



Emerging Best Practices: Energy Benchmarking and Disclosure in U.S. Cities

That
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branding



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Caroline Keicher

Program Manager, Building Energy Performance Policy

Institute for Market Transformation

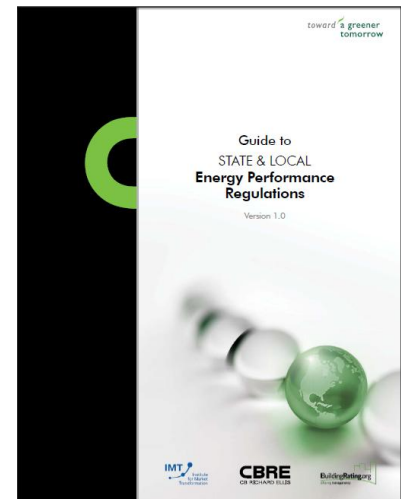
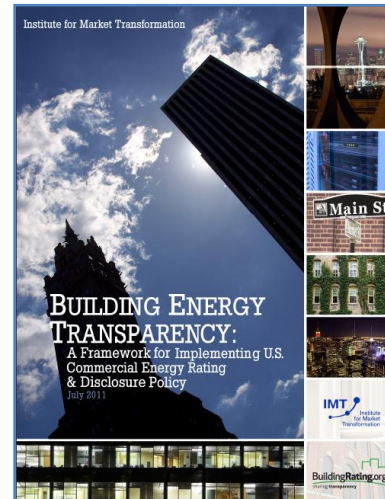
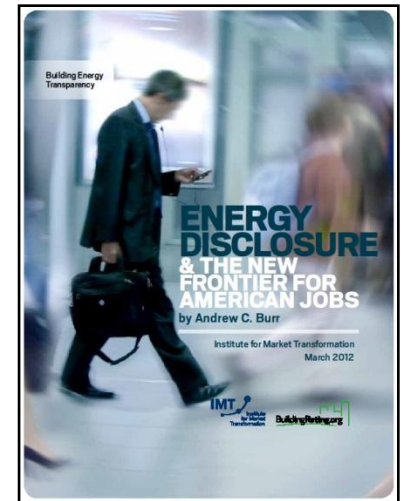
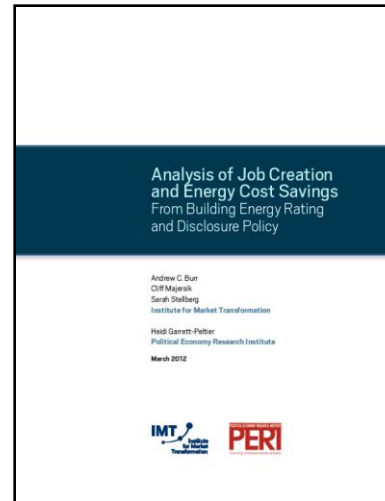
caroline@imt.org

Institute for Market Transformation

- National best practices center for the design, adoption and implementation of building energy performance policies in cities.
- Policy advisor to state and local governments, federal agencies, the Administration, and industry groups
- Hands-on experience assisting cities in preparation and execution of policies
- Serves as the U.S. hub for the Global Buildings Performance Network, an international best practices network for building energy efficiency, and DATA Alliance, partnership with large building owners

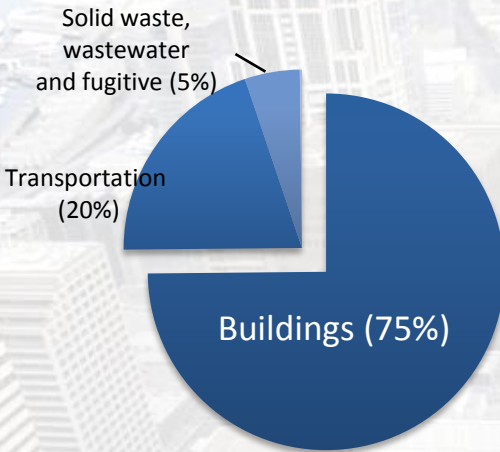


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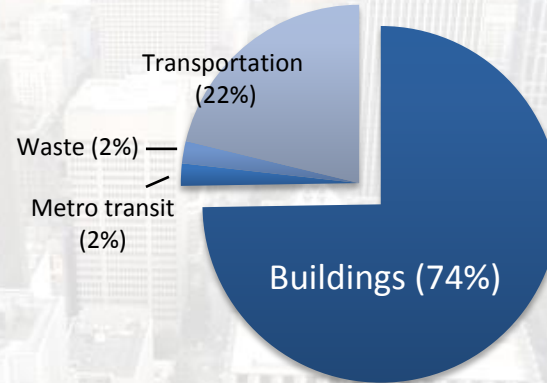


Greenhouse Gas Emissions in Major Cities

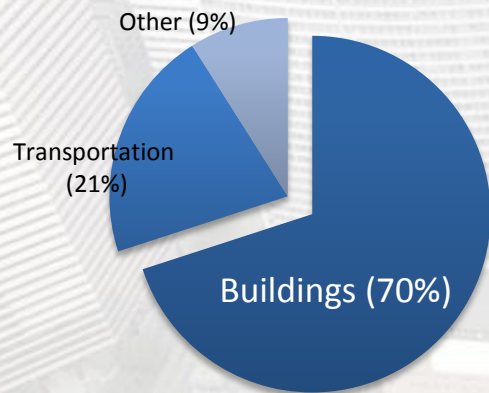
NEW YORK CITY



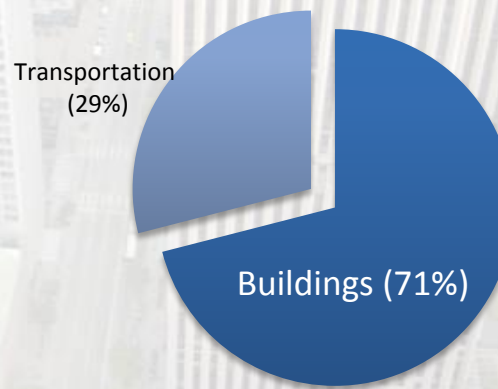
DISTRICT OF COLUMBIA



CHICAGO

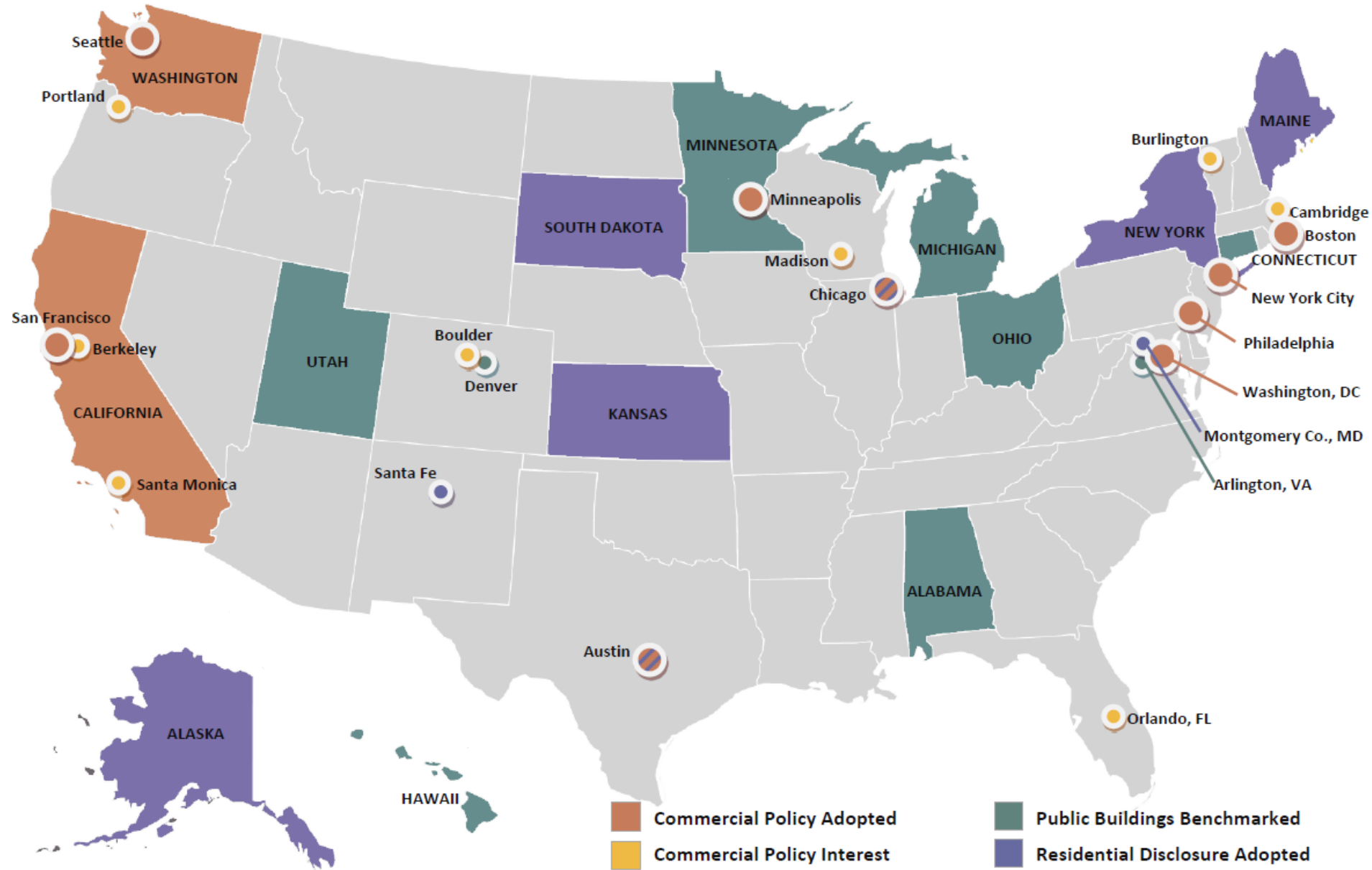


BOSTON



In large cities with significant public transportation, buildings typically account for 70% or more of CO₂ emissions and energy usage.

U.S. Benchmarking Policy Landscape



Commercial Building Policy Elements

Jurisdiction	Benchmarking (Building Type and Size)		Reporting	Disclosure					Audits	RCx
	Non-residential	Multi-family		To local gov't	On public web site	To tenants	To transactional counterparties			
						Sale	Lease	Financing		
Austin	10k SF+	5+ units	✓	-	-	✓	-	-	✓	-
Boston	35k SF+	35k SF+/ 35+ units	✓	✓	-	-	-	-	✓	✓
California	5k SF+	-	✓	-	-	✓	✓	✓	-	-
Chicago	50k SF+	50K SF+	✓	✓	-	-	-	-	-	-
Washington, DC	50k SF+	50k SF+	✓	✓	-	-	-	-	-	-
Minneapolis	50k SF+	-	✓	✓	-	-	-	-	-	-
New York City	50k SF+	50k SF+	✓	✓	-	-	-	-	✓	✓
Philadelphia	50k SF+	-	✓	✓	-	✓	✓	-	-	-
San Francisco	10k SF+	-	✓	✓	✓	-	-	-	✓	-
Seattle	20k SF+	20k SF+	✓	-	✓	✓	✓	✓	-	-
Washington state	10k SF+	-	-	-	-	✓	✓	✓	-	-

