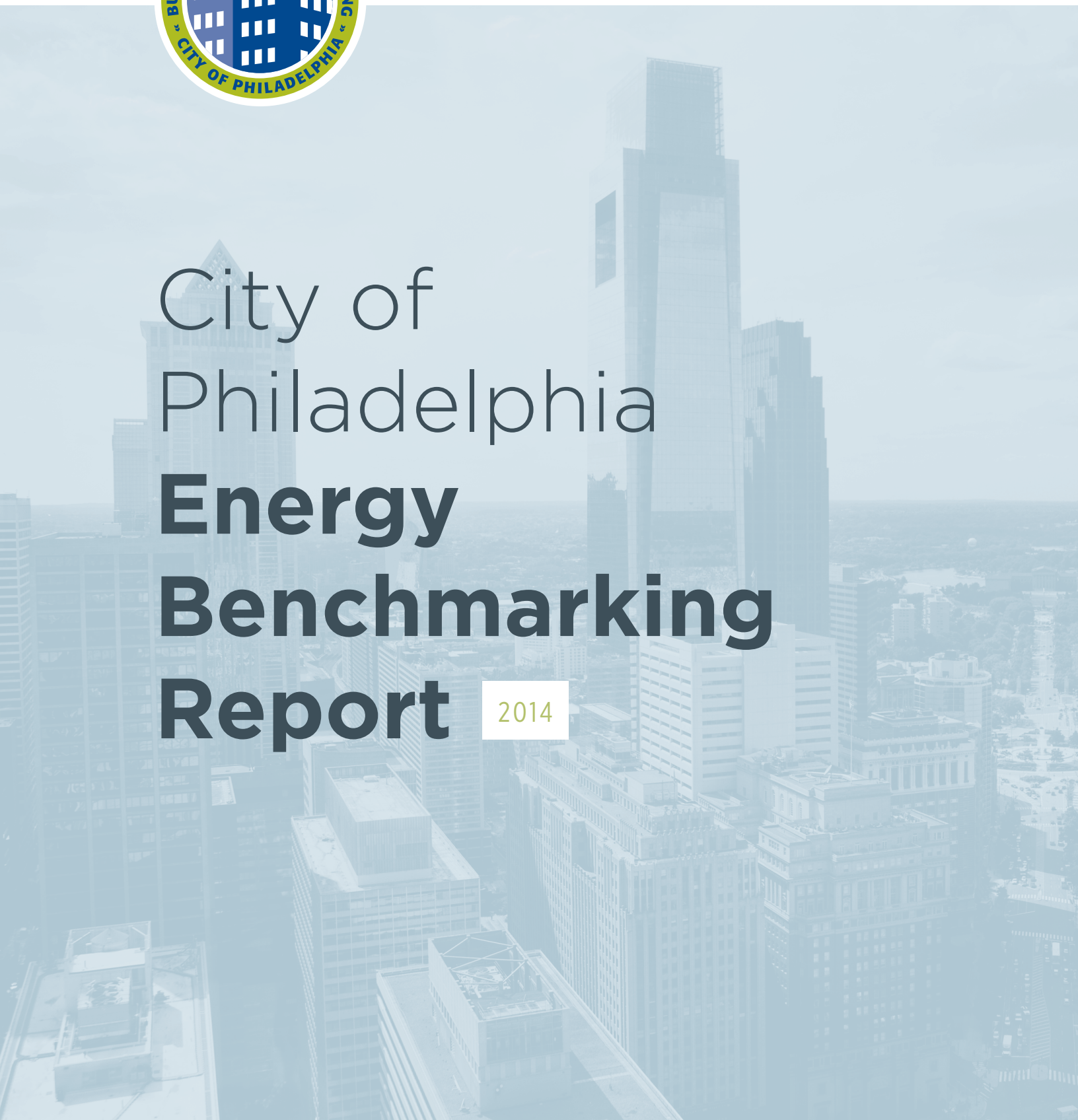
MAYOR'S OFFICE OF SUSTAINABILITY
DECEMBER 2014



City of Philadelphia **Energy Benchmarking Report** 2014

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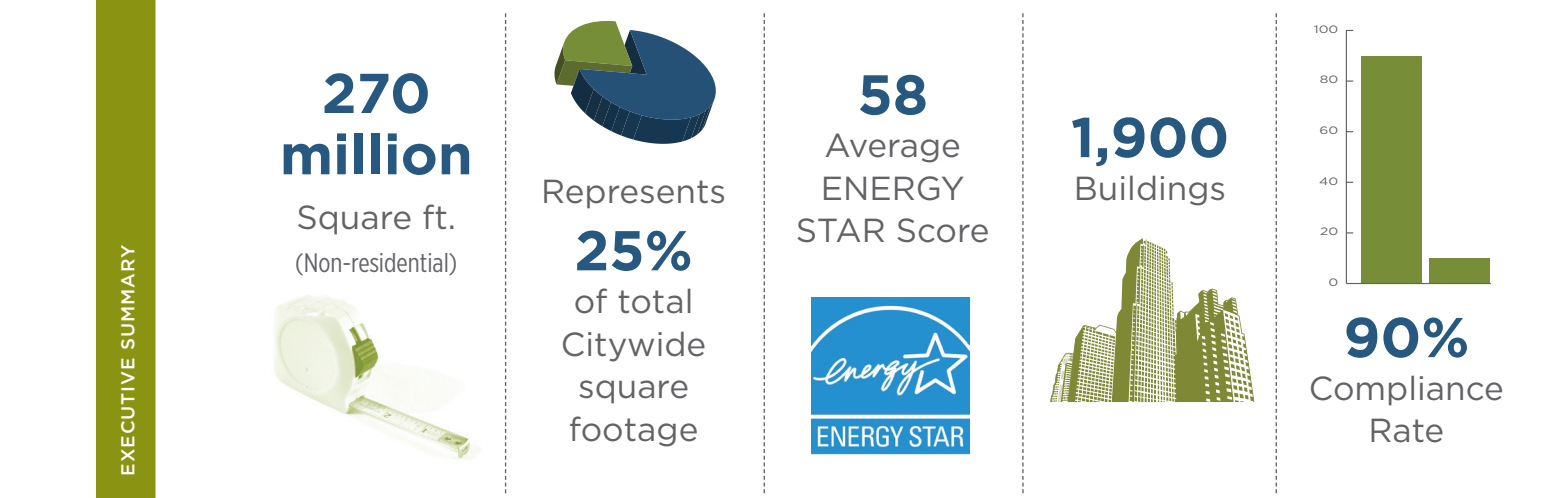
Executive Summary

This report summarizes findings from the second year of the Philadelphia benchmarking program, which collects energy performance data for the city's largest non-residential buildings. More than 90 percent of required buildings reported in Year Two, providing a snapshot of 2013 energy and water usage for a quarter of the city's total floor area. Overall, facilities performed above national averages, but energy efficiency in commercial buildings continues to be a great opportunity to save Philadelphia business owners money and reduce the city's carbon footprint.

Philadelphia's energy and benchmarking disclosure law (Philadelphia Code Section 9-3402) requires large non-residential buildings 50,000 square feet and larger to report their energy and water usage to the City of Philadelphia using the U.S. Environmental Protection Agency's Portfolio Manager tool. This law passed in 2012, and initial benchmarks were due in November 2013. The second year of reporting was completed in June 2014.

Building energy performance is a critical metric for cities dedicated to mitigating the causes of climate change. In Philadelphia, more than 60 percent of citywide greenhouse gas emissions stem from building energy use. As part of the City's *Greenworks* sustainability plan, Philadelphia set a goal to reduce emissions 20 percent by 2015. Improving building performance will help Philadelphia reach that goal, and benchmarking provides building owners with the data they need to begin making informed decisions about upgrading and investing in energy efficiency.

FIGURE 1 **Year Two Benchmarking Highlights**



In conjunction with the release of this report, the Mayor's Office of Sustainability (MOS) is releasing a subset of building performance information submitted through Portfolio Manager. This data is available online at www.phila.gov/benchmarking. Public disclosure of benchmarking results is required by law, and will provide building owners, tenants, and brokers with new information to make decisions about transactions and investments. Recent research has indicated that energy-efficient buildings are more highly valued in the marketplace, and investments in efficiency can dramatically lower energy costs for owners and operators.

The City has been benchmarking and reporting on its own buildings' performance since 2011, and has continued to invest in its facilities through the Energy Efficiency Fund, which supports department-led energy conservation projects on a competitive basis. The City's first-ever guaranteed energy savings project in City Hall and three nearby office buildings will be completed in 2015. As part of this project, the replacement of the iconic City Hall clock tower lights with low-cost, high-efficiency LED bulbs will save taxpayers $40,000 in annual energy, material, and labor costs.

KEY FINDINGS FROM THE YEAR TWO BENCHMARKING REPORT

- Philadelphia buildings eligible for the 1 to 100 ENERGY STAR score received an average rating of 58, eight points higher than the national average. While this baseline is encouraging, the score required to be ENERGY STAR-certified as a high-performing building is 75, demonstrating that most buildings have opportunities for improvement.
- Facilities of all shapes and sizes reported as part of Year Two of the energy benchmarking program, but the majority of buildings in Philadelphia over the 50,000 square feet threshold are offices and K-12 schools. The School District of Philadelphia is currently in the process of developing a district-wide sustainability plan, which will include facility planning to improve building performance.
- Universities and hospitals emit nearly half of the carbon emissions represented in the portfolio of properties reported. The City of Philadelphia continues to work with its institutional partners, many of which already have sustainability and carbon-reduction plans in place, to improve the efficiency of these vital sectors.
- For those buildings that reported in both 2012 and 2013, weather-normalized energy usage intensity (EUI) remained nearly constant. MOS will continue to compare the subset of buildings that report consistently each year to assess the quality of benchmarking data and long-term trends in building performance.

