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Energize Denver: Energy Efficiency Ordinance

Meeting our Climate Goals & Unlocking Opportunity

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BENCHMARKING AND TRANSPARENCY


Compare this vehicle to others in the FREE FUEL ECONOMY GUIDE available at the dealer.
CITY MPG
23
Actual Mileage will vary with options, driving conditions, driving habits and vehicle's condition. Results reported to EPA indicate that the majority of vehicles with these estimates will achieve between
19 and 27 mpg in the city
and between
26 and 35 mpg on the highway.
Fuel Economy Information
DOE EPA
1993 CANARY 2.0 LITER
L4 ENGINE FUEL INJECTED
AUTO 3 SPD TRANS CATALYST
FEEDBACK FUEL SYSTEM
Estimated Annual Fuel Cost:
$850
HIGHWAY MPG
30
For Comparison Shopping, all vehicles classified as COMPACT have been issued mileage ratings ranging from 1 to 31 mpg city and 16 to 41 mpg highway.

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What is benchmarking?

- Benchmarking means measuring the energy performance of a building by comparing it to a large national dataset of similar buildings.
- ENERGY STAR Portfolio Manager is a free online tool offered by the EPA.
- Property managers or building owners can use it to get a 1-100 score on energy performance.
- 100 is the best and 50 is the national average.
- It takes about 4 hours to set up a property profile and 1-3 hours of time annually per building to report.

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What is transparency?

- Gives information to the market to drive competition and investment in energy efficiency.
- Publish the ENERGY STAR score, weather normalized site EUI (kBtu/ft^2), total GHG emissions (metric tons CO_2e), and a couple other data points for each building.
- Data will be made available to the public in 2 ways:
  - Searchable database where you enter the address
  - A clickable map
- Exemptions exist for confidential business practices.

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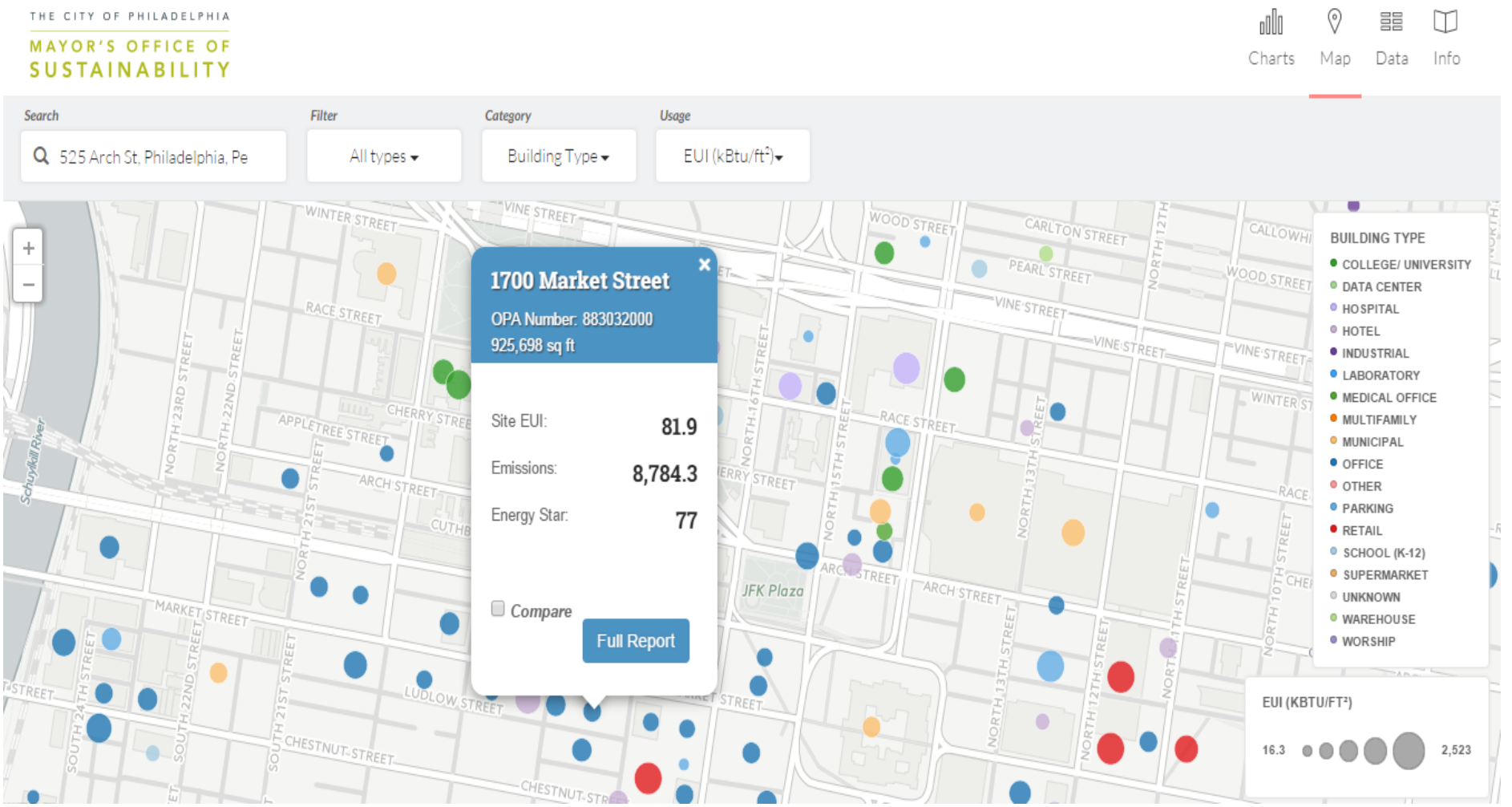
Clickable Map Example



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Energy Saved through Full Transparency

City	Program Attributes	Energy Reduction	Annual Energy Reduction
Seattle (2011 -2013)[1]	Benchmarking & Transactional Disclosure	0.6% (over 2 years)	0.3%
San Francisco (2010-2014)[2]	Benchmarking & Transparency	7.9% (over 4 years)	2%
New York City (2010 -2013)[3]	Benchmarking & Transparency	5.7% (over 3 years)	1.9%
Washington, D.C. (2012 -2013)[4]	Benchmarking & Transparency	9% (over 3 years)	3%

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$1.3 billion opportunity in Denver

Source: "United States Building Energy Efficiency Retrofits: Market Sizing and Financing Models." Rockefeller Foundation and Deutsche Bank Group. March 2012. Numbers scaled to City and County of Denver.

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Energy efficiency as an investment

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Evidence for energy and utility bill savings

- "Does Information Provision Shrink the Energy Efficiency Gap? A Cross-City Comparison of Commercial Building Benchmarking and Disclosure Laws"
- YES- evidence from benchmarking and transparency ordinances in Austin, New York, San Francisco, and Seattle found that the laws reduced utility expenditures by about 3 percent.
- U.S. Department of Energy. "New York City Benchmarking and Transparency Policy Impact Evaluation Report."
- This report states that NYC saw a cumulative energy savings of 5.7% during the first four years of the benchmarking policy from 2010 through 2013.
- This is equal to a total dollar savings of $267,492,147.

Energize Denver Task Force and Process

- The Goal: Reduce energy consumption of commercial and multifamily buildings by 10% by the end of 2020 and double that in the following decade.
- Task Force Membership: Property managers, building owners, investors, utility, energy efficiency contractors, affordable housing, hotels, and others. Eight meetings from January through July 2016.
- The City's Commitment: Based on the task force's recommendations, the City will develop and implement new building efficiency programs and policies.

www.energizedenver.org

Energize Denver Task Force Members:

Adam Knoff, Unico Properties, 2030 District member

Bob Macauley, Xcel Energy

Christian Williss, Colorado Energy Office

Dawn Murray, KW Commercial Real Estate, DMCAR member, ICSC member

Elizabeth Babcock, Denver Department of Environmental Health

Elizabeth Caswell-Dyer, Sopra Communities, BOMA member, CAI member

J Drever, Mapleton Asset Management, NAIOP member

Jarrett Wendt, Panasonic

Jennifer Gremmert, Energy Outreach Colorado, Housing Colorado member

Jerry Glick, Columbia Group LLC, Former Chair of the Downtown Denver Partnership, and of Denver Civic Ventures

Jim Ptacek, NORESCO, ULI member

John Hersey, Enterprise Community Partners

Michael Totten

Mike Hicks, AIA member & ULI member

Mike Michna, Sage Hospitality

Patti Mason, USGBC Colorado

Phillip Saieg, McKinstry, BOMA member, USGBC member, advisor to NREL

Robin Kniech, City Council

Robert Martinez, Kaiser Permanente, DMCC member

Tony Massaro, Coalition for an Energy Efficient Denver

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Cities with Benchmarking and Transparency Policies

Cities with Benchmarking and Transparency Policies	
Atlanta, GA	Montgomery County, MD
Austin, TX	New York City, NY
Berkeley, CA	Philadelphia, PA
Boston, MA	Pittsburgh, PA
Boulder, CO	Portland, ME
Cambridge, MA	Portland, OR
Chicago, IL	Seattle, WA
Kansas City, MO	San Francisco, CA
Minneapolis, MN	Washington, D.C.