Commercial Building Policy Elements

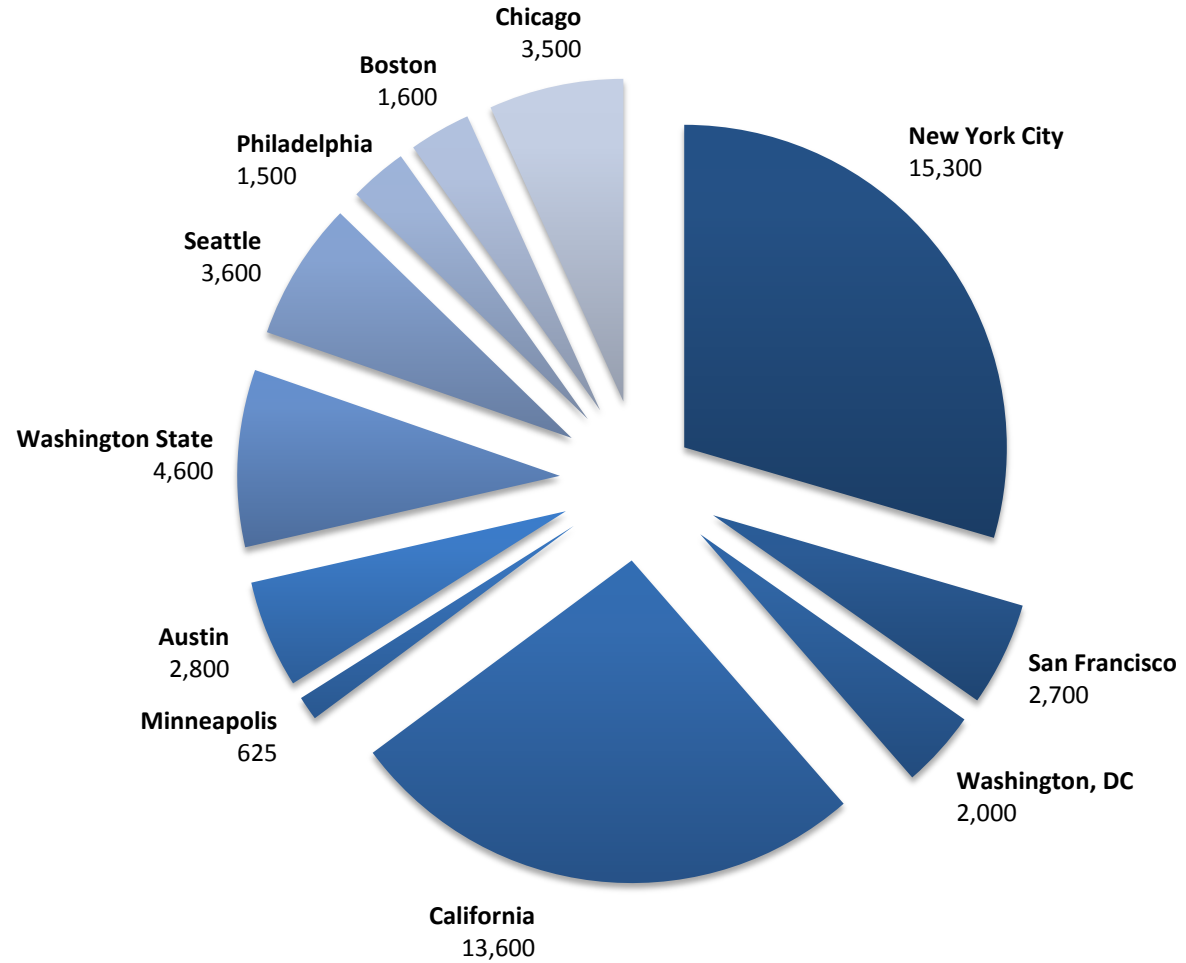
Mandatory policies impact 4-16x the floor area:

	Type	Program/Policy	Buildings included	Floor area included (mil sq ft)
Boston	Voluntary	Challenge for Sustainability (2009-2013)	97	27
	Mandatory	Building Energy Reporting and Disclosure Ordinance (2013)	1,600	250
Minneapolis	Voluntary	BOMA of Greater Minneapolis Kilowatt Crackdown (2012)	80	25
	Mandatory	Commercial Building Rating and Disclosure Ordinance (2013)	625	110
Seattle	Voluntary	Seattle Kilowatt Crackdown (2009)	53	18
	Mandatory	Council Bill 116731 (2010)	3,600	295

Adapted from analysis by:
Eric Mackres
Local Policy Manager, ACEEE
202-507-4038, emackres@aceee.org

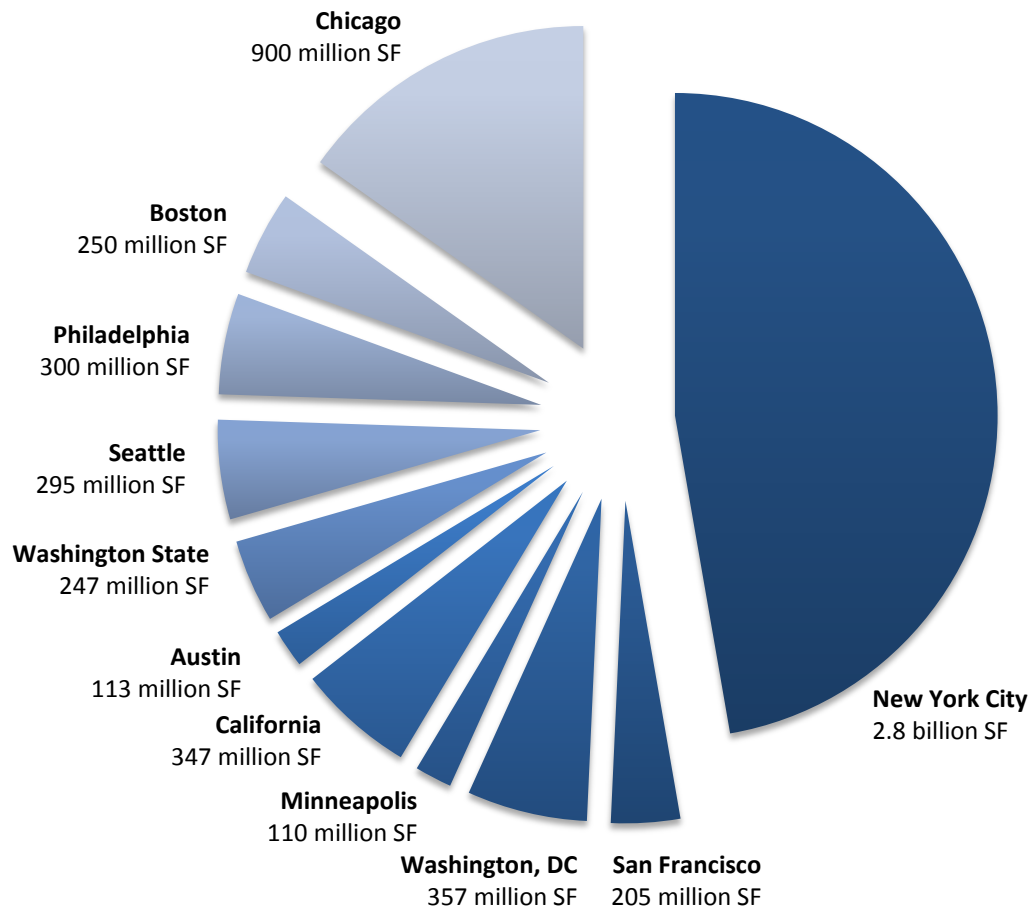
Each year,
existing policies
will impact
more than
51,000
properties

Number of Properties Covered Annually

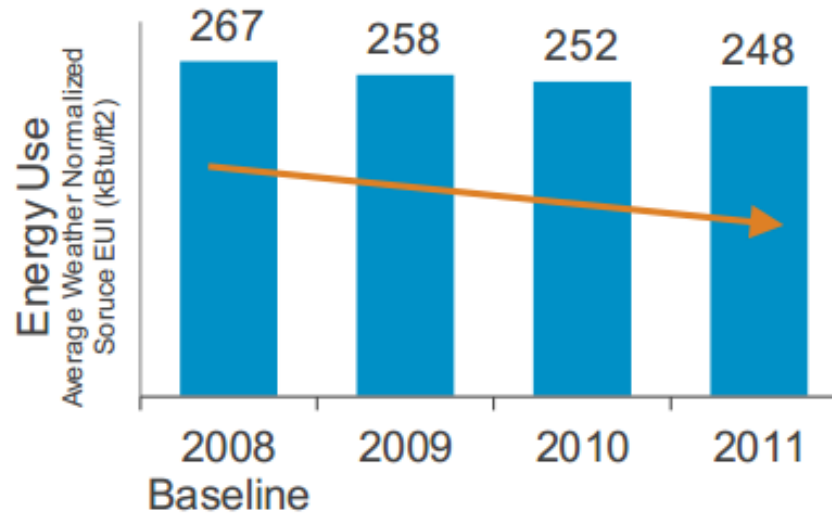


**Totaling
approximately
5.8 billion SF
of floor space in
major real estate
markets**

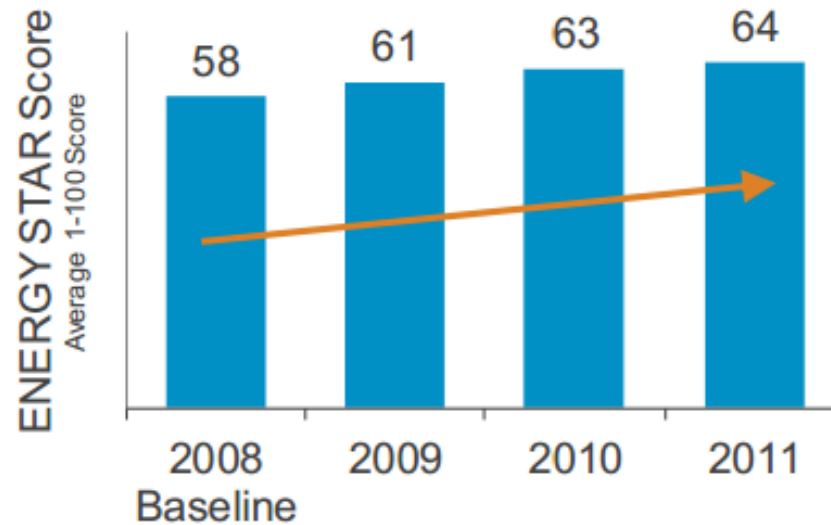
Building Area (in Square Feet) Covered Annually



According to a 2012 EPA analysis, buildings that used Portfolio Manager to track energy usage between 2008 and 2011 realized an annual energy savings of 2.4% and a total energy savings of 7%.



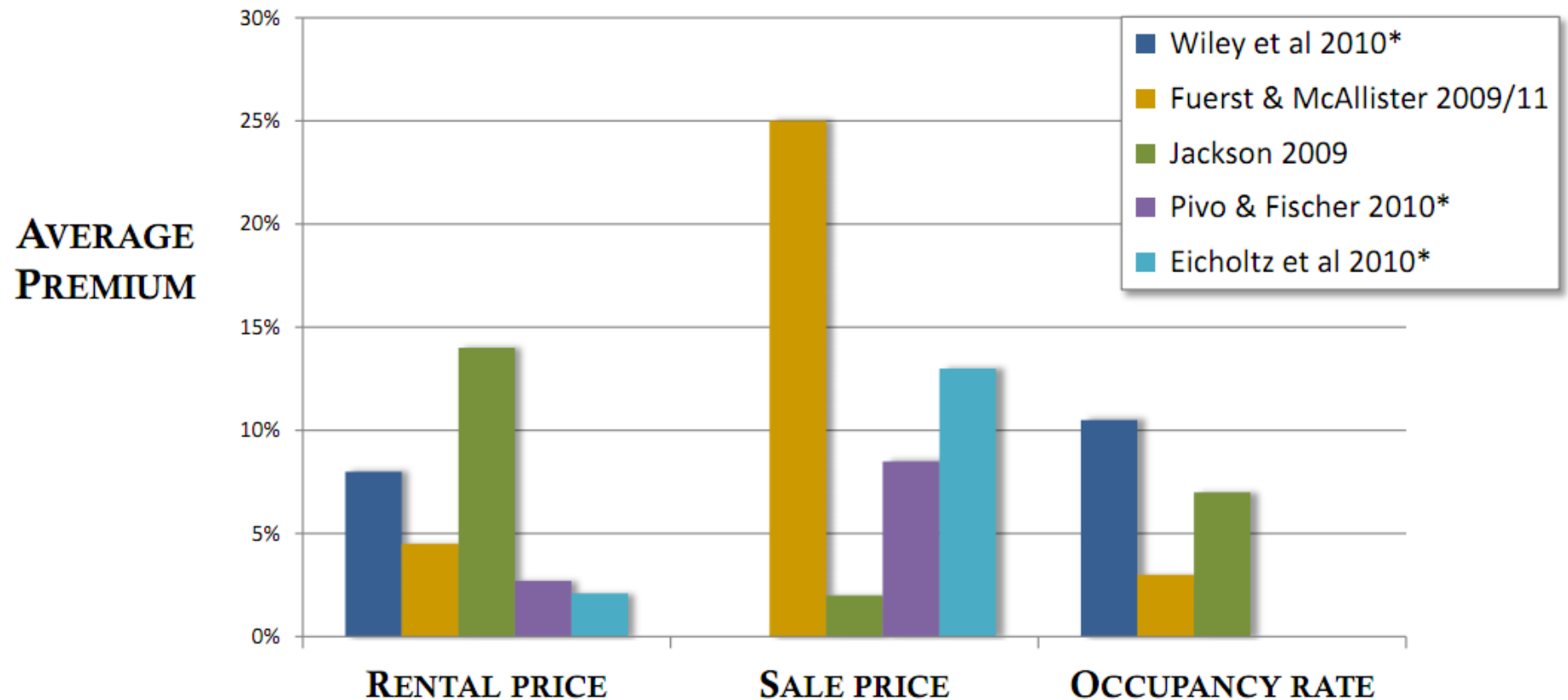
7% Savings



6 point increase

Many studies now correlate Energy Star-certified buildings to rental and occupancy premiums, increasing NOI for owners

Added Value of ENERGY STAR-Labeled Commercial Buildings in the U.S. Market



Building Energy
Transparency

**ENERGY
DISCLOSURE**
& THE NEW
FRONTIER FOR
AMERICAN JOBS
by Andrew C. Burr

Institute for Market Transformation
March 2012



A recent survey of markets with existing benchmarking and disclosure laws found that **local businesses were experiencing significant new demand for energy efficiency services and hiring new employees**, driven by increased awareness on building energy efficiency opportunities.