FIGURE 2

Carbon Emissions Reported By Sector

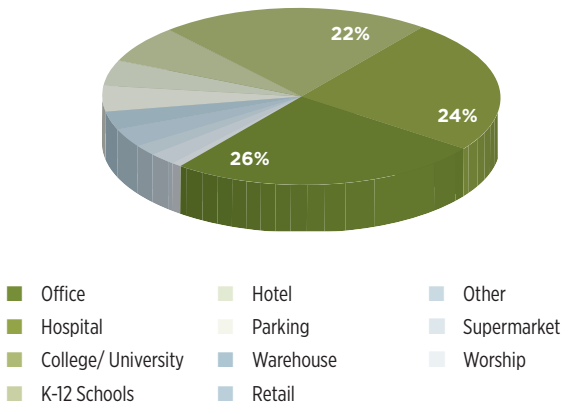
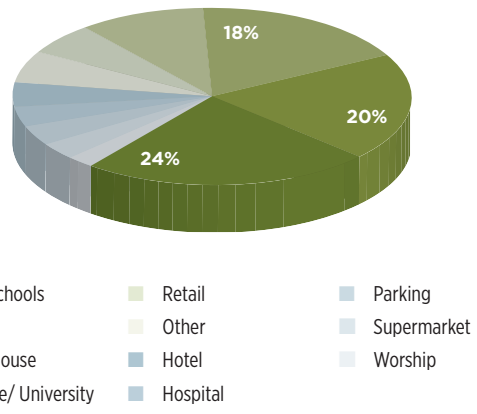


FIGURE 3

Reported Buildings by Sector



NEXT STEPS

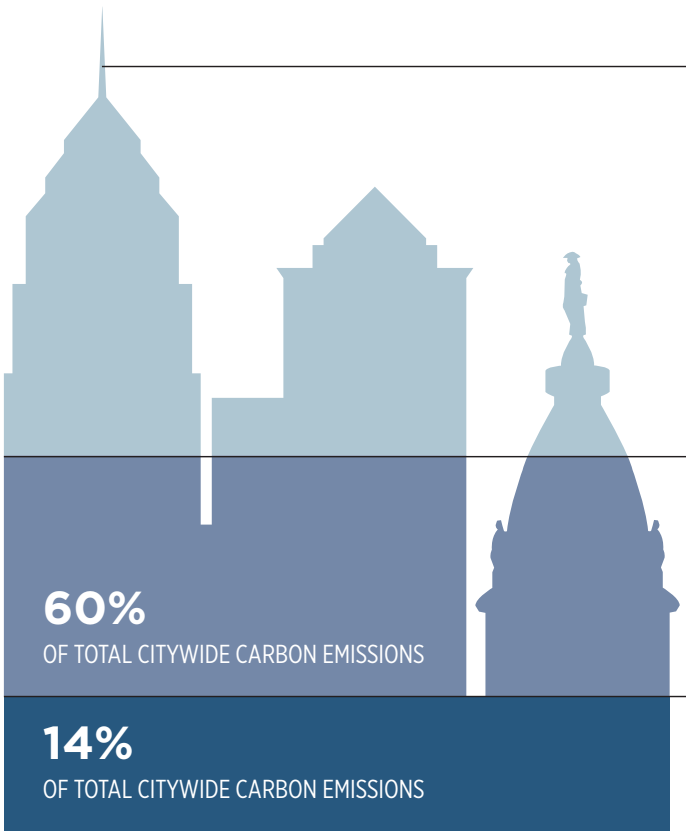
The City of Philadelphia remains committed to energy benchmarking and disclosure as a first step to inform the marketplace and drive building owner and operator action on energy efficiency. Operational or capital investments made in the city's building stock now will be reflected in **Year Three** benchmarks, which will be due on June 30, 2015.

In October 2014, Philadelphia launched the **Energy Reduction Race**, a one-year challenge to those buildings that have participated in energy benchmarking to reduce their usage 5 percent by September 2015. The Energy Reduction Race is funded in part through the City Energy Project (CEP), a commitment to improve building performance across the United States. The City of Philadelphia is one of ten cities invited to participate in CEP, which is dedicated to using data and information sharing among participants to develop best practices for driving reductions in building energy usage.

As part of this goal, MOS has been helping building owners to better understand what benchmarking data means for their facilities. In September 2014, MOS mailed **Building Energy Performance Profiles** to every building owner who participated in Year Two of benchmarking, outlining how their building stacked up to its peers and highlighting existing incentive programs. MOS is currently developing a data visualization tool to improve the usability of this information as well as piloting an in-person program to support building owners who request further assistance developing energy efficiency retrofit project plans for their facilities.

FIGURE 4

Carbon Emissions of Philadelphia's Benchmarked Buildings

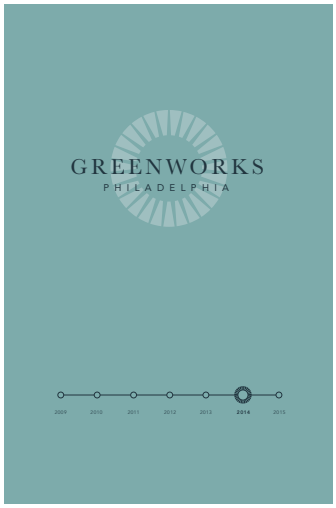


20.9
MILLION Mt CO2e
Citywide Carbon Emissions

12.6
MILLION Mt CO2e
Carbon Emissions from All Buildings in Philadelphia

2.8
MILLION Mt CO2e
Carbon Emissions from Buildings Benchmarked in 2013

Background & Context



In 2009 Mayor Michael Nutter laid out an ambitious sustainability agenda in *Greenworks Philadelphia*. The plan features several targets focused on energy and carbon pollution, including municipal energy reduction, increased renewable energy production, and a goal to reduce citywide building energy consumption 10 percent by 2015.

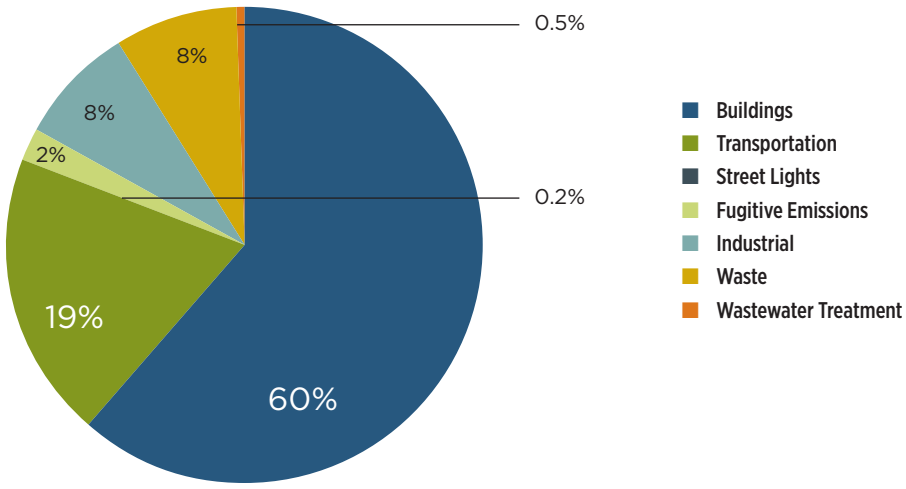
Energy is often treated as a fixed cost by building owners, but improving performance can help owners realize significant savings, especially considering that large commercial buildings waste up to 30 percent of what they use. Analysis conducted by the Mayor's Office of Sustainability (MOS) in spring 2014 found that bringing underperforming large commercial buildings up to an average level of energy efficiency could save owners $100 million in energy costs *annually.*

Buildings—particularly in the commercial sector—are also a key driver of greenhouse gas emissions. The most recent citywide carbon emissions inventory concluded that buildings account for more than 60 percent of total emissions in Philadelphia.

Improving the performance of large, energy and carbon intensive buildings is the best opportunity to achieve the *Greenworks* target of reducing greenhouse gas emissions 20 percent by 2015, but tackling this problem requires good information. To help building owners and managers in Philadelphia better understand the energy and water usage in their facilities, City Council passed a law in 2012 requiring non-residential buildings 50,000 square feet or larger to benchmark their facilities using Portfolio Manager, a free tool provided by the EPA. Key metrics from this tool's output will be publicly disclosed, providing the building owners, tenants, and brokers with individual building performance data for the first time.

