Seattle
Municipal
Buildings

2012-2013 ENERGY PERFORMANCE REPORT

December 11, 2014

City of Seattle

Acknowledgments

The 2012-2013 City of Seattle Benchmarking Report for City-owned buildings was prepared by the Office of Sustainability & Environment based on the benchmarking results provided by each of the City's capital departments. We would like to acknowledge the efforts of facility management staff from each department who compiled data for their buildings and participated in the process.

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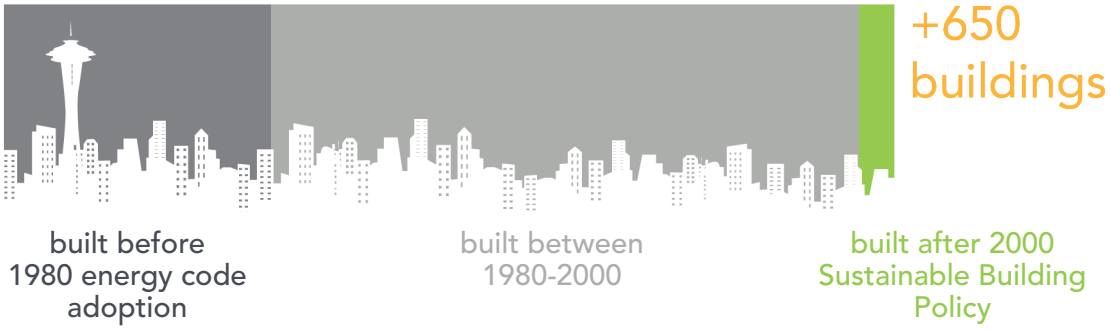
01 Introduction

The City of Seattle has set an ambitious target to be a carbon neutral community by 2050. To get there, the entire community needs to reduce its environmental impact and City government must be a leader and an active participant. This report demonstrates that leadership by publicly sharing the results of the City's work to rate the energy efficiency, or "energy performance" of City-owned facilities.

The City of Seattle has an excellent track record of reducing the environmental impact of City operations, among them: a Commute Trip Reduction Program to reduce miles employees travel to and from work, Green Fleets to reduce emissions from on-the-job travel, and a Sustainable Buildings and Sites Policy to ensure that new construction and renovations meet strict energy performance criteria. The City also recognizes the critical importance of improving the efficiency of existing buildings—and the Mayor has set a goal of reducing energy use across City-owned buildings 20% by 2020 (from 2008).

Most of the buildings that will shape Seattle in 2050 have already been built. This is equally true for City-owned buildings. Of the approximately 650 City-owned buildings, only 34[1]—those built since the Sustainable Buildings Policy was implemented in 2000—were constructed to green building standards. In fact, 30% of the City's buildings were built before 1980, the year the first Washington State Energy Code was adopted.

The first step toward reducing energy consumption is effectively tracking energy use to understand existing conditions. Monitoring the energy and water use of City-owned buildings is not new. City departments track utility bills, and those departments with many buildings



City-owned building stock consists primarily of buildings built prior to the launch of City green building standards.
(Source: City of Seattle, Graphic: GGLO)

1 As of December 2013

use resource tracking software. In addition, greenhouse gas (GHG) emissions from municipal buildings and facilities are reported in the City of Seattle Municipal GHG Emissions Inventory, which is a summary of GHG emissions from all municipal operations. At 31% of total emissions, buildings are the City's second largest source of emissions after vehicle fleets.

The City of Seattle Energy Benchmarking and Reporting Program requires owners of non-residential and multifamily buildings 20,000 square feet or larger to track and annually report whole-building energy efficiency, or "energy performance" to the City. The program also requires building owners to disclose the results to any current or prospective tenant, buyer, or lender upon request. Like many other building owners, the City is benchmarking the energy use of its facilities to understand, at a portfolio-wide scale, where it is doing well, and where improvement is needed. Energy benchmarking sets the baseline for a road map to significantly increase City-owned building energy efficiency and reduce GHG emissions by 2020. Improvements will help the City meet its environmental goals and reduce operating costs.

The City believes energy benchmarking is an important best management practice and public disclosure of building energy performance promotes transparency and accountability. To lead by example, the City is going beyond the minimum requirements of the benchmarking law by publicly sharing the energy performance of City-owned buildings. As a member of the Seattle 2030 District, an organization seeking to create a high performance building district in the heart of Seattle, the City is also sharing information to support collaboration among building owners. In addition, because the City values the energy performance of all its buildings, it is tracking and reporting as many City facilities as is feasible, by setting its own minimum reporting requirement at 10,000 square feet and by including all public service facilities — community centers, libraries, fire stations, and police stations — regardless of size. All told, the City is benchmarking and reporting the energy performance of 8.1 million square feet of building area. The benchmarking data presented here will help building owners learn from the City's efforts and further public understanding of how to achieve more energy-efficient buildings.

This report covers City-owned building energy use for calendar years 2012-2013. It includes:

- Background on the Energy Benchmarking and Reporting Program
- An overview of the City's building stock and how it has performed
- Benchmarking results, reported by building type
- A comprehensive table of all benchmarked City-owned buildings

For the year prior, see the 2011-2012 report here.

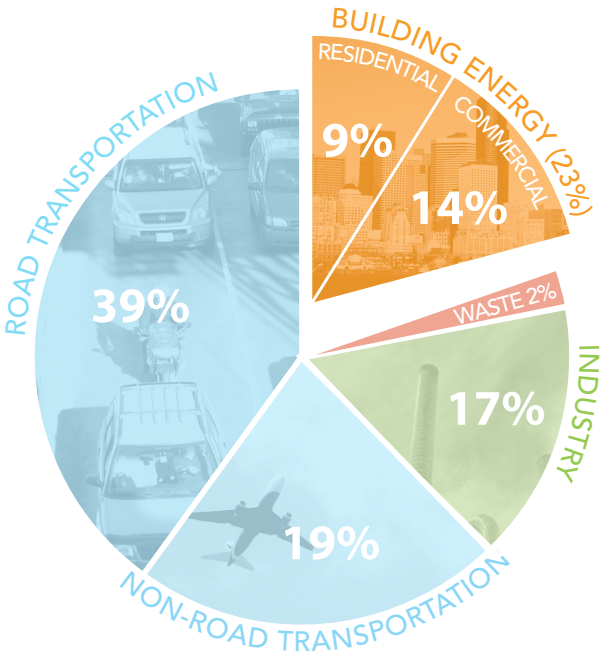
02 Energy Benchmarking & Reporting Program

99% of Non-Residential & Multifamily building owners
(representing about 272 million sq ft)
reported 2013 energy performance to the City of Seattle
the highest compliance rate of any U.S. City.

The City of Seattle Energy Benchmarking and Reporting Program was enacted into law in 2010 through Ordinance 123226 (updated in 2012 via Ordinance 123993). Non-residential and multifamily building owners of facilities 20,000 square feet or larger are required to track whole-building energy performance (benchmark) using the Environmental Protection Agency's (EPA) ENERGY STAR Portfolio Manager. Results for the prior year must be reported annually on April 1st to the City of Seattle. In addition, upon request, building owners must provide the building's energy performance results to any current or prospective tenant, buyer, or lender involved with a real estate or financing transaction.

The result of Seattle's 2011-2012 benchmarking analysis are available at www.seattle.gov/energybenchmarking. The program expects to release an analysis of 2013 data in early 2015.

Seattle's benchmarking law aims to help building owners manage energy resources, reduce energy costs and lower carbon emissions. Benchmarking establishes a baseline of energy performance for each property that can be used to guide energy efficiency investments. Annual reports of building energy performance will help the City monitor progress towards citywide energy efficiency goals, identify market sectors with the greatest needs and opportunities, and guide the development of future policies and incentive programs. Lastly, energy performance disclosure allows an informed market to compare energy efficiency and future operating costs between similar properties and guide purchasing, leasing and financing decisions.