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Local Action on Climate Change is Critical

- **Our responsibility** - Cities are responsible for much of the carbon pollution that causes climate change
- **Local health impacts of climate change**
  - Hotter temperatures → more air pollution → increased asthma rates
  - Increased number of 100 degree days in Denver, when 50% of homes do not have AC, risks lives
  - 3rd worst city for urban heat island effect; difference between urban and surrounding rural temperature is significant

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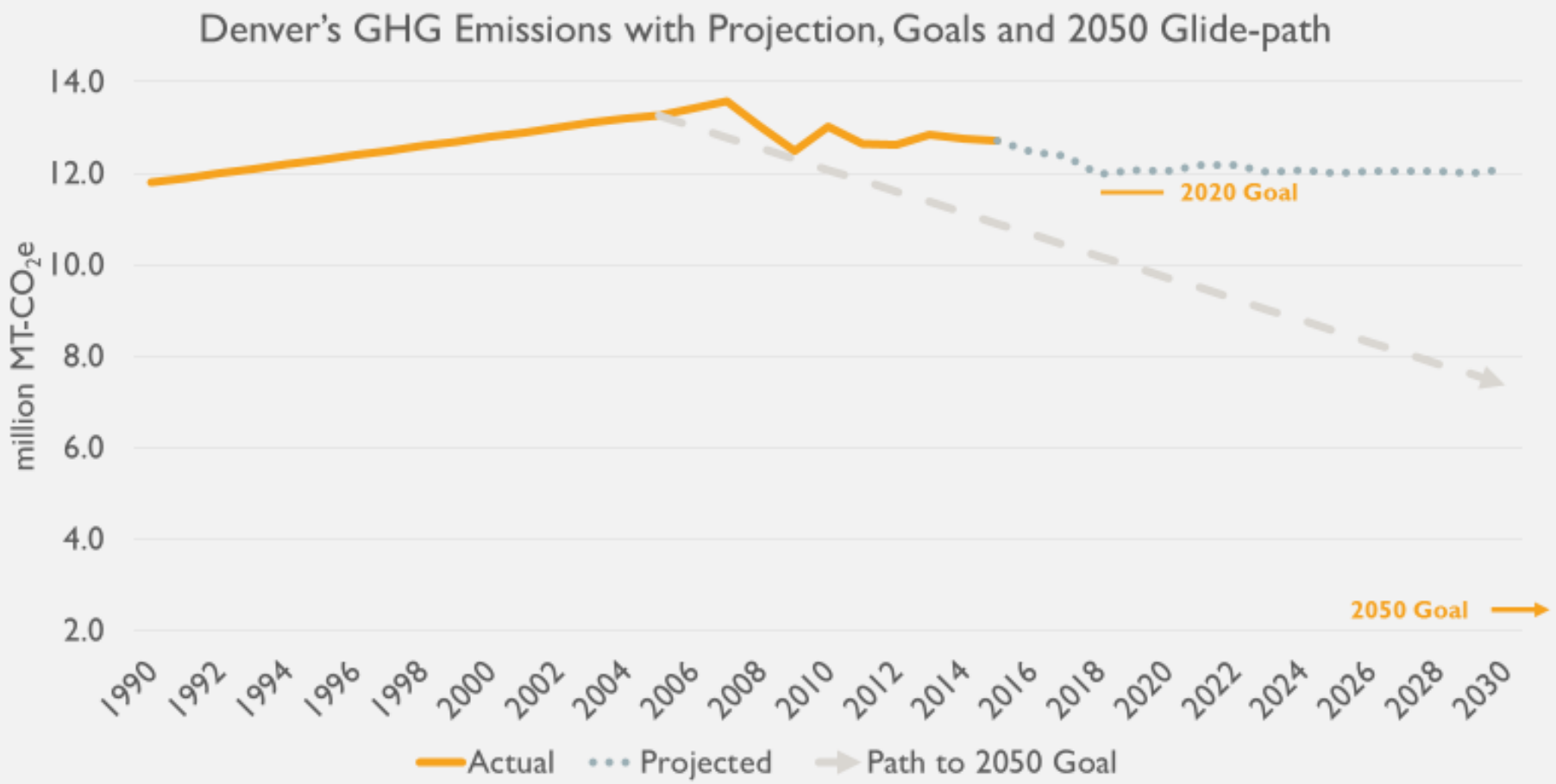
Denver's GHG Emissions and Climate Goals



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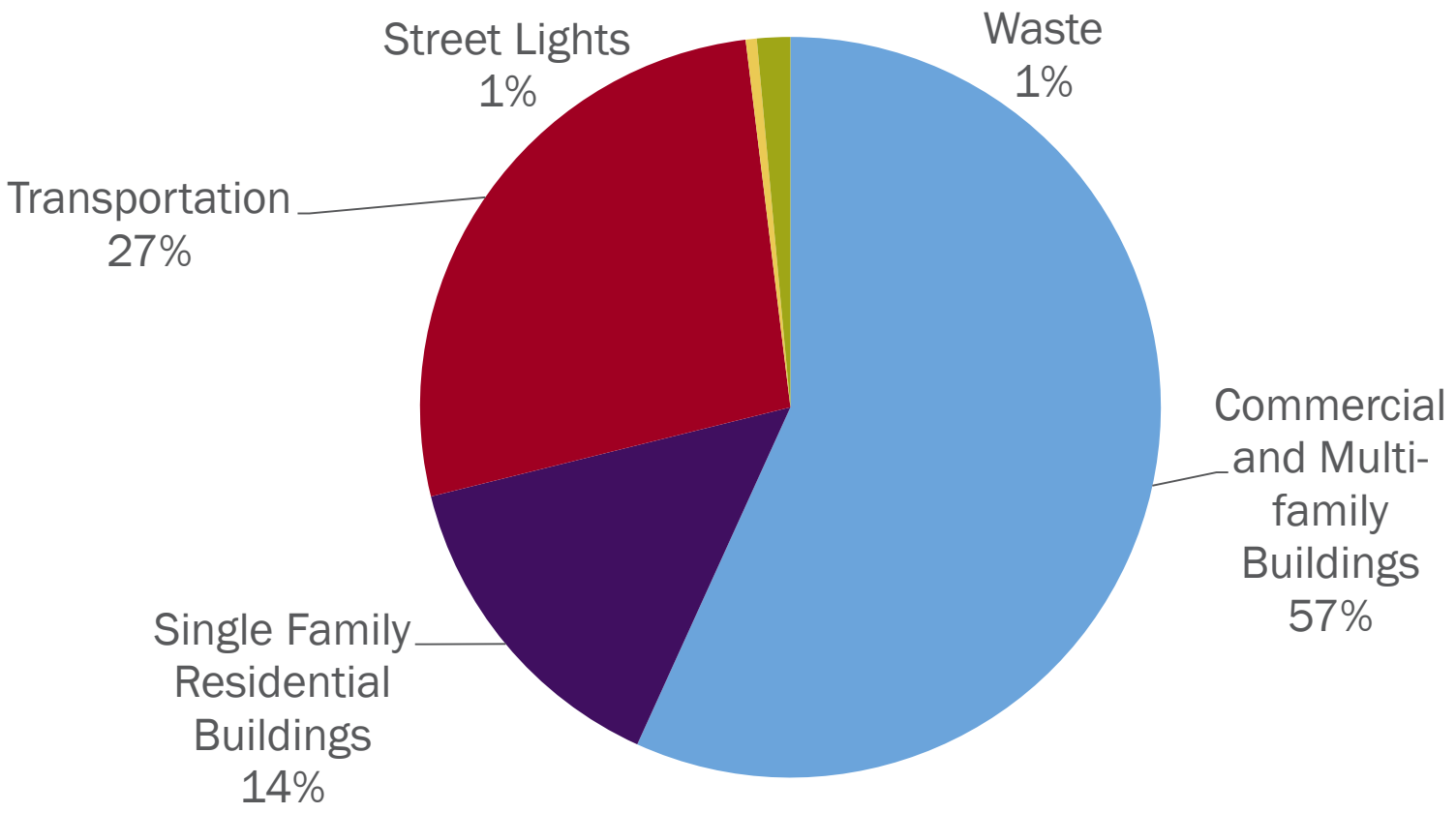
Denver's Core GHG Emissions Sources