FIGURE 5

Sources of Greenhouse Gas Emissions in Philadelphia



Buildings account for the majority of carbon emissions citywide. (SOURCE: 2012 Philadelphia Greenhouse Gas Inventory)

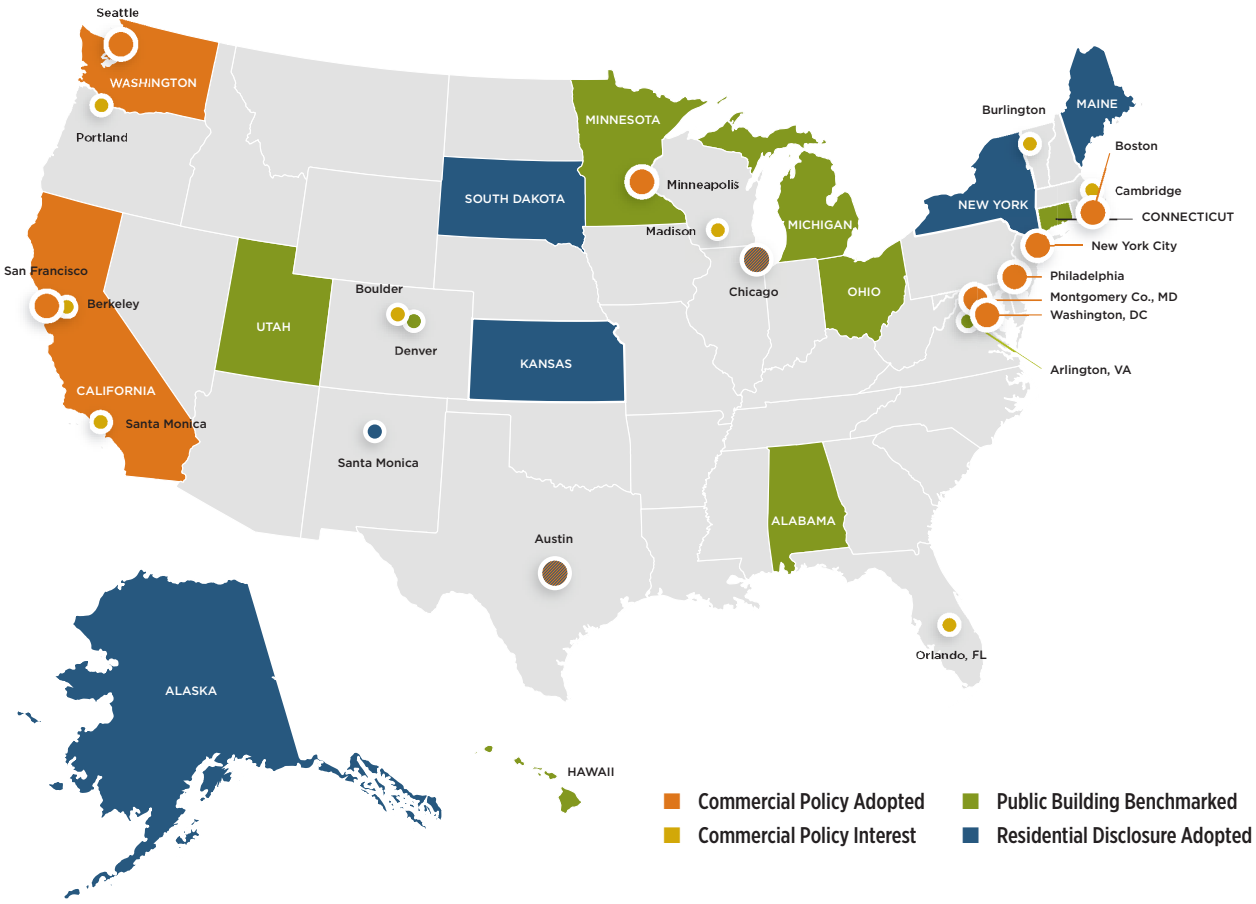
The City of Philadelphia has been benchmarking its own buildings since 2011 as part of an effort to reduce municipal energy consumption. Results for municipally-managed facilities 10,000 square feet and larger are available in the 2011 Municipal Benchmarking Report (available at www.phila.gov/green) as well as through the City's Github portal. 2013 results for many of these buildings are included as part of this report's analysis.

Philadelphia is not alone in mandating benchmarking for large buildings. Cities, counties, and states around the country have passed similar benchmarking and disclosure laws to improve the energy performance of large buildings. As of September 2014, 10 cities require annual benchmarking, and more than three billion square are covered by mandatory programs nationally.

The first year of benchmarking in Philadelphia was completed in fall 2013, with top-level results released online at www.phila.gov/benchmarking. The deadline for all subsequent years is June 30. In September 2014, MOS sent individual report cards to each of the more than 1,900 buildings that have complied to date. These report cards include a full explanation of individual results along with local and national comparisons and details on local incentive programs to improve energy performance.

FIGURE 6

U.S. Building Benchmarking and Disclosure Properties



Overall Building Characteristics and Performance

Any building can use the ENERGY STAR Portfolio Manager tool to compare its energy usage to similar facilities and track its performance over time. Buildings of all shapes and sizes reported as part of the second year of benchmarking (see page 12 for sector-level results), though nearly 40 percent of reported properties were offices or educational facilities. Not all building types are eligible for a 1 to 100 ENERGY STAR score through the Portfolio Manager tool, but the Environmental Protection Agency recently added multi-family residential buildings to the current list of 18 ratable buildings types.

For those buildings eligible for a 1 to 100 ENERGY STAR rating, the median score was 63, down slightly from Year One results (see sidebar on page 10) but still well above the nationwide median score of 50.

Mirroring findings in other cities with mandatory benchmarking and disclosure laws (as well as Year One benchmarking results), ENERGY STAR scores for buildings varied little by decade of construction. In contrast to initial concerns that public disclosure of benchmarking data would unfairly penalize older buildings, this data shows that older facilities often outperform newer buildings (see profile of the Bourse Building, page 11).

FIGURE 7

Building Performance by Decade

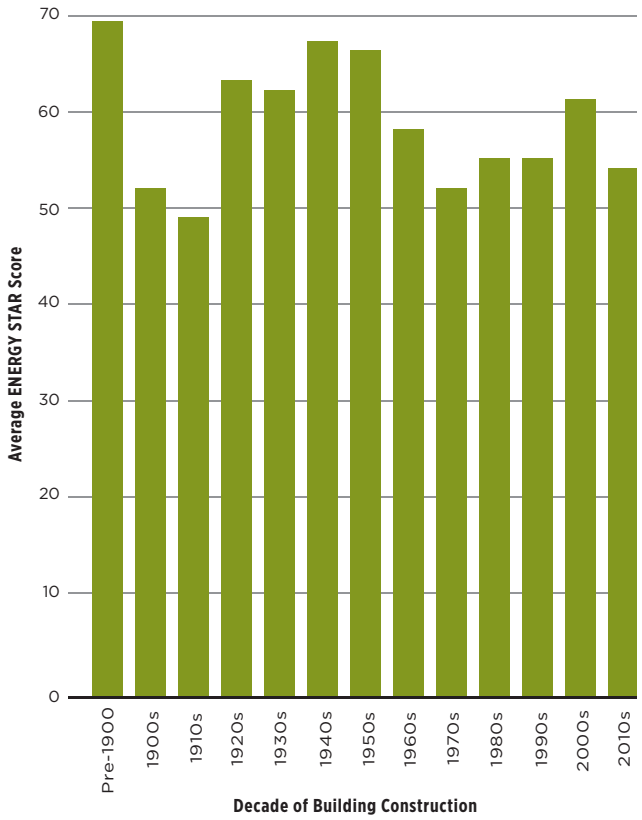
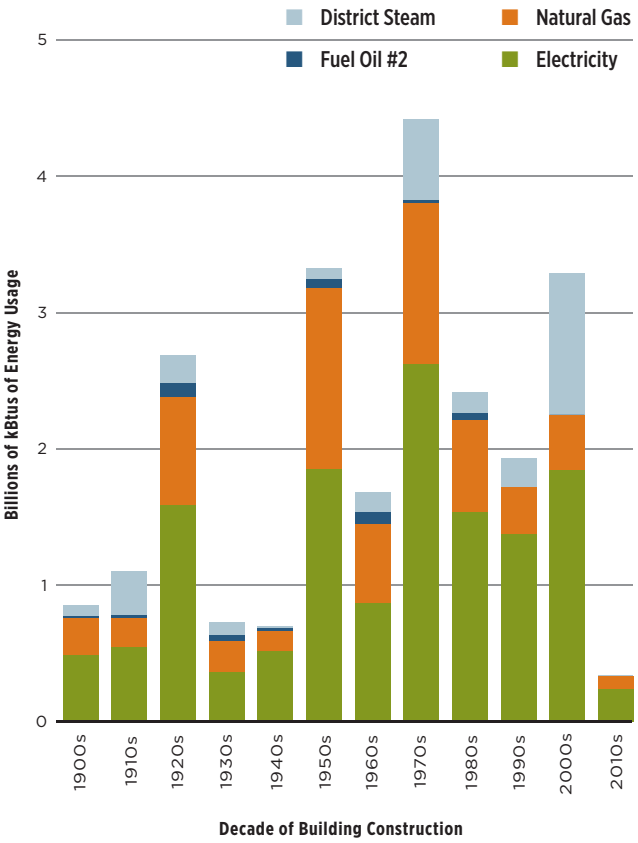