Energy use in buildings accounts for about 1/4th of Seattle's total carbon footprint (Source: 2012 Seattle Community GHG Inventory, Table 3 Expanded View of Seattle's GHG Inventory. Graphic: GGLO)

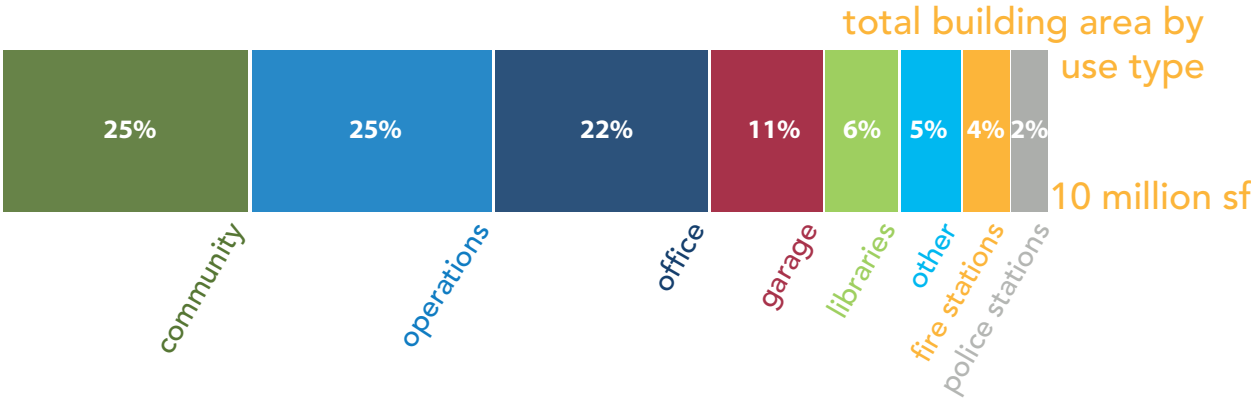
Seattle's benchmarking policy builds on Washington State Law (RCW 19.27A.170) that requires State and non-residential building owners and operators to disclose benchmarking results to potential buyers, renters or lenders. Seattle is one of ten cities or counties nationwide that has building energy benchmarking requirements. Learn more at www.buildingrating.org.

The City offered free services in 2013 to help building owners understand the requirement and report, including a call center, benchmarking workshops, free technical assistance and a how-to guide. To learn more about the program, visit www.seattle.gov/energybenchmarking. Free technical assistance is available via e-mail: energybenchmarking@seattle.gov or phone: 206.727.8484.

Benchmarking, or tracking a building's energy performance, gives owners and managers a better sense of how their buildings are using—and wasting—energy and also helps identify cost-effective opportunities to lower energy use and save money.

Benchmarking City-Owned Buildings

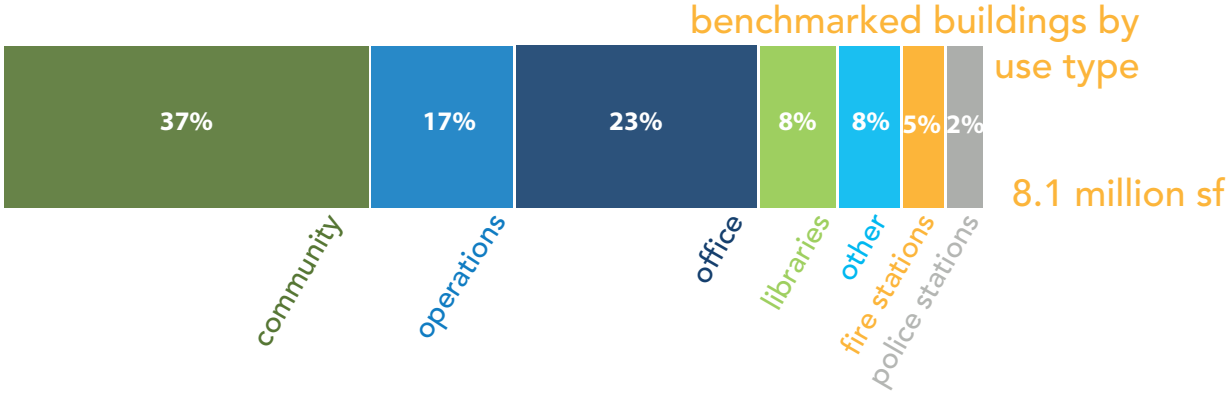
The City owns more than 650 buildings, totaling approximately 10 million square feet. These range from small storage sheds, to libraries, to the Seattle Municipal Tower, an office building of more than one million square feet. Offices, community facilities (e.g. performance halls and community centers), and operations support buildings make up the majority of the square footage. Libraries, police stations, and fire stations are numerous but each building is relatively small, so they account for a smaller percentage of the total building area.



City Building Area by Use Type

This chart was compiled from several sources with the assignment of each building to a single category based on its predominate use. Because many of the City's buildings are multi-use, some use types may be over or under-represented. (Source: City of Seattle; Graphic: GGLO)

Of the 10 million square feet of City buildings, 8.1 million square feet have been benchmarked to date. This accounts for more than 80% of the City's total building area. While tracking energy use is not new to the City, as part of the benchmarking program, the City is using Portfolio Manager as a consistent reporting tool for energy performance across its buildings, with a focus on medium and larger buildings and on building types with multiple facilities, such as libraries and fire stations. However, the energy use of the City's smallest buildings—for example, unconditioned storage sheds and park restrooms—cannot be usefully tracked with Portfolio Manager.

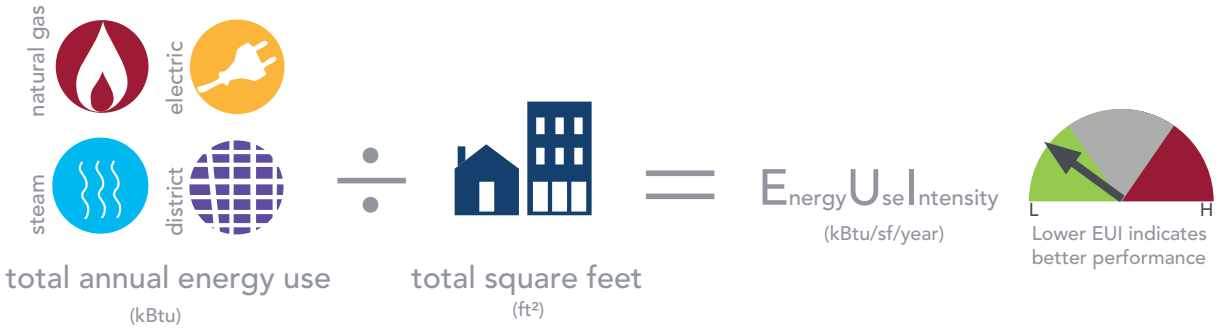


Benchmarked City Building Area by Use Type
(Source: City of Seattle; Graphic: GGLO)

About Benchmarking Energy Performance

Energy Use Intensity[1] – One of the most basic ways to benchmark a building's energy efficiency or performance is to calculate the amount of energy used for each square foot, known as its Energy Use Intensity (EUI). The EUI is determined by totaling the annual energy used by all utilities that serve the building, such as electric and natural gas, and dividing that number by the total floor space of the building. It is typically measured in kBtu/sf (one thousand British thermal units per square foot). EUIs normalize for building size, which allows buildings of various sizes to be compared to each other. **Higher EUIs show greater energy use, whereas lower EUIs indicate more energy efficient buildings.**

What is an EUI?