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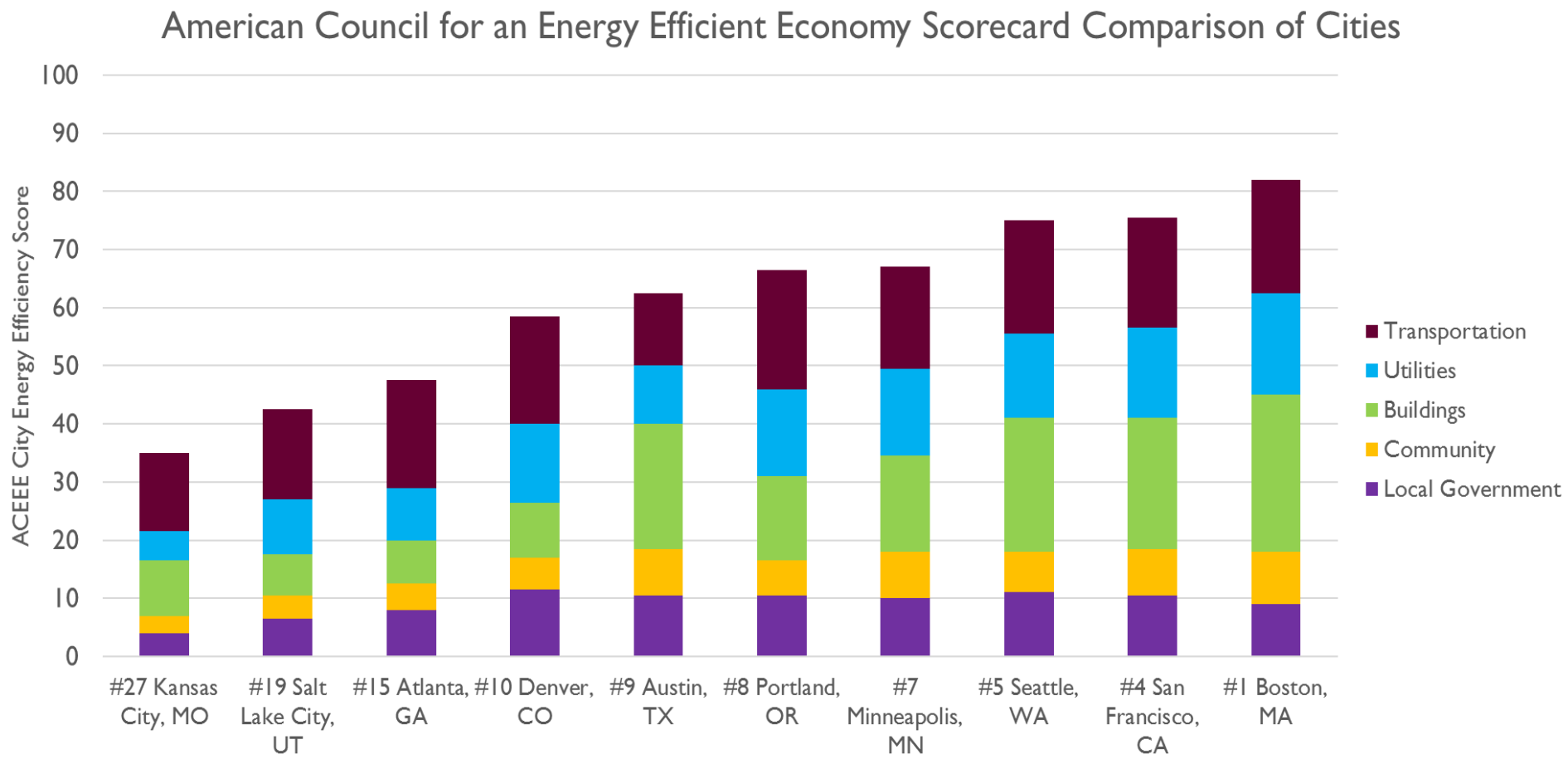
How does Denver compare?



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INCENTIVES AND SUPPORT

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Incentives and Support

- Free call center to provide education, training and answer questions about benchmarking
  - Also conducts QA on data
- Free score cards to building owners with incentives, market comparison data and other tools
- Policies to rebate permit fees for highly efficient buildings (new construction or major renovations)
- Pro-bono benchmarking support for buildings in financial distress or affordable and low-income housing or nonprofits

Energy Usage Report

Owner: Building Owner
Year Built: 1987
Square Footage: 6,666 sf
Analysis Period: 12/1/2013-12/1/2014

ENERGY STAR® PortfolioManager™ Score

Your Building's Score

94

Average Score For Your District

64

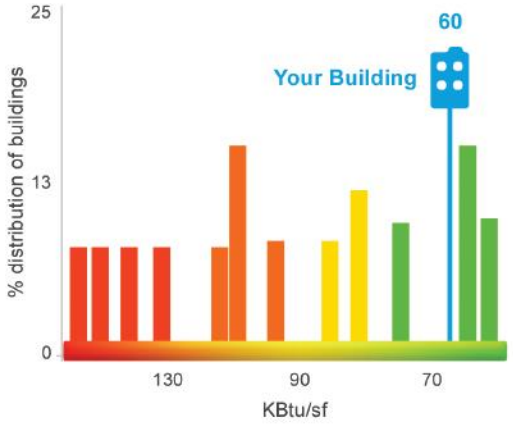
Total Carbon Footprint:

27,109,373 lbs/year

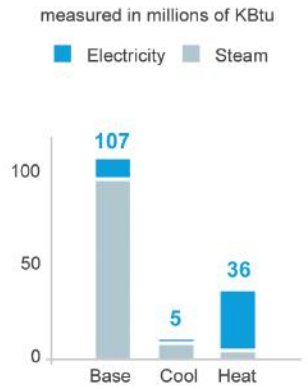
The total building energy is converted to one consistent unit (Btus) to allow for comparison with other buildings. Display of carbon emissions accounts for the environmental impact of the site energy used and considers the source fuel for electricity.

Annual Site Energy Consumption

How You Compare to Your District

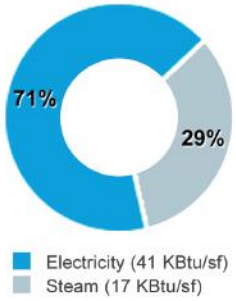


Total Energy By Use



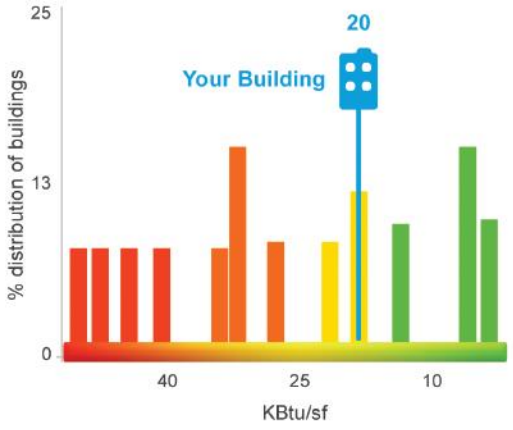
Total Site Energy Consumption

142,150,096 KBtu
(58 KBtu/sf)



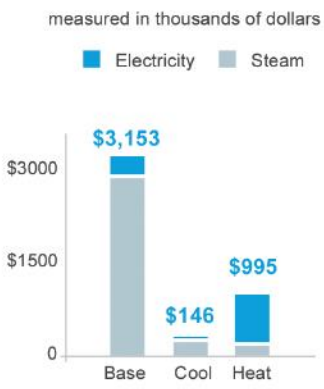
Annual Carbon Emissions

How You Compare to Your District



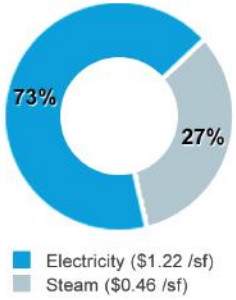
Total Annual Energy Cost

Total Cost By Use



Total Cost

4,123,730.71 ($1.68/sf)
($868.34/occupant)



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Next Steps

- DEH is asking council to add this benchmarking and transparency requirement to the code
- Board of Environmental Health will follow up with Rules and Regs to further define requirements
  - public input in that process
- Buildings over 50,000 sq ft will report in 2017, over 25,000 sq ft in 2018
- Municipal buildings will lead by example and report all over 25,000 in 2017