FIGURE 8

Fuel Mix of Reported Buildings by Decade

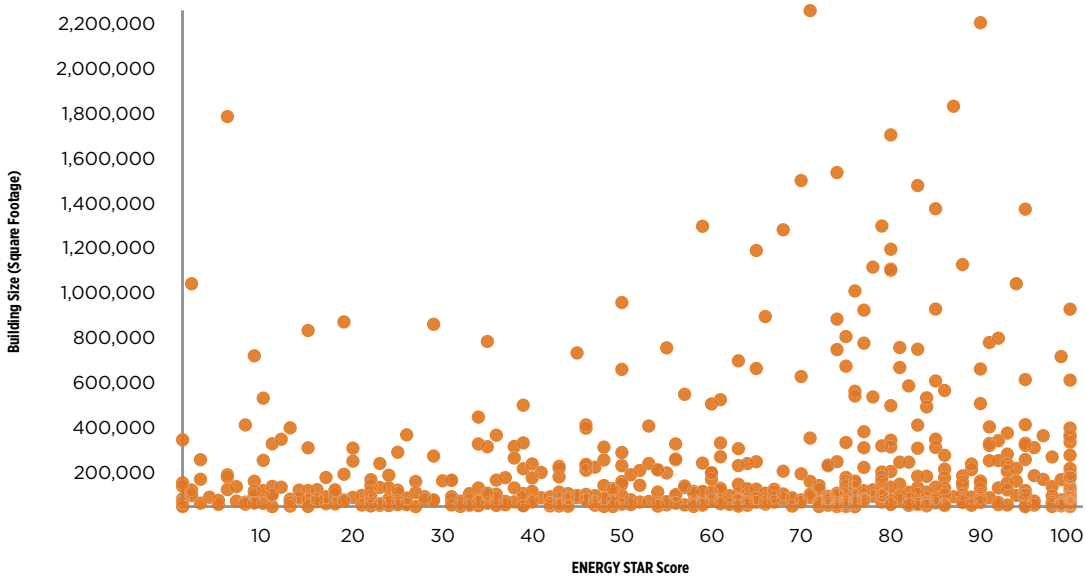


Similarly, little correlation is apparent between building size and ENERGY STAR score, particularly for smaller buildings. As shown in Figure 9, buildings under 500,000 square feet reported scores across the 1 to 100 range, an unsurprising result given that the score normalizes energy usage by the size of facilities. Notably, the largest buildings tended to report higher-than-average scores, a reflection of high performance among Philadelphia's commercial high-rises.

Benchmarking data also provides information about the fuel mix of the city's largest commercial buildings (that is, how much of the energy in these buildings is generated by electricity, natural gas, steam, or fuel oil). Only two percent of energy reported in Year Two benchmarking data was generated by fuel oil, the most carbon-intensive form of energy used in buildings, though this number jumps to 18 percent for K-12 school buildings.

FIGURE 9

ENERGY STAR Score by Size of Building

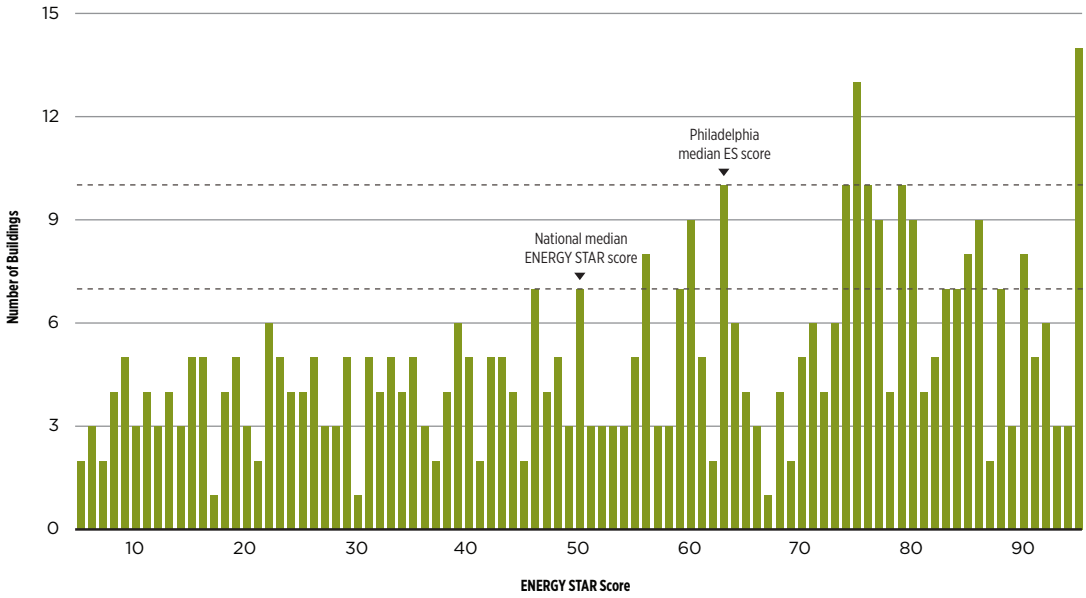


The performance of smaller buildings in Philadelphia varied along the 1 to 100 scale, but larger buildings tended to perform above the national median of 50.

Data analysis performed in July 2014. Buildings that submitted benchmarking reports or updated data after that time may not be included in some metrics.

FIGURE 10

Distribution of ENERGY STAR Scores



Trends in the First Two Years of Benchmarking Data

More than 1,500 buildings reported energy usage in both years of benchmarking compliance, providing the first opportunity to analyze the performance of Philadelphia's commercial building stock over time. The median Site EUI for buildings that reported in each year increased from 68.0 to 73.6 in 2013, while the median ENERGY STAR score fell by four points to 63. However, when using the weather-normalization capabilities of Portfolio Manager to account for the extreme weather of 2013, energy usage stayed nearly constant between the two years, rising just .3 kBtu/ft^2 to 75.

As the first year of benchmarking compliance was not completed until November 2013, building owners had little opportunity to impact their Year Two results, which cover January 1 through December 31, 2013. MOS anticipates the new information benchmarking provides to building owners and the real estate market will impact citywide building performance during Years Three and Four of the program (See page 22 for next steps for energy benchmarking and disclosure in Philadelphia).

	Year One Results (2012)	Year Two Results (2013)
Median Site EUI (kBtu/ft^2)	68.0	73.6
Median ENERGY STAR Score	67	63
Median Weather-Normalized Site EUI	74.7	75.0

"It turns out this 120-year old building was a winner. Don't doubt your old building. Controls, proper systems and best practices can make the old shell very energy efficient."

- Max Kaiserman
Special Projects

KAISERMAN COMPANY
Responsible Real Estate Services and Solutions

Case Study: The Bourse Building, Historic and Energy Efficient

The Bourse Building at 111 S. Independence Mall East has been a model of innovation since it was completed in 1895. Back then it was one of the nation's first steel-framed buildings and home of America's first commodities exchange. Nearly 120 years later, benchmarking to measure and rate the building's energy performance is helping it to be a model of energy efficiency.

A protected, historic landmark, the Bourse Building is one of America's oldest commercial buildings with rooftop solar panels. Given its age, "I was surprised when I saw the building's initial benchmarking rating," required by the city's ordinance in 2013, said Max Kaiserman, who manages sustainability metrics for the property owner, Kaiserman Company, Inc. "But older buildings sometimes outperform newer buildings. A building that already exists, given all of the embodied energy it brings to the table, is a great place to start for sustainability." The building's initial ENERGY STAR Portfolio Manager rating of 77—already high enough to qualify for ENERGY STAR status—had risen to 83 by the time the building was officially certified.

Energy efficiency reflects his company's sustainability values, said Kaiserman; the company owns and operates two other ENERGY STAR-certified office buildings and is striving to certify the remainder of its portfolio. That's why the Bourse Building had already taken major steps to improve its energy efficiency prior to benchmarking, such as:

- Installing Variable Frequency Drive (VFD) technology
- A T8 lighting retrofit
- Switching from incandescent lights to Compact Fluorescent Lights (CFLs), and some Light-Emitting Diodes (LEDs), including sensor switches for common-area bathroom lighting

The company took it one step further by installing a 43 kW solar photovoltaic system on the roof of the building that offsets some of the common-area electricity and provides $5,000 in annual savings. Kaiserman said using rebate programs helped these investments pay back quickly. Working with their utility and the state—through PECO's Smart Ideas initiative and the state's Pennsylvania Sunshine Solar Program—led to getting the projects started. "In this age of technology, there are multiple opportunities for harvesting low-hanging fruit," Kaiserman added. "Any capital improvement to reduce an operating cost immediately goes to the bottom line. We must keep earning, but one dollar saved is worth more than one dollar earned."

