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

# Data Tools

## BPD, SEED & Data Accelerator

BTO Peer Review

April 23, 2014

2:00-3:30

**Elena Alschuler**
Building Technologies Program
U.S. Department of Energy

# Building Owners Use Data to Improve Energy Efficiency

**Among facility managers who have used ENERGY STAR for benchmarking:**

**70%**
Have used ENERGY STAR to guide energy efficiency upgrade plans

**67%**
have used ENERGY STAR to justify an energy efficiency project

Audin, Lindsay. "Finding Your Best Energy Opportunity." Building Operating Management. December, 2011.

**Utility programs promoting benchmarking can drive similar results:**

**62%**
said that benchmarking strongly influenced them to take energy management actions

**84%**
made energy efficiency retrofits or operational improvements to their buildings

California Statewide Benchmarking Process Evaluation, NMR Group, Inc. April, 2012.

# DOE's Vision for Performance-Based Approaches

## By making building energy performance clearly traceable:

- **Owners, operators, and product and service providers** can understand the drivers of variations in building performance, identify efficiency investment opportunities, and project the likely savings from investments.

- **Public sector actors** can tailor the design and implementation of energy efficiency programs and policies to be most effective given local market conditions and trends.

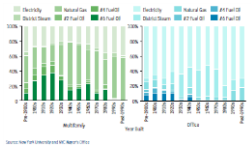
# Building a Foundation for Private Tools & Activities



