Better Buildings®
U.S. DEPARTMENT OF ENERGY

Mobilizing Benchmarking Data to Create New Outcomes

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May 10, 2016

U.S. DEPARTMENT OF ENERGY

Energy Benchmarking

Seattle Office of Sustainability and Environment

5.10.16

Mobilizing Benchmarking Data to Create New Outcomes

Overview

SEATTLE ENERGY BENCHMARKING & REPORTING

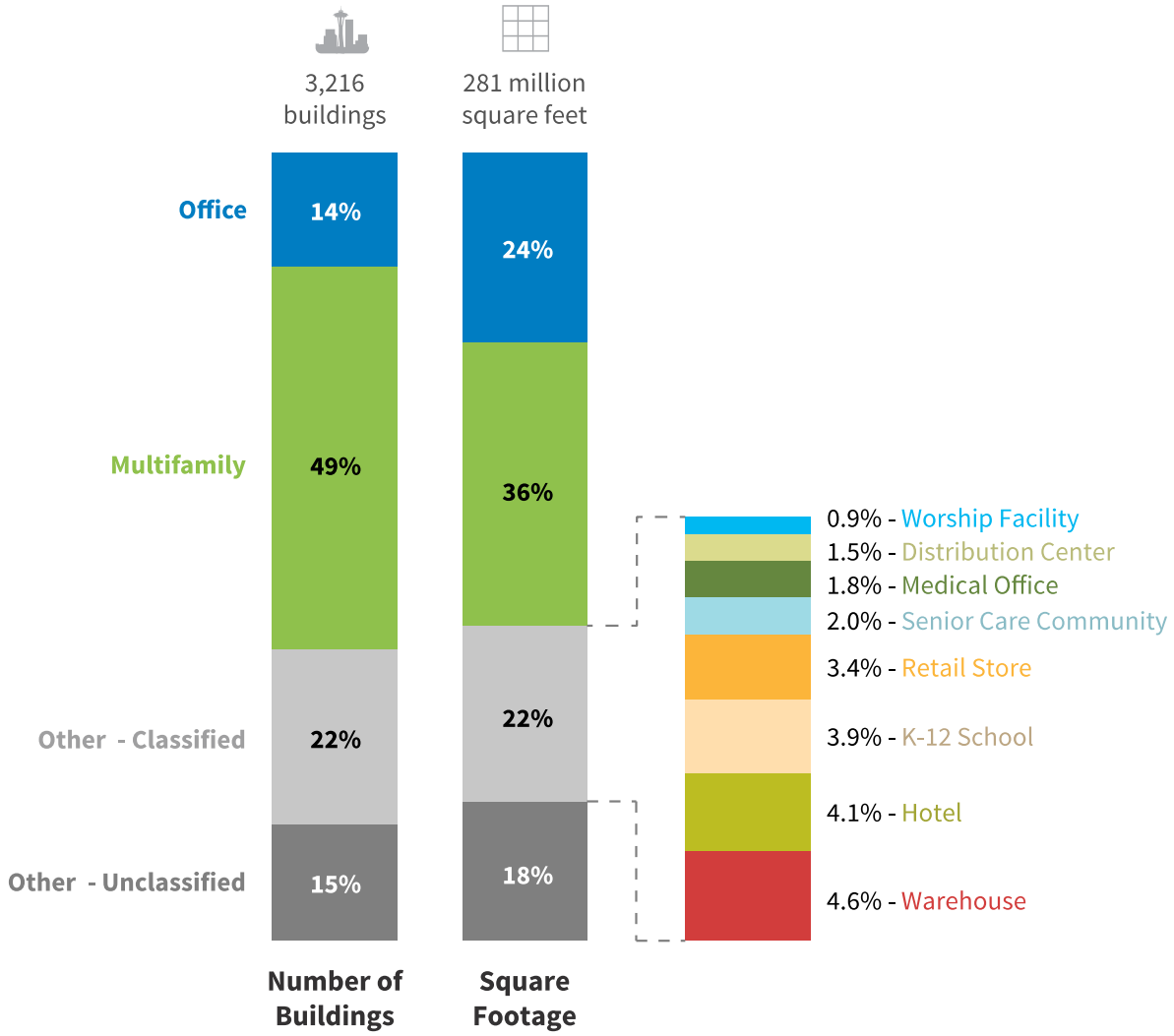
Seattle Policy Landscape

- Climate Action Plan
  - Carbon Neutral by 2050
- Annual Energy Benchmarking
  - Commercial & multifamily buildings 20,000 sf +
- Building Tune-ups
  - Commercial buildings 50,000 sf+ every 5 years

SEATTLE CLIMATE ACTION PLAN

Benchmarking Dataset

SEATTLE ENERGY BENCHMARKING & REPORTING



3,216
buildings

281
million square feet

99%
Compliance Rate

Performance Ranges

SEATTLE ENERGY BENCHMARKING & REPORTING

Type of Building	2014 Annual Energy Use Intensity (Site EUI in kBtu/sf)					Number of Buildings	Year Built (median)	Size (median sf)	EPA ENERGY STAR (median)[1]
	Median	Lowest Use (1st Quartile)	Medium-Low (2nd Quartile)	Medium-High (3rd Quartile)	Highest Use (4th Quartile)				
Low -Rise Multifamily[2]	29.6	≤24	25-30	31-37	≥38	937	1978	29,816	74*
Mid-Rise Multifamily[2]	33.2	≤27	28-33	34-44	≥45	467	1997	52,101	70*
High-Rise Multifamily[2]	47.7	≤40	41-48	49-59	≥60	87	1981	140,241	49*
Small- to Mid-size Office[3]	54.9	≤38	39-55	56-72	≥73	303	1962	37,500	70
Large Office[3]	58.1	≤49	50-58	59-76	≥77	145	1983	204,993	81
Warehouse	25.7	≤14	15-26	27-46	≥47	187	1964	39,600	57
Distribution Center	28.6	≤20	21-29	32-43	≥44	54	1967	46,355	54
Self-Storage Facility	17.0	≤12	13-17	18-30	≥31	23	1956	38,959	NA
Refrigerated Warehouse	47.2	≤31	32-47	48-99	≥100	11	1955	27,200	81
K-12 School[4]	42.5	≤36	37-43	44-52	≥53	127	1961	54,986	81
Retail Store	61.8	≤42	43-62	63-92	≥93	98	1966	41,881	68
Hotel/Motel	80.0	≤55	56-80	81-100	≥101	70	1977	88,468	57
Worship Facility	35.4	≤24	25-35	36-46	≥47	68	1952	26,298	70
Medical Office	82.5	≤66	67-83	84-112	≥113	41	1984	66,588	50
Senior Care Community	67.8	≤51	52-68	69-105	≥106	40	1981	87,550	53
Hospital	208.2	≤169	170-208	209-222	≥223	10	1960	428,993	53
Supermarket	272.3	≤206	207-272	273-304	≥305	36	1997	42,104	38
Restaurant	145.8	≤97	98-146	147-192	≥193	13	1919	31,020	NA

www.seattle.gov/Documents/Departments/OSE/EBR-2014-EUI-Chart.pdf

Data Analysis

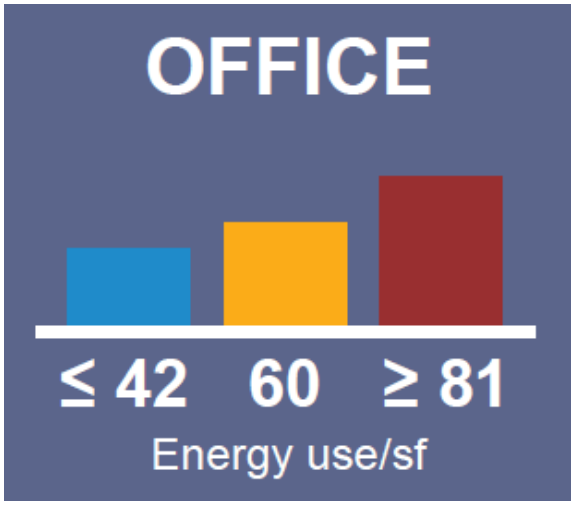
SEATTLE ENERGY BENCHMARKING & REPORTING

Inform Owners: Encourage Action

SEATTLE ENERGY BENCHMARKING & REPORTING

How does your building stack up?