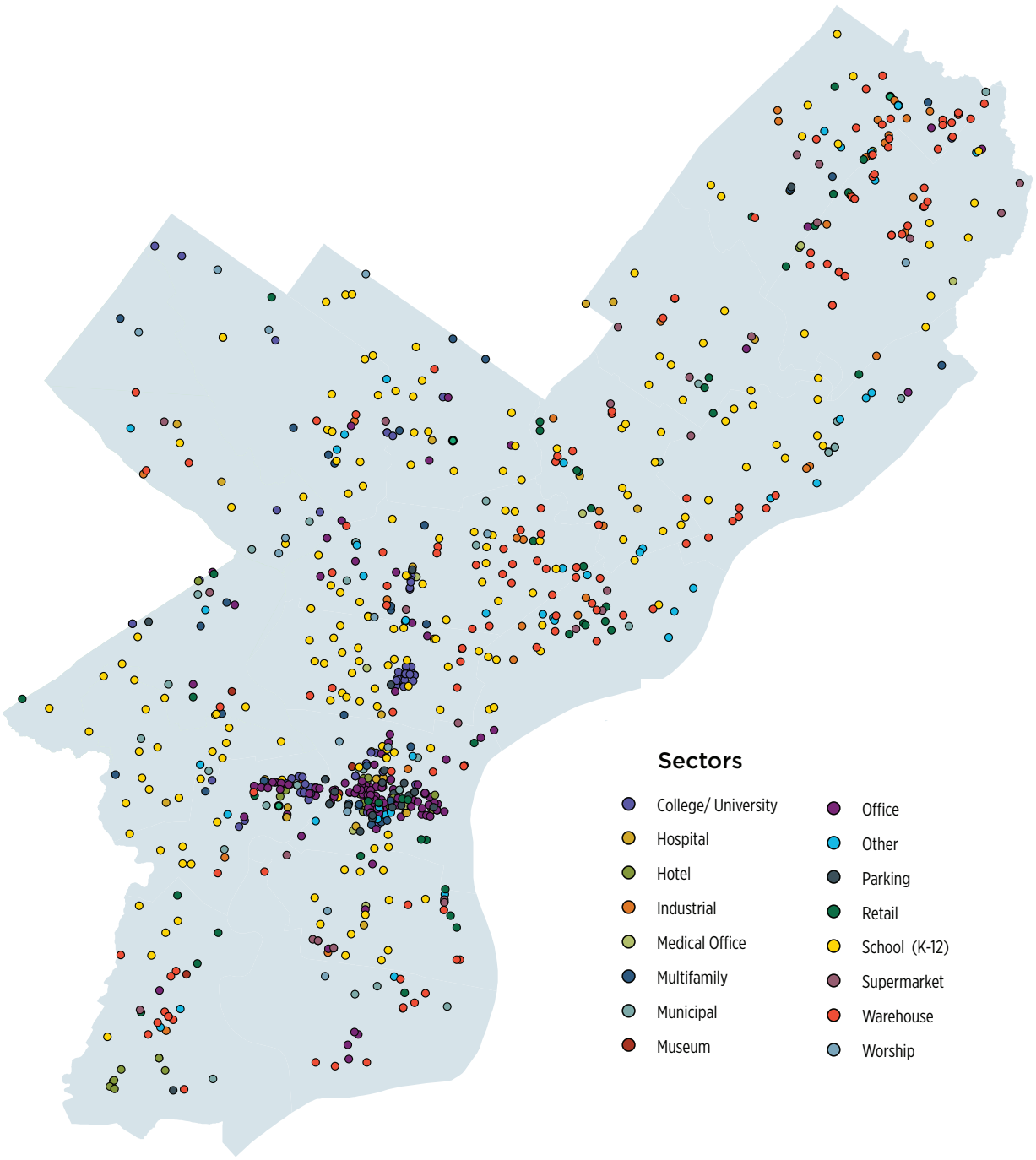
Case study prepared for the Mayor's Office of Sustainability by Resource Media.

Benchmarking Results by Sector

Benchmarking data can help building owners in two ways: by providing a baseline to measure future performance against, and by offering comparisons to similar buildings locally and nationwide. To provide these comparisons, benchmarked facilities have been divided into twelve categories based on property use type.

	Number of Buildings in Sector	Total Floor Area (square feet)	Average Year of Construction	Average of ENERGY STAR Score	Average of Site EUI (kBtu/ft²)	Average of Water Use (kgal)
School (K-12)	216	26,070,419	1950	53	77.3	1,534
Office	177	61,338,086	1952	64	87.0	5,750
Warehouse	161	25,650,536	1962	70	29.4	567
College/ University	93	16,241,376	1972	N/A	161.0	13,058
Retail	55	6,561,100	1984	65	90.0	1,939
Other	52	6,904,697	1943	N/A	68.1	1,707
Municipal	43	27,348,687	1961	N/A	188.0	49,343
Hotel	40	10,626,650	1975	41	105.7	26,537
Industrial	35	5,131,338	1953	N/A	181.7	12,340
Hospital	33	25,523,062	1953	56	226.3	52,247
Parking	32	13,924,390	1978	N/A	111.3	7,902
Supermarket	29	2,157,827	1996	55	222.4	1,747
Worship	18	1,435,129	1935	78	197.7	903
Medical Office	15	2,463,021	1966	39	173.3	5,706
Museum	7	612,148	1939	N/A	70.6	813

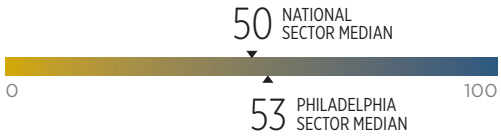
FIGURE 11 **Benchmarked Facilities by Sector**



K-12 Schools

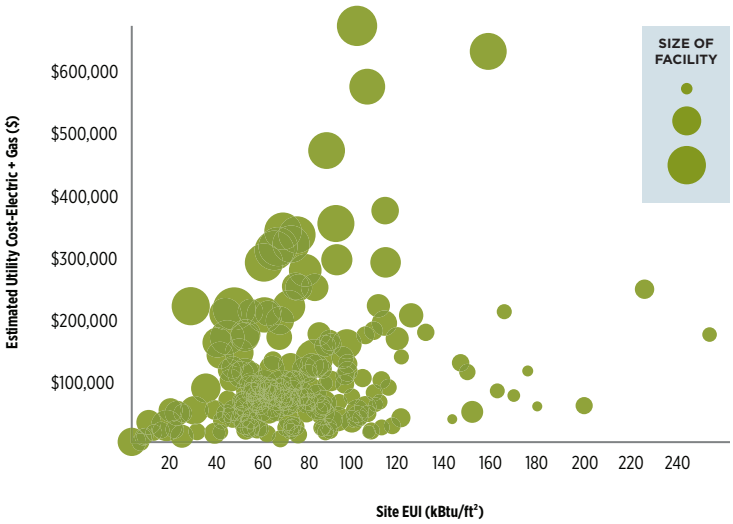
# OF PROPERTIES	**216**
SF OF FLOOR AREA	**26 million**
TOTAL GHG EMISSIONS MtCO2e	**152,762**

ENERGY STAR Score



SITE EUI

FIGURE 12 **Estimated Utility Costs/Site EUI for K-12 Schools**



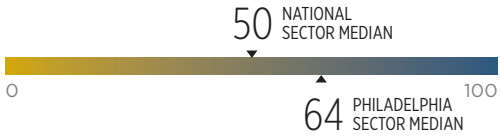
As the largest consumer of fuel oil #2 by sector in the city, schools can lower their carbon footprint by switching from oil to less carbon-intensive natural gas. The School District of Philadelphia is currently in the process of developing a district-wide sustainability plan, which will include facility planning to improve building performance.

Because of their limited operating schedules, building control systems are an important tool for maximizing efficiency in school buildings while they are not in use. Lighting upgrades, which have a fast payback and real benefit to the learning environment, are another good way for school buildings to improve performance. The School District of Philadelphia is currently implementing a $25 million lighting upgrade project using a performance contracting model, where the energy savings over time cover the project's construction costs.

Office

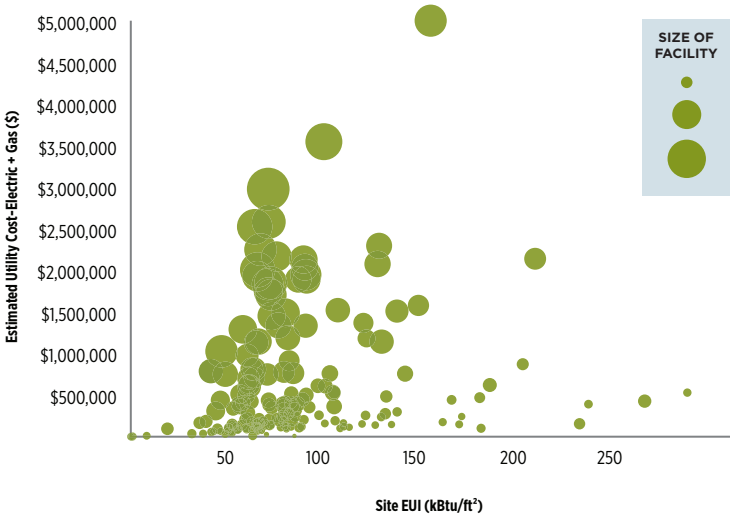
# OF PROPERTIES	**177**
SF OF FLOOR AREA	**61.3 million**
TOTAL GHG EMISSIONS MtCO2e	**569,550**

ENERGY STAR Score



SITE EUI

FIGURE 13 **Estimated Utility Costs/Site EUI for Offices**



The 26 largest office buildings account for nearly half of greenhouse gas emissions for the sector, and have an average ENERGY STAR score of 76, which makes them eligible for ENERGY STAR certification as a high-performing facilities.

As the largest sector by square footage in the city, office buildings represent the single greatest opportunity for energy savings. This is particularly true for office buildings smaller than 100,000 square feet, which have an average ENERGY STAR score nine points below their larger counterparts.

Cost estimates included in the sector summaries were derived by estimating electricity and natural gas prices for commercial buildings in 2013 using data available through the Energy Information Administration. Steam and fuel oil were not modeled as part of this analysis.

Warehouse

# OF PROPERTIES	**161**
SF OF FLOOR AREA	**25.6 million**
TOTAL GHG EMISSIONS MtCO2e	**74,472**

ENERGY STAR Score

50 NATIONAL SECTOR MEDIAN

0 — 100

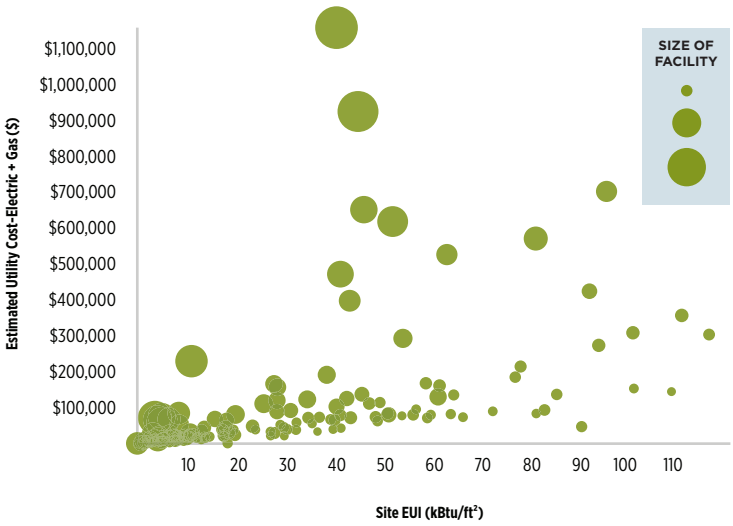
70 PHILADELPHIA SECTOR MEDIAN

SITE EUI

10 — 50

18.5 kBtu/sf PHILADELPHIA SECTOR MEDIAN

FIGURE 14 **Estimated Utility Costs/Site EUI for Warehouses**



Though the average site EUI for warehouses is the lowest of any sector in this analysis, there is still potential for major energy savings. Energy cost estimates indicate that the top 10 percent of energy users in this sector pay more than $200,000 annually in combined electric and gas bills. The EPA provides a savings checklist for warehouses, which is available at http://tinyurl.com/ESPMwarehouses.