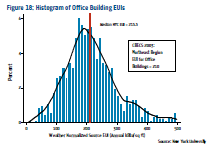
③ An Ecosystem of Private Tools

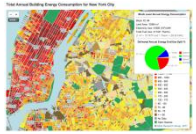
② A Common Data Taxonomy

① A Linked Set of Metrics and Platforms



**Private Sector Tools**





**Building Energy Performance Data Exchange Specification (BEDES)**

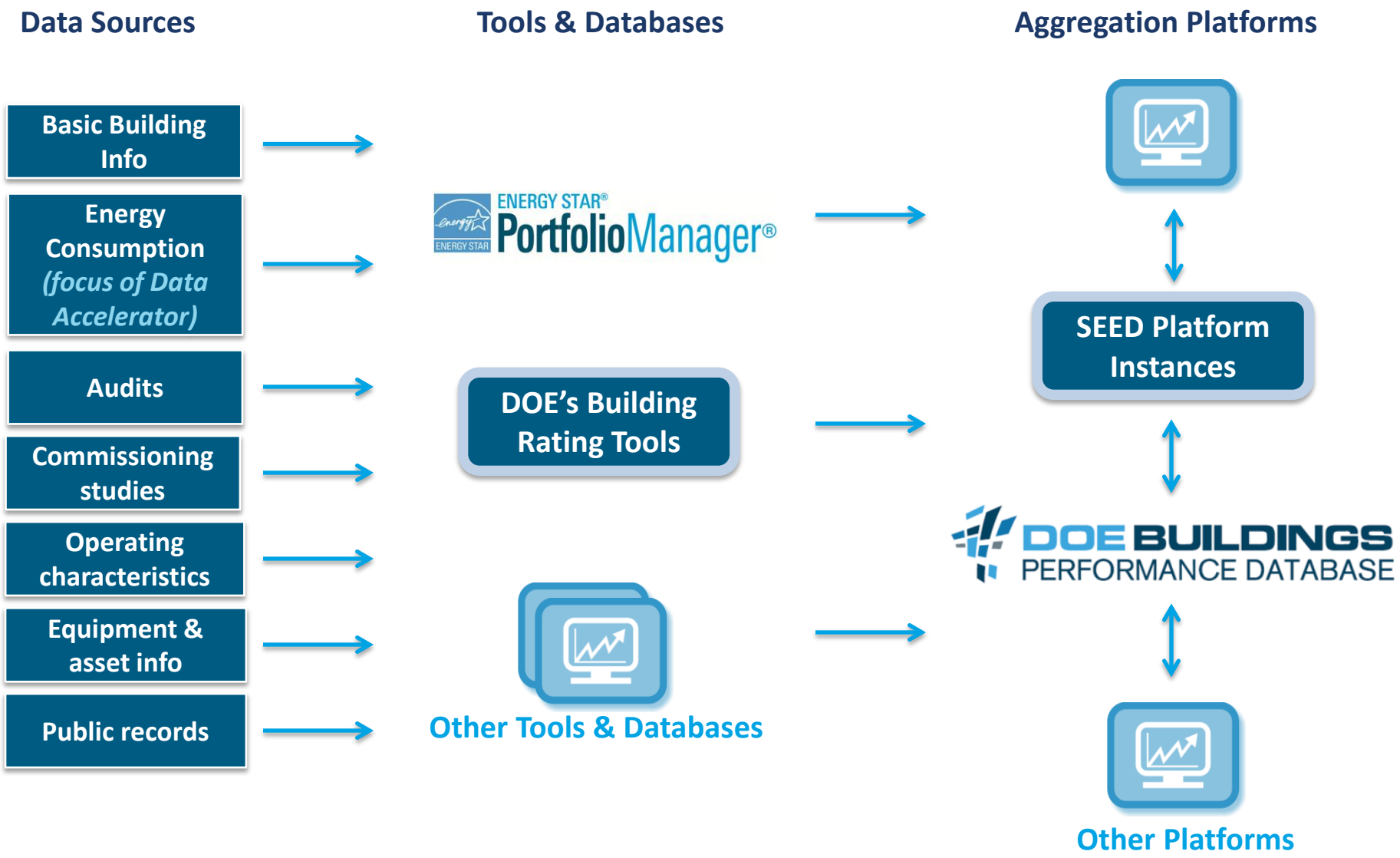
**Open Studio**

**National Bldg Rating System: Asset Score, Operational Assessment, Peer Benchmarking**

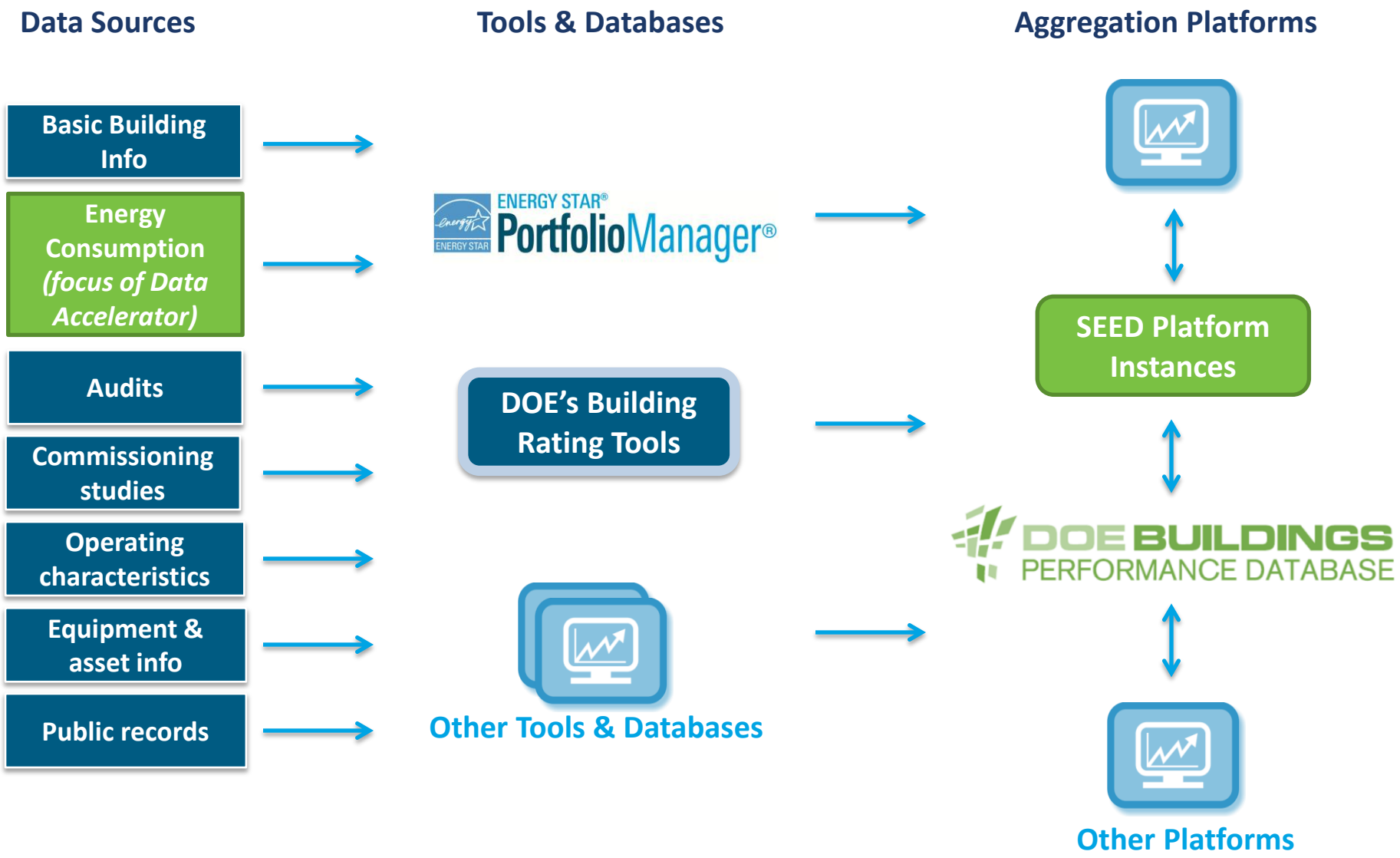
**SEED Platform**

**Buildings Performance Database (BPD)**

# Supporting Interoperability at Different Scales

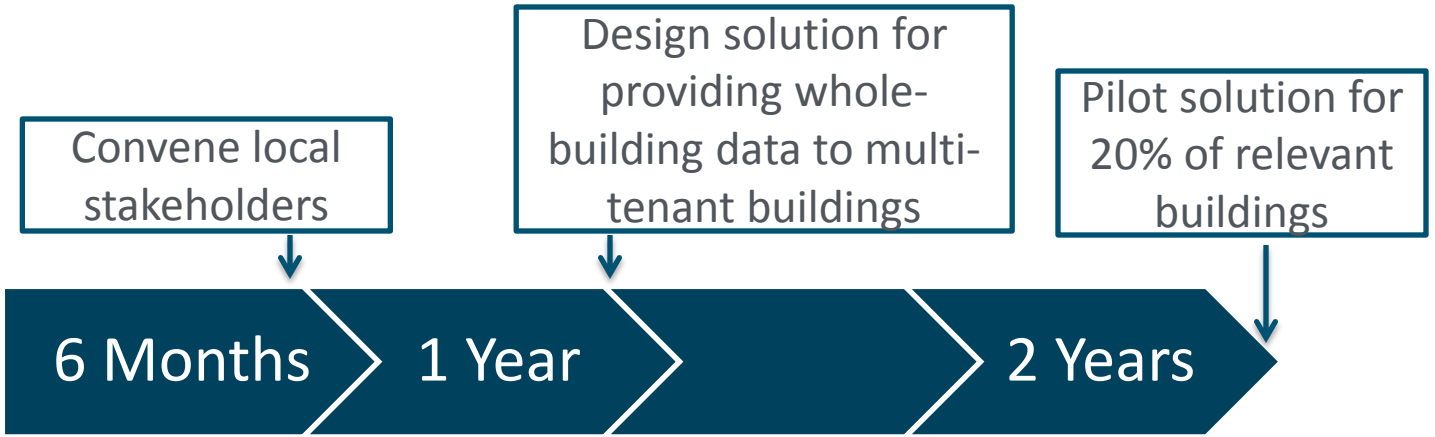


# Today's Agenda



# DOE Energy Data Accelerator

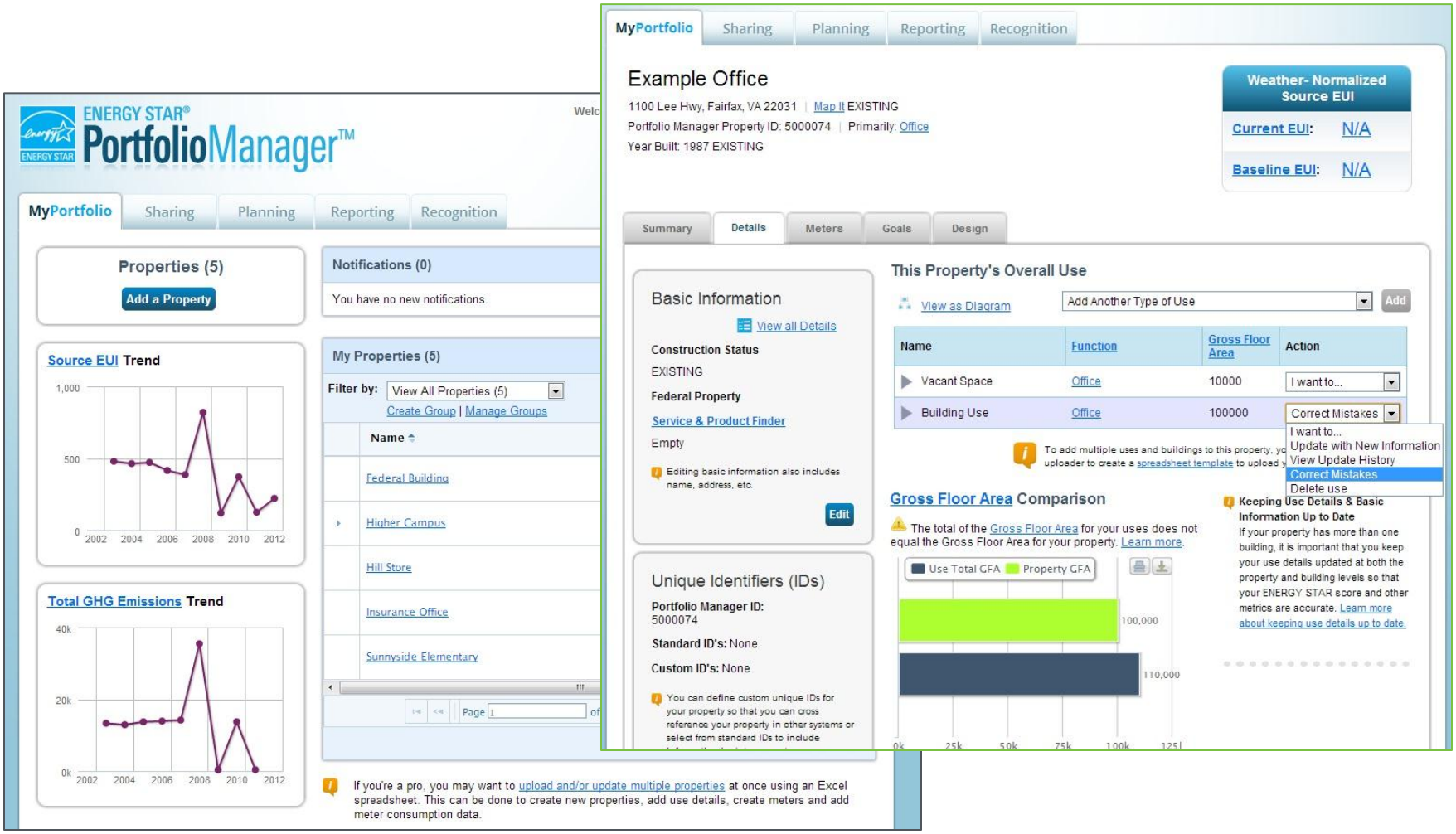
By the end of two years DOE will accelerate the ability of building owners to gain access to whole-building data by working together with cities and utilities to:




- Demonstrate **low-cost, standardized approaches** for providing energy data for the purpose of whole-building energy performance benchmarking.
- Develop best practice approaches for **reliable and secure** utility aggregation of energy data from multiple accounts to facilitate whole-building benchmarking while **protecting privacy**.
- Demonstrate tools that **streamline the transfer** of utility bill data to benchmarking tools, including standard data formats for ENERGY STAR® Portfolio Manager.