Philadelphia Benchmarking Ordinance

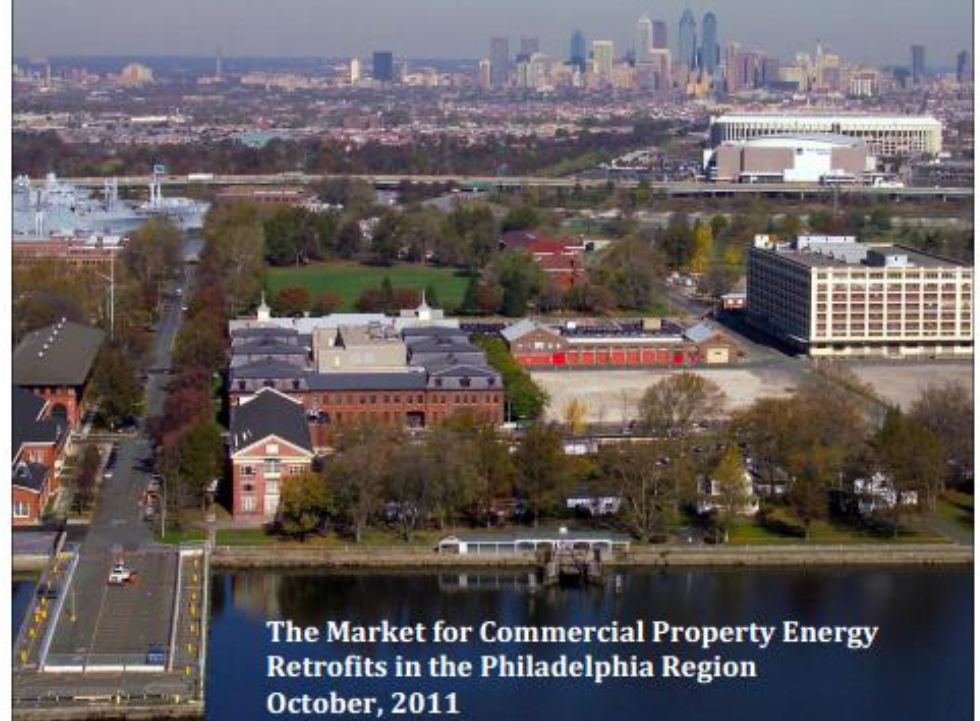
- Philadelphia set a goal to reduce overall greenhouse gas (GHG) emissions 20% by 2015, and citywide building energy consumption by 10%
- The city saw an increase in energy consumption between 2008-2010, mostly driven by commercial buildings
- Passed June 2012: Energy and water benchmarking and public disclosure for nonresidential buildings 50,000 square feet and greater
- Modeled after requirements in other jurisdictions
- City finished benchmarking municipal buildings in November 2012



A recent study by the Energy Efficient Buildings Hub found that 77% of Philadelphia's commercial building stock – or 7,000 buildings – need energy upgrades. Retrofitting them would generate more than \$600 million in local spending and support 23,000 jobs.



Greater Philadelphia Innovation Cluster
for Energy-Efficient Buildings
A U.S. DOE Energy Innovation Hub



**The Market for Commercial Property Energy
Retrofits in the Philadelphia Region
October, 2011**

**Greater Philadelphia Innovation Cluster (GPIC)
for Energy-Efficient Buildings
Policy Markets and Behavior Task Team**

Author: Econsult Corporation

San Francisco Existing Commercial Buildings Energy Performance Ordinance

Innovative compliance
tracking through
[HonestBuildings.com](https://www.honestbuildings.com)

677 Compliant **422** Not Compliant



New York City Greener, Greater Buildings Plan

- NYC set a greenhouse-gas (GHG) reduction target of 30 percent by 2030
- **Energy benchmarking and public disclosure for large buildings, + mandatory audits, RCx, lighting upgrades and tenant sub metering**
- NYC buildings account for \$15 billion annually in energy costs and 94% of electricity usage
- Properties over 50,000 SF account for ~2% of building stock by number, but 50% of floor area
- 85% of existing buildings will still exist in 2030




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[About PlaNYC Green Buildings & Energy Efficiency](#)
[Greener, Greater Buildings Plan](#)
[LL84: Benchmarking](#)
[LL85: NYC Energy Conservation Code \(NYCECC\)](#)
[LL87: Energy Audits & Retro-commissioning](#)
[LL88: Lighting Upgrades & Sub-metering](#)
[Outreach & Training](#)
[Greening the City's Codes & Regulations](#)
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Benchmarking Scores & Reports

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New York City's Second Year Benchmarking Scores for All Covered Properties

On September 25, 2013, New York City released the 2012 energy and water use data for all properties required to annually benchmark under Local Law 84. New York City is the first in the nation to publicly disclose data for large multifamily buildings.

Approximately a million New Yorkers can now see how much energy and water their apartment buildings consumed in 2012.

The new data set includes more than 9,000 self-reported multifamily properties, effectively more than tripling the size of the first year's list. The data also represents the first year's results of both manual and automatic water benchmarking, with more than 6,800 properties reporting water data.

- View the City's 2012 [Energy and Water Data Disclosure for Local Law 84](#) (In Excel)
- Read the [overview and definitions](#) for the data set

New York City's First Benchmarking Scores for Non-Residential Covered Properties

On September 4, 2012, New York City publicly posted the 2011 energy and water benchmarking results for non-residential properties covered under the benchmarking ordinance (Local Law 84). The list was updated on September 24th to account for discrepancies in building identification. Please make sure you are using the most up to date list. Also note that buildings were determined as non-residential by the New York City Department of Finance (DOF).

- View the City's 2011 [Energy and Water Data Disclosure List](#), posted on the Department of Finance website. *Latest version dated 9/24/12*
- Read the [definitions](#) for the data set
- Understand the [significance of New York City's public disclosure](#)

Quick Links

- » [Special Initiative for Rebuilding and Resiliency](#)
- » [PlaNYC](#)
- » [LL84: Benchmarking](#)
- » [LL87: Audits & Retro-commissioning](#)
- » [Outreach & Training](#)
- » [Energy Aligned Clause.](#)

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General

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Neutral Calculation Check Cell Explanatory ... Input

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
	BBL	Street Number	Street Name	Borough	Zip	Benchmarking Submission	Entry Number	Site EUI (kBtu/ft ²)	Weather Normalized Source EUI (kBtu/ft ²)	Indoor Water Intensity (All Water Sources) (gal/ft ²)	Reported Water Method	ENERGY STAR Score	Total GHG Emissions (MtcO ₂ e)	Property Floor Area (Buildings and Parking) (ft ²)	Primary Property Type - Self Selected	Number of Buildings	Reported BINs
1																	
2	1000010010	1	GOVERNORS ISLAND	MANHATTAN	10004	No Record as of 08/1/13										1	
3	1000020002		MARGINAL STREET	MANHATTAN	10004	No Record as of 08/1/13										0	
4	1000047501	1	WATER STREET	MANHATTAN	10004	Yes	41	102	287.9	16.37	Manual	75	25932.68	2428325	Office	1	1000005
5	1000057501	125	BROAD STREET	MANHATTAN	10004	Yes	3871	119.6	261.5		Manual	70	11637.42	1338000	Office	1	1000006
6	1003620001	134	AVENUE D	MANHATTAN	10009	Yes	8312	30.3	85.7	1.57		N/A	13709.99	5207812	Multifamily Housing	7	1077504;1077538;1077539;1077540;1077541;1077541;1077544;1077545;1077546;1077547;1077548;1077549;1077550;1077550;1077551;1077552;1077553;1077554;1077554;1077896;1078045;1078046;1078047;1078048;1078048;1078050;1078051;1078052;1078053;1078054;1078055;1078056
7	1000090001	34	WHITEHALL STREET	MANHATTAN	10004	Yes	8575	99.5	302.6		Manual	55	7771.16	852840	Office	1	1000018
8	1000090014	17	STATE STREET	MANHATTAN	10004	Yes	735	79.7	210		Manual	82	4033.53	574095	Office	1	1000020
9	1000090029	24	WHITEHALL STREET	MANHATTAN	10004	Yes	93	139.4	295.2	11.06	Manual	41	10308.19	859807	Office	1	1000021
10	1000100014	33	WHITEHALL STREET	MANHATTAN	10004	Yes	641	134.5	432.9		Manual	36	5068.06	405310	Office	1	
11	1000100016	90	BROAD STREET	MANHATTAN	10004	Yes	2711	39.8	118.2		Manual	90	1405.66	388153	Office	1	1-00010-0016
12	1000100023	1	WHITEHALL STREET	MANHATTAN	10004	Yes	90	102.8	244.4	17.90	Manual	67	2939.91	329991	Office	1	1000027
13	1000110001	2	BROADWAY	MANHATTAN	10004	No Record as of 08/1/13										1	
14	1012900021	535	MADISON AVENUE	MANHATTAN	10022	Yes	136	71.8	207.5	5.88	ABS	80	3091.99	473356	Bank/Financial Institution	1	1035747
15	1000110021	80	BROAD STREET	MANHATTAN	10004	Yes	12104	52.6	146.3		Manual	96	2254.53	475000	Office	1	1000038
16	1000130001	1	BROADWAY	MANHATTAN	10004	Yes	12928	65.7	183.7		Manual	72	1241.58	208039	Office	1	1000043
17	1000130005	11	BROADWAY	MANHATTAN	10004	Yes	638	80.1	214		Manual	78	3030.18	423348	Office	1	BIN# 1000044



**NEW YORK CITY
LOCAL LAW 84
BENCHMARKING
REPORT
AUGUST 2012**

A GREENER, GREATER NEW YORK



The City of New York
Mayor Michael R. Bloomberg



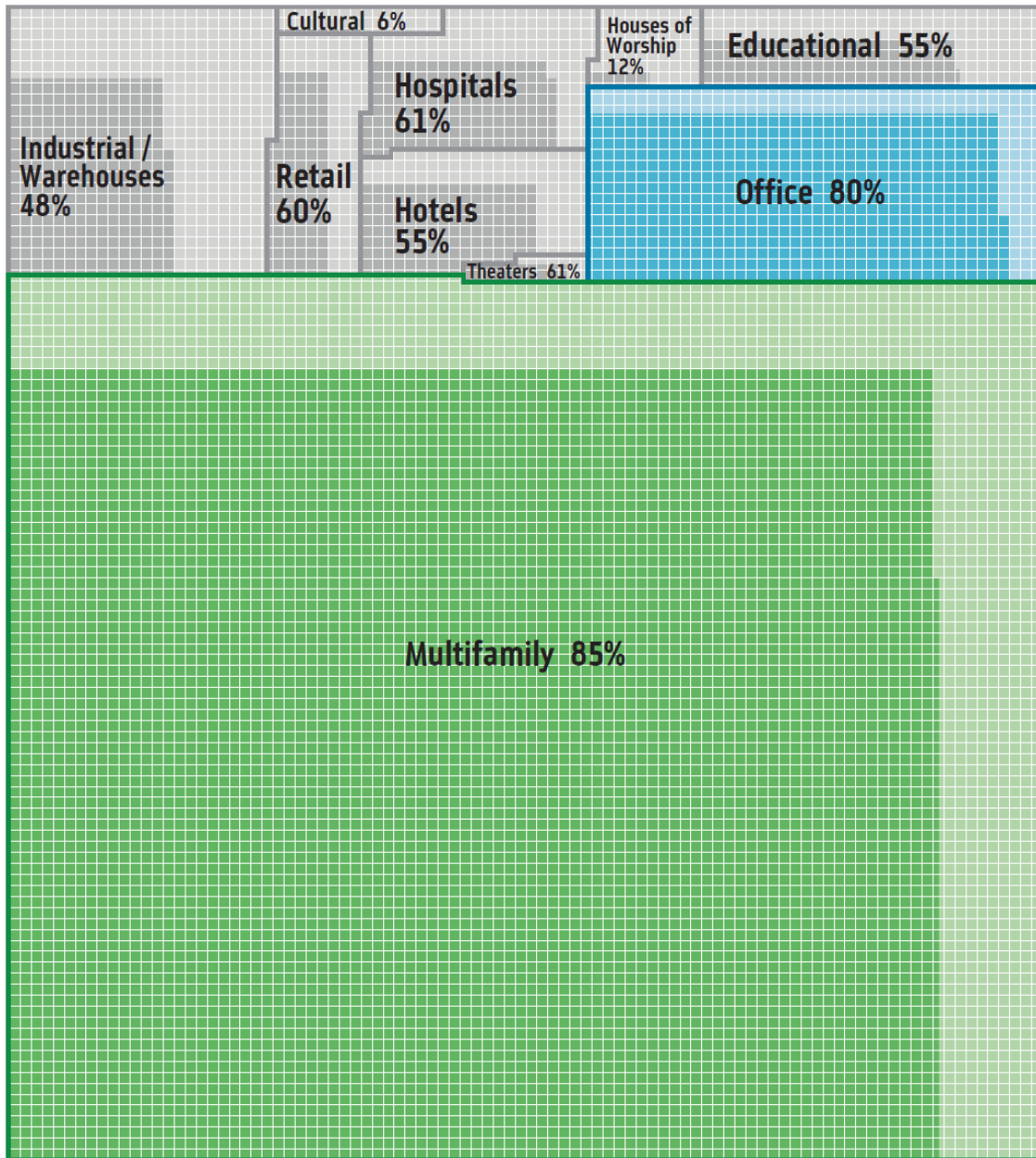
**NEW YORK CITY
LOCAL LAW 84
BENCHMARKING
REPORT
SEPTEMBER 2013**