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Next Steps

- **Use benchmarking data to inform program**
  - Better alignment of Xcel Energy and other incentives
  - Promote Property Assessed Clean Energy (PACE) financing
  - Develop new and innovative market-based solutions
  - Revisit Part 2 of Energize Denver task force recommendations in early 2018
- **80 X 50 Climate Plan process**
  - Continue stakeholder engagement
  - Release plan mid 2017

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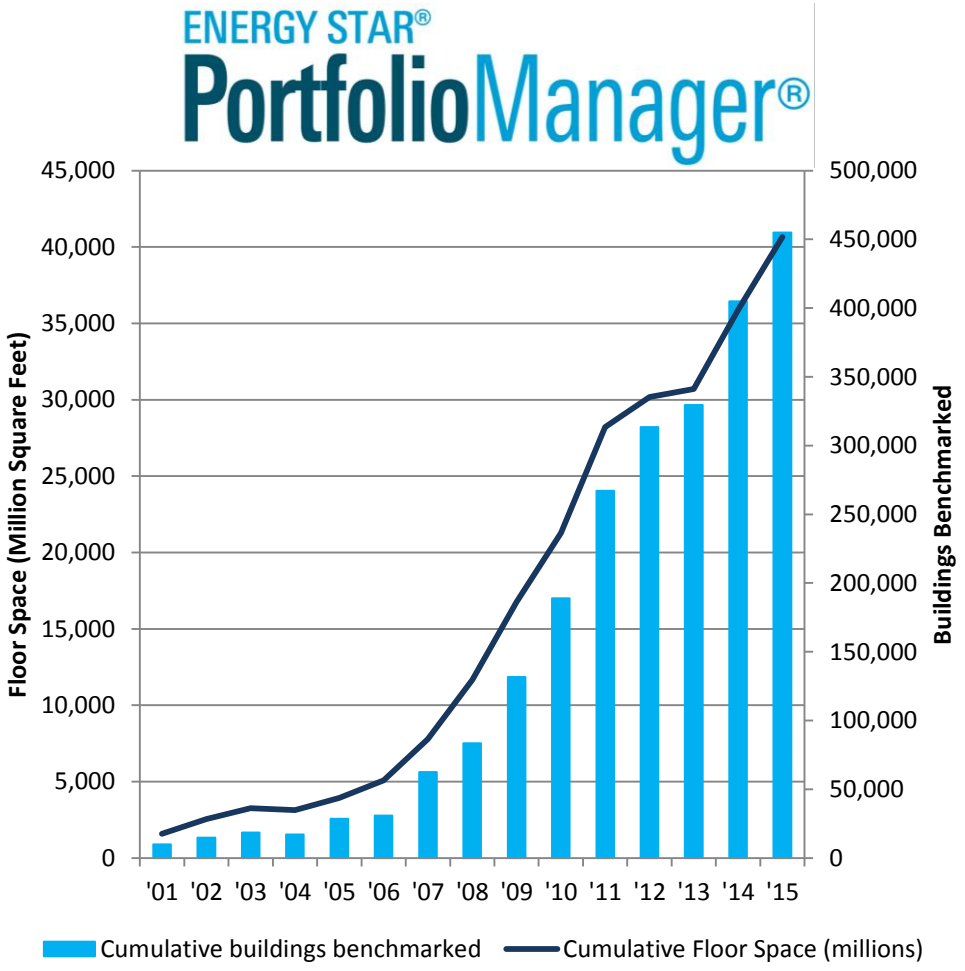
APPENDIX

Benchmarking with ENERGY STAR is the industry standard

- Through 2015, accessed by more than 75,000 accounts tracking more than 450,000 buildings, representing more than 40 billion square feet of commercial and institutional building space in the U.S.
  - Adopted by leading commercial real estate, retail, healthcare, and educational organizations
  - Incorporated in state and local mandatory benchmarking laws
  - Required for use in buildings owned and occupied by US Federal Agencies
  - Selected by the Canadian Government as the platform for their national energy management program for existing commercial and institutional buildings



450,000+ buildings! Where they located? What types of buildings are benchmarking?

- The ***ENERGY STAR Snapshot*** is EPA's annual summary of the ENERGY STAR commercial and industrial activity
  - Portfolio Manager benchmarking and ENERGY STAR certification trends at the national, state, and metro area levels
  - National benchmarking and ENERGY STAR certification trends by sector
  - Summary of EPA's national ENERGY STAR campaign participation and results

2015 ENERGY STAR Snapshot now available!
www.energystar.gov/buildings/about-us/research-and-reports/energy-star-snapshot

Figure 2b. Cumulative square footage benchmarked in Portfolio Manager by type

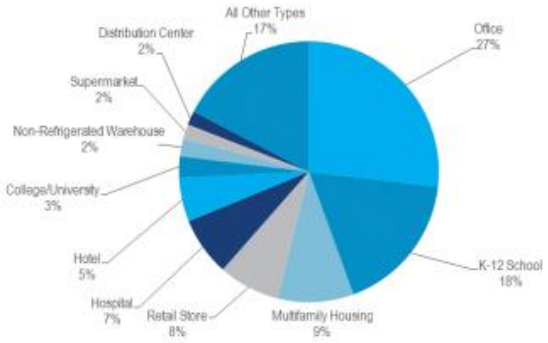
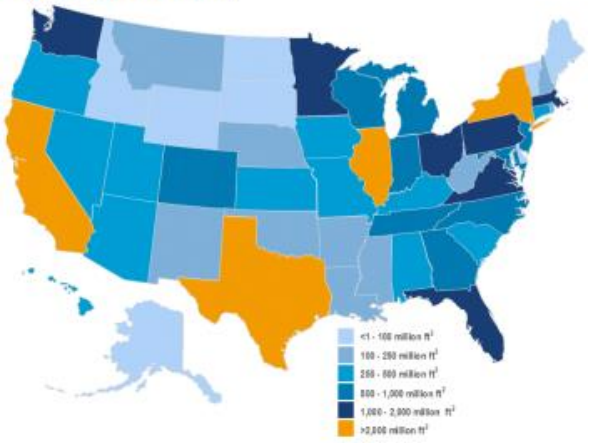


Figure 3a. Square footage of benchmarked buildings by state (cumulative)



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Denver's Buildings

~3,000 buildings > 25k SF

5% in CBD

Source: Denver tax assessor data

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Types of Buildings

	Number of Buildings	% of Buildings	% of Square Footage
Commercial	3077	52%	48%
Multi-family	1986	33%	32%
Municipal	194	3%	7%
Institutional	542	9%	11%
Industrial	159	3%	2%

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Sizes of Buildings

	Number of Buildings	% of Buildings	% of Square Footage
10,000-25,000	2867	48%	11%
25,000-50,000	1260	21%	11%
50,000-100,000	885	15%	16%
100,000-250,000	658	11%	25%
250,000+	288	5%	36%

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Ages of Buildings

	Number of Buildings	% of Buildings	% of Square Footage
Pre-1950	1093	18%	10%
1950-1973	2331	39%	29%
1974-1987	1331	22%	28%
1988-2004	754	13%	20%
2004-2014	449	8%	12%