- ❑ Energy Management
- ❑ Connect to Incentives



Seattle Office Building Energy Performance

LOWEST USE	MEDIUM-LOW	MEDIUM-HIGH	HIGHEST USE
42 or less	43-60	61-80	81 or more

Your Building's EUI: **77** kBtu/sf

Potential Savings

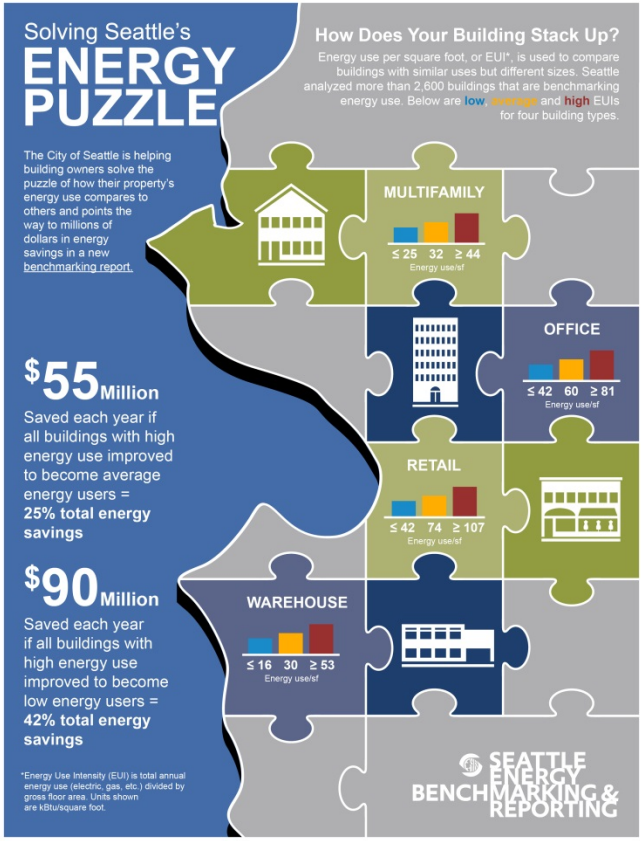
SEATTLE ENERGY BENCHMARKING & REPORTING

$55 million

saved each year if all buildings with high energy use improved to become average energy users
= **25% total energy savings**.

$90 million

saved each year if all buildings with high energy use improved to become low energy users
= 40% total energy savings.



Market Research

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- Ethnography
- Interviews
- Focus groups
- Surveys

Feedback Loops

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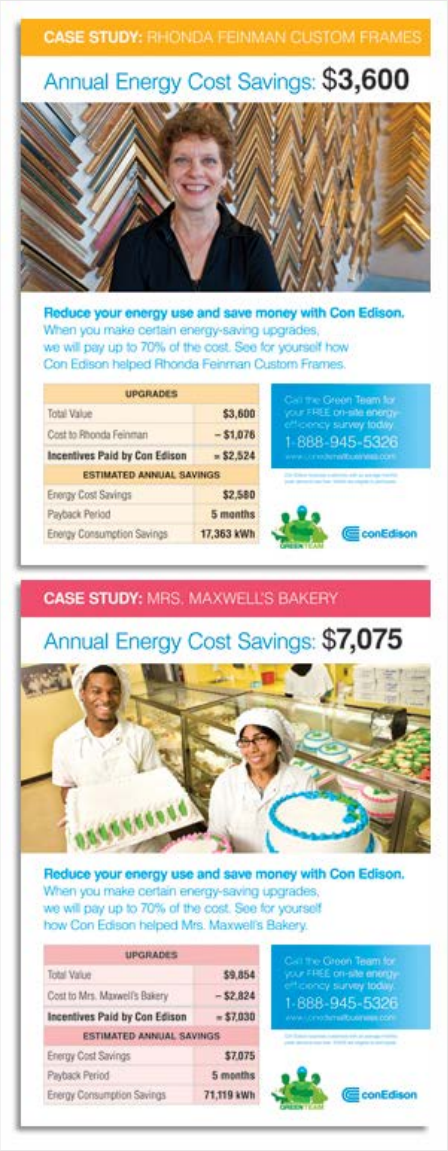
Support Property Managers

SEATTLE ENERGY BENCHMARKING & REPORTING

- Relatable similar scenarios
- Financial incentives
- Data visualization
- Give us personalized support
- Share peer success stories



Data Access

How does your building stack up?

Compare your building's energy performance to similar buildings in Seattle. To see if your building is a low, average, or high energy user, select your building type and input its *site EUI* and *ENERGY STAR Score* (if available). Your building will appear as a dotted line on the performance charts below.

Enter your building's information below:

Your Building Type	**Your Building's EUI**	**ENERGY STAR score** *(where applicable)*
(All)	0	None

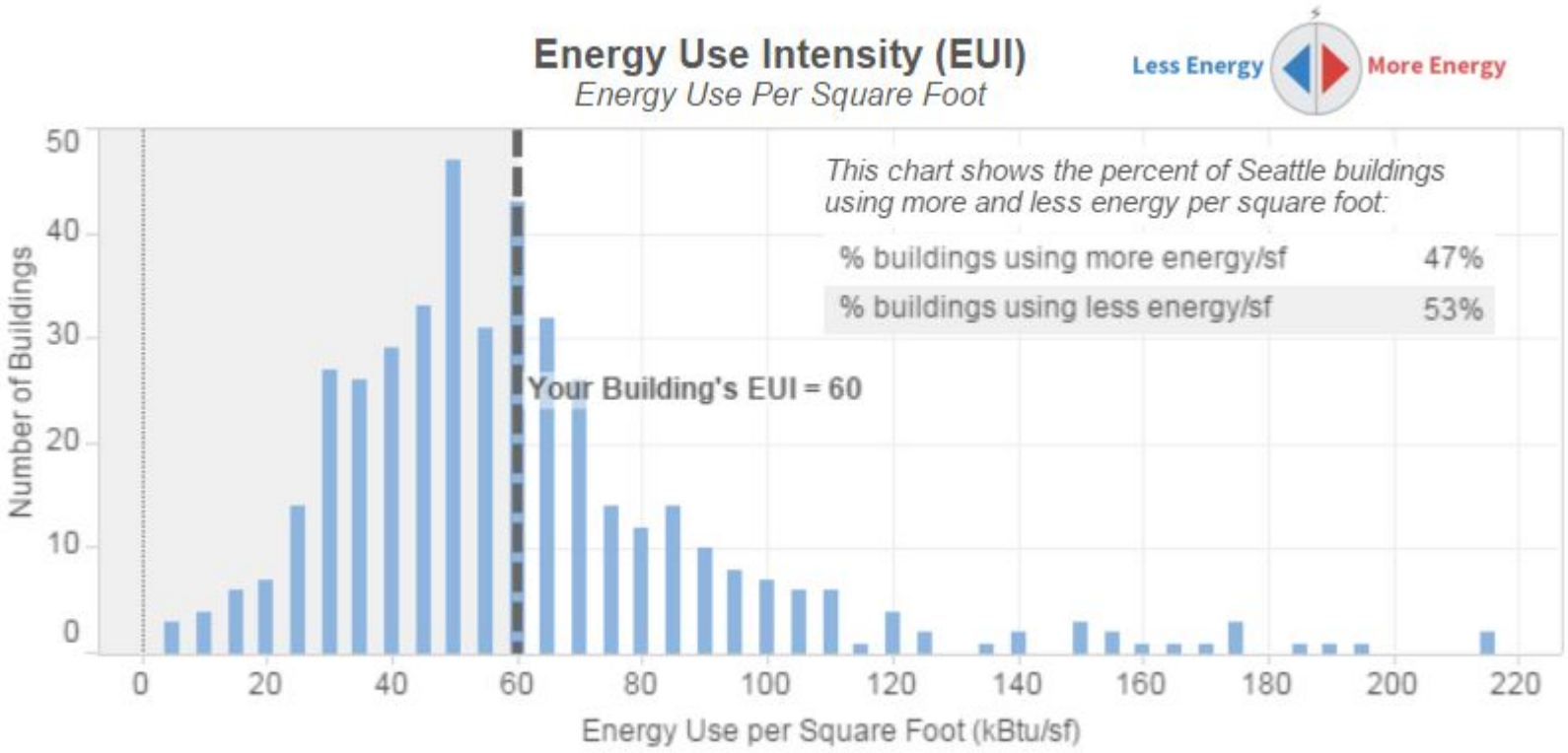
For a more refined comparison, select the vintage of your building (*available for some building types only*):

Date Constructed (optional)

(All)