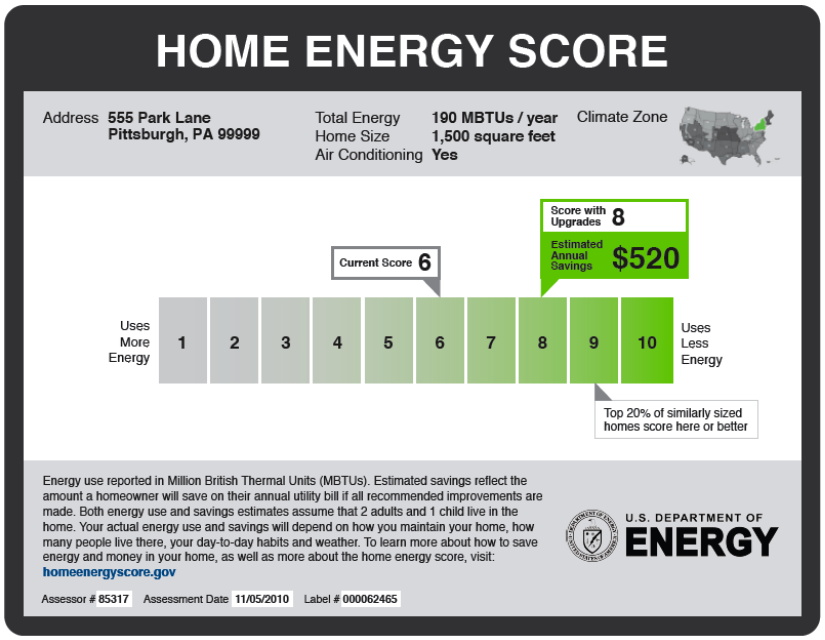
# ENERGY STAR Portfolio Manager

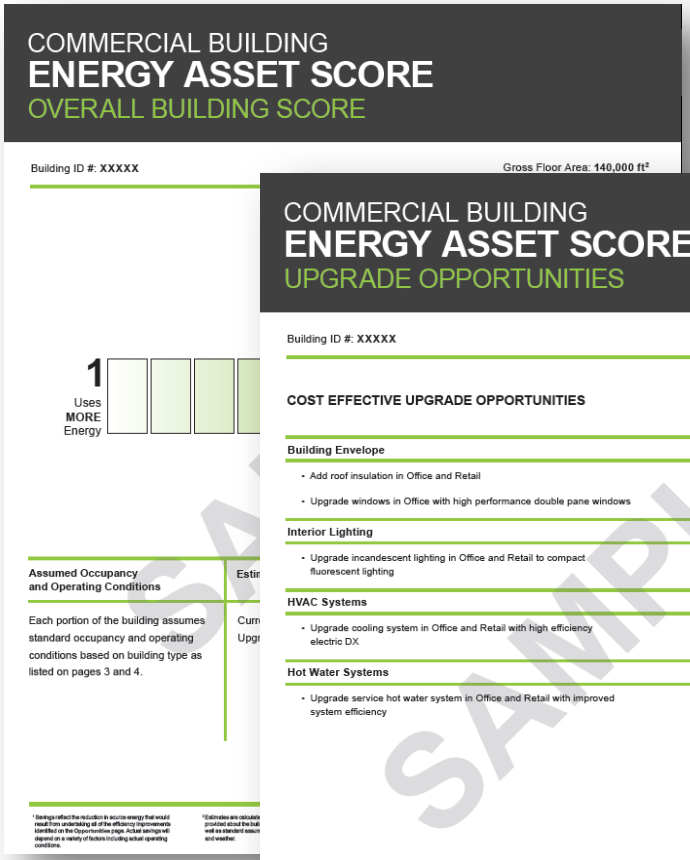
Tracks building energy and water consumption, and provides a weather normalized EUI and a whole building score, based on actual energy performance.