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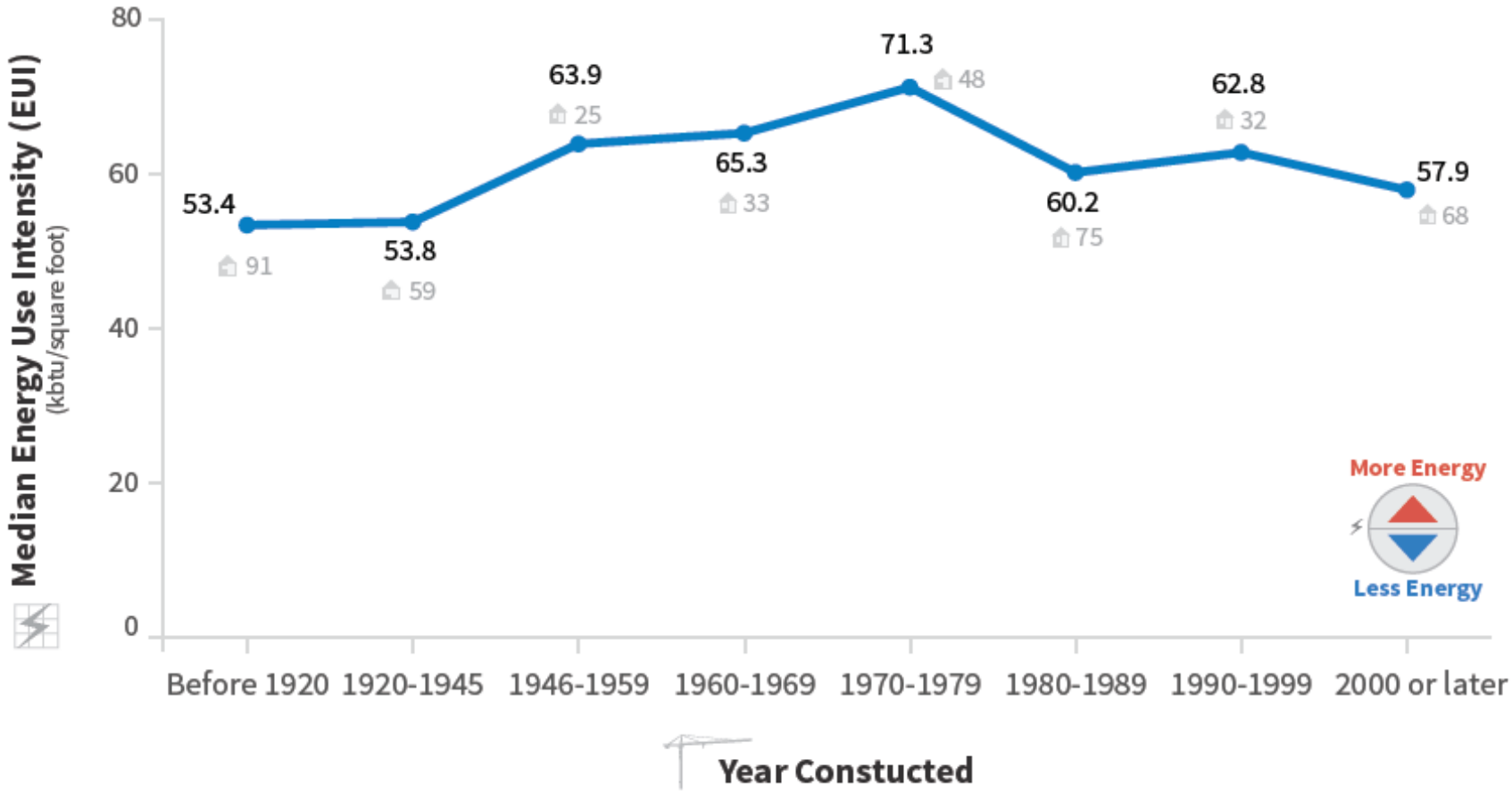
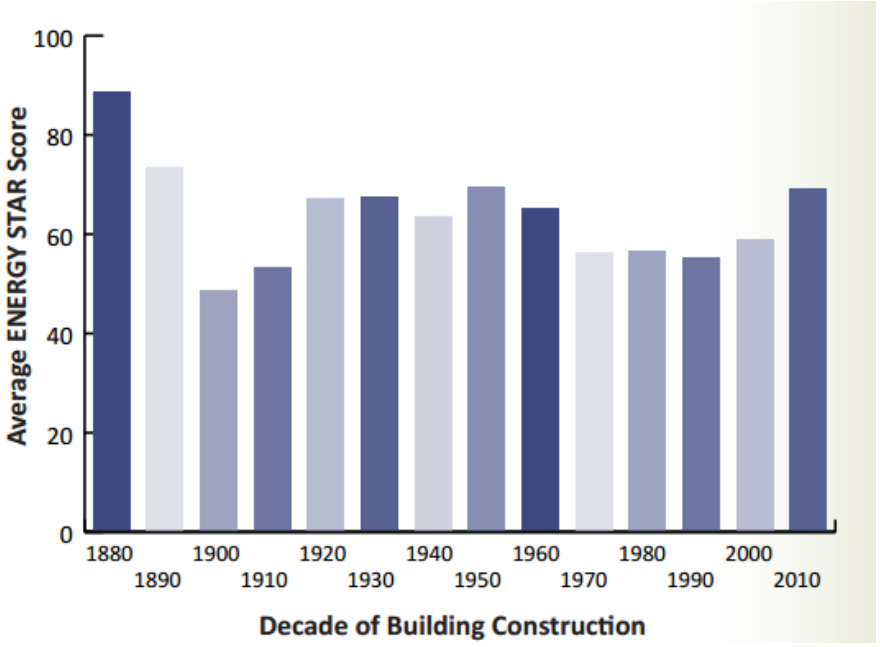
Historic Buildings are MORE Efficient: Seattle