A GREENER, GREATER NEW YORK



The City of New York
Mayor Michael R. Bloomberg

Early Findings from Energy Benchmarking in New York City



[Fig. 29] Compliance by Sector Gross Floor Area

74%

gross floor area that achieved compliance in Year Two

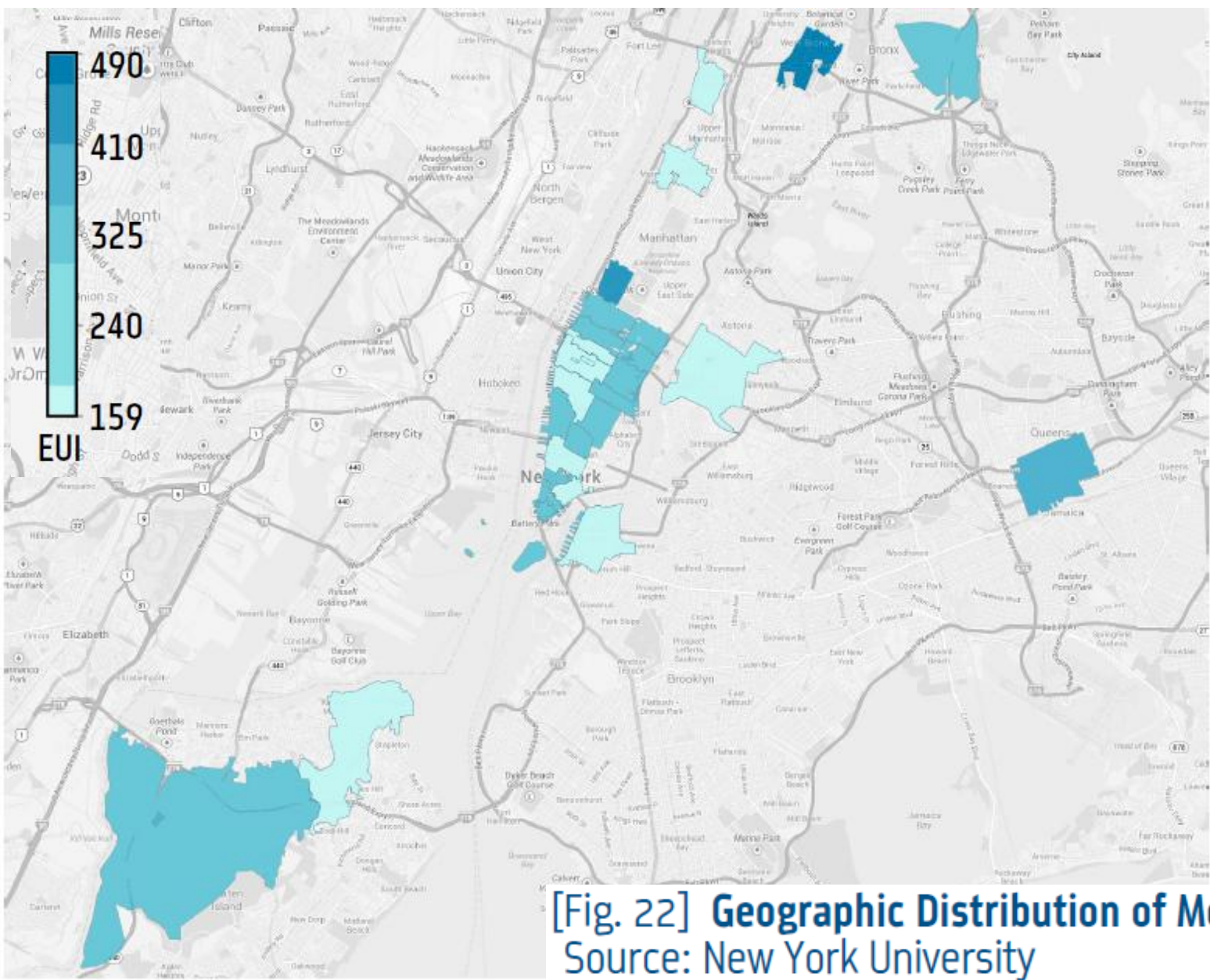
1,668,232,620

square feet of gross floor area that achieved compliance in Year Two

□ = 250,000 sq. ft.

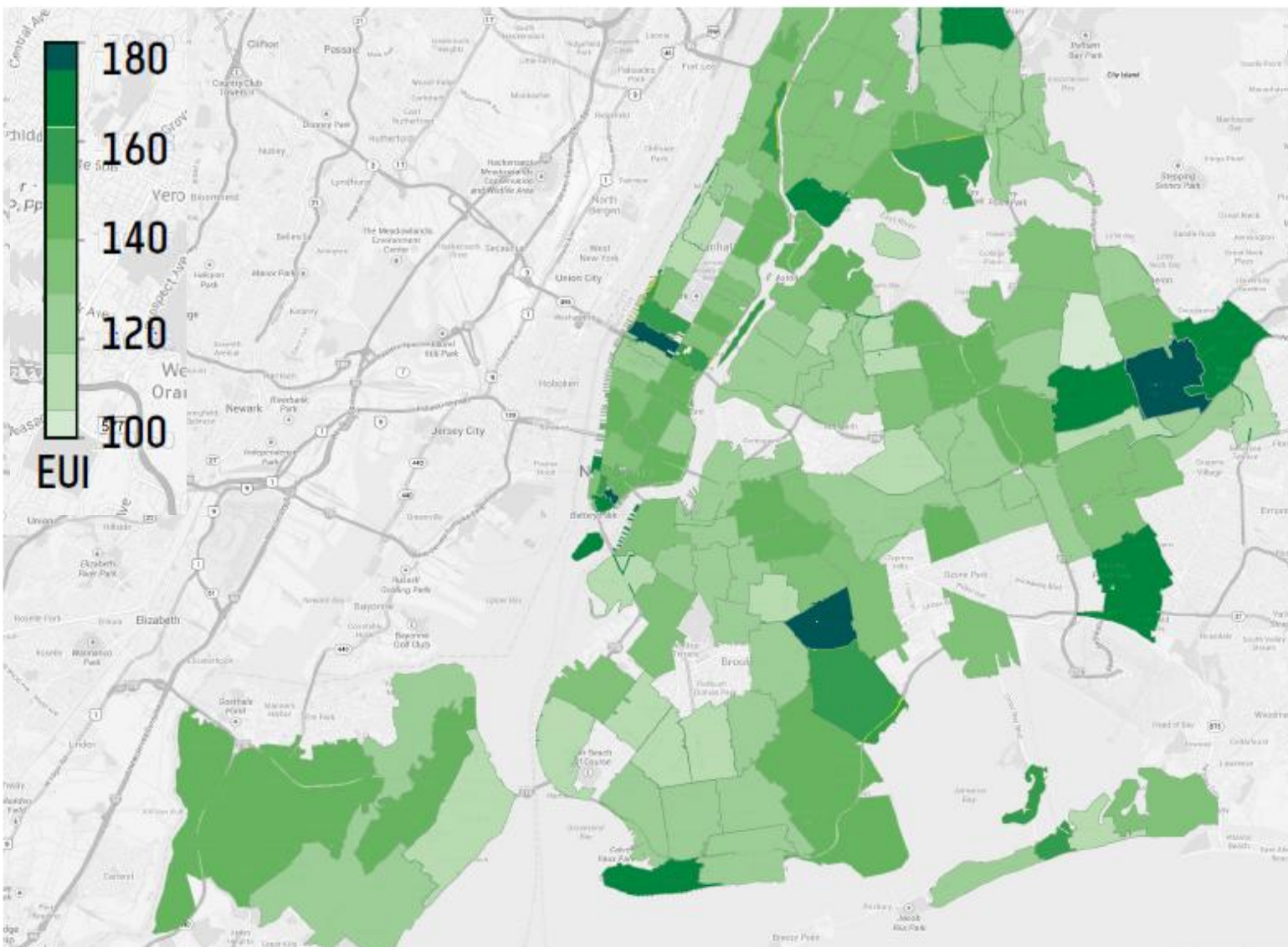
Source: NYC Mayor's Office

Early Findings from Energy Benchmarking in New York City



[Fig. 22] Geographic Distribution of Median Office EUI
Source: New York University

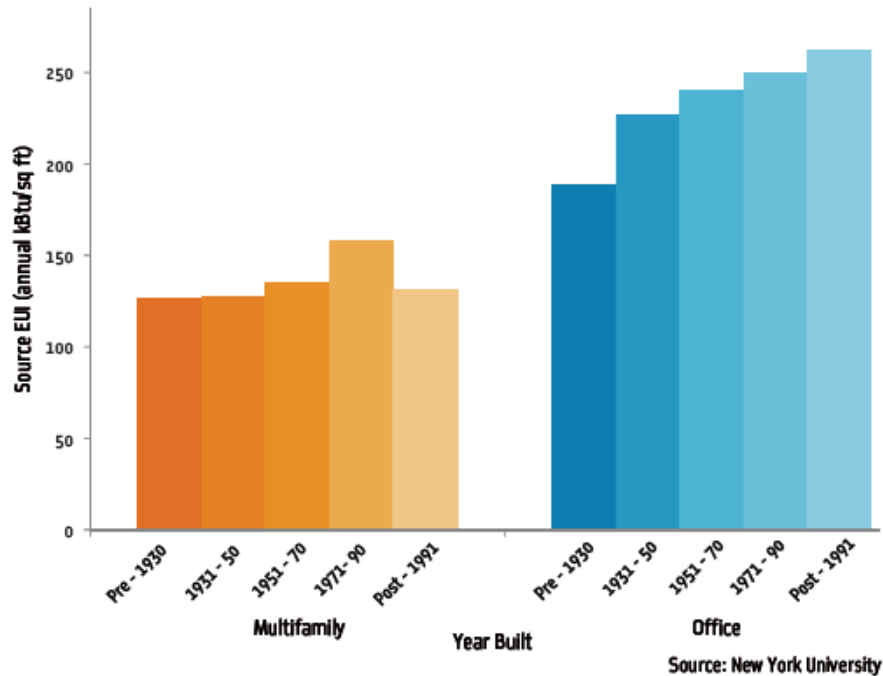
Early Findings from Energy Benchmarking in New York City



[Fig. 23] Geographic Distribution of Median Multifamily EUI
Source: New York University