College/University Buildings

# OF PROPERTIES	**93**
SF OF FLOOR AREA	**16.2 million**
TOTAL GHG EMISSIONS MtCO2e	**492,206**

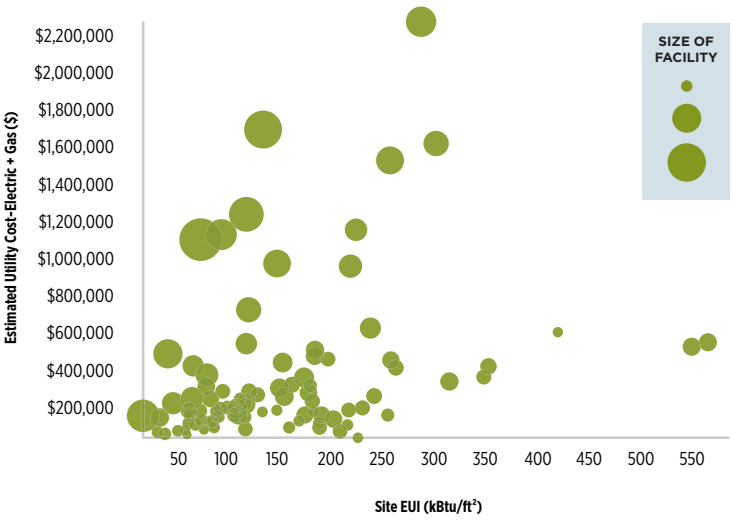
SITE EUI

130.7 kBtu/sf NATIONAL SECTOR MEDIAN

52 — 178

125.5 kBtu/sf PHILADELPHIA SECTOR MEDIAN

FIGURE 15 **Estimated Utility Costs/Site EUI for College/University Buildings**



The utility cost analysis for this sector does not include district steam use, which comprises 43 percent of the energy used for universities in Philadelphia. While Veolia's natural gas-powered steam is a low-carbon energy solution, universities still represented 17 percent of the total carbon emissions for all benchmarked facilities and 4 percent of citywide building carbon emissions for 2013. A sector-wide commitment to reduce emissions 10 percent would result in greenhouse gas savings equivalent to planting more than one million trees.

Retail

# OF PROPERTIES	**55**
SF OF FLOOR AREA	**6.5 million**
TOTAL GHG EMISSIONS MtCO2e	**72,694**

ENERGY STAR Score

50 NATIONAL SECTOR MEDIAN

0 — 100

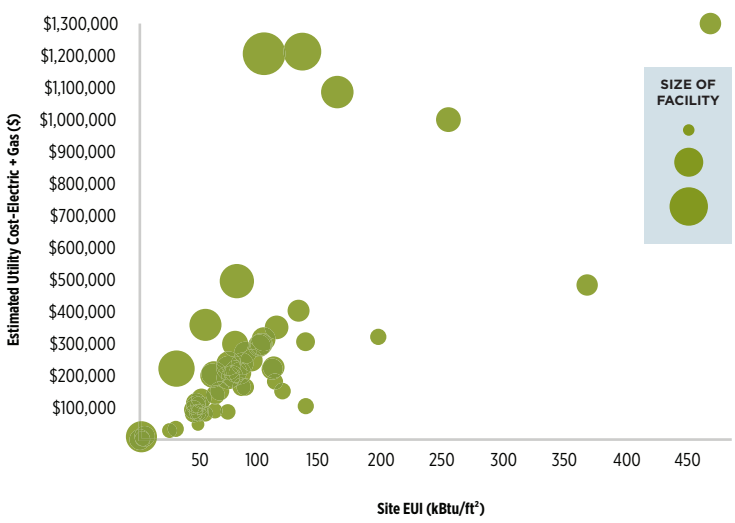
65 PHILADELPHIA SECTOR MEDIAN

SITE EUI

52 — 178

75.5 kBtu/sf PHILADELPHIA SECTOR MEDIAN

FIGURE 16 **Estimated Utility Costs/Site EUI for Retail**



Analysis indicates that retail buildings with utility costs above $400,000 tended to have higher site EUIs (averaging 210 kBtu/ft²), but were not necessarily the largest buildings by floor area. These buildings could decrease utility costs (and improve energy performance) by considering operational or system improvements in their facilities.

Other

# OF PROPERTIES	**52**
SF OF FLOOR AREA	**69 million**
TOTAL GHG EMISSIONS MtCO2e	**46,517.40**

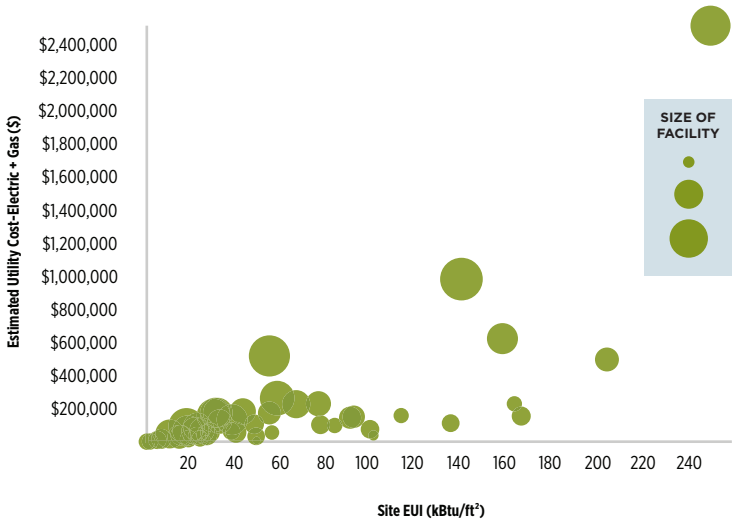
SITE EUI

78.8 kBtu/sf NATIONAL SECTOR MEDIAN

30 — 178

41.9 kBtu/sf PHILADELPHIA SECTOR MEDIAN

FIGURE 17 **Estimated Utility Costs/Site EUI for Other**



This sector includes all of the buildings that do not fit clearly into one of the sectors listed here. These buildings vary a great deal in terms of use and energy demands. Although the average site EUI is low compared with other sectors, properties should be evaluated on an individual basis to assess the opportunity for investment.

Hotels

# OF PROPERTIES	**40**
SF OF FLOOR AREA	**10.6 million**
TOTAL GHG EMISSIONS MtCO2e	**106,347**

ENERGY STAR Score

50 NATIONAL SECTOR MEDIAN

0 — 100

41 PHILADELPHIA SECTOR MEDIAN

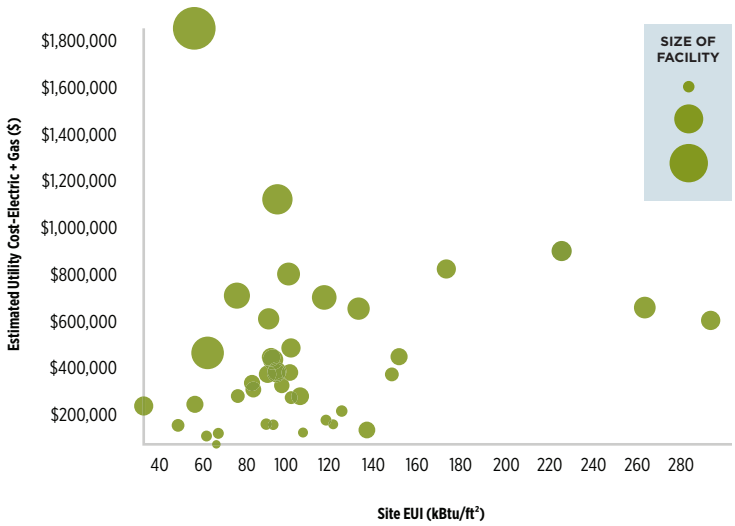
SITE EUI

73.4 kBtu/sf NATIONAL SECTOR MEDIAN

52 — 178

93.4 kBtu/sf PHILADELPHIA SECTOR MEDIAN

FIGURE 18 **Estimated Utility Costs/Site EUI for Hotels**



Hotels had high annual estimated utility costs, which is not a surprise given that hotels have longer operating hours than other facilities. Nonetheless, buildings with an ENERGY STAR score of above 60 had lower average annual utility costs (averaging $371,000) versus those buildings below 60 (averaging more than $450,000), demonstrating the value of high-performing buildings in reducing energy costs.