Figure 18: **Office Median Site EUI by Year Constructed**

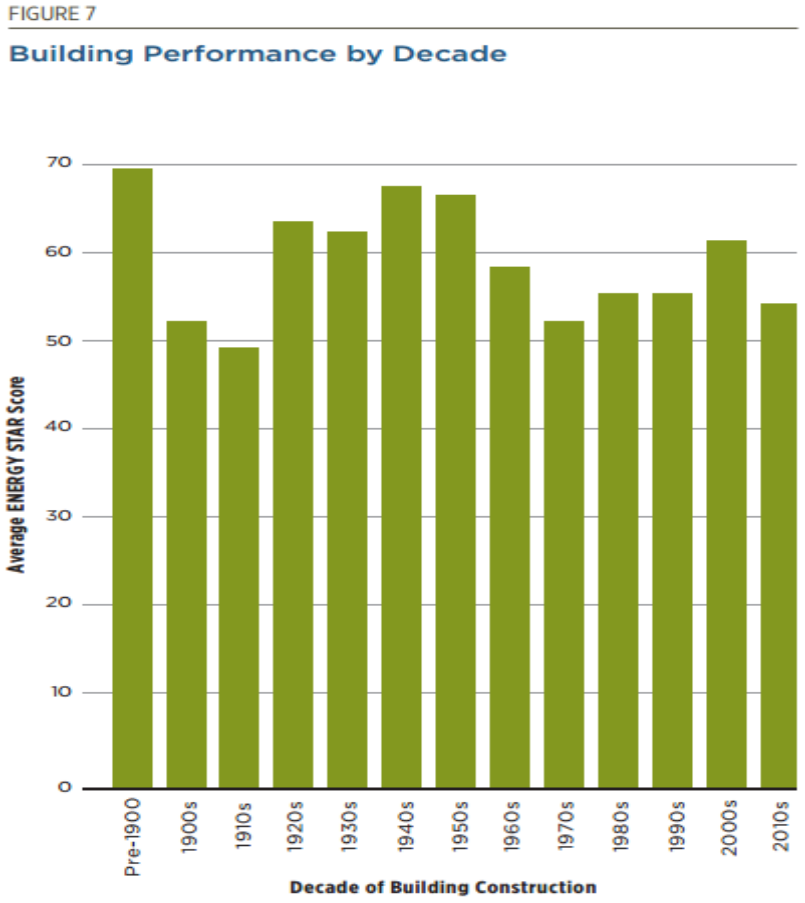


Historic Buildings are MORE Efficient: Philadelphia

Year 1



Year 2



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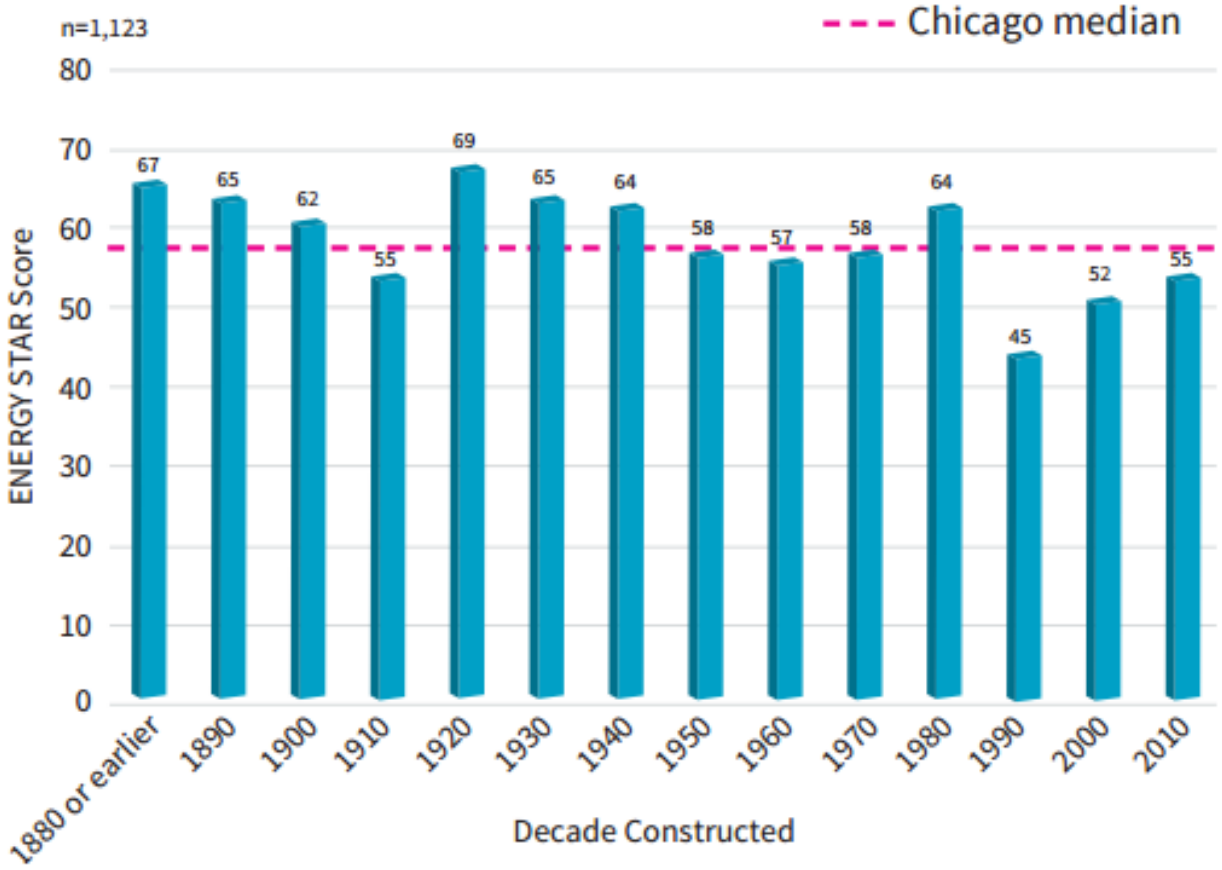
Historic Buildings are MORE Efficient: Chicago

Figure 13: ENERGY STAR Scores by Decade of Construction



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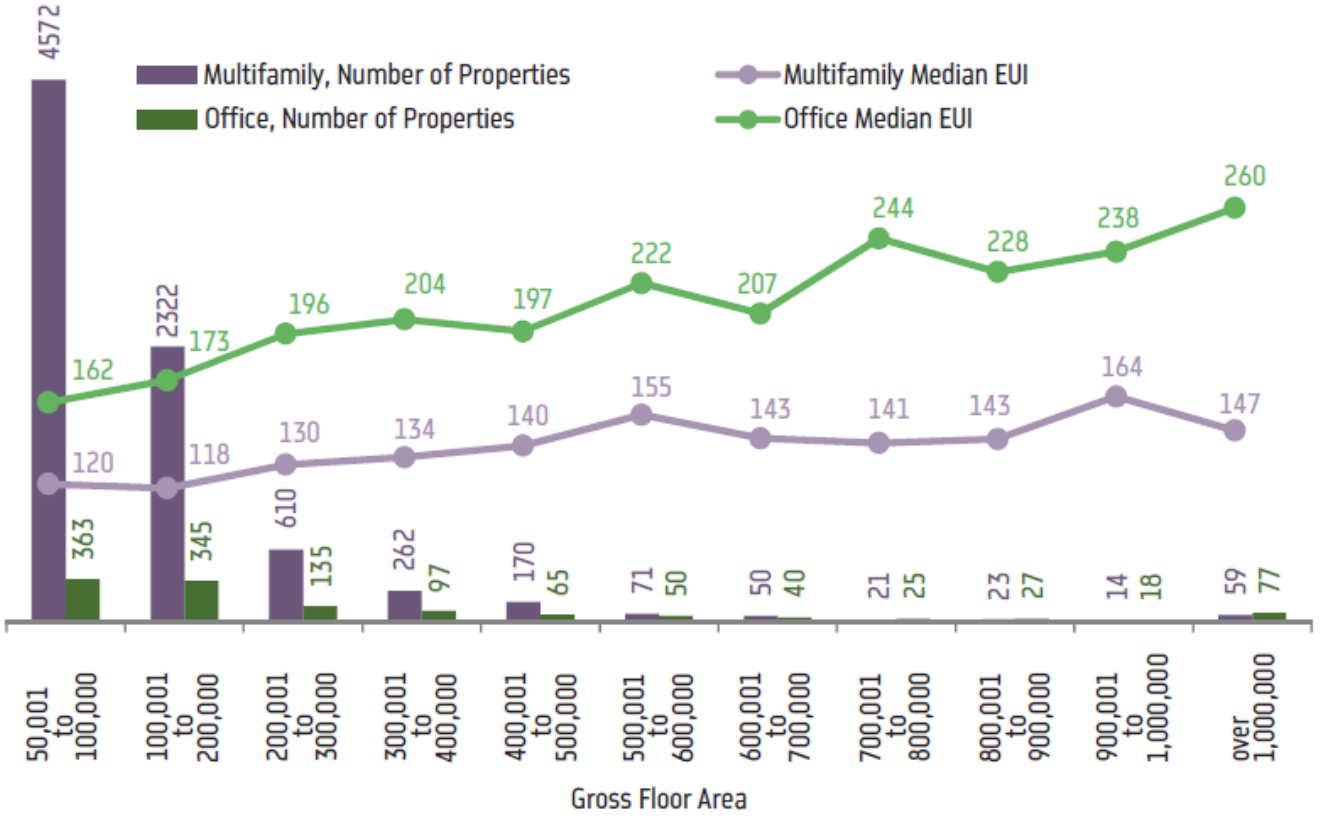
Small Buildings Are Not Less Efficient



[Fig. 16] **Number of Multifamily and Office Properties by Gross Floor Area (square feet) and Median EUI**

Source: NYU and NYC Mayor's Office

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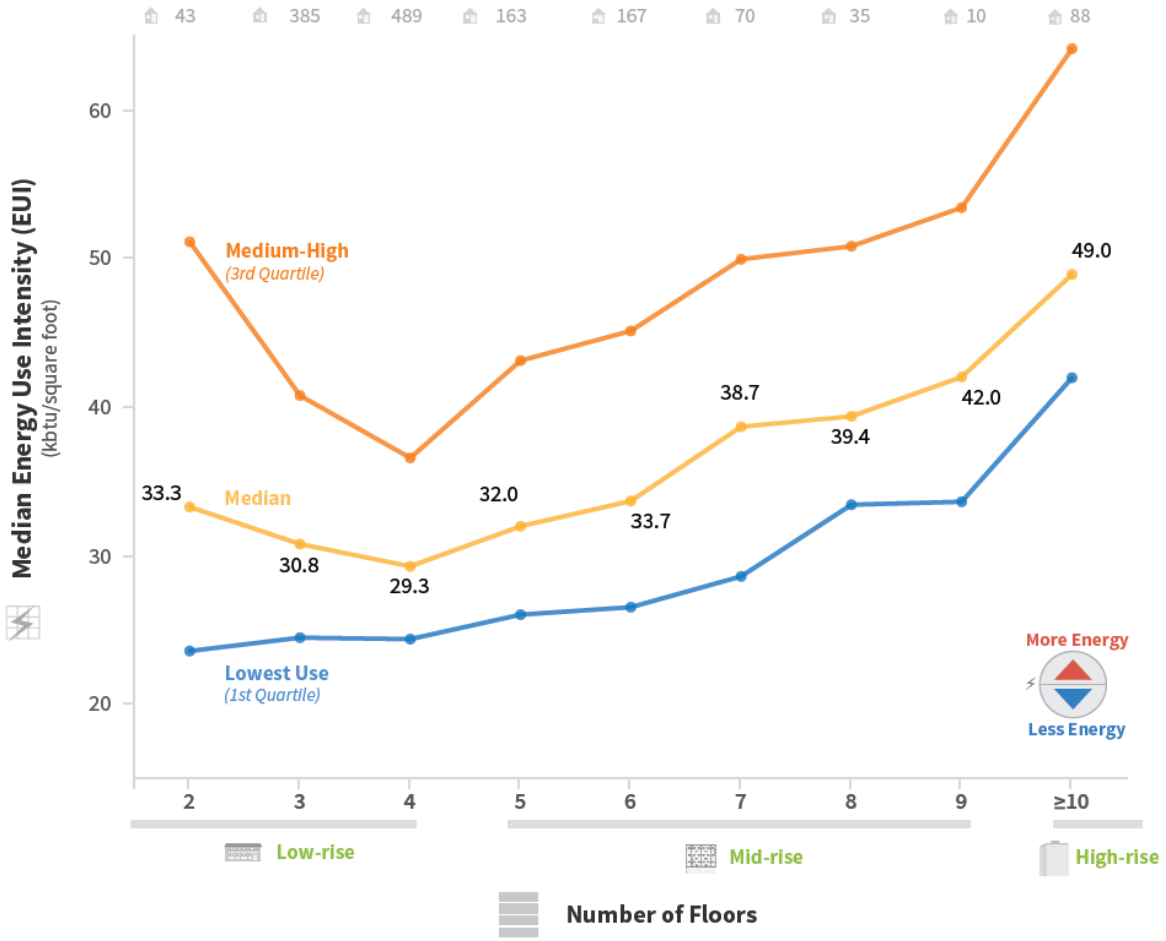
Small Buildings Are Not Less Efficient