ENERGY STAR Ratings – Portfolio Manager is a powerful tool for calculating EUIs for all types of buildings, and for calculating a more robust metric—the ENERGY STAR rating—for about 21 building types, such as offices, courthouses and warehouses. The 1 – 100 rating shows how the building's energy efficiency compares to similar buildings in the United States. The EPA uses the Commercial Building Energy Consumption Surveys (CBECS) data to generate ENERGY STAR ratings, which also account for differences in local climate, yearly weather variations, number of occupants, and operating hours. Learn more at www.energystar.gov/benchmark. **In contrast to EUIs, higher ENERGY STAR scores represent better energy efficiency.**

The 1 – 100 ENERGY STAR rating represents the percentile ranking of the building's energy performance:

- A score of 50 is average performance.
- A score of 75 means the building outperforms 74% of other buildings. This is the threshold for EPA's ENERGY STAR certification.
- A score of 1 means the building is among the very poorest performers.
- A score of 100 indicates the best relative performance.

Higher ENERGY STAR rating indicates better performing buildings

1 This report uses the "Site EUI" metric, which represents the total on-site energy use—the most relevant metric for facility managers. Site EUI, however, does not account for the environmental impacts of energy sources. Another metric, "Source EUI" that includes energy source impacts, is also available through Portfolio Manager. Energy sources for City-owned buildings include electricity, natural gas, and steam.

03 City Building Portfolio Overview

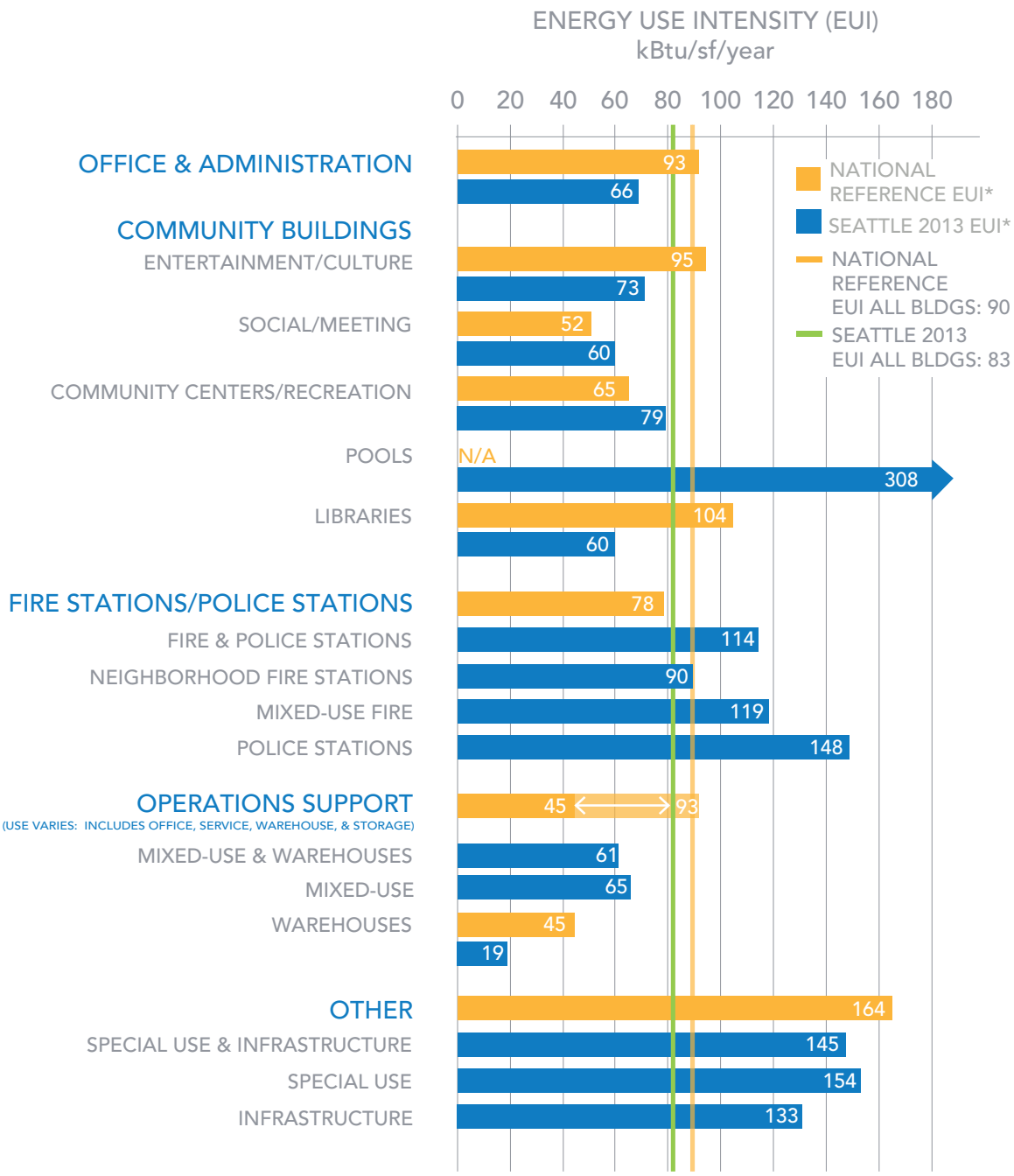
Overall Performance of City-Owned Buildings

City buildings in this report have been grouped into categories based on type of use, which allows the City to tap into one of the most powerful aspects of benchmarking—comparing energy performance across buildings in a portfolio. Even within a building type that is doing well overall, such as libraries, there is a wide range of energy performance. Examining the energy efficiency and characteristics of buildings based on type of use can help to identify opportunities for energy savings. Best practices may be learned from the efficient buildings and applied to those that need improvement.

A building's EUI and ENERGY STAR rating (if available) can also be used to compare buildings to other similar buildings in the United States. Good national references for EUIs are the Energy Information Agency's Commercial Building Energy Consumption Surveys (CBECS) 2003 dataset of commercial buildings in the United States, and the 2030 Challenge Targets, which are derived from CBECS data. Comparing a particular building's EUI to these national EUI values provides a rough idea for how a building's energy efficiency stacks up to similar buildings across the country, however, the specific characteristics and uses of the buildings are not always a good match for CBECS data.

The National Reference and City EUI graph on page eight identifies the CBECS and 2030 Challenge EUI means (averages) most relevant to City-owned building types, and compares them to the City's 2013 benchmarking results. Additional information is provided in Table 1: National Reference and City EUIs, in the Appendix.