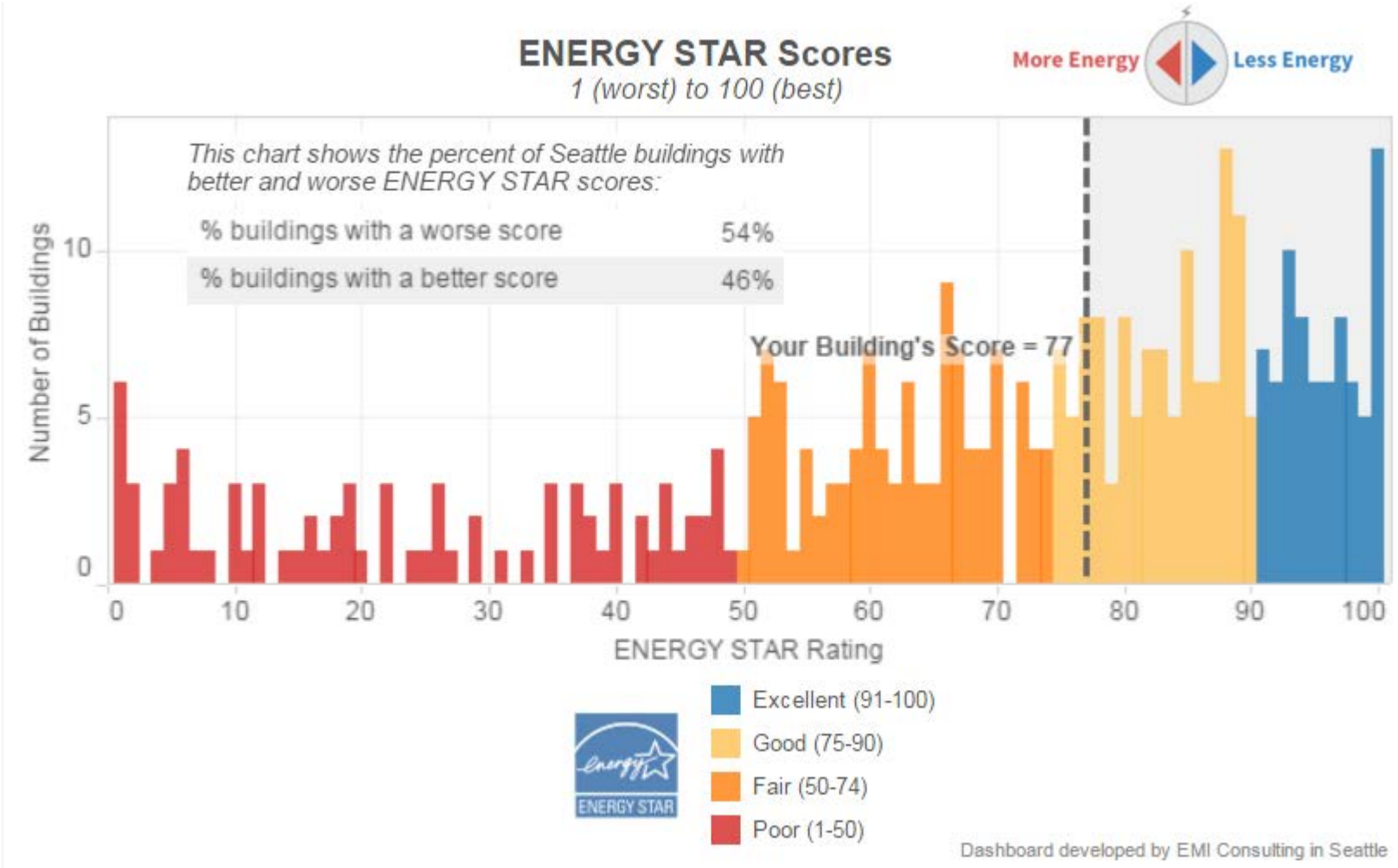
Seattle Dashboard

SEATTLE ENERGY BENCHMARKING & REPORTING



Compare Building Scores

SEATTLE ENERGY BENCHMARKING & REPORTING

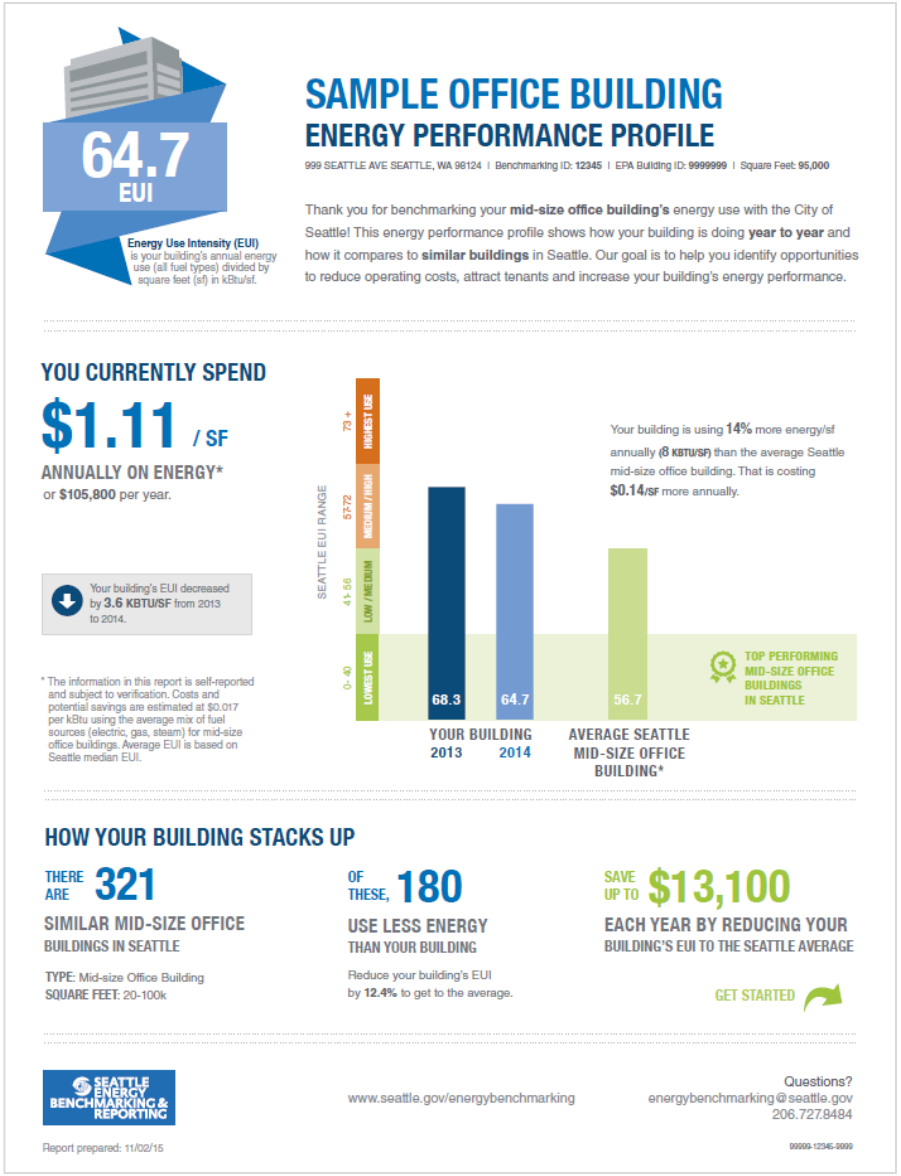


Performance Profiles

SEATTLE ENERGY BENCHMARKING & REPORTING

Prepared for office and multifamily buildings by size:

- Large office 100K+ SF
- Mid size office 20-100K
- Low rise multifamily 1-4 stories
- Mid rise multifamily 5-9 stories
- High rise multifamily 10+ stories



SAMPLE SENT TO BUILDINGS WITH EUIs HIGHER THAN 25TH PERCENTILE (FRONT)

Performance Profiles

SEATTLE ENERGY BENCHMARKING & REPORTING

Utility incentives and workshops were promoted on the back.

SAMPLE SENT TO BUILDINGS WITH EUIs HIGHER THAN 25TH PERCENTILE (BACK)

PUT THE MONEY YOU SAVE IN ENERGY COSTS BACK INTO YOUR BUILDING.

Reduce your building's EUI by **12.4%** and meet the average to **save up to $13,100** each year. That's real money to put back into your building to improve your property, attract new tenants and continue reducing energy bills.

GET STARTED

10% IMPROVEMENT CAN YIELD UP TO **$10,600** In annual energy savings (EUI of 58)

20% IMPROVEMENT CAN YIELD UP TO **$21,200** In annual energy savings (EUI of 52)

YOUR BUILDING'S PATH TO IMPROVEMENT

Learn from experts and take advantage of low and no cost options that will help improve your building's score, save money and increase tenant satisfaction.

1. GET A FREE ENERGY SAVINGS ASSESSMENT

from an energy expert to identify energy saving opportunities and qualify your building for rebates on controls, HVAC and more. Rebates can cover up to 70% of the cost of upgrades.

Seattle City Light
www.seattle.gov/light/assessment

2. UPGRADE TO ENERGY EFFICIENT LIGHTING

and controls in common areas, parking garages and tenant spaces for significant cost savings. Qualifying businesses can save up to 70% on project costs through rebates.