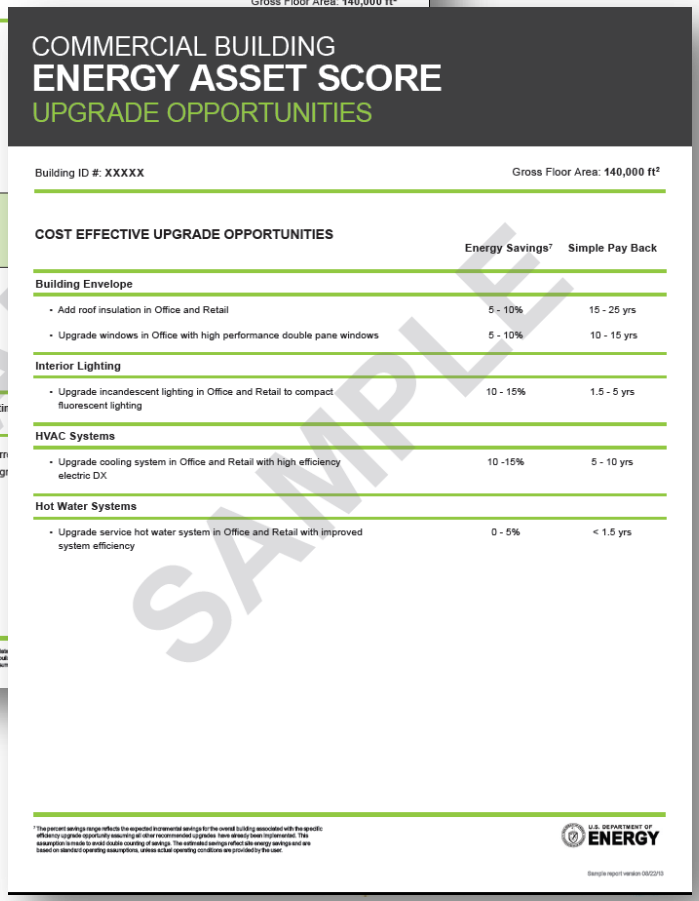


# Commercial Asset Score & Home Energy Score

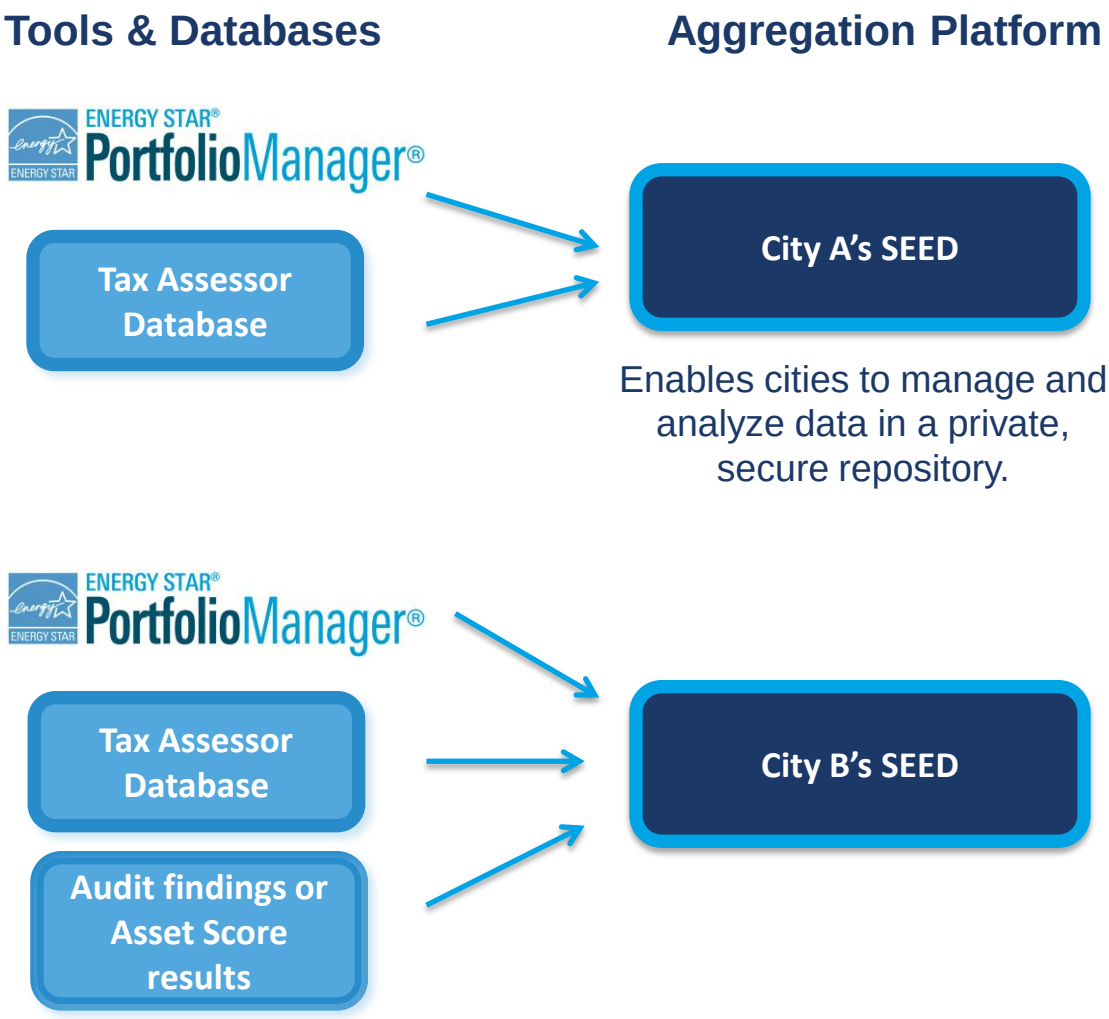
Provides a whole-building score and identifies inefficient systems and potential capital upgrades, based on as-built physical characteristics (independent of operations).