Overall Performance of City-Owned Buildings



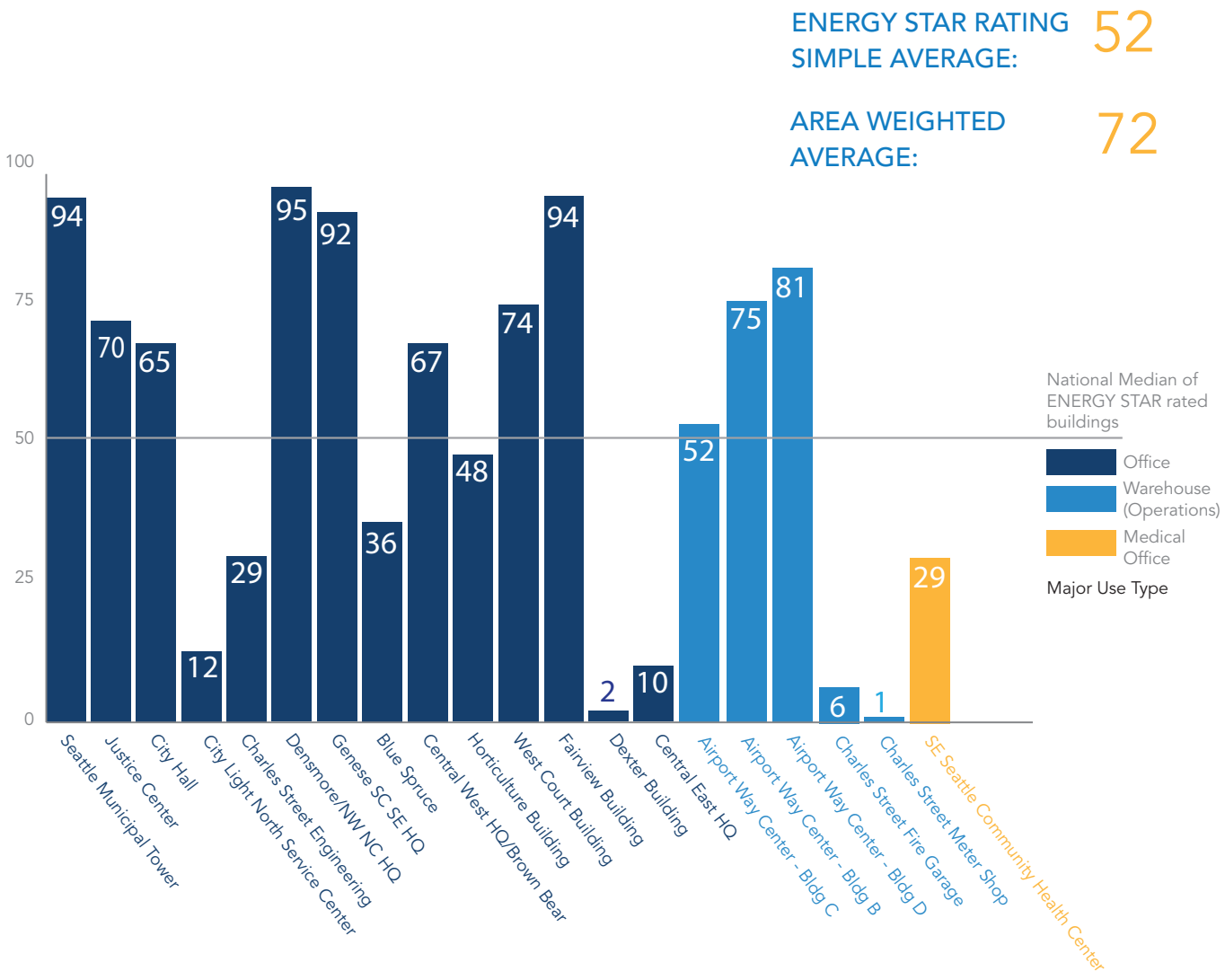
National Reference & City EUIs

Lower EUI indicates better performing buildings
*Mean Site EUI - See Apendix for Table 1: National Reference & City EUI
(Source: 2003 CBECS and City of Seattle, Graphic: GGLO)

03 City Building Portfolio Overview

Overall Performance of City-Owned Buildings

Of the 173 buildings the City has benchmarked in Portfolio Manager, only 21 are types eligible for an ENERGY STAR rating. The majority of City-owned buildings—including police and fire stations, libraries and community centers and buildings with multiple uses—are not eligible for the ENERGY STAR rating. Additionally, many of the City's buildings have multiple uses, making them ineligible. Private building owners with diverse building types often face similar challenges.



City of Seattle 2012 ENERGY STAR Performance Ratings
See Appendix for detailed table (Source: City of Seattle; Graphic: GGLO)

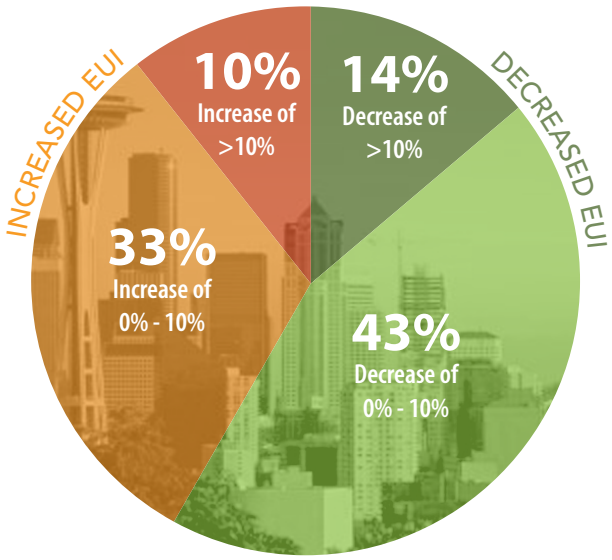
Overall Performance of City-Owned Buildings

The energy performance of Seattle's municipal buildings is similar to private building stock—some buildings are doing very well, while others have the opportunity to improve. City buildings that were targeted with energy efficiency improvements highlight the value of intervention. Energy use reductions from 2012 to 2013 at the Seattle Municipal Tower, the Justice Center and City Hall (8.9%, 3.4% and 3.5% decrease, respectively) are primarily the result of operational revisions to temperature setpoints. At branch libraries, operational and mechanical control sequencing improvements have led to reduced energy use ranging from 10% to 19%. Lighting upgrades at the Hiawatha Community Center gym resulted in a 10% energy use reduction, while a full retrofit of lighting, boilers and controls at Loyal Heights Community Center contributed to nearly a 20% reduction in energy use.

The City's 2013 benchmarking results indicate an overall decrease of 0.5% in energy use, based on results for buildings benchmarked in both 2012 and 2013. The reduction can be primarily attributed to the effects of a warmer winter in 2013 and would be expected to be even greater. However, growing employee counts (the City added 489 staff in 2013), increasing plug loads (computers, monitors, printers, portable electronic devices, and task lighting) and additional operating hours were likely the key drivers increasing energy demands. As one example, libraries increased operating hours by 7% in 2013.

In addition to the actual EUI, energy consumption trends also show a dynamic portfolio. More buildings are improving than not and generally, improvements occur where there have been focused efforts, or reductions in occupancy.

The following chapter, Detailed Building Performance, provides the 2012 and 2013 site EUI for each City-owned building benchmarked and compares it to national averages based on building type. The change in EUI from 2012 by building type (not adjusted for weather[1]) is also included.



City Portfolio Energy Use Intensity Trends
More than half of Seattle's benchmarked municipal building square footage had a lower EUI in 2013.
(Source: Table 3: Benchmarked City-Owned Buildings, page 26; Graphic: GGLO)

1 The detailed results are not adjusted, or "normalized," for weather. This should be kept in mind when comparing changes from 2012 to 2013 because 2013 was about 9% warmer than 2012 as measured by Heating Degree Days at Boeing Field (60 degree base). The 2013 cooling load was approximately 75% more than in 2012. For small buildings, reductions in energy use of less than 2-3% are likely attributed to the warmer weather in 2013, not improvements in energy efficiency. Reductions of greater than 2-3% may reflect actual improvements in overall energy efficiency. For air conditioned buildings over 50,000 square feet, the cooling and heating impacts often canceled each other out and reductions reflect efficiency improvements.

04 Detailed Building Performance

OFFICE: Buildings in this category principally consist of office space (more than 80%), lobbies, conference, meeting and training rooms. They may also include small amounts of other spaces, such as data centers, courtrooms, retail shops, restaurants, and storage

OFFICE CHANGE IN EUI FROM 2012: -6.4% (decrease)

COMMUNITY BUILDINGS: Performance of this single largest category of the City's benchmarking efforts are best understood by using the following sub-categories:

COMMUNITY CHANGE IN EUI FROM 2012: 2.1% (increase)

Performance Venues: Buildings typically consist of performance and rehearsal halls, sporting event venues, and administrative and support spaces.