Seattle City Light
www.seattle.gov/saveenergy

3. ATTEND A FREE PORTFOLIO MANAGER WORKSHOP

where you'll learn how to fine-tune your account for accuracy, develop energy use reports and learn tips about better energy use management.

Seattle Office of Sustainability & Environment
www.seattle.gov/energybenchmarking

IT ALL STARTS WITH A CALL!

Our Energy Advisors are ready to help you find the best ways to get started reducing your building's energy costs.

206.684.3800

ENERGY STAR®

Your building's ENERGY STAR score shows you how your building is performing as a whole: its assets, its operations and the people who use it. Update your Portfolio Manager account with accurate building use data for a detailed look at your building's performance!

Learn more at www.energystar.gov/buildingcertification

YOUR SCORE **79**

Congratulations

You may be eligible for ENERGY STAR certification!

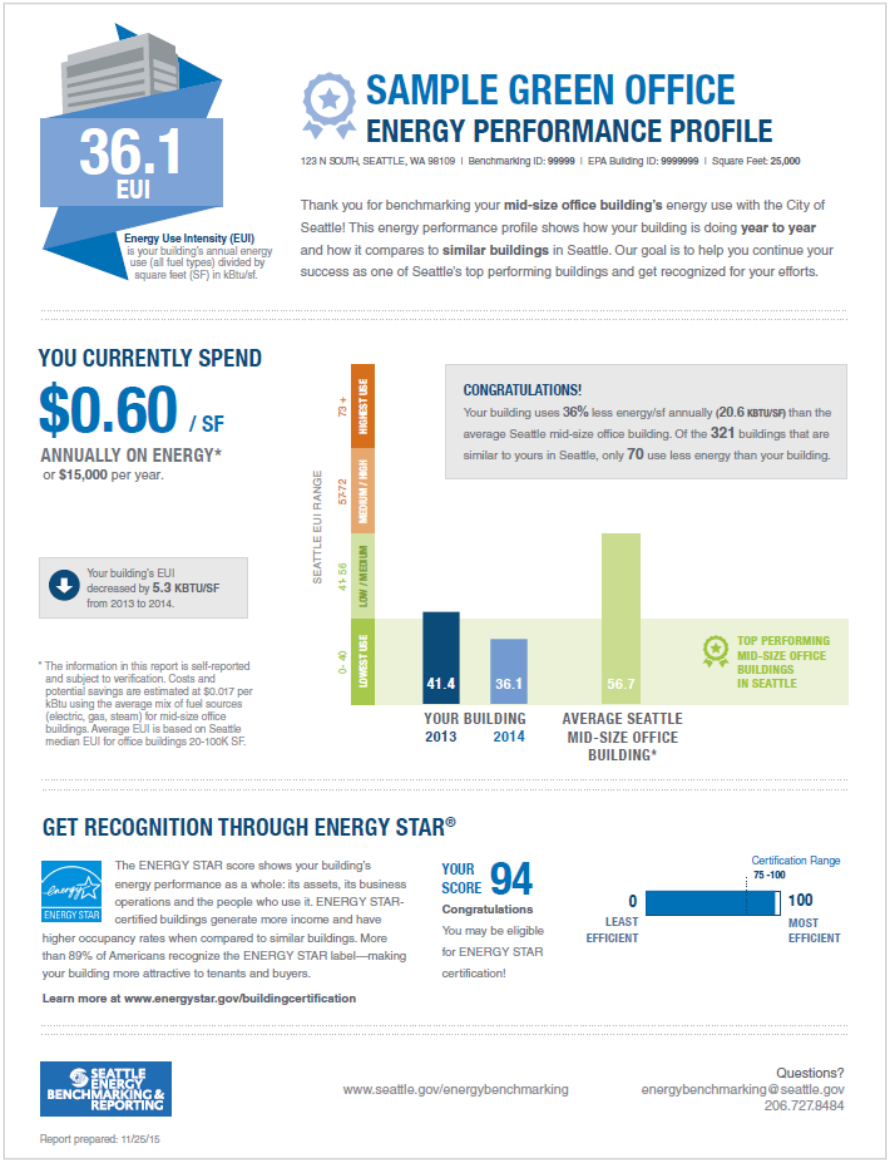
Certification Range 75 -100

0 LEAST EFFICIENT — 100 MOST EFFICIENT

Performance Profiles

SEATTLE ENERGY BENCHMARKING & REPORTING

Highest performing office buildings were sent version that specifically promoted ENERGY STAR certification.



SAMPLE SENT TO BUILDINGS WITH EUIS IN 25TH PERCENTILE (EXCLUDING OUTLIERS)

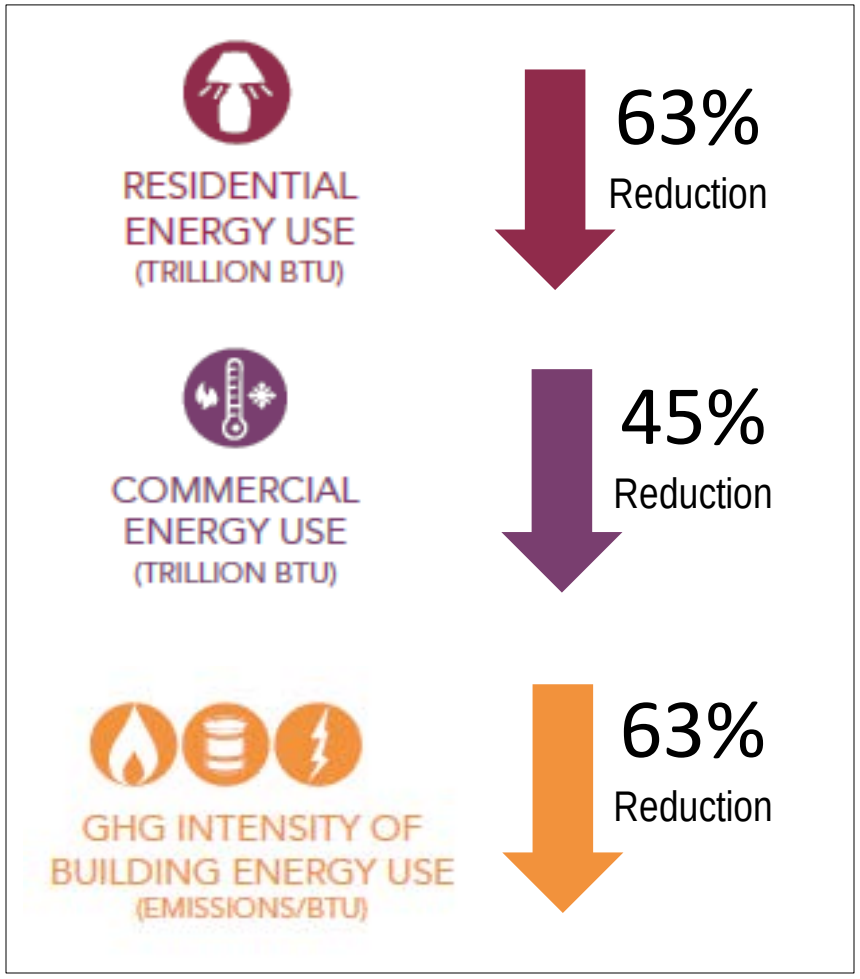
Climate Action Plan Goals

SEATTLE ENERGY BENCHMARKING & REPORTING

2008: 45.5 TRILLION BTU

2050: 21.7 TRILLION BTU

2050 ENERGY AND CARBON GOALS



Energy & GHG Targets

SEATTLE ENERGY BENCHMARKING & REPORTING

Seattle is establishing energy & GHG targets by building type to track progress toward meeting Climate Action Plan goals.

Policy Design

SEATTLE ENERGY BENCHMARKING & REPORTING

Tracking progress toward Energy & GHG targets by building type will guide potential policy focus areas.

Impact Evaluation

SEATTLE ENERGY BENCHMARKING & REPORTING

Using benchmarking data to measure impact of implemented policies and guide future policy focus areas and approaches.

Q & A

SEATTLE ENERGY BENCHMARKING & REPORTING

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SEATTLE OFFICE OF Sustainability & Environment

Mobilizing Benchmarking Data to Create New Outcomes: The Chicago Experience

May 10, 2016

Anne Evens

ELEVATE ENERGY

Smarter energy use for all

©2015 Elevate Energy

We promote smarter energy use for all.

We give people the resources they need to make informed energy choices.

We design and implement efficiency programs that lower costs, and protect the environment.

We ensure the benefits of energy efficiency reach those who need them most.

