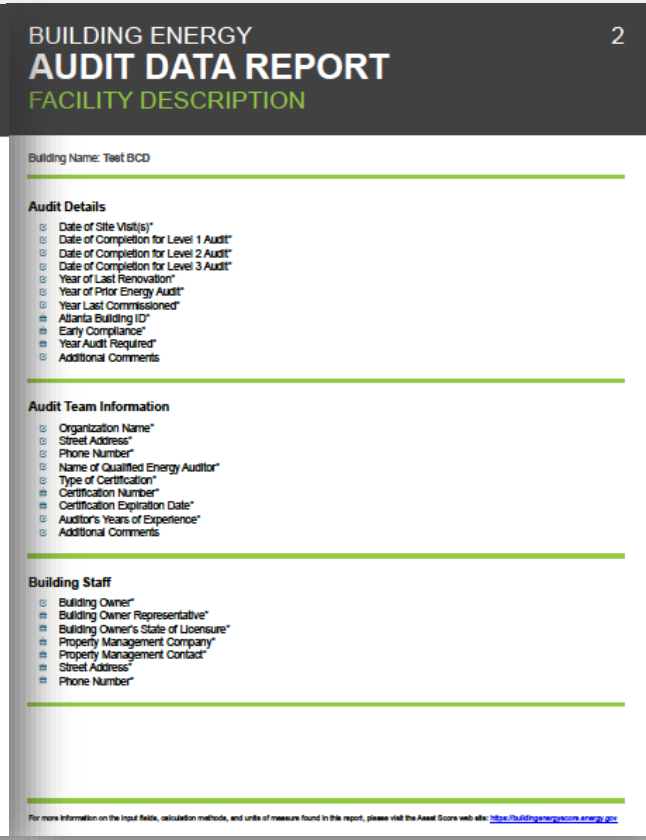

BUILDING ENERGY 2
AUDIT DATA REPORT
FACILITY DESCRIPTION

Building Name: Test BCD

Audit Details

- Date of Site Visit(s)*
- Date of Completion for Level 1 Audit*
- Date of Completion for Level 2 Audit*
- Date of Completion for Level 3 Audit*
- Year of Last Renovation*
- Year of Prior Energy Audit*
- Year Last Commissioned*
- Atlanta Building ID*
- Early Compliance*
- Year Audit Required*
- Additional Comments

Audit Team Information

- Organization Name*
- Street Address*
- Phone Number*
- Name of Qualified Energy Auditor*
- Type of Certification*
- Certification Number*
- Certification Expiration Date*
- Auditor's Years of Experience*
- Additional Comments

Building Staff

- Building Owner*
- Building Owner Representative*
- Building Owner's State of Licensure*
- Property Management Company*
- Property Management Contact*
- Street Address*
- Phone Number*

For more information on the input fields, calculation methods, and units of measure found in this report, please visit the Asset Score web site: https://buildingenergyscore.energy.gov

Preview (One Page)