Public Assembly, Social/Meeting: Buildings house multiple uses—high school, retail, and administrative spaces, in addition to meeting and conference rooms that accommodate trade shows, dances, receptions and meetings.

Community Centers: Buildings typically consist of gyms, sport courts, public meeting rooms and administrative areas. Some have kitchens and many have extensive outdoor lighting for sports fields and courts, both of which are included on the building electric meter.

Pools: Buildings have public swimming pools and locker rooms and may be collocated with community centers.

LIBRARIES: Libraries have traditional library and reading room spaces, quiet public work rooms, office and administrative spaces, data centers and public meeting rooms.

LIBRARIES CHANGE IN EUI FROM 2012: -2.2% (decrease)

FIRE STATIONS CHANGE IN EUI FROM 2012:
0.7% (increase)

FIRE STATIONS:

Neighborhood Fire Stations: – Buildings are lived in by Seattle Fire Department personnel while on extended shifts and include offices, meeting rooms, dormitories, locker rooms, and exercise spaces. They also house an apparatus (fire truck) bay that is somewhat heated. The kitchen or "beanery" is generally more extensive than a typical lunch room with the equivalent of a light commercial kitchen.

Mixed-Use Fire: Buildings have functions beyond those of a basic fire station such as data centers, alarm and emergency operations centers, or office and meeting spaces. They also house a neighborhood fire station.

POLICE STATIONS CHANGE IN EUI FROM 2012:
3.3% (increase)

POLICE STATIONS: City police stations have 24 hour operations and consist of office and administrative spaces, holding cells, data and communication centers, locker rooms, meeting rooms, and training ranges.

OPERATIONS CHANGE IN EUI FROM 2012:
2.4% (increase)

OPERATIONS SUPPORT:

Mixed-Use: Facilities combine many uses within each building, such as offices, warehouses, distribution centers, data centers, service areas (vehicle maintenance and other repair and fabrication shops), locker rooms, and other miscellaneous uses.

Non-Refrigerated Warehouses: Building are dominated by material storage, although they may include some office and shop space.

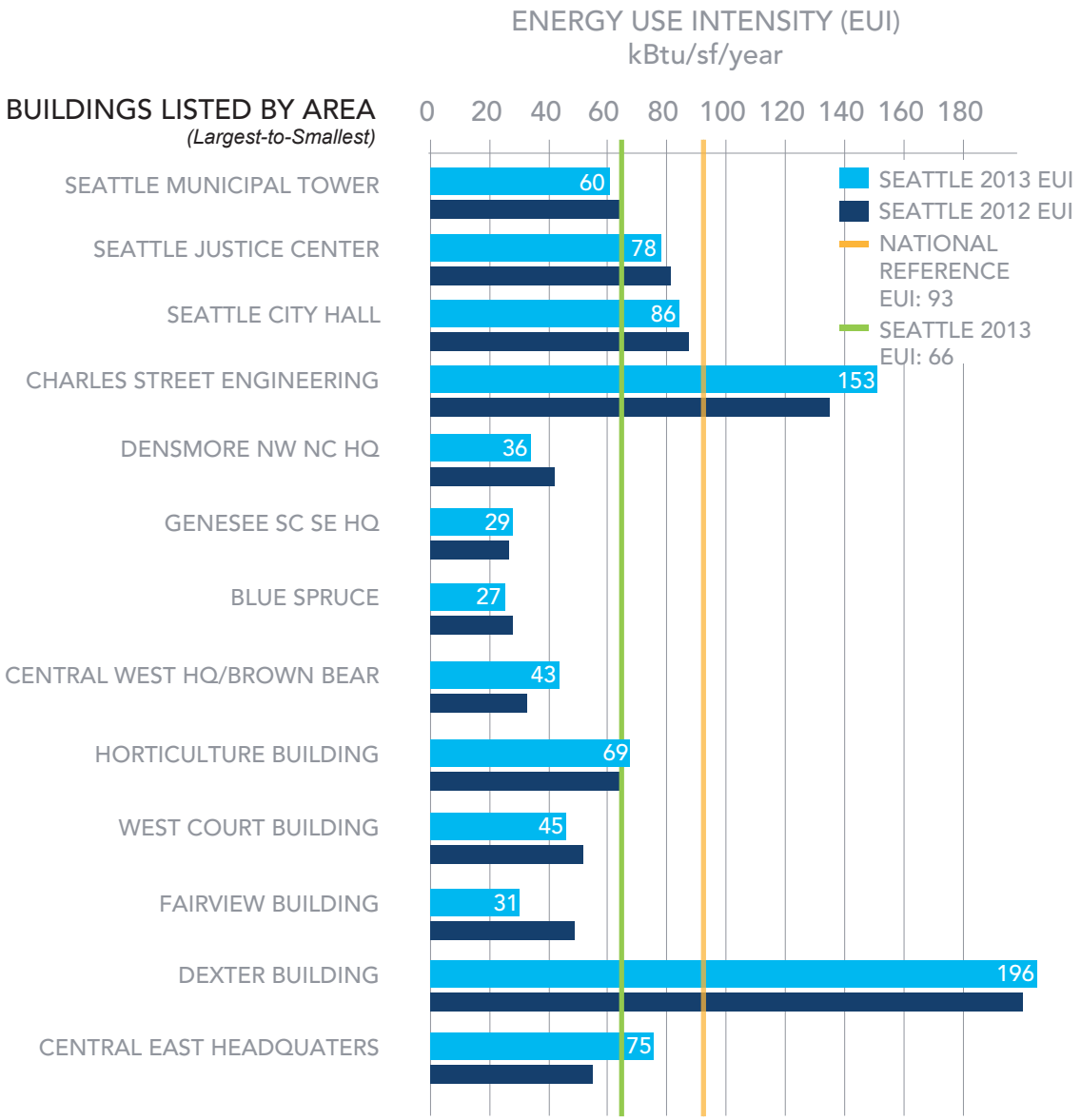
OTHER CHANGE IN EUI FROM 2012:
-3.2% (decrease)

OTHER: This is an eclectic category split between "Special Use" and "Infrastructure" that can't be well classified elsewhere.