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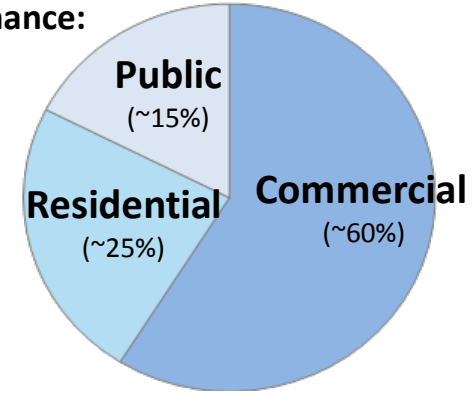
Chicago Ordinance

- Buildings larger than 50,000 ft^2 are required to
  1. Track whole-building energy use (annually)
  2. Verify data accuracy (every three years)
  3. Report to the City by June 1 (annually)
- Reports are submitted through ENERGY STAR Portfolio Manager a standard, free online tool
- The ordinance is phased in over 3 years

Building Types Covered by the Chicago Energy Benchmarking Ordinance:



Building sector	Building size (ft^2)	Benchmarking Timeline:			
		2014	2015	2016	2017
Non-Residential	≥ 250,000	★			★
	≥ 50,000		★		
Residential	≥ 250,000		★		
	≥ 50,000			★	

★ = Years in which verification is required (every 3 years, ongoing)

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In 2015, a five fold increase in participation reveals potential savings of $184 million

More than 1840 properties, spanning over 600 million square feet, reported through Portfolio Manager

- 242 properties reported voluntarily
- 75 properties received a temporary exemption
- 84% reporting rate representing 92% of covered square footage

Overall, buildings reported energy performance scores higher than national medial levels

- Median ENERGY STAR Score of 58 out of 100
- Multi-year data indicated a slight decrease in weather normalized site energy use

Improving buildings' energy intensity to average or above-average levels (by sector) could yield:

- 13%–24% reduction in site energy use
- $100–184 million in energy cost savings
- 795,000–1,400,000 tons of avoided greenhouse gas emissions (equivalent to removing 167,000–306,000 cars from the road)
- More than 2,000 jobs from investments to achieve these savings

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Chicago Energy Benchmarking Role

Elevate leads the efforts to:

- Identify buildings that are covered by the ordinance
- Notify individuals associated with each covered building
- Create written resources to help building representatives
- Respond to question via phone, email and webform
- Monitor compliance with the ordinance and follow up with questions
- Analyze the energy data

Elevate supports efforts of the Mayor's Office, C40, City Energy Project, USGBC-Illinois and other partners to:

- Provide weekly trainings
- Connect building representatives that need additional help with service providers
- Enlist others to help raise awareness of the ordinance
- Disseminate results

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Engaging non-energy efficiency stakeholders

Outreach During Compliance Period

- 20 Industry or trade associations
- 2 Labor unions
- 75 Neighborhood Business Development Centers
- Pro-bono “Data Jams” for Chicago Housing Authority

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Engaging stakeholders beyond compliance

Housing Officials

Economic Development Offices

Public Health Researchers

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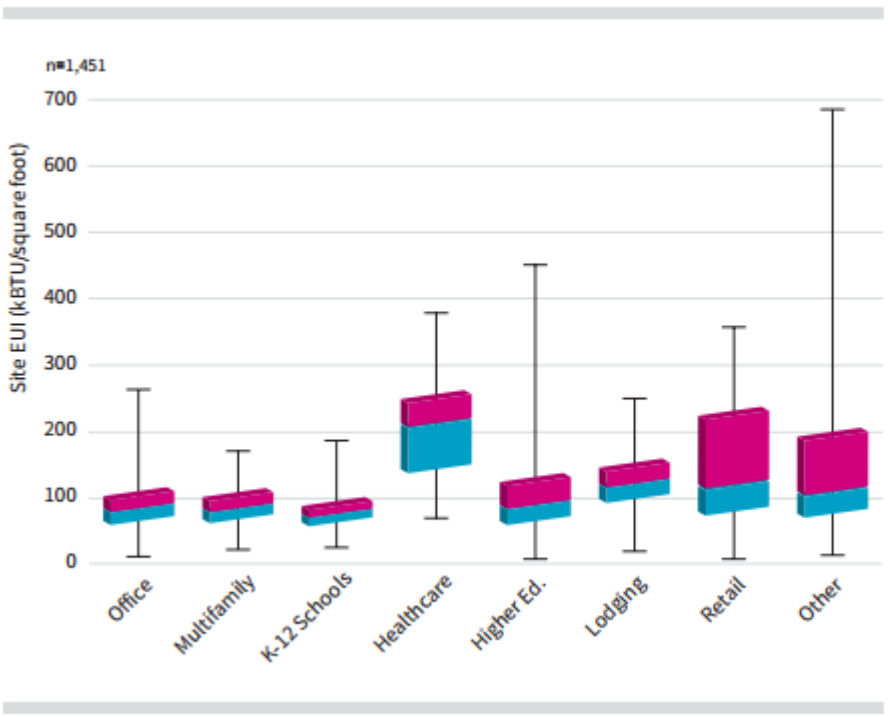
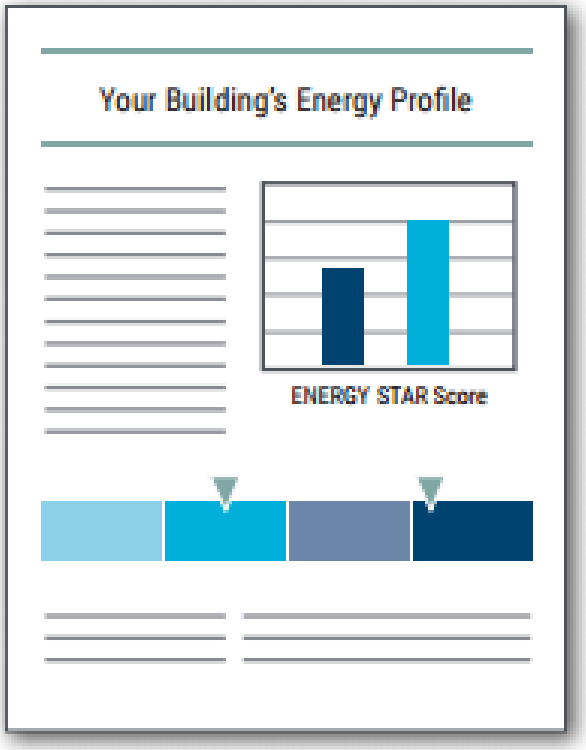
Driving to Action: The Opportunity