- Score Range and Improvement Potential

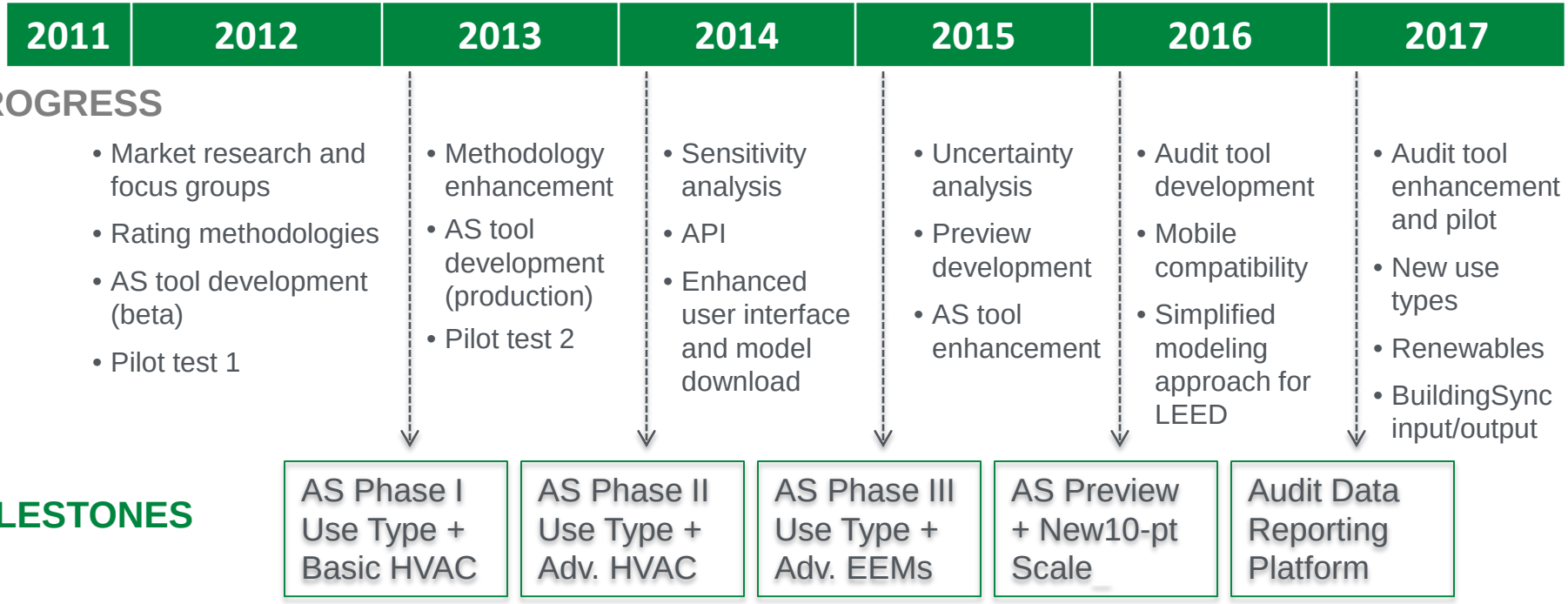
Asset Score (Four Sections)

- Score
- System Evaluation
- Upgrade Opportunities
- Building Asset

Audit Data Report

- Standard ASHRAE audit report in PDF, CSV, and BuildingSync formats

Progress and Accomplishments



Use Types

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

Progress and Accomplishments

Asset Score was recognized in the White House event on Jan 28, 2016.

- Created the 21 organization National Leadership Network.
- Demonstrated utility of the tool to both public and private sector orgs.

https://www.whitehouse.gov/the-press-office/2016/01/29/fact-sheet-cities-utilities-and-businesses-commit-unlocking-access

- AECOM
- Arup
- Association of Energy Engineers
- CH2M Hill
- City of Milwaukee, WI
- DNV GL
- FS Energy
- Ingersoll Rand
- JBG Companies
- Liberty Property Trust
- Marriott International
- Marx Okubo
- National Oceanic & Atmospheric Administration
- Performance Systems Development
- Skidmore, Owings & Merrill
- State of Missouri
- State of Rhode Island
- Steven Winter Associates
- Transwestern
- U.S. General Services Administration
- YR&G

Adoption:	January 2016	February 2017
Buildings Scored	825	1735
Sq.ft. Valuated	83 million	186 million
Sq.ft. in Progress	155 million	169 million
States	30	45
User Accounts	792	1716

Project Integration and Collaboration

Project Integration:

- Reached out to 200+ entities
- Maintaining communications with 50+ key stakeholders
- A national network of DOE, leading companies, federal agencies, and state and local governments has been formed to expand the tool's use and guide its future development

Subcontractors and Collaborators:

- NREL providing Open Studio technical support
- PSD providing Help Desk user support
- CBEI provided regional user outreach and NJIT developed training curriculum

Communications:

- Greenbuild 2016
- Energy Exchange 2016
- World Energy Engineering Congress 2016
- ACEEE Summer Study 2016
- Better Buildings Summit 2017
- Building Simulation 2017
- Numerous 1:1 webinars with interested stakeholder groups
- Invited presentations and trainings