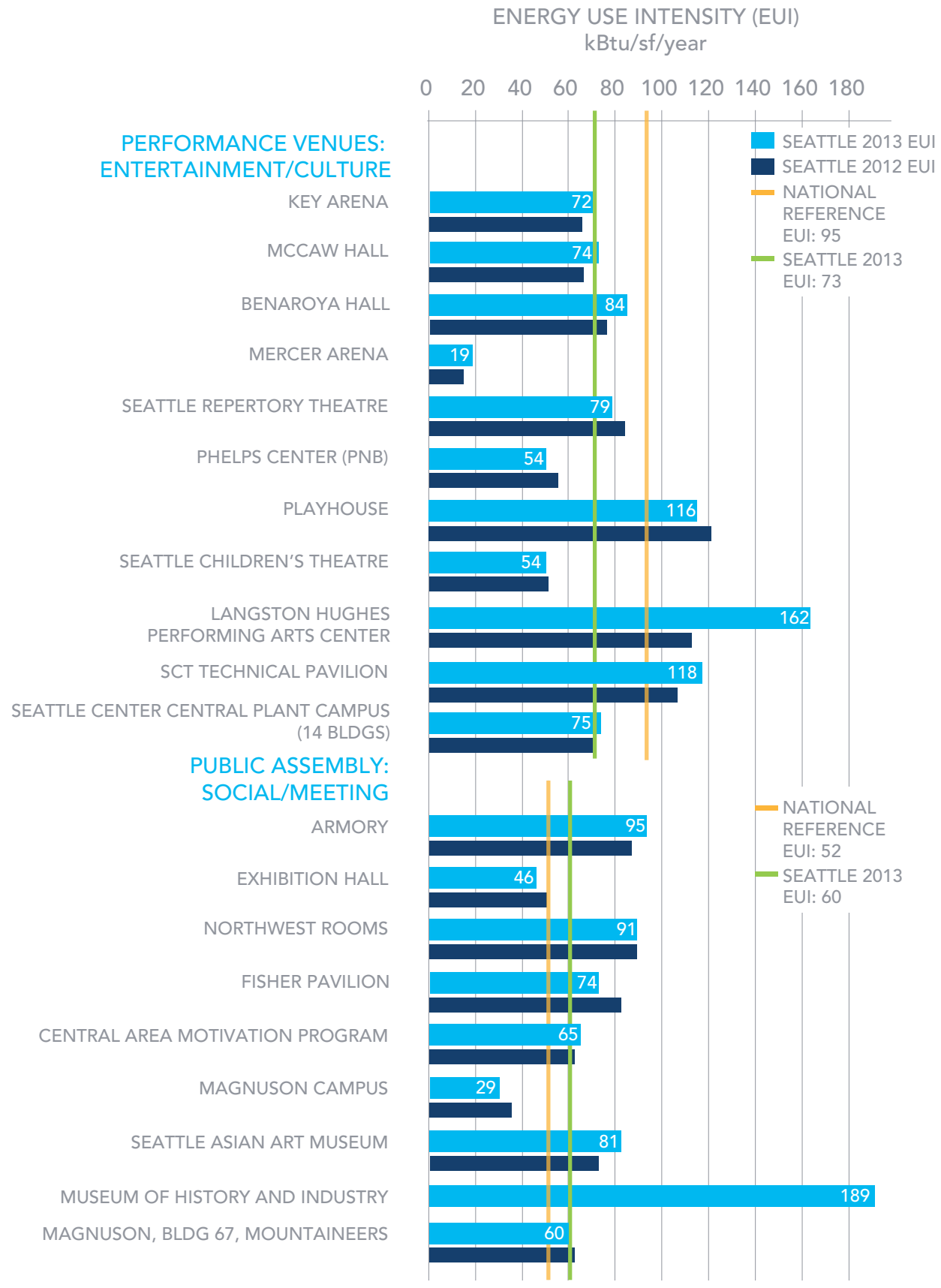
Special Use: Several unique space types, such as laboratory, medical office, specialty control room, transit station, aquarium, and an animal shelter.

Infrastructure: Buildings that typically have a unique function as part of the provision of a city service. They include substations, power houses, treatment plants and some control centers.