Figure 19: Range of Site EUI by Building Sector



Source: City of Chicago 2015 Benchmarking Report

Building Owner Engagement



Data informed customer service

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Stay in Touch

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Facebook/elevateenergy

LinkedIn

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MOBILIZING BENCHMARKING DATA TO CREATE NEW OUTCOMES

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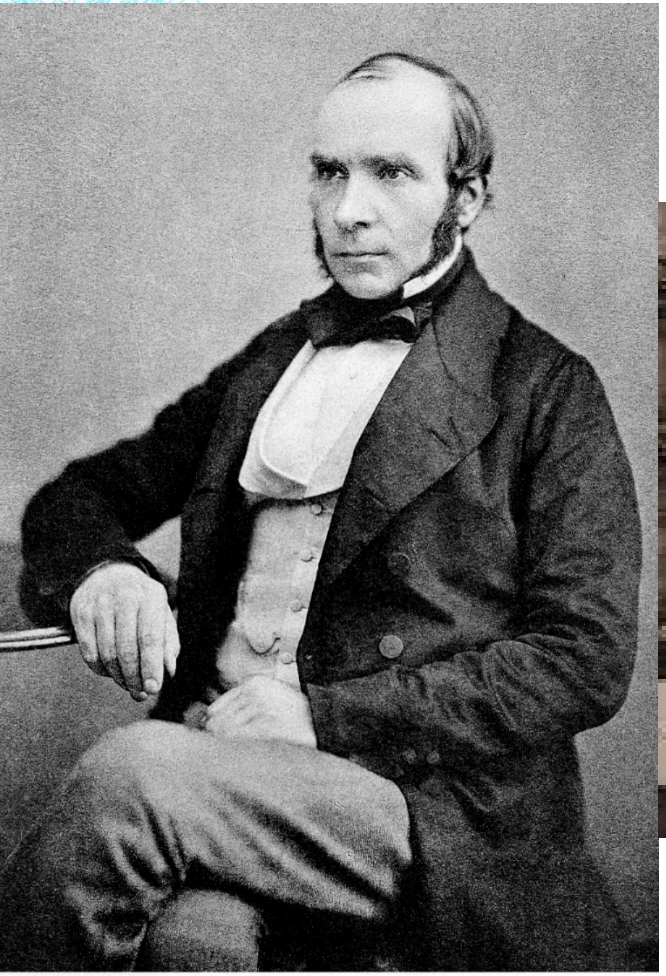
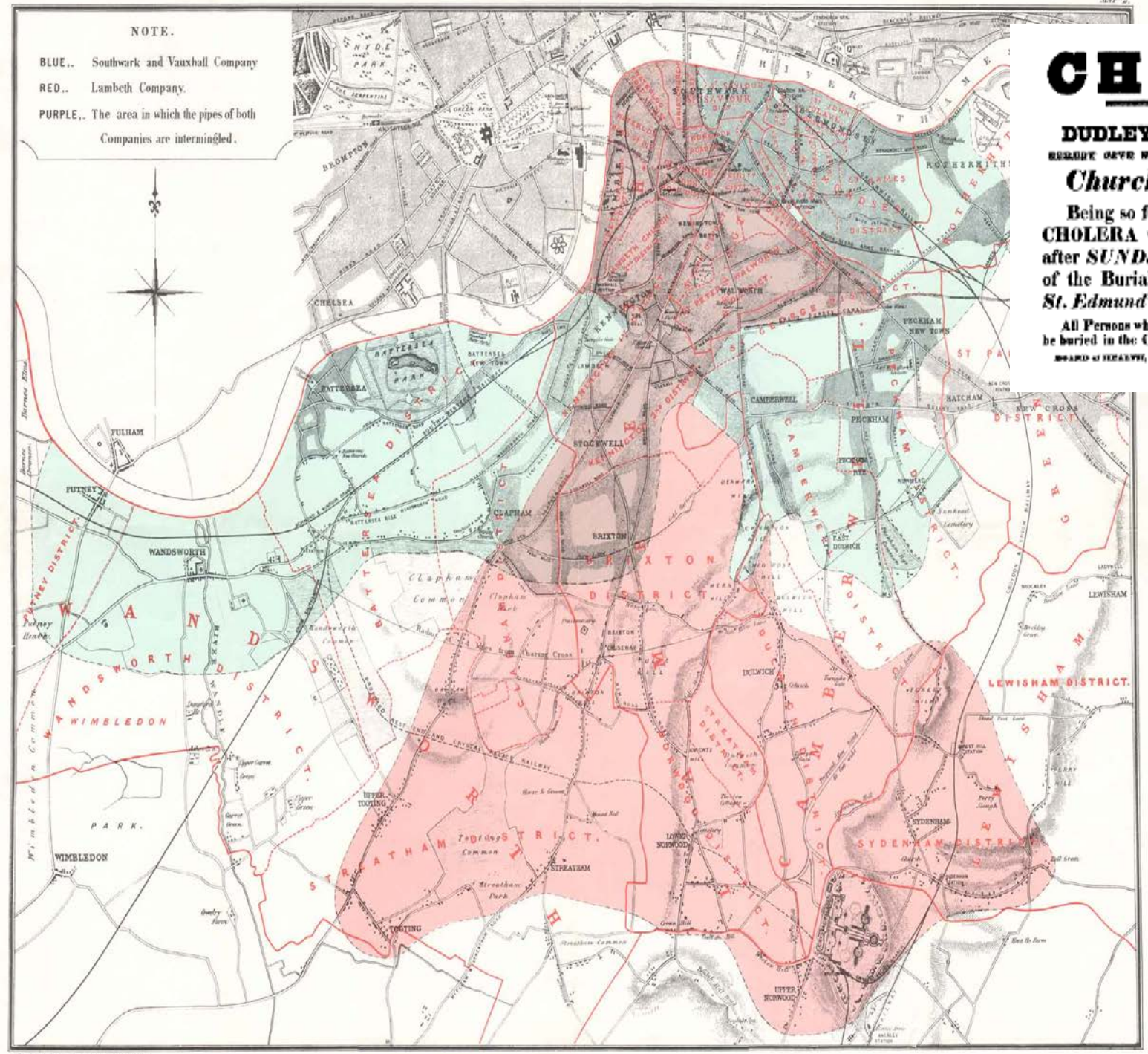
Chief – Office of Energy and Sustainability
Montgomery County Department of General Services



John Snow



CHOLERA.

THE

DUDLEY BOARD OF HEALTH,

BEGGS GIVE NOTICE, THAT IN CONSEQUENCE OF THE

Church-yards at Dudley

Being so full, no one who has died of the **CHOLERA** will be permitted to be buried after ***SUNDAY*** next, (To-morrow) in either of the Burial Grounds of ***St. Thomas's***, or ***St. Edmund's***, in this Town.

All Persons who die from CHOLERA, must for the future be buried in the Church-yard at Netherton

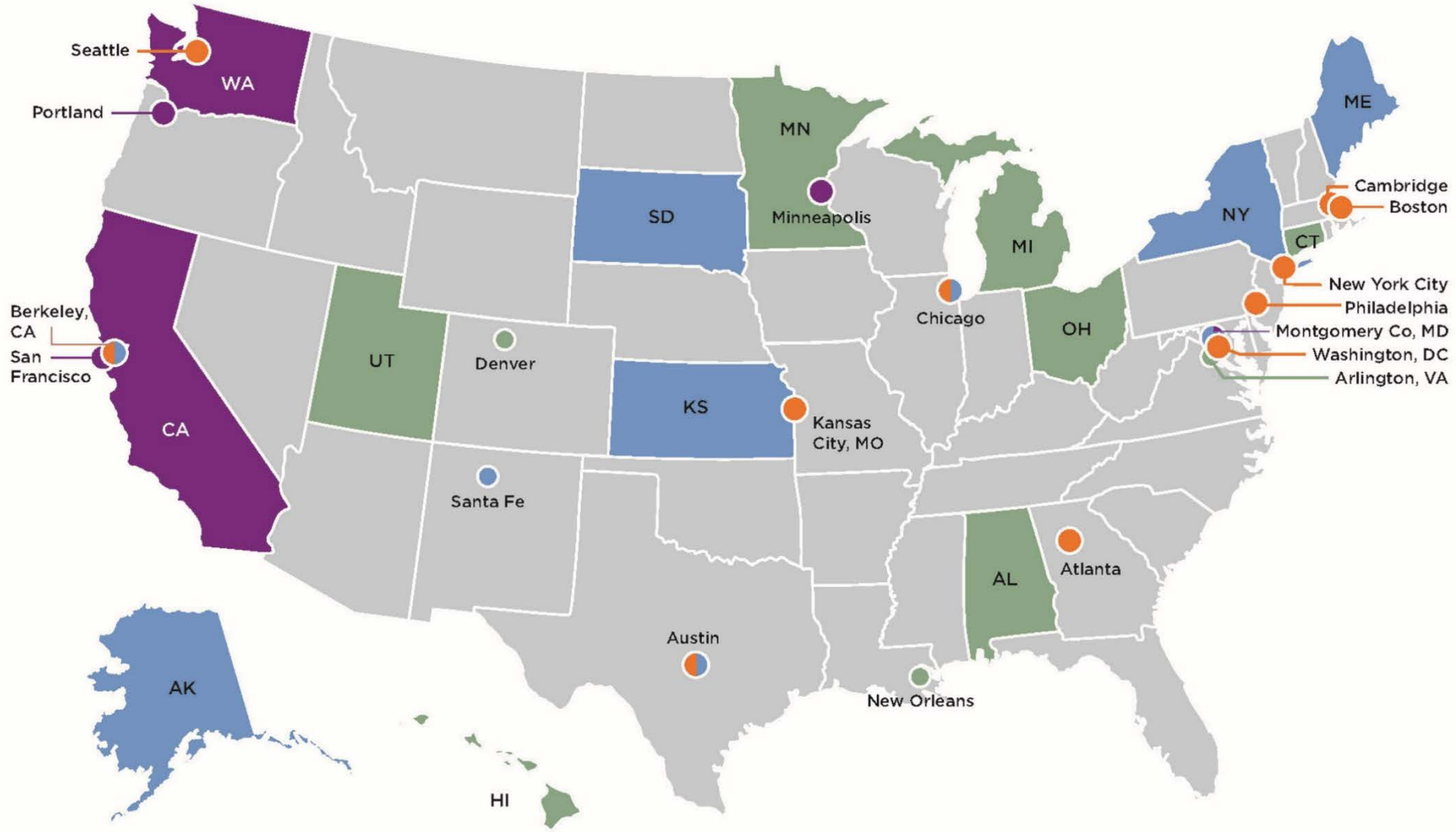
BOARD OF HEALTH, DUDLEY

Energy Performance Benchmarking and Disclosure

- Requires building owners to measure building energy performance by a common method (e.g. ENERGY STAR)
- Disclose data publically on a scheduled basis or as part of a transaction
- Public data can be available through government portals and open data initiatives
- Powerful dataset on building performance across a community