Figure 14: **Site EUI by Number of Floors for Multifamily Housing**



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Sizes of Commercial Buildings

(Commercial, Institutional, Industrial, Municipal)

	Number of Buildings	% of Commercial Buildings	% of Commercial Square Footage
10,000-25,000	1800	47%	11%
25,000-50,000	870	23%	12%
50,000-100,000	595	16%	16%
100,000-250,000	394	10%	23%
250,000+	178	5%	37%

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Sizes of Multi-family Buildings

	Number of Buildings	% of Multi-family Buildings	% of Multi-family Square Footage
10,000-25,000	1002	67%	13%
25,000-50,000	297	20%	11%
50,000-100,000	141	9%	16%
100,000-250,000	36	2%	30%
250,000+	12	1%	31%
<39 units	1246	68%	34%
40-199 units	489	27%	37%
200+ units	103	6%	29%

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Sizes of Mixed-use Buildings

	Number of Buildings	% of Mixed Use Buildings	% of Mixed Use Square Footage
10,000-25,000	59	46%	8%
25,000-50,000	16	13%	5%
50,000-100,000	18	14%	12%
100,000-250,000	17	13%	22%
250,000+	18	14%	53%

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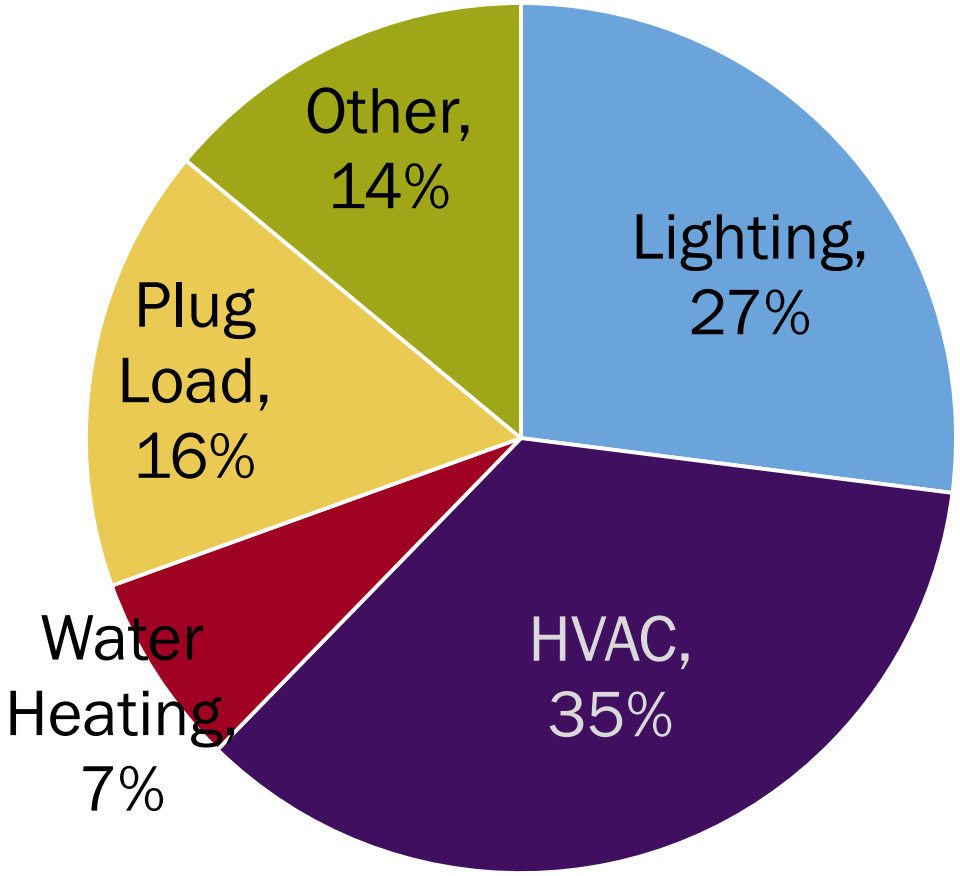
Commercial Building Primary Energy End Use



Source: "Energy Efficiency Trends in Residential and Commercial Buildings" Department of Energy. 2008. Data is a national average. Commercial buildings averaged here include encompassing hospitals, schools, offices, houses of worship, lodging, and the retail sector with its big box stores, enclosed malls, strip malls, grocery stores and fast food and sit-down restaurants.