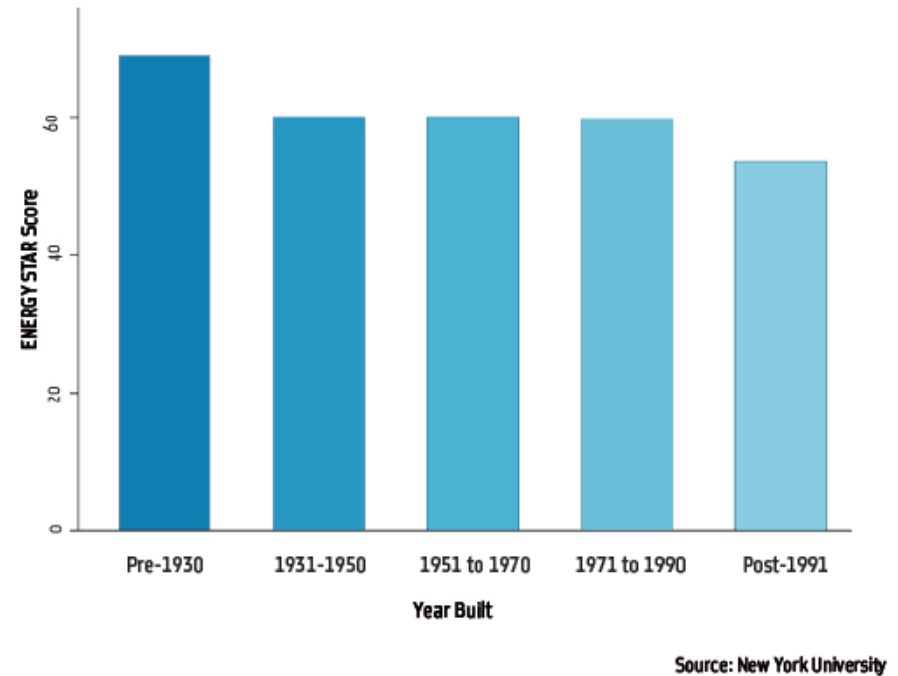
Early Findings from Energy Benchmarking in New York City

Figure 24: Median Energy Use Per Sq Ft by Building Type and Age Group



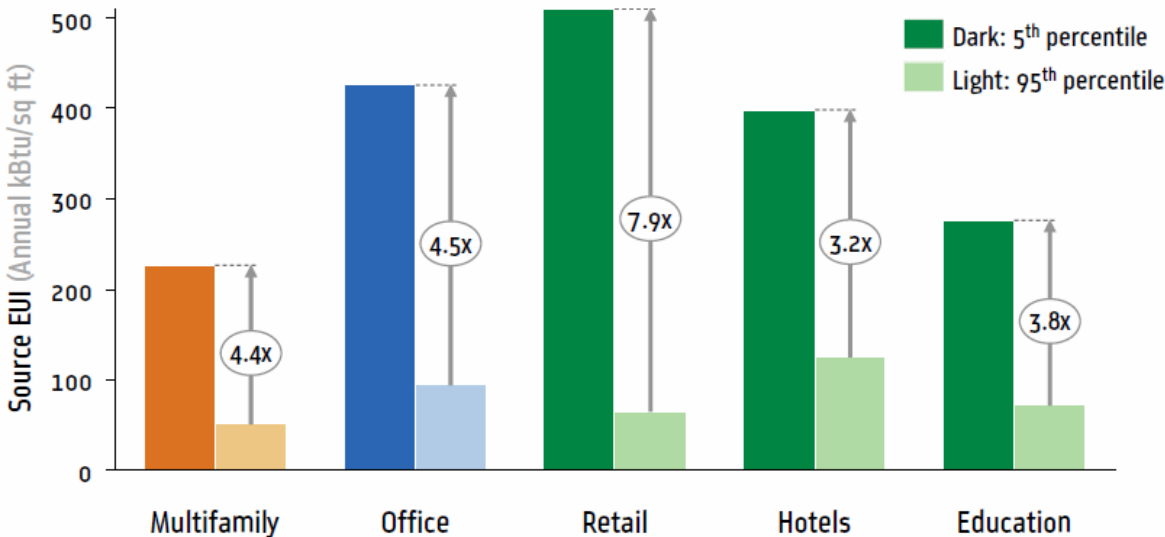
Energy intensity is greater in newer buildings than older buildings.

Figure 25: ENERGY STAR Score for Office Buildings Based on Year Built



ENERGY STAR scores are higher in older buildings than newer buildings.

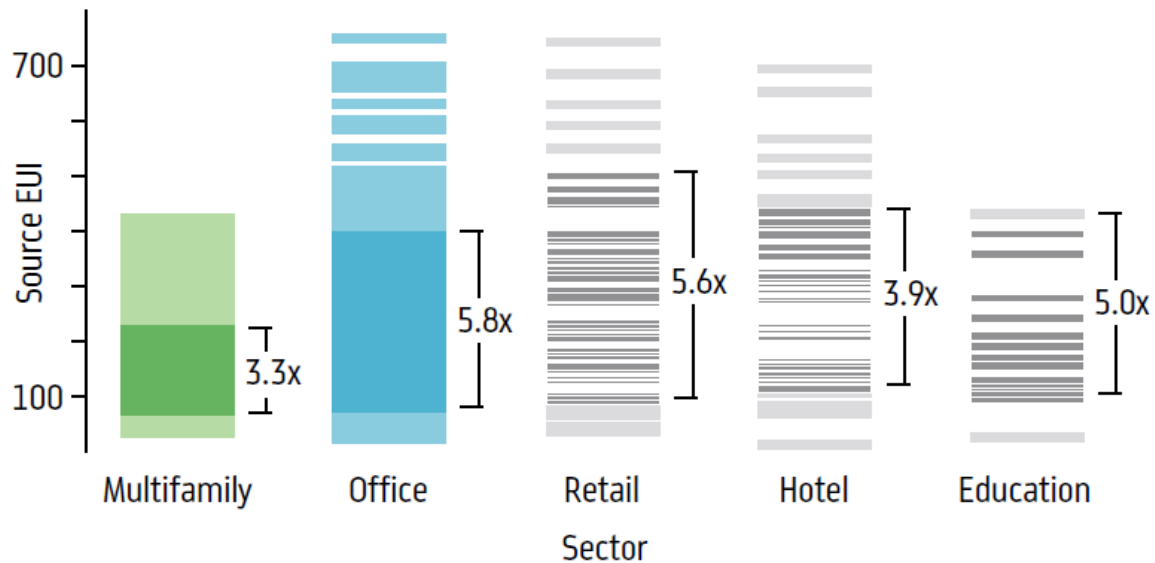
Early Findings from Energy Benchmarking in New York City



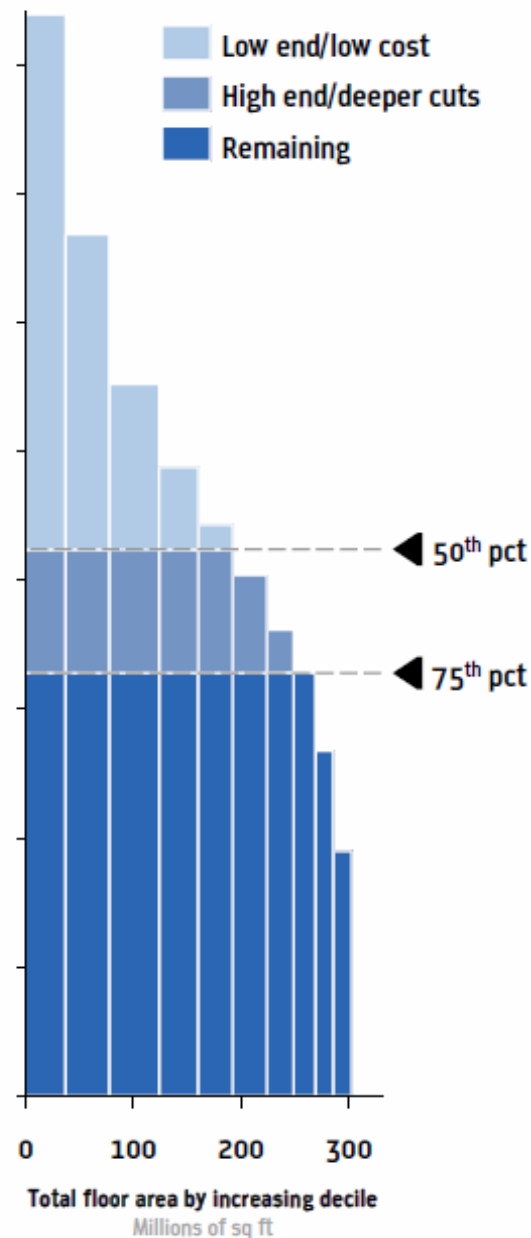
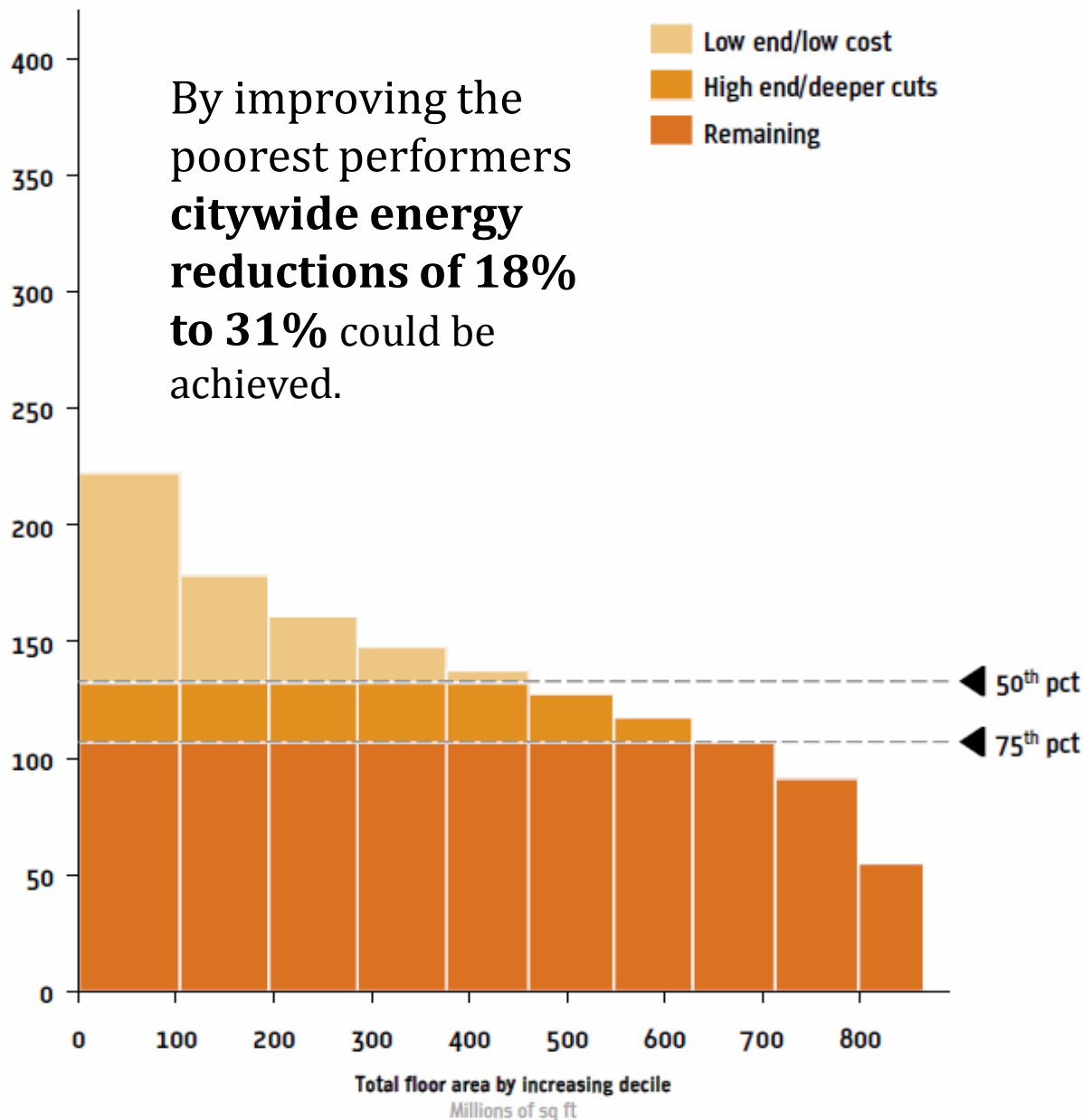
2012: Within the multifamily sector, the poorest performing buildings **use 4 times the energy** of the highest performing buildings.