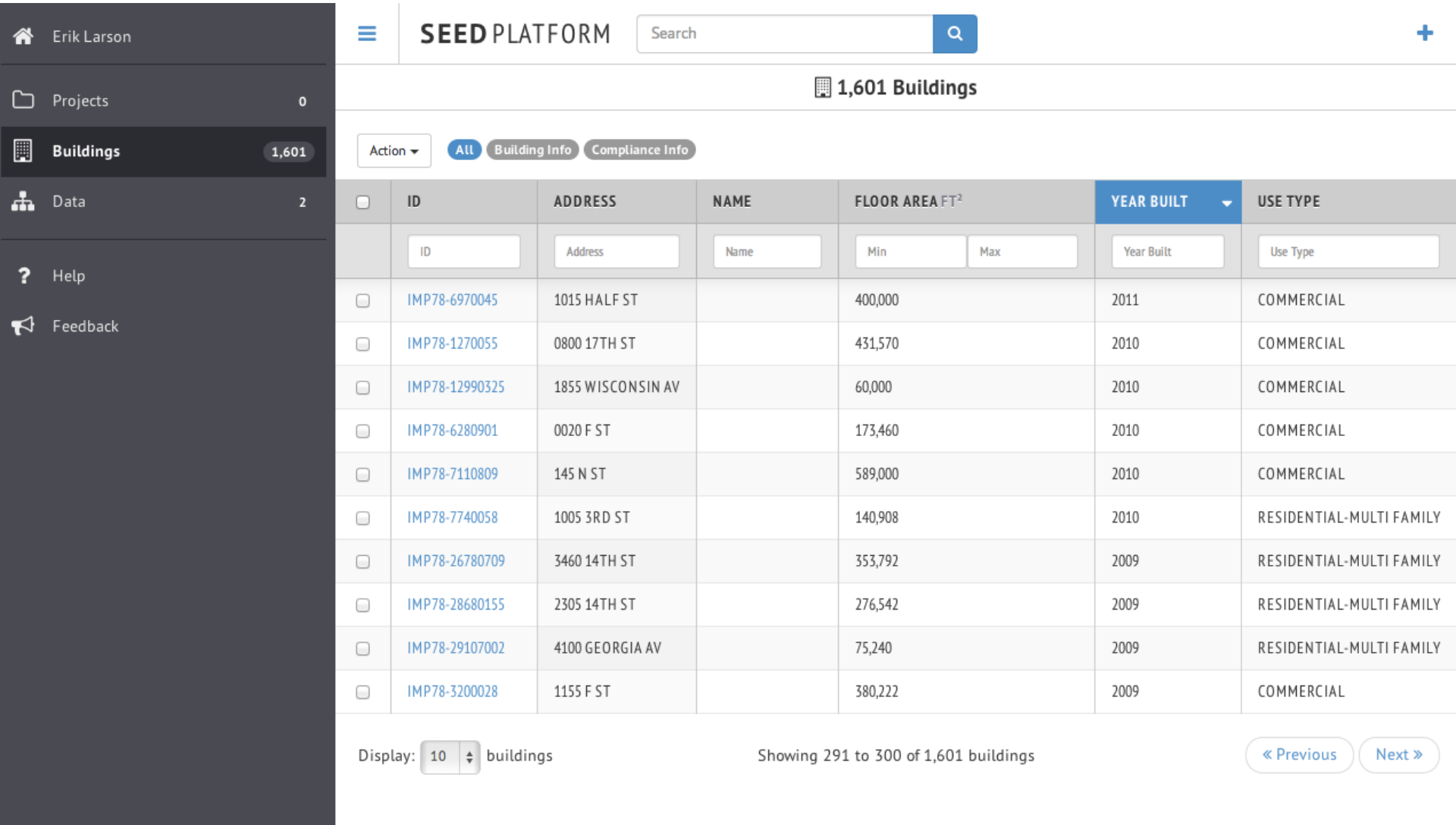



# To manage benchmarking programs, Cities combine data about many buildings from a range of tools and sources

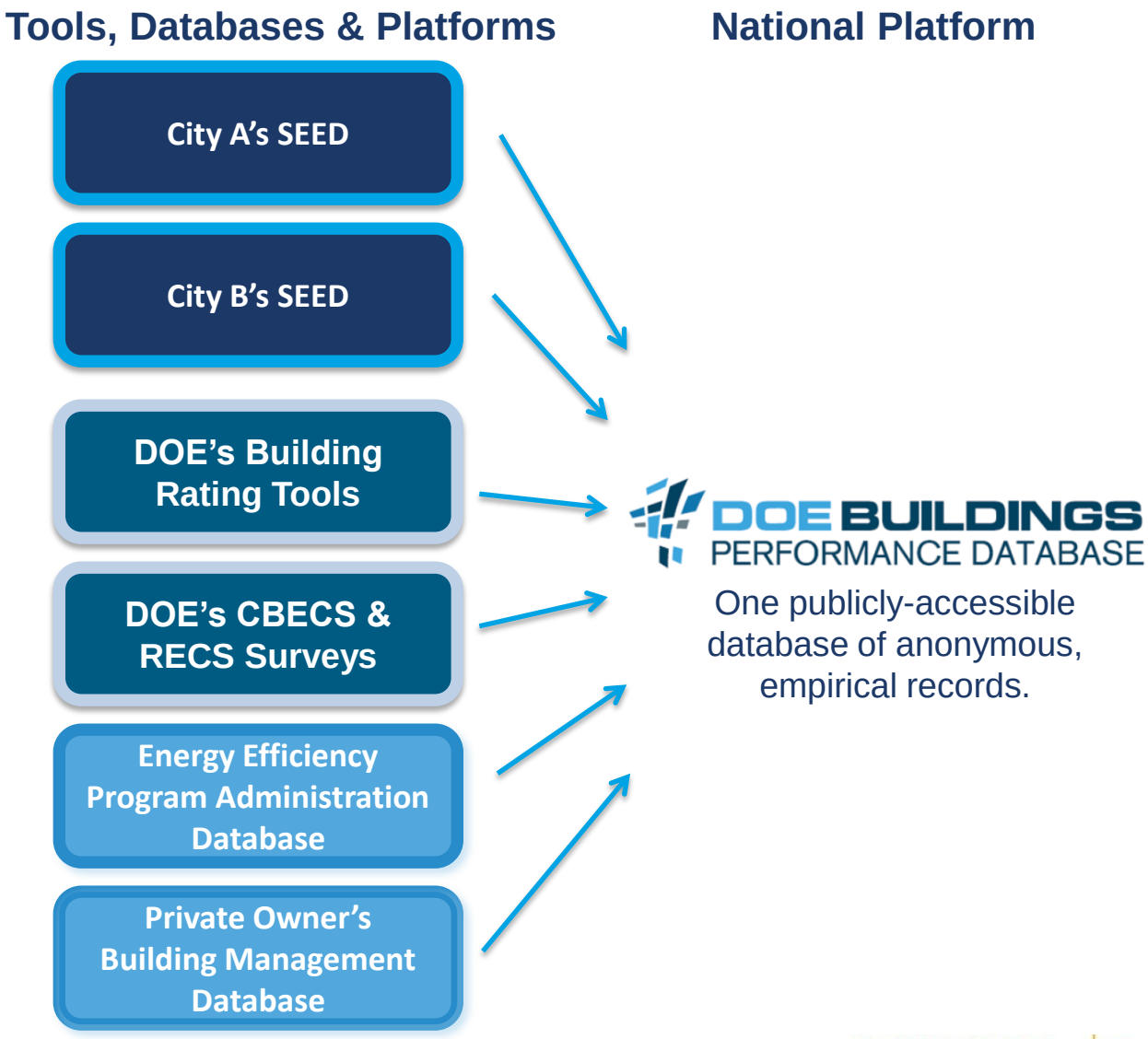


# Standard Energy Efficiency Data (SEED) platform

- V1 designed to help cities manage data resulting from building performance reporting programs for private and/or public buildings.
- Potential for a wide range of other uses by public entities, efficiency programs, etc.