Next Steps and Future Plans

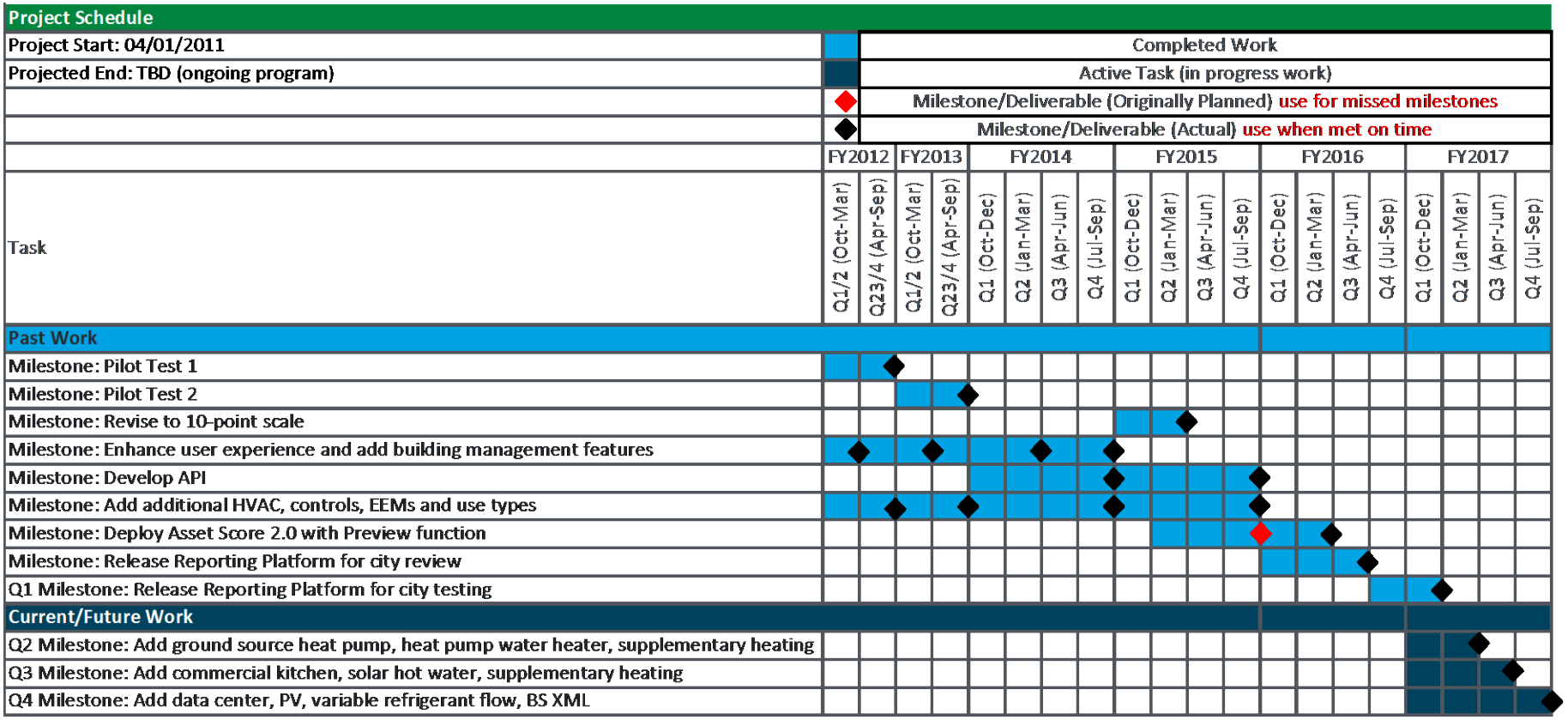
- Expand building use types to include food service, food sales, hospitals, data centers, laboratories
- Integrate onsite renewables
- Read and write BuildingSync XML to exchange data with other tools
- Pilot test Reporting Platform with cities
- Test Preview with City of Seattle (through building retuning ordinance) and City of Portland (through building benchmarking and permitting)
- Work with GBCI on testing simplified modeling approach for LEED energy credits
- Develop unique building identification to facilitate data integration with other markets beyond building energy efficiency
- Develop assessor qualifications and associated quality assurance protocols

REFERENCE SLIDES

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Project Budget

Cost to Date: $9,350,783
Additional Funding: none

Budget History					
April 2011 – FY 2016 (past)		FY 2017 (current)		FY 2018 – TBD (planned)	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
$7,263,000	$0	$2,087,783	$0	TBD	$0

Project Plan and Schedule