[Fig. 11] Variation in Source EUI by Sector (5th-95th percentile)
Source: NYC Mayor's Office

2013: Energy use varies by a factor of about three for multifamily buildings (5th-95th percentile)

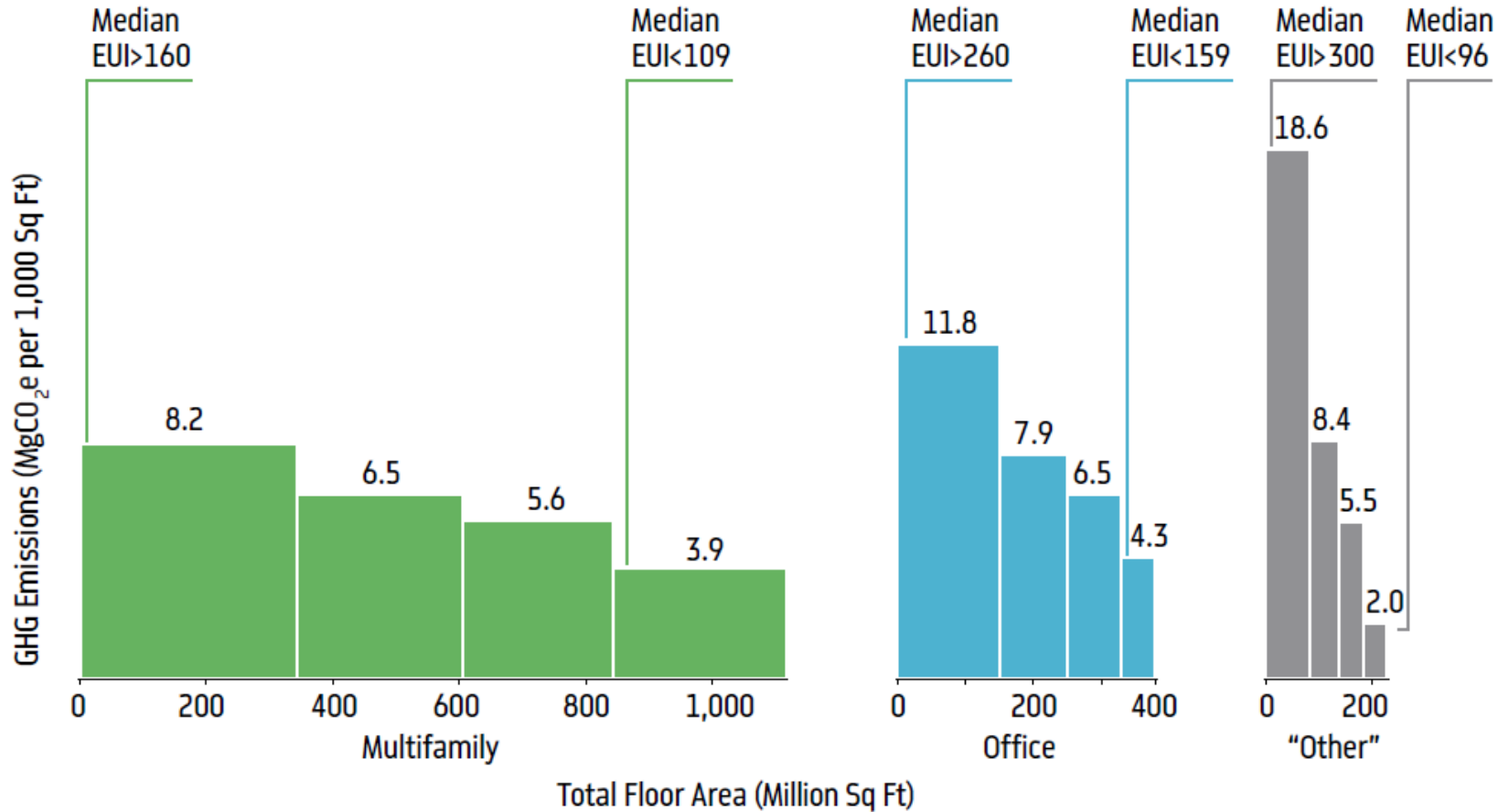


Early Findings from Energy Benchmarking in New York City



Early Findings from Energy Benchmarking in New York City

[Fig. 14] Total GHG Emissions by Sector Quartiles



*Width of each bar corresponds to total floor area of each quartile.

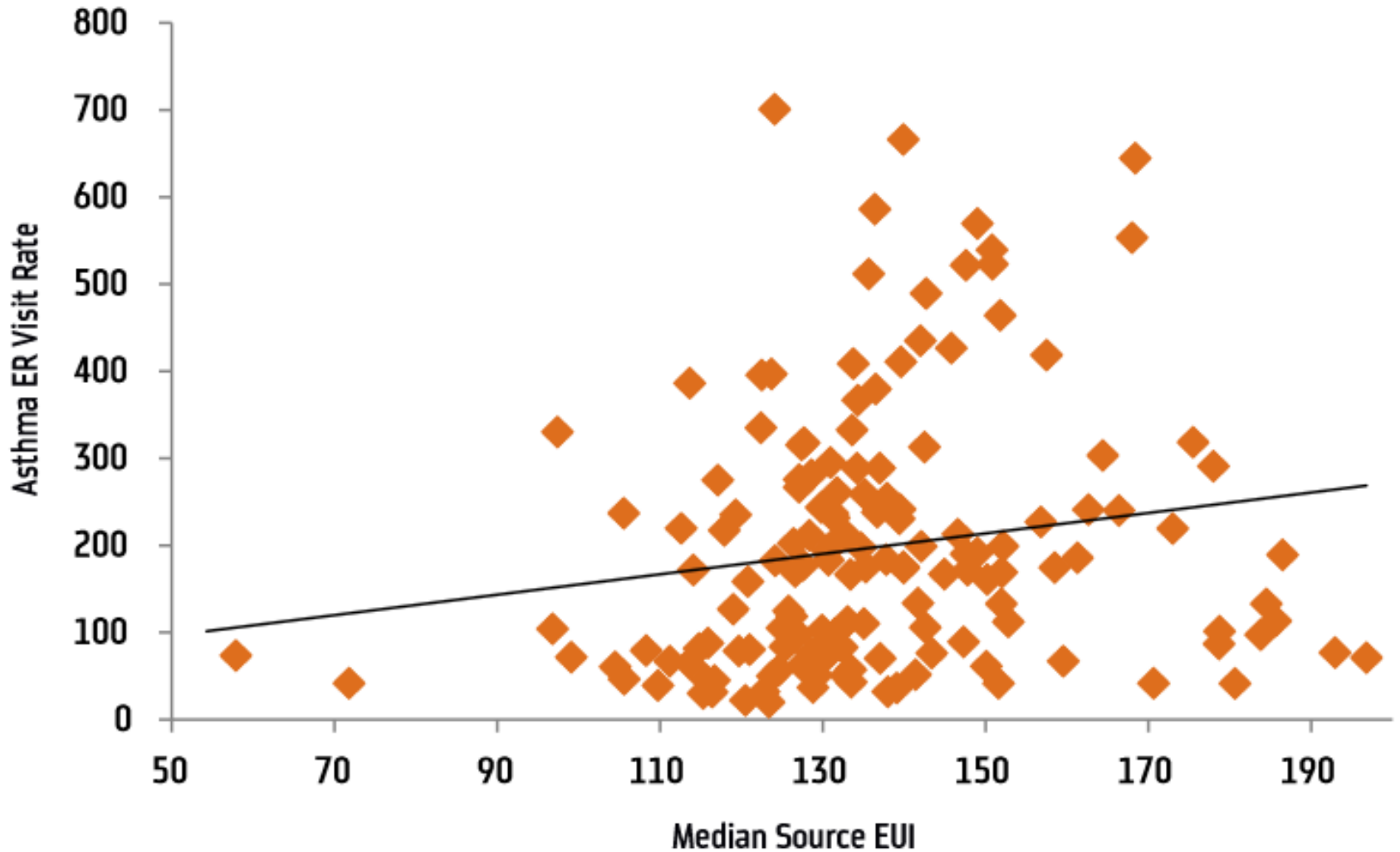
A EUI ≤ 109 **B** 109 < EUI ≤ 132 **C** 132 < EUI ≤ 160 **D** EUI > 160

[Fig. 16] Multifamily Working Grades

Source: NYC Mayor's Office

Early Findings from Energy Benchmarking in New York City

Figure 28: Scatter Plot of Asthma ER Visit Rate Versus Multifamily EUI





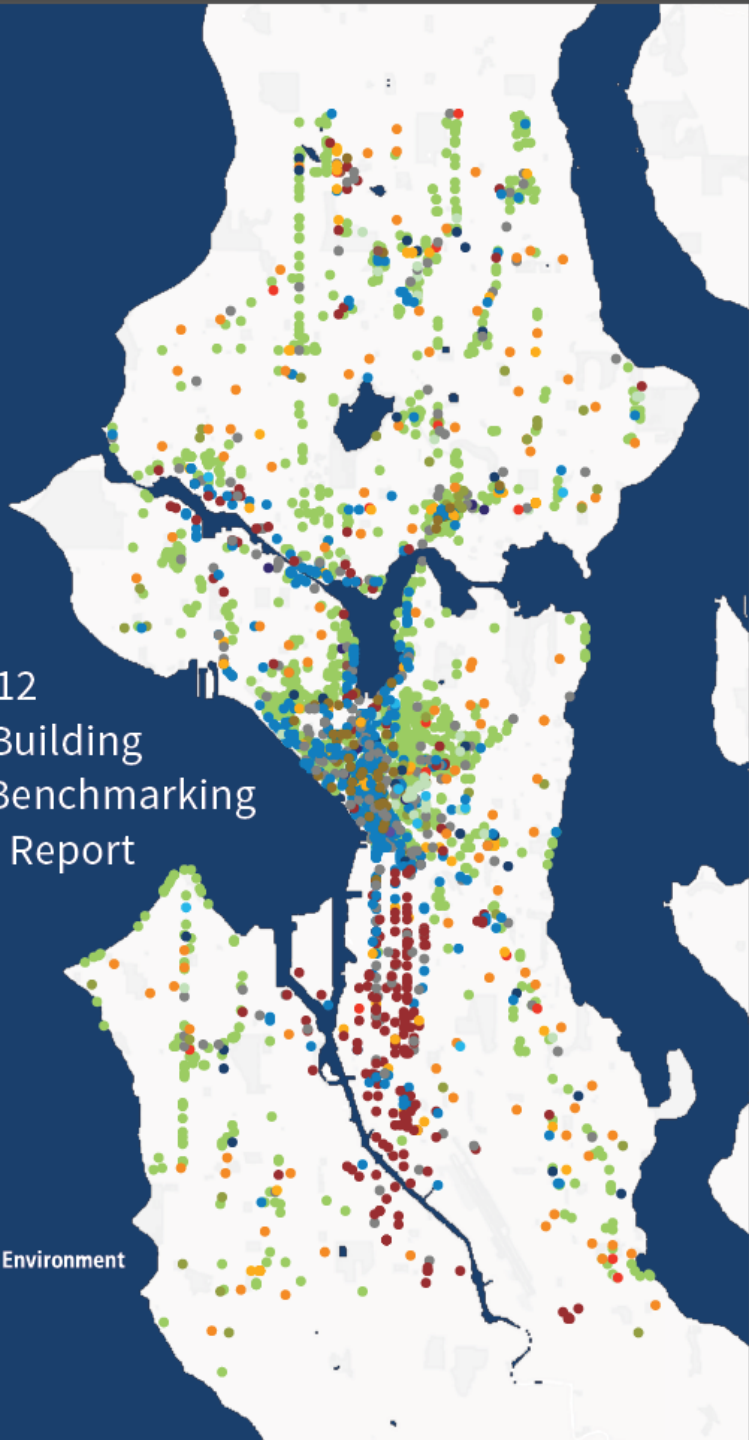
2011/2012
Seattle Building
Energy Benchmarking
Analysis Report

Prepared by



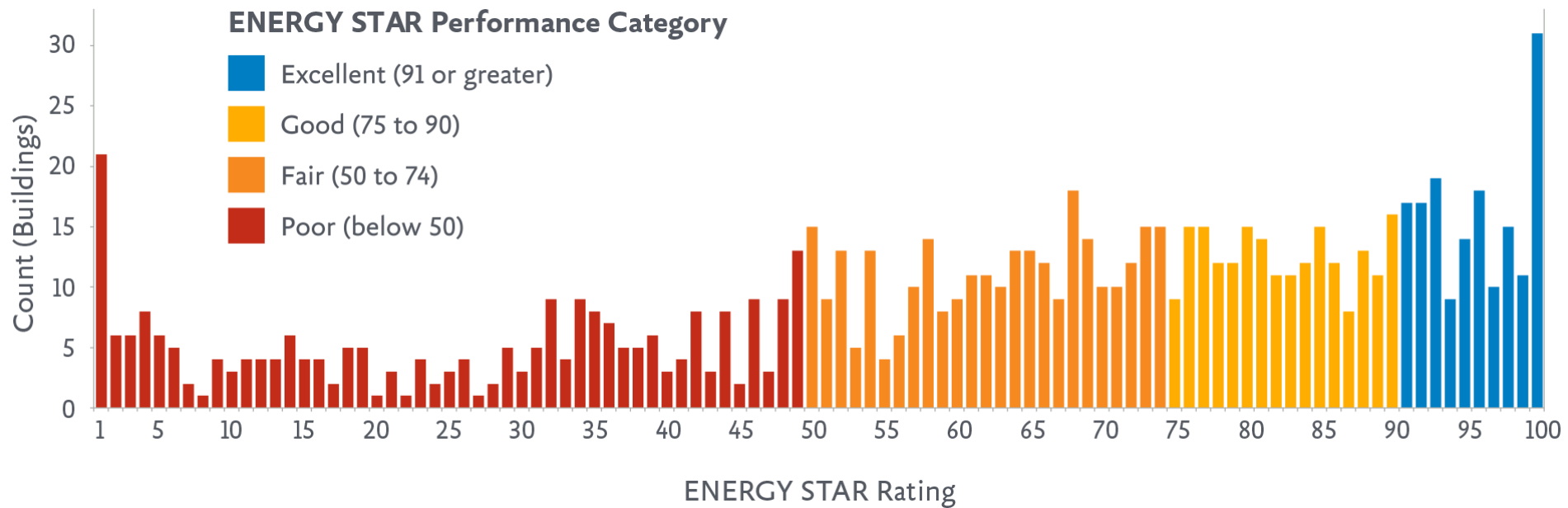
SEATTLE OFFICE OF
Sustainability & Environment