Energy Performance Benchmarking

- Creates transparency in the building sector
- Enables awareness of energy consumption
- Promotes market competition and consumer choice
- Drives investment by highlighting energy savings opportunities
- Creates jobs in energy services sector, building trades
- Enables smarter government and utility programming



Building Rating
SHARING TRANSPARENCY FOR A MORE EFFICIENT FUTURE

IMT
INSTITUTE FOR MARKET TRANSFORMATION

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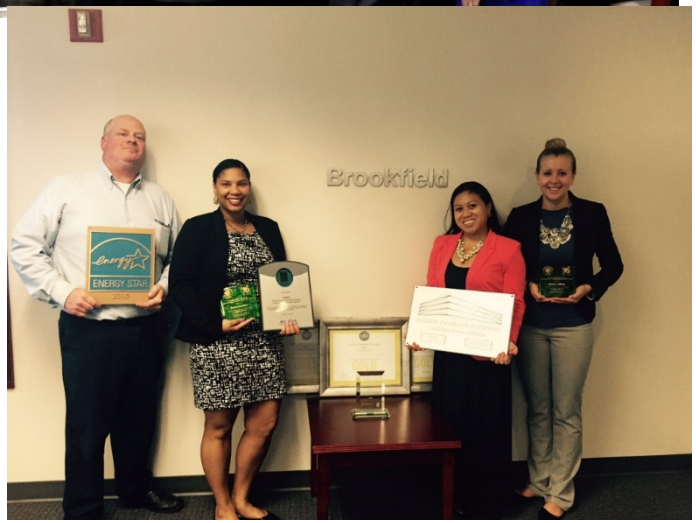
Montgomery County Benchmarking Law

- County and certain non-residential buildings 50,000 square feet and greater
  - County government buildings benchmarked first, leading by example
  - County and private commercial (no multi-family/residential buildings)
- Benchmark in ENERGY STAR Portfolio Manager
  - Building characteristics and energy data only; no water data
- Verification required
  - Montgomery County and Chicago are the only jurisdictions to require this
- Report to the County for public disclosure
- Work groups to develop/improve requirements and regulations including 70 stakeholders *(utility, building owners, energy service companies, non-profits and associations)*.

Early Montgomery County Law Successes

- Benchmarking of Public Buildings
- Benchmarking Ambassador network
- Recognition of Early Bird Benchmarkers (Hughes Networks, JBG, Montgomery College and more)
- Local Partnerships with AOBA, Chamber of Commerce, USGBC and others
- Open office hours and other touchpoints with building community
- Outreach/promotional opportunities for early adopters



Partnerships and Collaboration

- Benchmarking requirements drive national and regional collaboration amongst organizations with common goals.

- Local Workgroup
- Institute for Market Transformation
- ENERGY STAR
- Department of Energy
- LBNL
- DC Department of Energy and Environment
- Sierra Club
- Montgomery County Chamber of Commerce
- More……

Montgomery County Financing and EE Programs

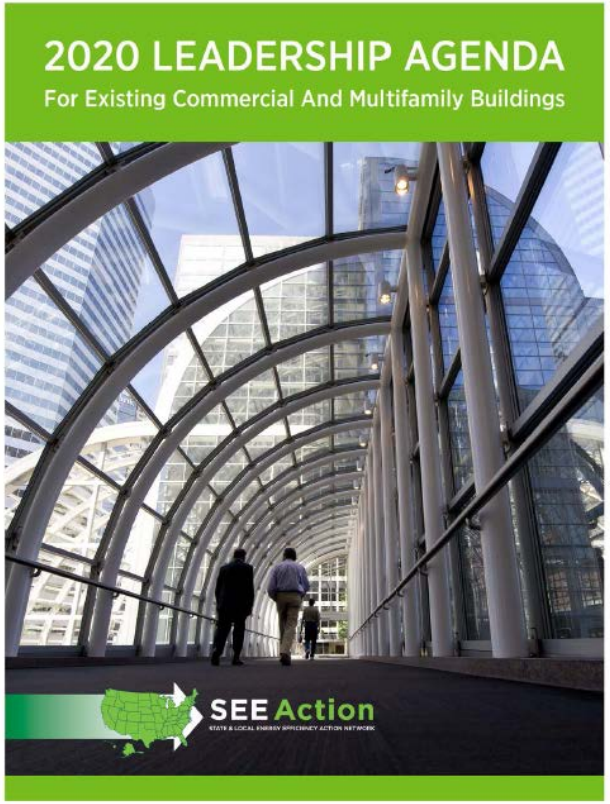
Benchmarking is essential to other energy programs:

- PACE: Property-Assessed Clean Energy financing
  - *Up to 100% financing, 20 year periods, competitive rates*
- County's Green Bank
  - *Work Group process started in October 2015*
- Utility Energy Efficiency Incentives
  - *Retrocommissioning and Ongoing Performance incentives*
- County Incentive Programs
  - *Recognition programs, profiles, case studies*

2020 Leadership Agenda for Commercial Buildings

Agenda of replicable programs to enable robust state and local government energy programs

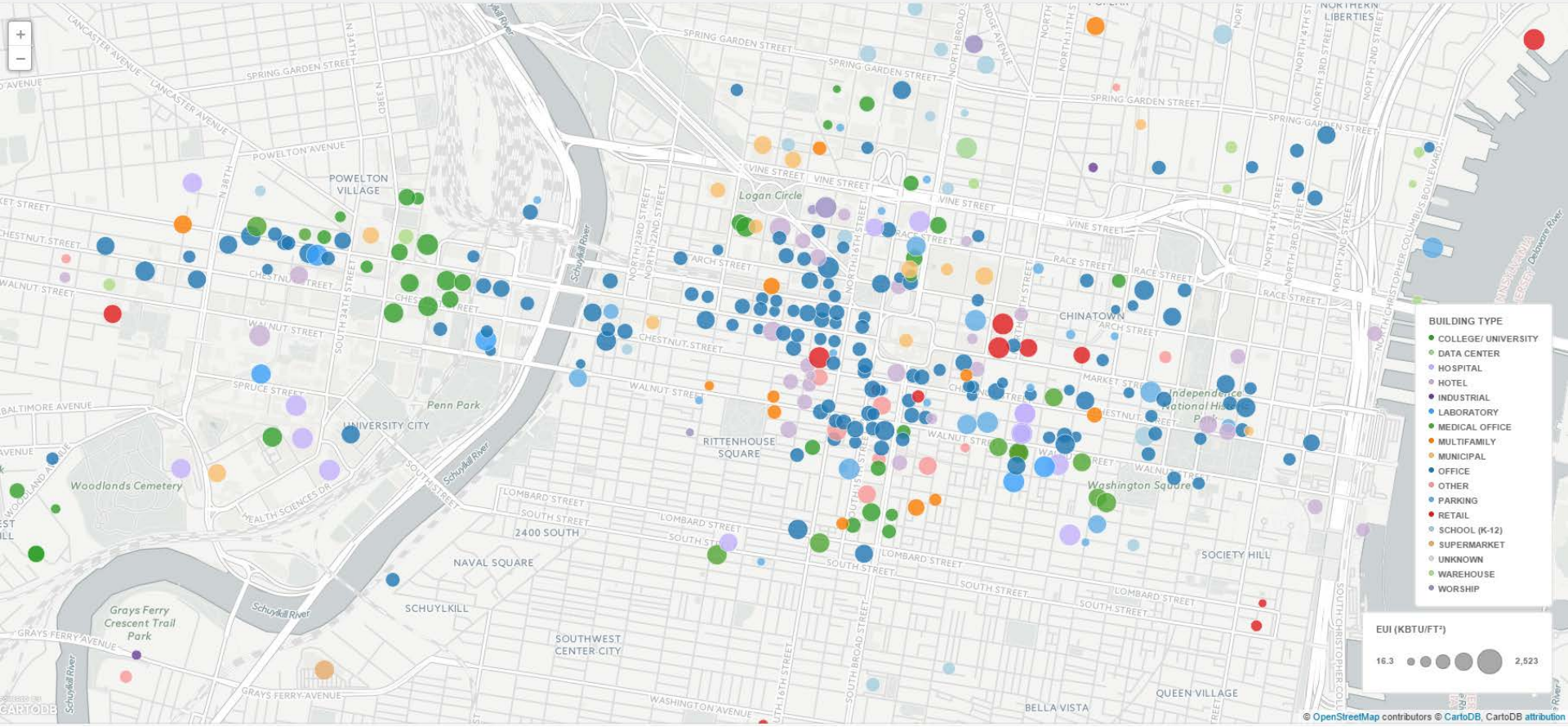
- Strengthen demand for energy efficiency
- Unlock data related to buildings and energy
- Expand public-private partnerships and intergovernmental collaboration
- Improve access to capital for energy efficiency improvements
- Improve the energy efficiency of publicly owned facilities
- Adopt and implement strong building energy codes