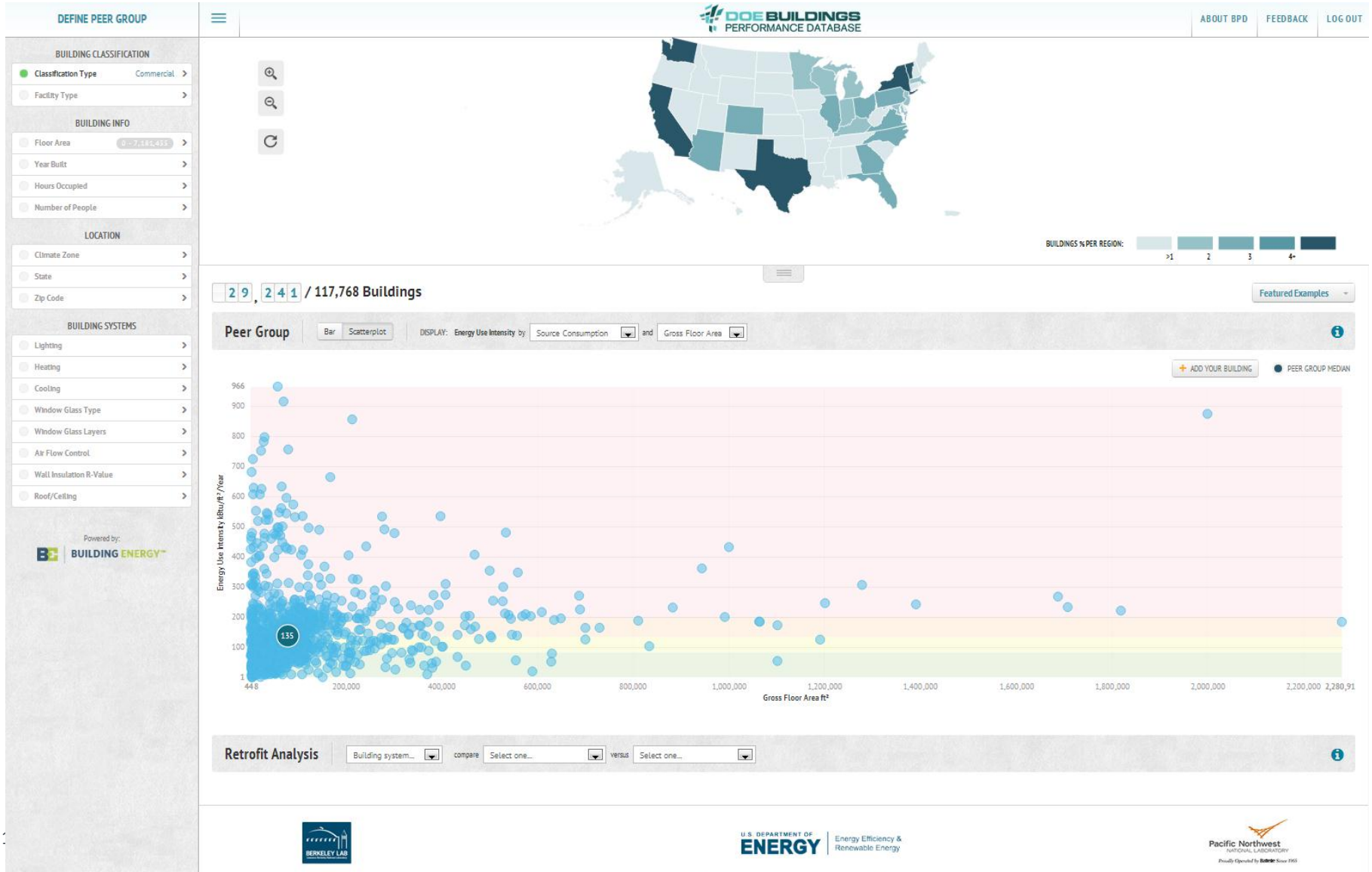


# Data contributed to the Buildings Performance Database can be accessed in aggregate by the public.



# The Buildings Performance Database (BPD)

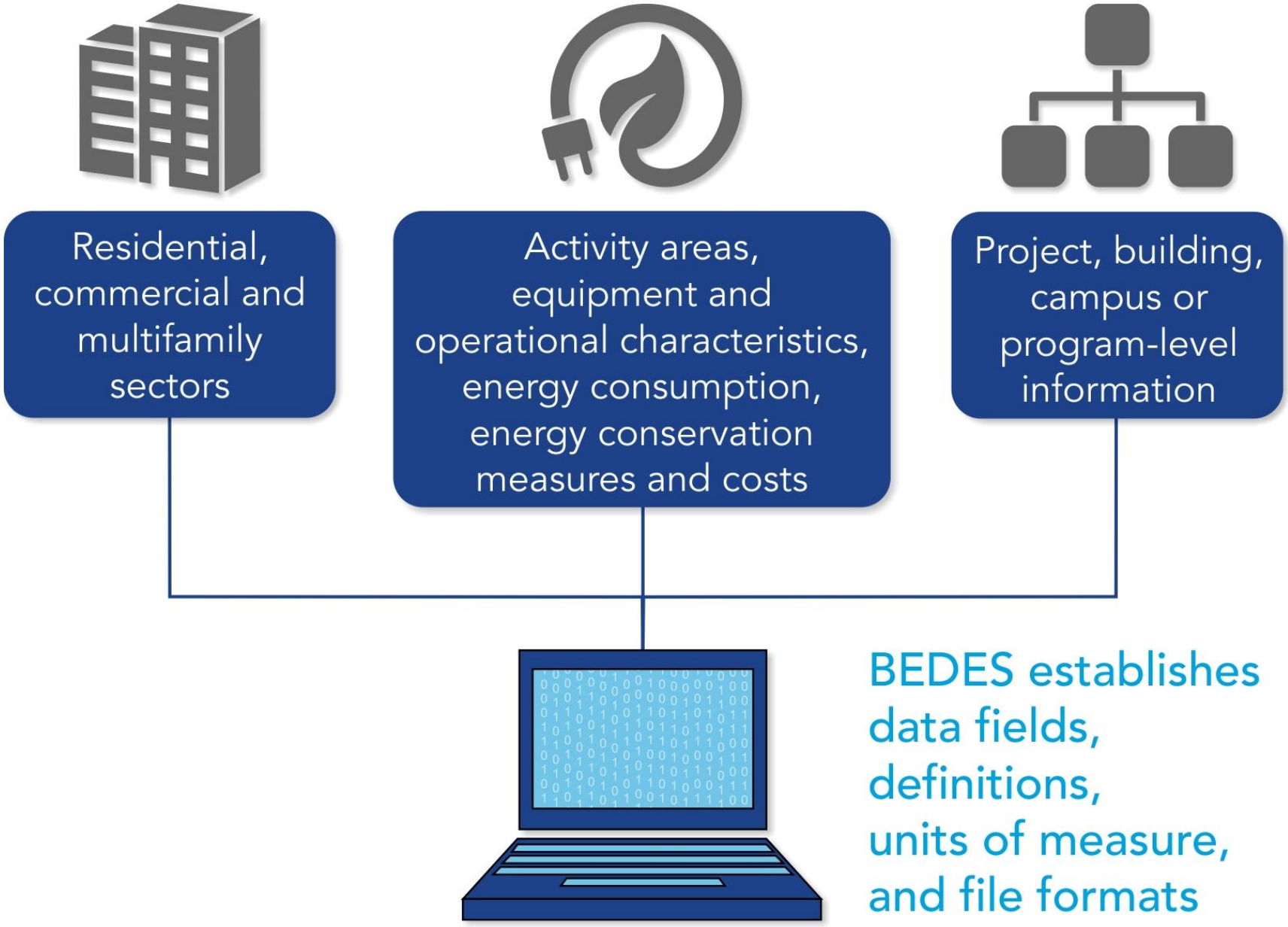
The BPD enables users to statistically analyze trends in the energy performance and physical & operational characteristics of real commercial and residential buildings.