January 2014



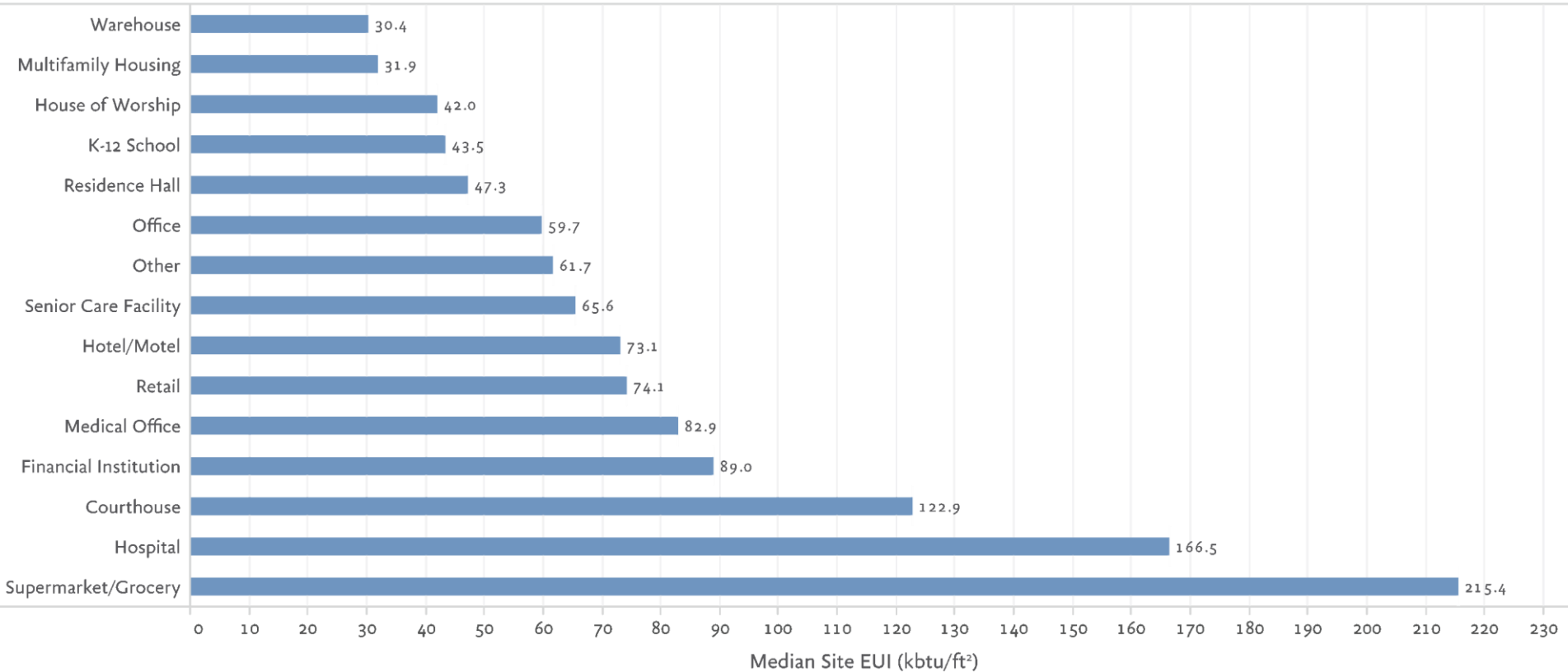
Seattle recently released the first report analyzing the energy performance data from its benchmarking ordinance.

SEATTLE ENERGY BENCHMARKING & REPORTING

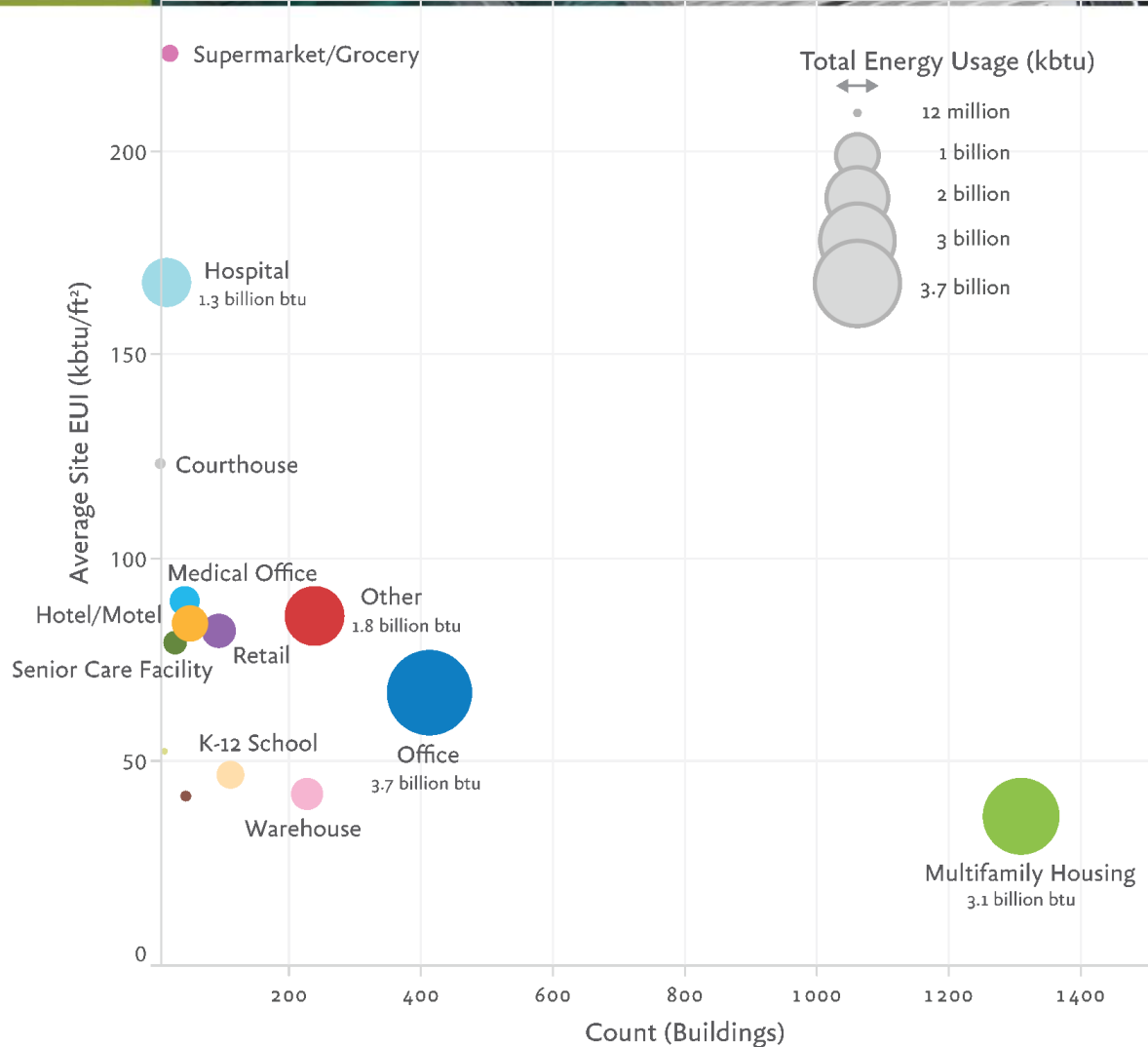


SEATTLE ENERGY BENCH & MARKING & REPORTING

Building Type



SEATTLE ENERGY BENCHMARKING & REPORTING



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Building Type

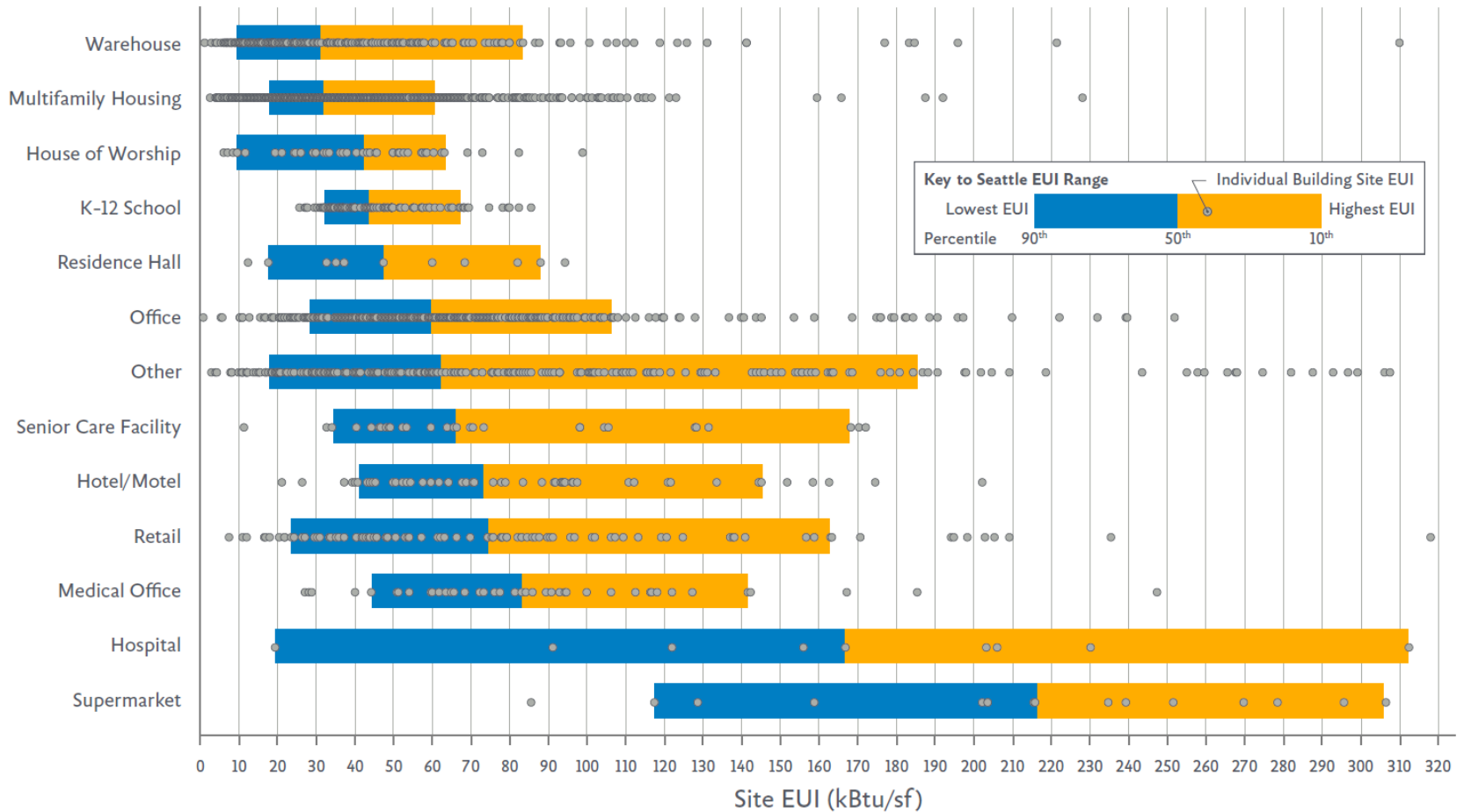


Figure 11: 2012 EUI Performance Range and Distributions by Building Type

SEATTLE ENERGY BENCHMARKING & REPORTING

Seattle Apartment & Condo Building Energy Performance

The numbers on the scale show the annual energy use intensity (kbtu/sf) ranges found in Seattle multifamily buildings (2012).