THE CITY OF PHILADELPHIA
MAYOR'S OFFICE OF SUSTAINABILITY

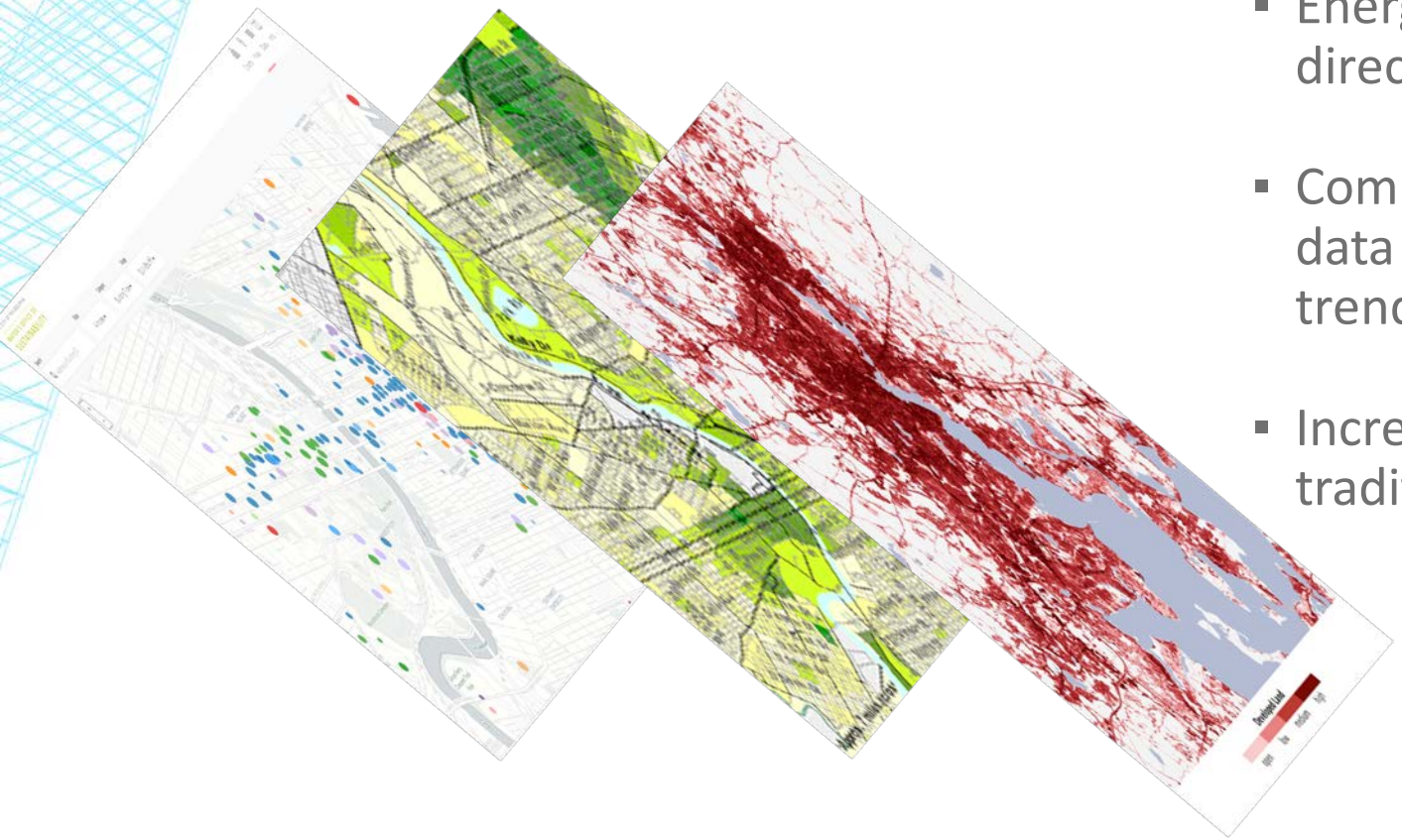
Charts Map Data Info

Search: Address or Building ID
Filter: All types
Category: Building Type
Usage: EUI (kBtu/ft²)



Source: City of Philadelphia Office of Sustainability

DATA CATALYST FOR INNOVATION



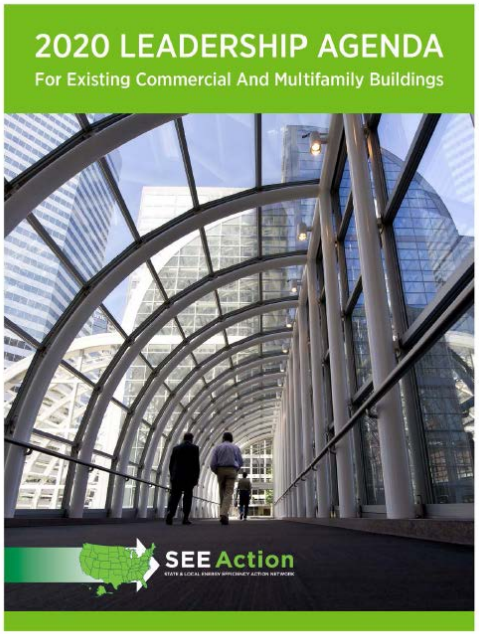
- Energy data provides direct value to consumers
- Combined with other data sets may reveal new trends and policy options
- Increasing value to non-traditional audiences

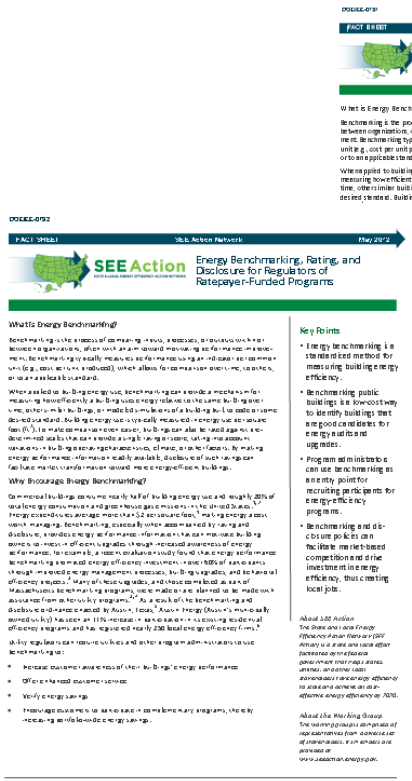
Leveraging Energy Data for Non Traditional Audiences

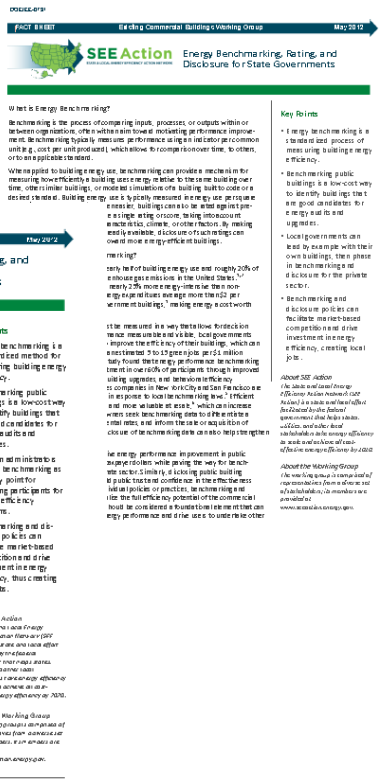
SEEA Commercial Building Working Group is examining how energy benchmarking and other energy data can be used for non-traditional audiences including:

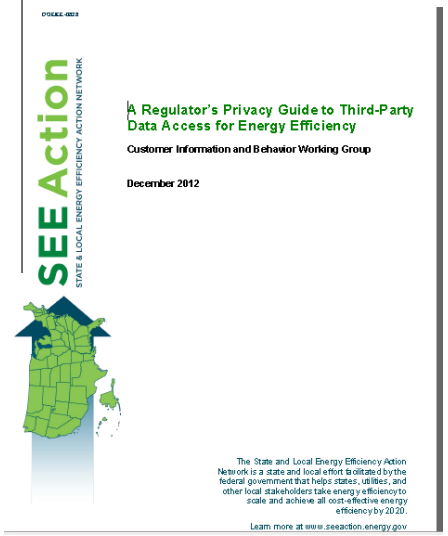
- Health professionals
- Economic developers
- Performance managers
- Resiliency and emergency management professionals
- Planners
- Entrepreneurs

SEE Action Resources









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