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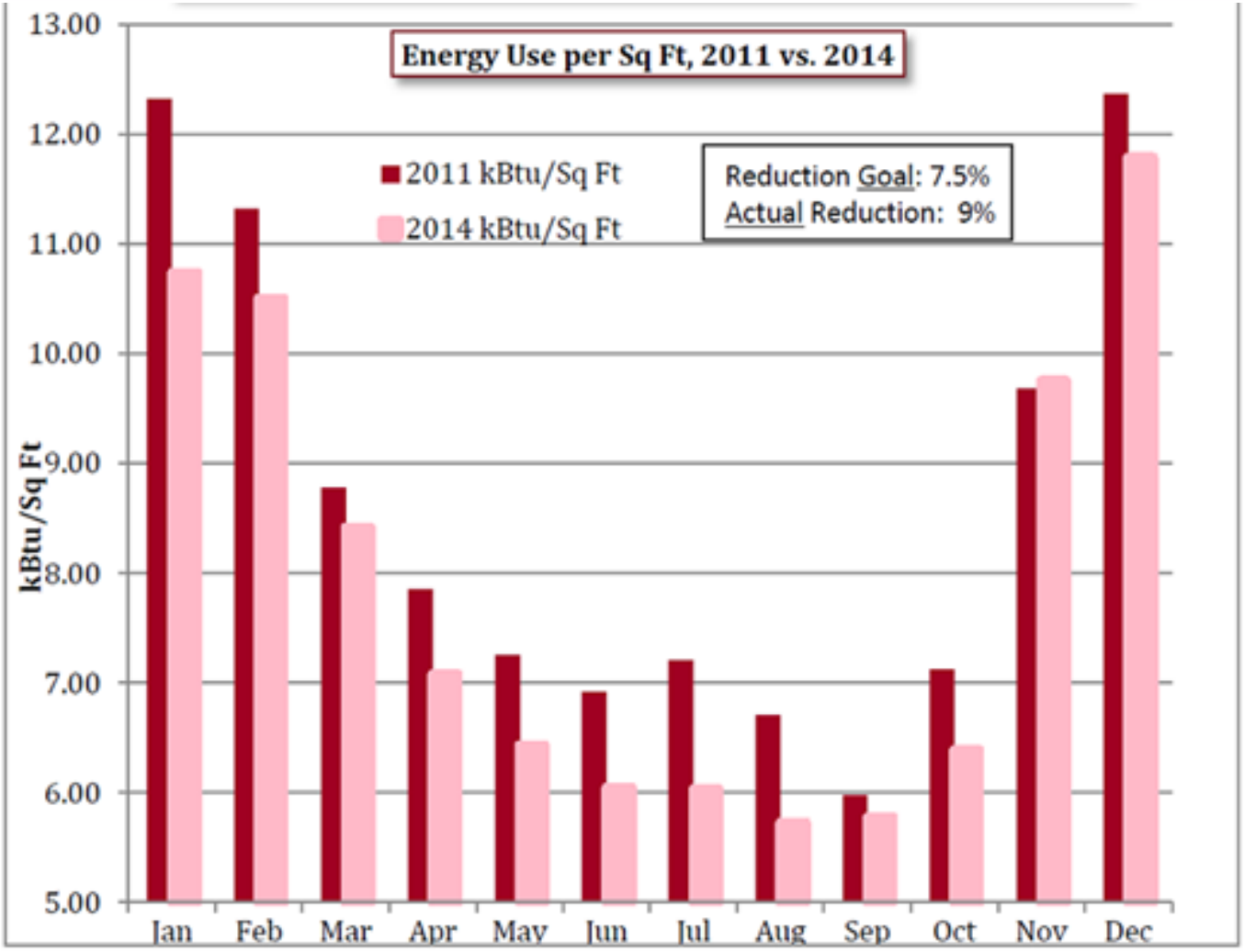
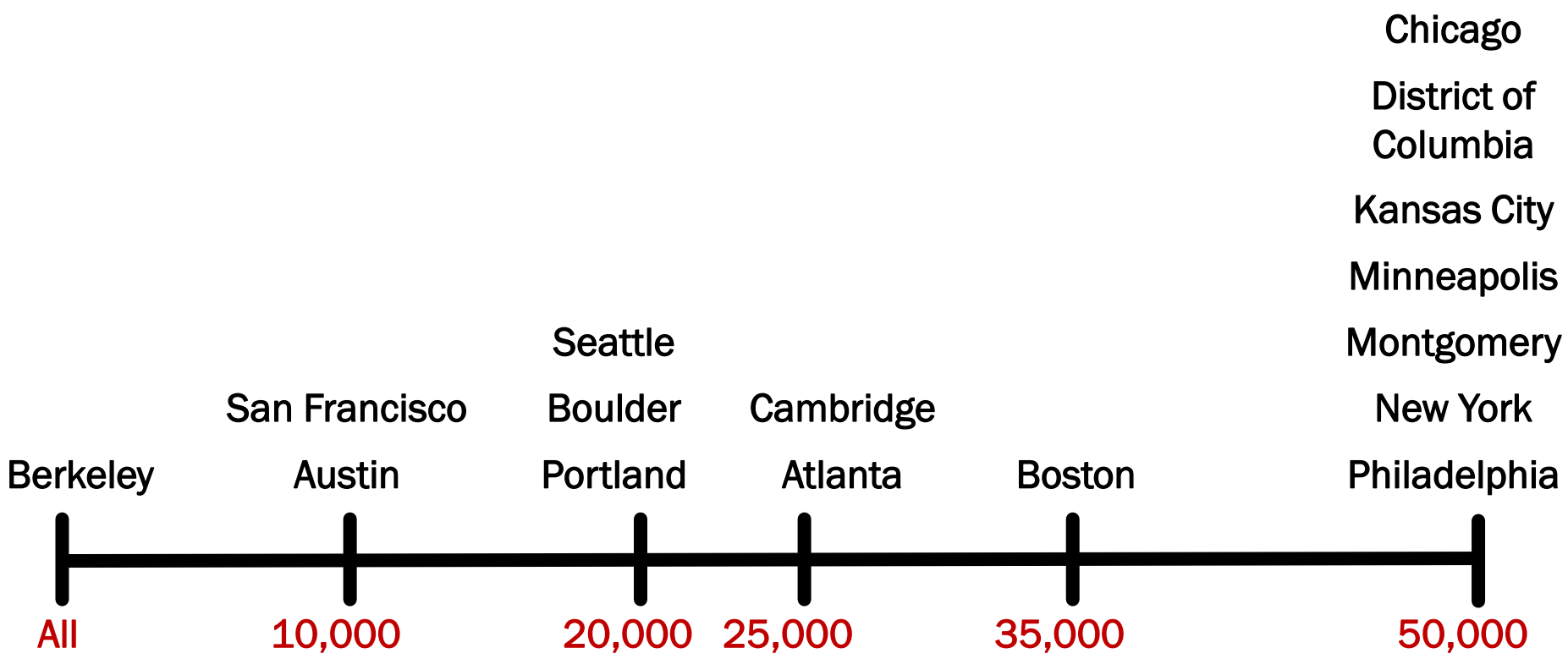
City Leading by Example



What size buildings do other cities include?

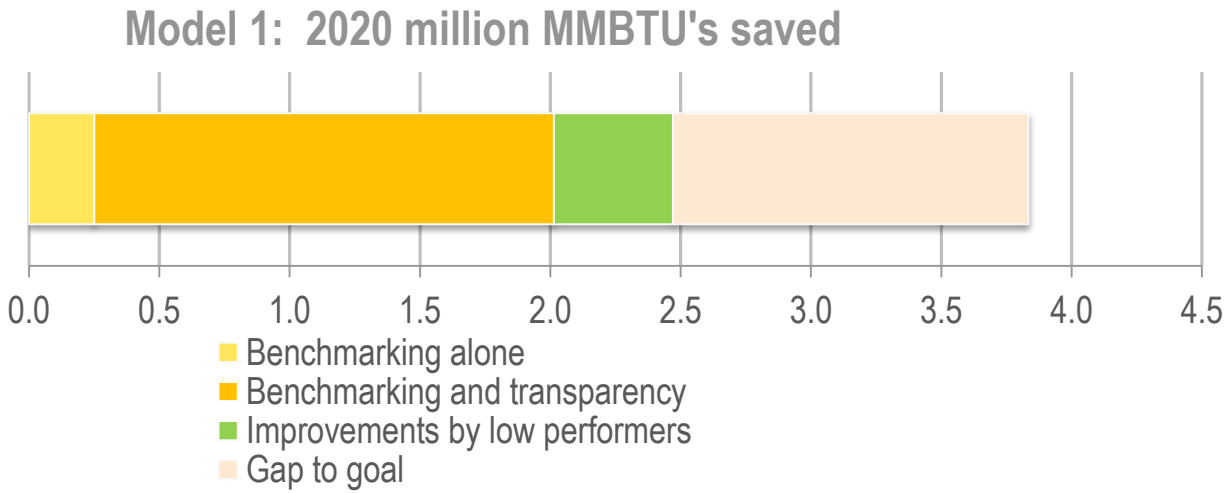
Private Buildings: Minimum Gross Square Footage for Benchmarking and Transparency



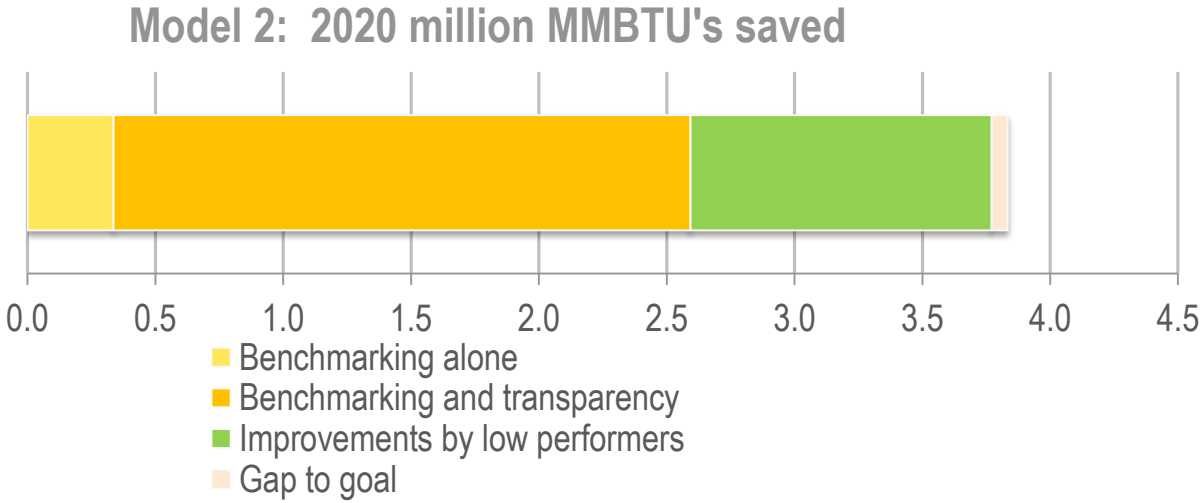
What buildings are exempt from policies in other cities?

Industrial Uses	All Industrial Uses	% Sq Ft Manufacturing or Process Energy Usage
Occupancy	% SQ FT Unoccupied	Maximum # of FTE occupants
Financial Distress	Tax Liens	Bankruptcy
New Buildings	Deferred Reporting	COO within 2 years before
Recently Sold Buildings	Deferred Reporting	Under SF Threshold reporting deadline
High Performance	ES Certification	LEED Certification

Model of Progress Towards the 2020 Goal: 3.8 million MMBTU



Model 1, Conservative Assumptions



Model 2, Aspirational Assumptions

Model of Progress Towards the 2030 Goal: 7.6 million MMBTU

Model 1, Conservative Assumptions