# A common data format makes it easier to exchange and combine data among all the tools, databases and platforms

The Building Energy Data Exchange Specification (BEDES)

# The Building Energy Data Exchange Specification



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# International Data Activities

## US-China CERC & US-India CBERD

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4:00-5:00

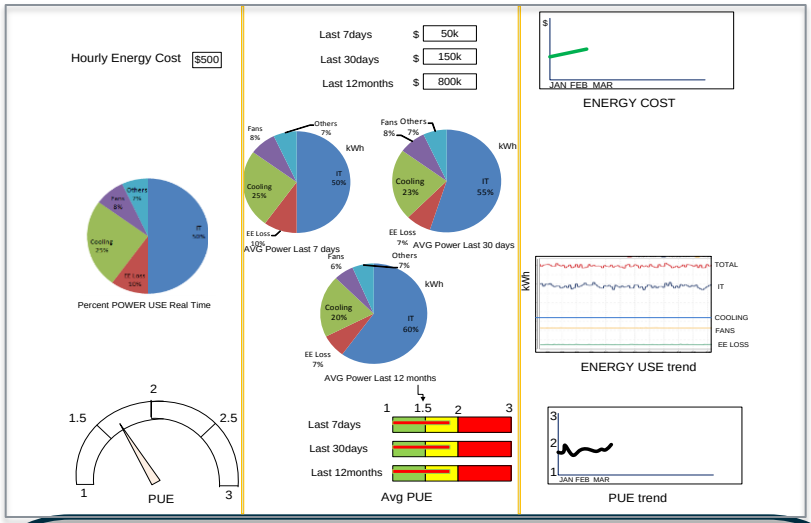
**Rich Karney**
Building Technologies Program
U.S. Department of Energy

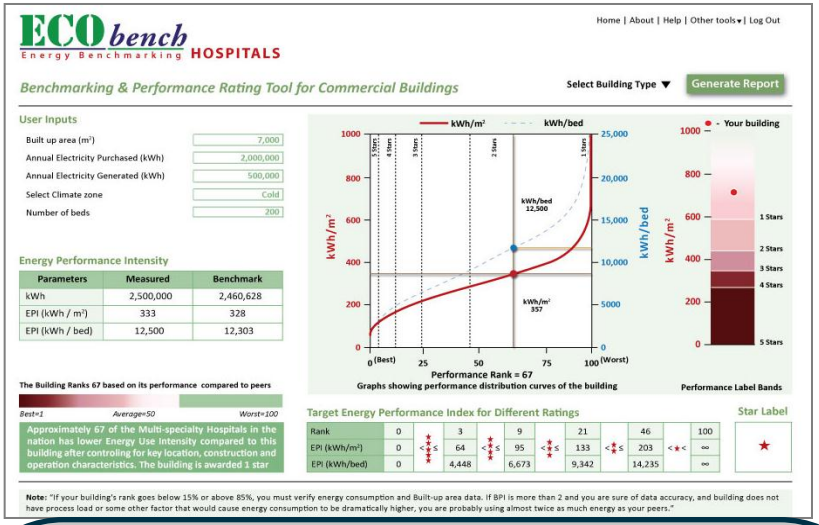
# US-China CERC: Research on low-energy building O&M

**Project Goals** (by December 2015):

- A piloted building energy database, benchmarking system, and policy framework for public buildings in China.
- US building technology and solution providers trained on use of benchmarking system to sell energy services (through US-China ECP platform).
- China incorporate benchmarking into 13th Five Year Plan activities.
- Research findings to US DOE on China's real-time energy monitoring; innovations in building energy performance codes, standards, and policies; and the development of the energy quota standard.

# US-India CBERD Monitoring and Benchmarking




## Monitoring

- *EIS Market Intelligence:* Market segmentation; technical, usability and cost requirements for EIS solutions
- *R&D:* Sample specification and selection guides; cost-benefit framework for packaged EIS
- *Deployment:* Implement in 5-10 demonstration sites

## Benchmarking

- *Market Intelligence:* Analysis of current state of the art, goals, use cases and gaps
- *R&D:* Develop new techniques/ algorithms for asset, operation and system level benchmarking.; Prototype next-gen database design, algorithms and tools
- *Deployment:* Training workshops; technical assistance to potentially Energy Star, India's BEE Benchmarking program etc



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