Hospitals

# OF PROPERTIES	**33**
SF OF FLOOR AREA	**25.5 million**
TOTAL GHG EMISSIONS MtCO2e	**542,226**

ENERGY STAR Score

50 NATIONAL SECTOR MEDIAN

0 — 100

56 PHILADELPHIA SECTOR MEDIAN

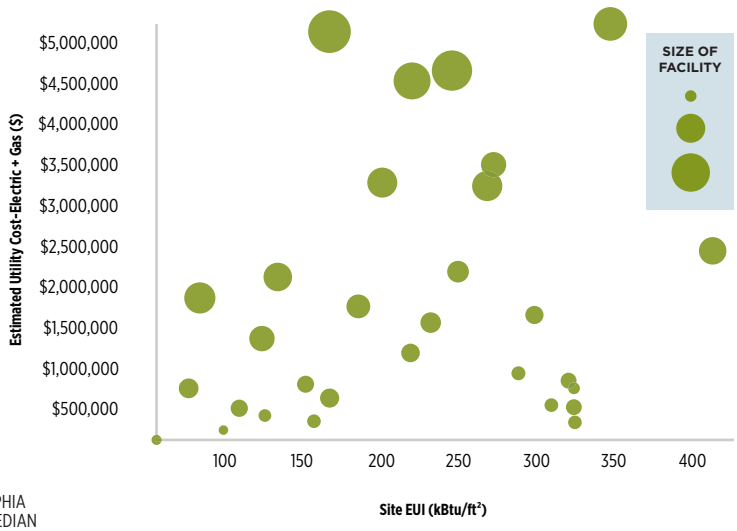
SITE EUI

196.9 kBtu/sf NATIONAL SECTOR MEDIAN

150 — 250

231 kBtu/sf PHILADELPHIA SECTOR MEDIAN

FIGURE 19 **Estimated Utility Costs/Site EUI for Hospitals**



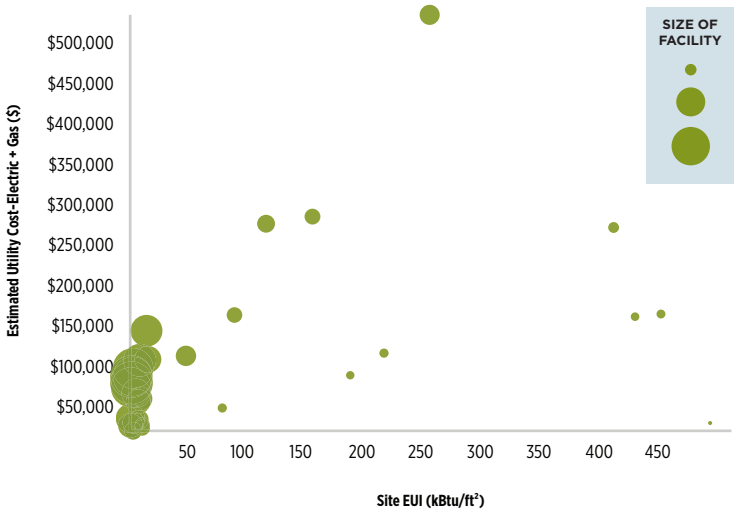
Estimated utility costs for the hospital sector were higher than any other sector, with costs for seventeen facilities exceeding one million dollars. Though the hospital sector has higher energy consumption in part due to high-energy building uses (including laboratories, operating rooms, and 24/7 patient facilities), the sector could lower their carbon footprint and increase energy savings and ENERGY STAR scores through energy efficiency upgrades. Mercy Hospital in West Philadelphia is a great example of a hospital facility that has continued to receive top ENERGY STAR scores through a series of targeted energy efficiency investments (see http://tinyurl.com/ESPMmercy for details).

Parking Facilities

# OF PROPERTIES	**32**
SF OF FLOOR AREA	**13.9 million**
TOTAL GHG EMISSIONS MtCO2e	**102,520**

SITE EUI

FIGURE 20 **Estimated Utility Costs/Site EUI for Parking Facilities**

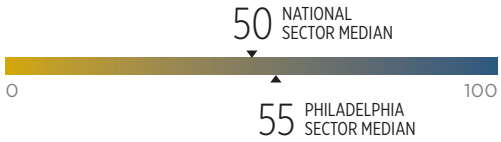


The parking sector does have an opportunity for energy savings, particularly through lighting retrofits. Energy-efficient lighting not only saves on utility costs but generally has a longer lifespan than older lighting systems, reducing labor costs from replacement.

Supermarkets

# OF PROPERTIES	**29**
SF OF FLOOR AREA	**2.1 million**
TOTAL GHG EMISSIONS MtCO2e	**102,520**

ENERGY STAR Score



SITE EUI

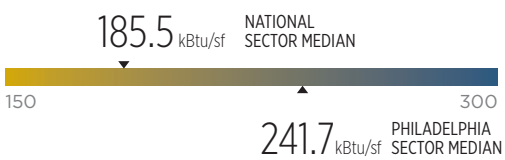
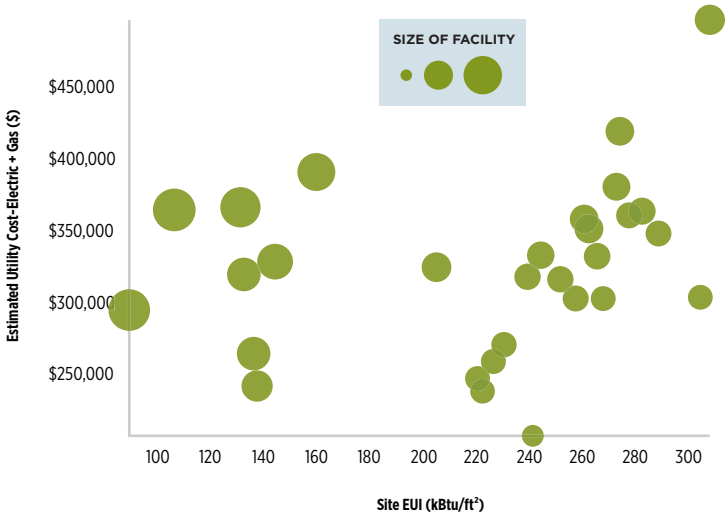


FIGURE 21 **Estimated Utility Costs/Site EUI for Supermarkets**



As with some other sectors in this analysis, supermarkets tend to have high site EUIs because of high energy demand equipment, but also have an opportunity to take advantage of energy savings. Brown's Shop Rite of Roxborough earned the ENERGY STAR label by installing LED fixtures, lighting controls, and upgrading refrigeration cases in a forty year old building. Since 2011, the store has saved more than $250,000 on energy through these investments, realizing a 2.5 year payback on the initial investment.

Houses of Worship

# OF PROPERTIES	**18**
SF OF FLOOR AREA	**1.4 million**
TOTAL GHG EMISSIONS MtCO2e	**18,457**

ENERGY STAR Score

SITE EUI

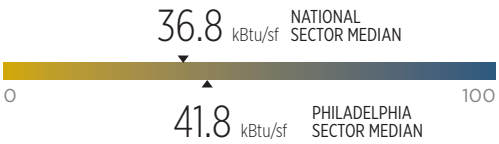
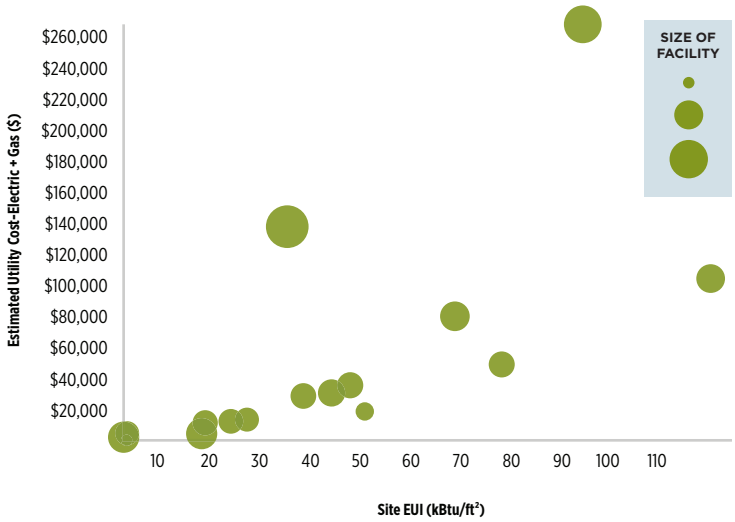


FIGURE 22 **Estimated Utility Costs/Site EUI for Houses of Worship**



Houses of worship, while the smallest sector by floor area, have a large and influential presence in the local community. The houses of worship have the opportunity to involve the community in educating and assisting with building energy savings within the sector.

Municipal Benchmarking Results

The City of Philadelphia has been using Portfolio Manager to benchmark municipally-owned and–operated buildings since 2011. The first municipal benchmarking report for City facilities is available at www.phila.gov/green, and covers 2011 results for all buildings larger than 10,000 square feet (and dozens below that threshold).

In addition to benchmarking, the City is committed to investing in energy efficiency in its facilities through the Energy Efficiency Fund, a competitive grant process supporting municipal conservation projects. The City is also wrapping up construction on its first-ever guaranteed energy savings project for four large downtown office buildings, including City Hall. As part of this project, the iconic City Hall clock tower is being outfitted with new, energy-efficient LED lighting.