HIGHEST USE
44 or more

AVERAGE USE
43-33

32-26

LOWEST USE
25 or less

Your building's score

41

This scale is based in performance by quartile. The 1st quartile in red (highest use) represents the range of EUIs among the 25% of buildings with the highest EUIs. The 2nd quartile in orange represents the range of EUIs for the next 25% of buildings with respect to EUI, and so on.

Chicago's Building Energy Use Benchmarking Ordinance

Benchmarking: Non-industrial buildings >50,000 square feet required to annually benchmark energy consumption using ENERGY STAR Portfolio Manager

- Commercial buildings >250,000 sq. ft. – June 1, 2014
- Residential buildings >250,000 sq. ft. – June 1, 2015
- Commercial buildings 50,000-250,000 sq. ft. – June 1, 2015
- Residential buildings 50,000-250,000 sq. ft. – June 1, 2016

Data Verification: First year and every third year, data verification required by LA, PE, or other professional designated by the Commissioner

Reporting & Disclosure:

- Annual reporting to the City
- City publishes annual report on overall trends
- Building-level data publicly shared starting the 2nd year of benchmarking



Improving access to data helps remove a significant barrier to widespread benchmarking

DATA

Data Access and Transparency Alliance

- BOMA, RER, IMT, USGBC form DATA Alliance to work with utilities and regulators to secure better access to utility data
- July 2011: NARUC approves resolution calling on regulators to provide better data access to commercial owners
- USGBC Existing Authorities memo identifies data access as key EE barrier and calls for increased federal involvement
- Collaboration with administration on expanding Green Button initiative to include commercial data access

Current Practices



Utility Company (State)

Aggregate Whole-
building Data

Automated Upload to
Portfolio Manager

Austin Energy (Texas)

✓

-

Avista (Washington)

✓

✓

California IOUs

-

✓

Commonwealth Edison (Illinois)

✓

✓

Consolidated Edison (New York)

✓

-

PECO (Pennsylvania)

✓

✓

Pepco (District of Columbia)

✓

2014

Puget Sound Energy (Washington)

✓

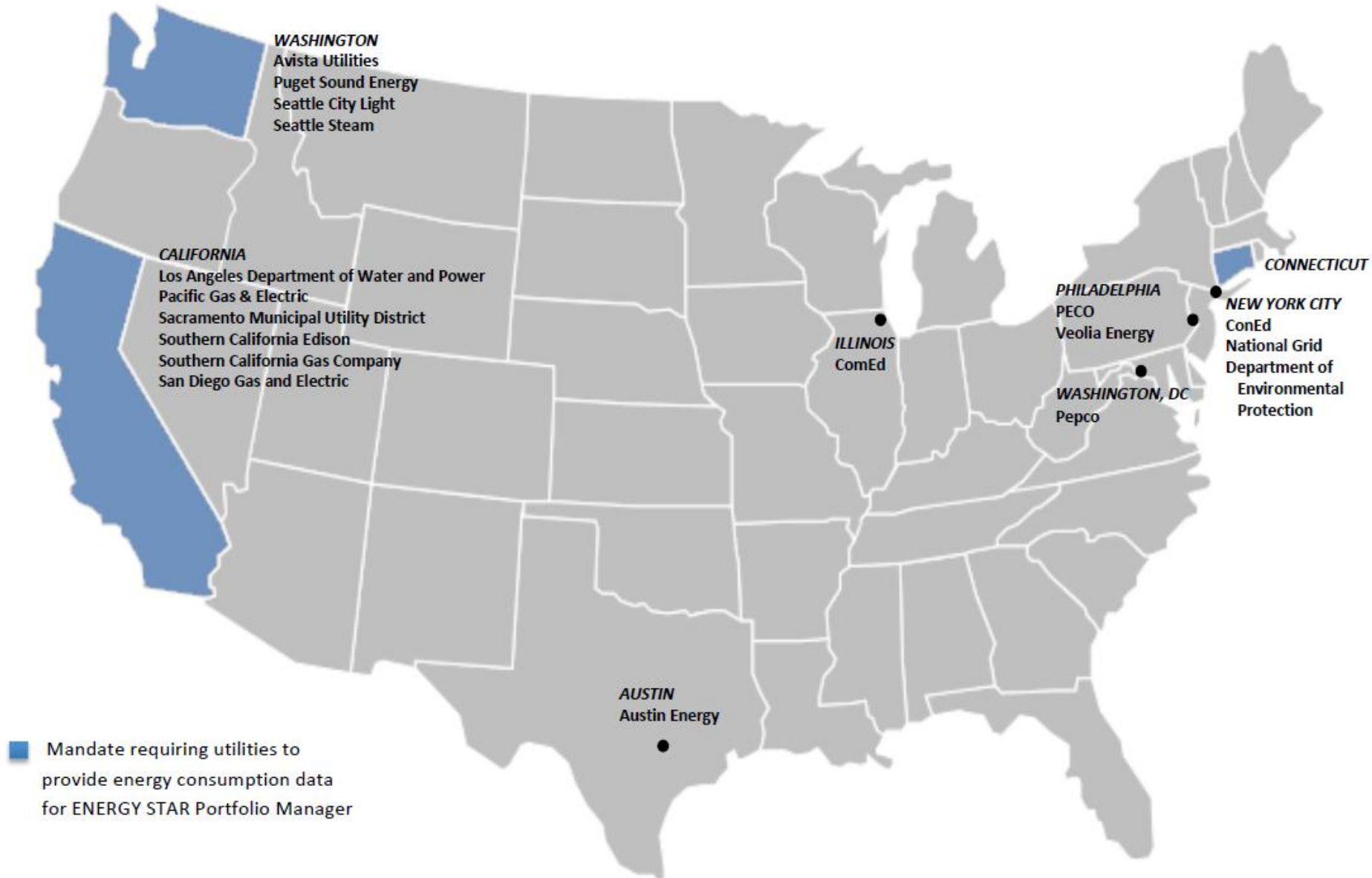
✓

Seattle City Light (Washington)

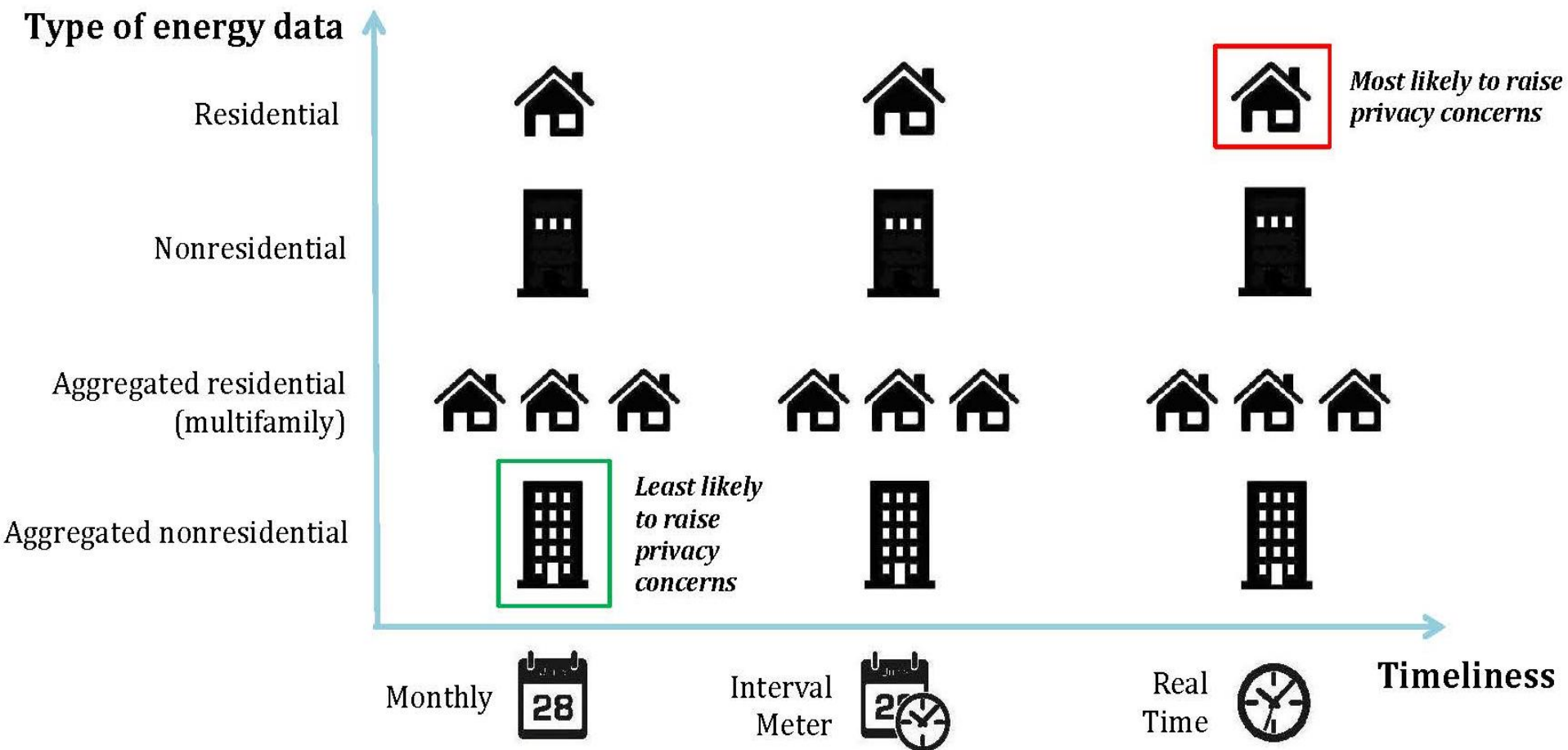
✓

✓

Utility Data Access Programs



Utility Meter Data Sensitivity



Current Practices

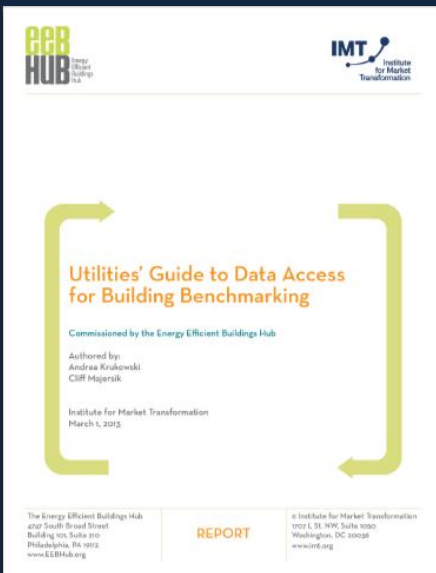
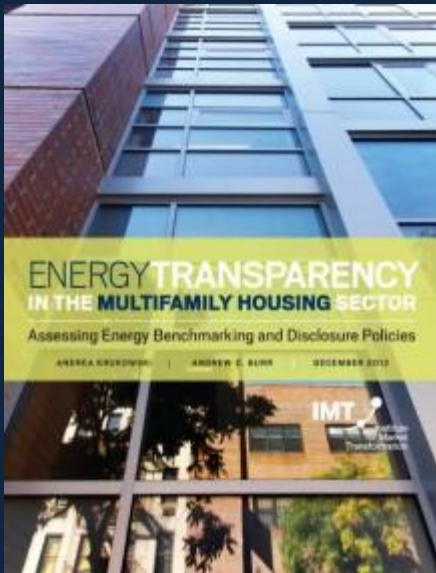


Utility Company (State)	Account Aggregation Threshold Number of accounts / maximum percentage of total energy usage one account can contribute
Avista (Washington)	No threshold
Consolidated Edison (New York)	No threshold
Seattle City Light (Washington)	No threshold
Commonwealth Edison (Illinois)	4
Austin Energy (Texas)	4/80*
Puget Sound Energy (Washington)	5
Pepco (District of Columbia)	5

* Only applies to commercial buildings

Opportunities and considerations

- Leading by example
- Promoting better access to data
- Challenge programs
- Leveraging partnerships
- Size thresholds
- Program manageability
- Regional collaboration
- Complementary programs



Resources

- Help Center Guide

<http://www.imt.org/resources/detail/benchmarking-help-center-guide>

- Utility's Guide to Data Access

<http://www.imt.org/news/the-current/new-utilities-guide-to-data-access>

- Lessons from Implementation in NYC, Seattle, San Francisco

<http://www.imt.org/resources/detail/lessons-learned-from-the-implementation-of-rating-and-disclosure-policies-i>

- BuildingRating.org/content/policy-comparison

- IMT.org/resources



Thank you!
Questions?

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