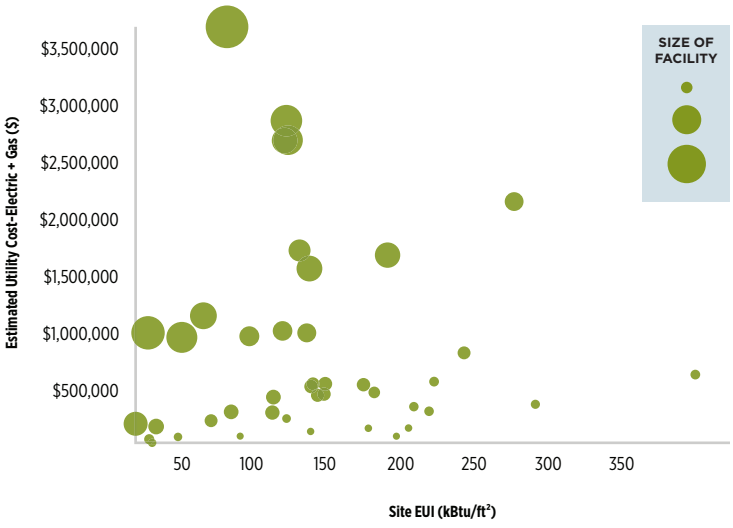
The City is also committing to improving energy tracking and transparency. In 2014, Philadelphia moved to a new platform for energy data management—the new software will allow for automated data transfer into Portfolio Manager and more robust public reporting of City energy data.

Municipal

# OF PROPERTIES	**43**
SF OF FLOOR AREA	**27.3 million**
TOTAL GHG EMISSIONS MtCO2e	**303,480**

SITE EUI

FIGURE 23 **Estimated Utility Costs/Site EUI for Municipal**



Benchmarking Compliance

In the second year of benchmarking, building owners submitted reports for around 1,900 buildings, a 7 percent increase over Year One. These additional buildings account for around 12 million square feet of floor area, bringing the total square footage reported to 270 million square feet, roughly 20 percent of citywide floor area.

This year, MOS focused outreach through an email list built during the first year of compliance, which reduced postal costs and helped benchmarking messages reach the appropriate contact more quickly than letters mailed to owners of record. MOS also conducted outreach sessions and managed benchmarking phone calls internally, eliminating the need for consultant or non-profit support.

Overall, 90 percent of buildings complied with Philadelphia Code 9-3402 in Year Two of benchmarking, up from 86 percent in Year One. This is competitive with similar programs around the country, which generally report compliance rates between 75 percent and 90 percent. MOS will continue to conduct outreach to non-compliant building owners, as well as work with Licenses and Inspections to enforce penalties and fines as required by law.

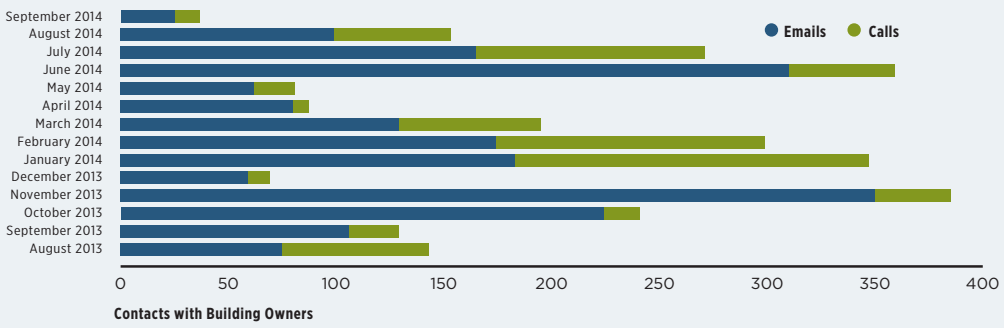
Trends in the First Two Years of Benchmarking Assistance

In contrast to other cities with benchmarking and disclosure policies (many of whom have non-profit partners that run independent "call centers" to support their programs), the Mayor's Office of Sustainability handled nearly all benchmarking assistance internally, with support from the Region III office of the Environmental Protection Agency.

As a result, MOS now has two years of data on nearly 3,000 instances of contact between its staff and building owners and operators in Philadelphia. As shown in the chart below, users needed benchmarking support most in the months prior to benchmarking deadlines (November 2013 and June 2014) and following the issuing of notices of violation from Licenses and Inspections (January and July 2014).

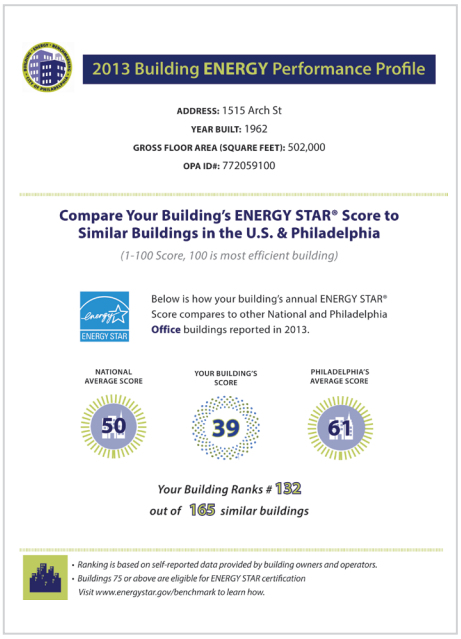
The chart also illustrates the extent to which MOS worked to make email the primary mode of communication with building owners. Overall, 71 percent of assistance was provided via email. This allowed MOS to better track the history of building owners' issues with benchmarking, improving the quality of its support and reducing required staff time.

By managing assistance in-house, MOS was also able to communicate the benefits of energy benchmarking directly to building owners and operators. In many instances, staff were able to learn more about the hurdles facing these buildings when considering investment in energy-efficient projects and direct them to available incentive and loan programs.



Transforming Benchmarking Data into Action at the Building Level

Philadelphia's benchmarking program is currently focused on spurring market action through better understanding and deployment of benchmarking data. To that end, MOS is working with a local firm, Azavea, to develop an easy-to-use data visualization tool which will allow building owners, tenants, and service providers easy access to this information. As the Philadelphia market moves beyond the public disclosure of a difficult-to-navigate spreadsheet toward a tool specifically designed to compare results and call out our most efficient buildings, MOS will continue to study the benchmarking scores of the city's largest buildings to assess the set of strategies currently in place to drive improvement in building performance.



With two years of benchmarking reporting complete, MOS is focused on helping commercial building owners continue to track trends and get the most value out of building performance data. In October 2014, MOS issued Energy Performance Profiles, customized report cards for every building that benchmarked in Year Two. These profiles help building representatives understand where they are relative to their peers and include details on several existing energy efficiency programs designed to help large commercial buildings improve their energy performance. MOS will continue to provide this kind of direct feedback in Year Three and beyond, and will work with building managers to identify performance trends.

In October 2014, MOS launched the Energy Reduction Race, a citywide competition to save energy across Philadelphia's largest buildings. The competition, which runs through September 30, 2015, will award prizes to the three top-performing buildings and provide free building operator training to every property that participates. While tracking progress against a reduction goal of 5 percent in one year, MOS will also gather and publish information on best practices from program participants in order to further scale efficiency opportunities going forward.

The Energy Reduction Race is supported by the City Energy Project (CEP), a national initiative led by the Natural Resources Defense Council and the Institute for Market Transformation. CEP is a three-year program to designed share best practices and develop programs to reduce the carbon impact of our nation's large buildings in ten cities across the country. In addition to the Energy Reduction Race, MOS will focus its CEP participation on improved efficiency in municipal buildings through building operator training and certification.

Glossary of Terms

British Thermal Unit (Btu)—A unit of energy, which can represent both thermal energy and electricity. One Btu is the amount of energy required to raise one pound of water one degree Fahrenheit.

Energy Benchmarking—The process of comparing a building's energy performance to other similar properties, based on a standard metric. ENERGY STAR Portfolio Manager was the software used to benchmark the buildings in this report, and the metric for comparison is Energy Use Intensity (EUI).

Energy Use Intensity (EUI)—The metric used for comparing buildings in Energy Star, EUI expresses a building's energy use relative to its size. In this report it is expressed as kBtu/ft^2, and is calculated by taking the total energy consumed in a year (in kBtu) and dividing it by the floor area of the building (in ft^2). All EUIs in this report are weather-normalized (see below).

ENERGY STAR Portfolio Manager—A free, online tool available by the U.S. Environmental Protection Agency (EPA) for building owners and managers to track and manage energy and water consumption and measure the carbon footprint of buildings. The tool can also give a building an ENERGY STAR rating (see definition below).

ENERGY STAR Rating—The 1 to 100 ENERGY STAR score was developed by the EPA and provides a metric for comparison with other similar buildings across the country. The score accounts for differences in climate, occupancy, and operating hours. A score of 50 represents median energy performance, while a score of 75 or better indicates a building is a top performer.

Site EUI—Site energy represents the amount of heat and electricity consumed by a building as reflected in your utility bills. This is a relevant metric for facility managers, to understand how a building's energy use has changed over time. Site EUI does not, however, account for the environmental impacts of transmission and delivery of energy. Site energy sources for public buildings in this report include: electricity, natural gas, chilled water, and steam.

Total GHG Emissions (MtCO2e)—The metric used in this report for greenhouse gas emissions, which represent a million metric tons of carbon dioxide equivalents. Equivalent CO2 (CO2e) is a universal standard measurement for greenhouse gasses and their ability to trap heat in the atmosphere. These greenhouse gasses include carbon dioxide, methane, nitrous oxide, and chloroflouro-carbons.

Weather Normalization—When energy use is adjusted to account year-to-year weather differences, allowing for comparison of a building to itself over time. Through this procedure, the energy in a given year is adjusted to express the energy that would have been consumed under 30-year average weather conditions.

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www.phila.gov/benchmarking

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