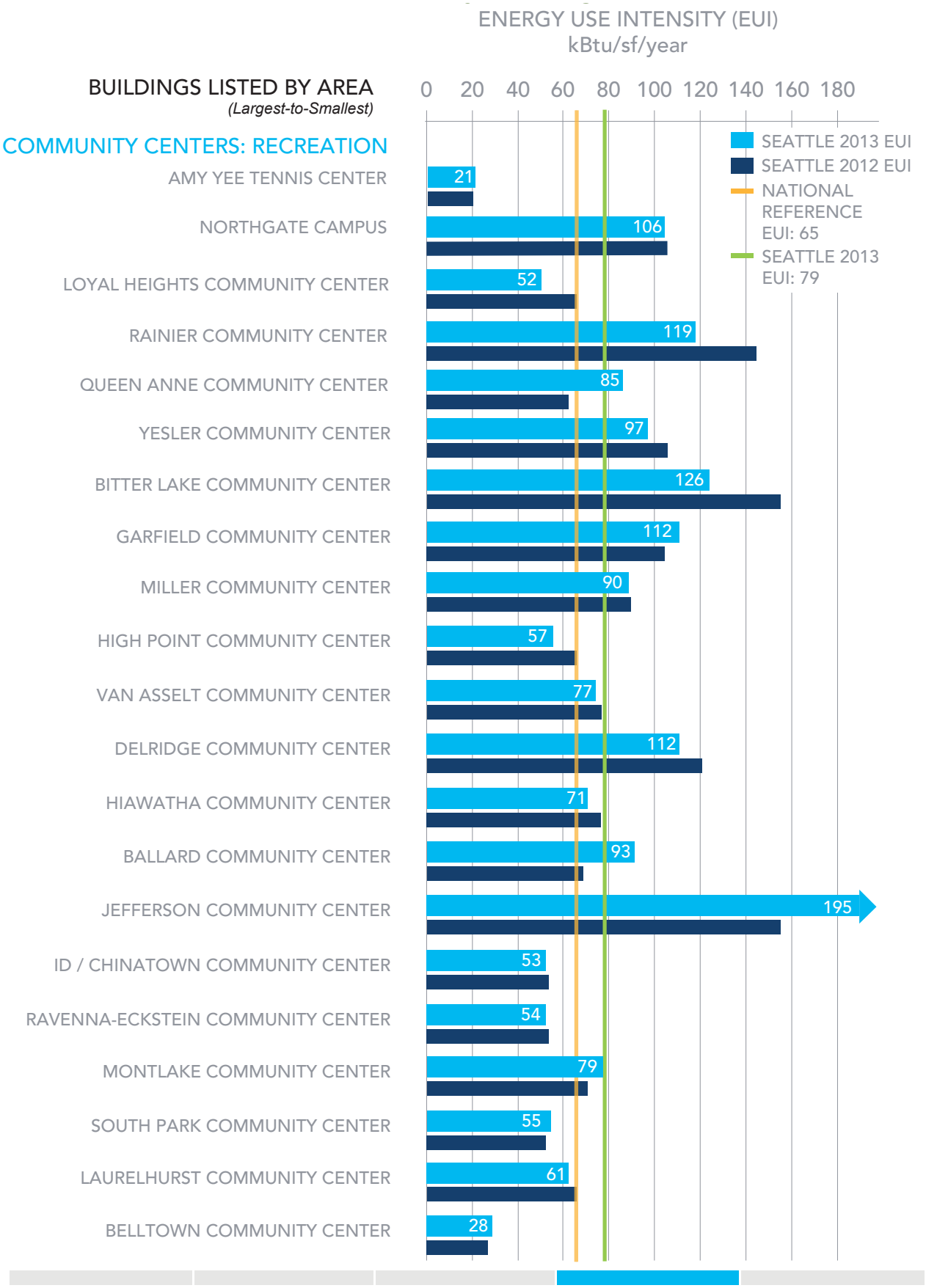
Office & Administration



Community Buildings

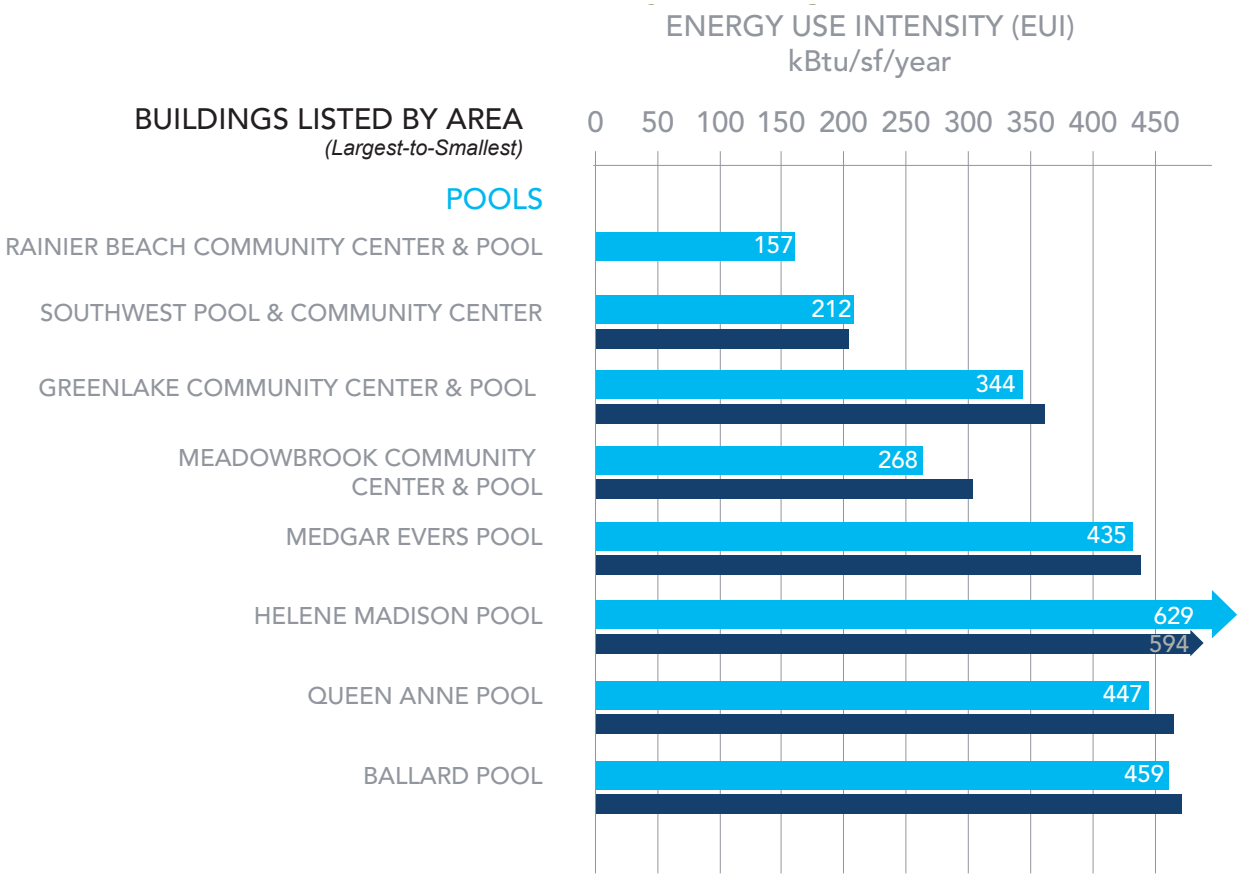


Community Buildings

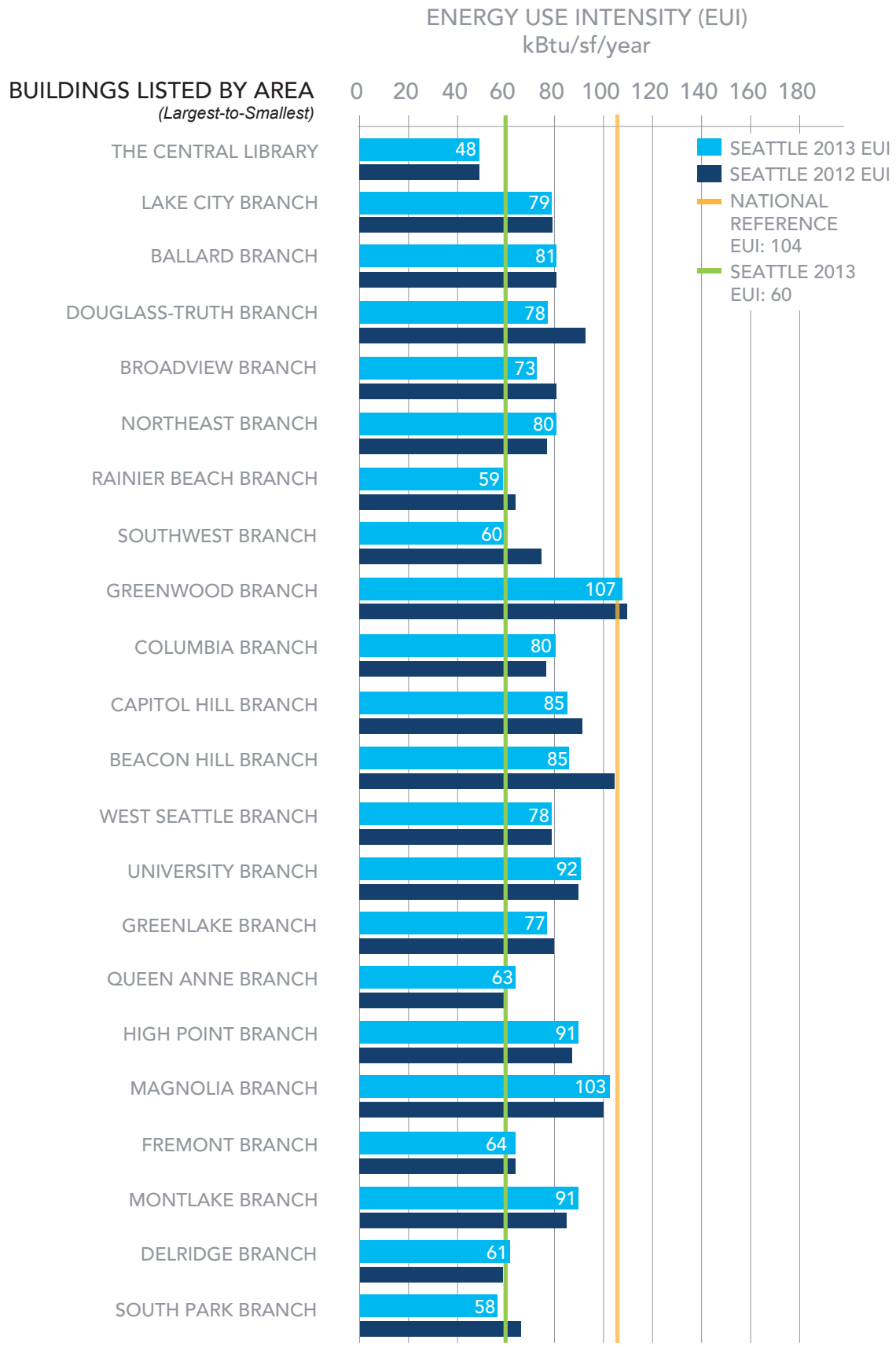


Community Buildings

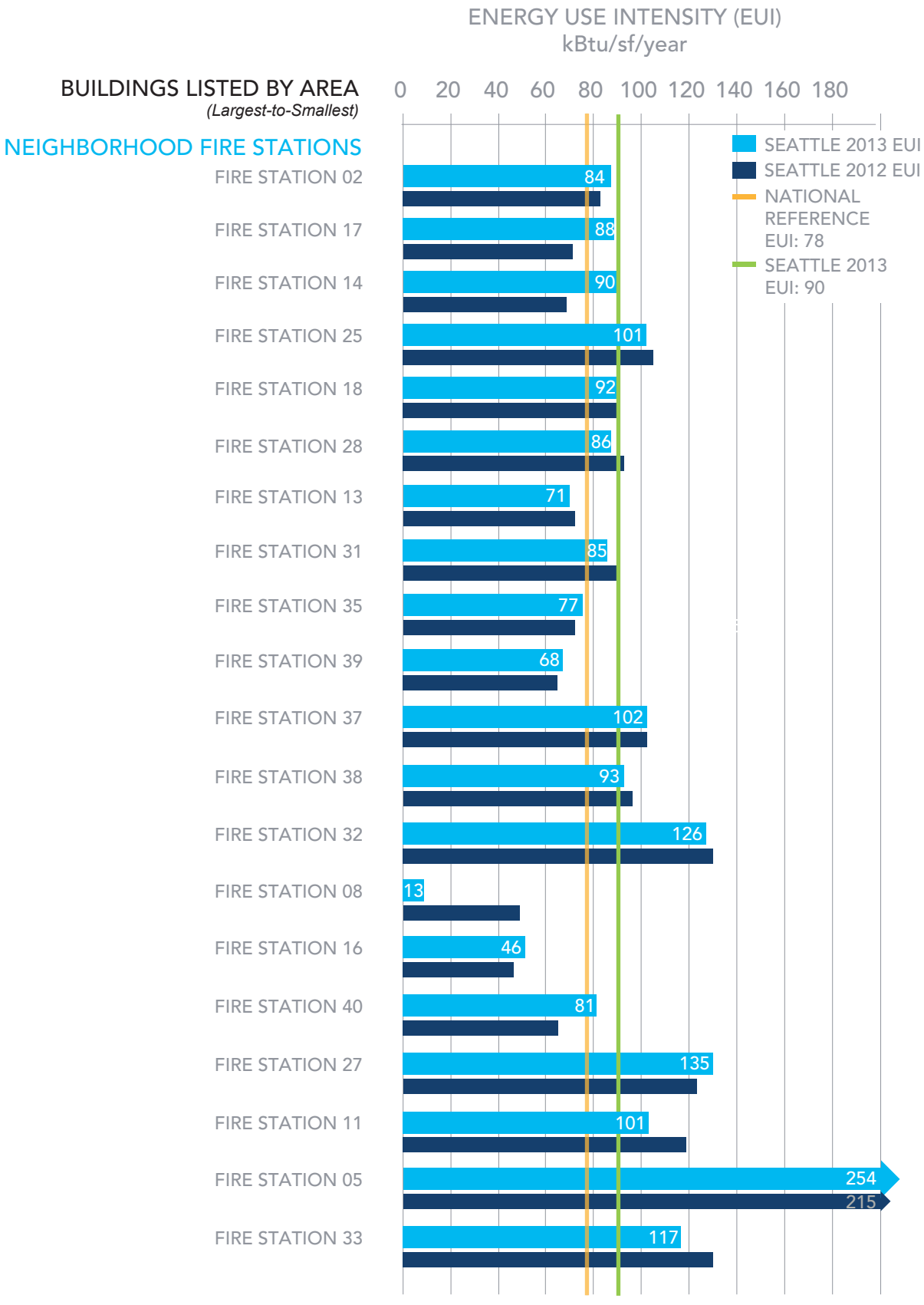
BUILDINGS LISTED BY AREA
(Largest-to-Smallest)



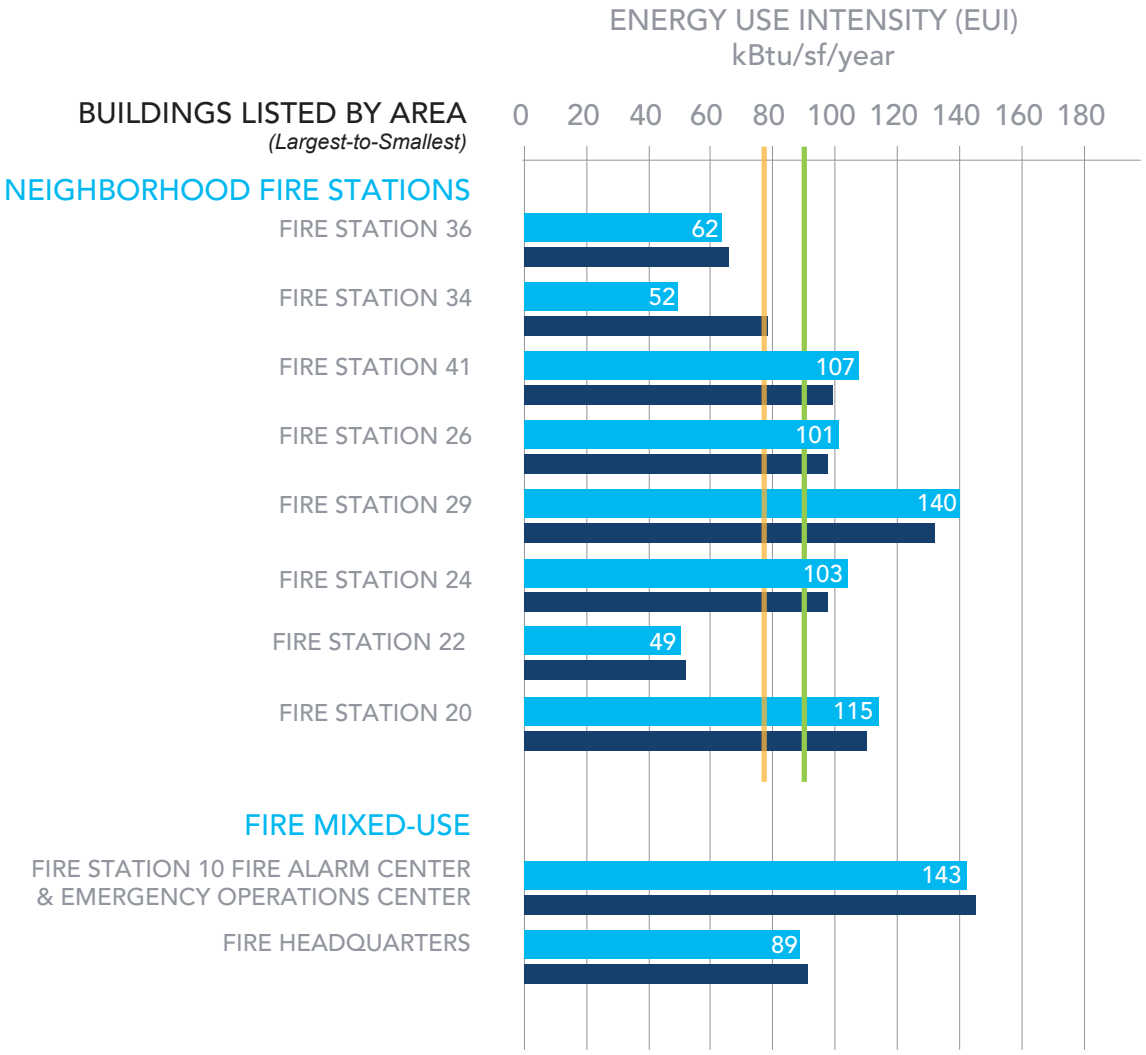
Libraries


ENERGY USE INTENSITY (EUI)
kBtu/sf/year
BUILDINGS LISTED BY AREA
(Largest-to-Smallest)
0 20 40 60 80 100 120 140 160 180
THE CENTRAL LIBRARY 48
LAKE CITY BRANCH 79
BALLARD BRANCH 81
DOUGLASS-TRUTH BRANCH 78
BROADVIEW BRANCH 73
NORTHEAST BRANCH 80
RAINIER BEACH BRANCH 59
SOUTHWEST BRANCH 60
GREENWOOD BRANCH 107
COLUMBIA BRANCH 80
CAPITOL HILL BRANCH 85
BEACON HILL BRANCH 85
WEST SEATTLE BRANCH 78
UNIVERSITY BRANCH 92
GREENLAKE BRANCH 77
QUEEN ANNE BRANCH 63
HIGH POINT BRANCH 91
MAGNOLIA BRANCH 103
FREMONT BRANCH 64
MONTLAKE BRANCH 91
DELRIDGE BRANCH 61
SOUTH PARK BRANCH 58
SEATTLE 2013 EUI
SEATTLE 2012 EUI
NATIONAL REFERENCE EUI: 104
SEATTLE 2013 EUI: 60

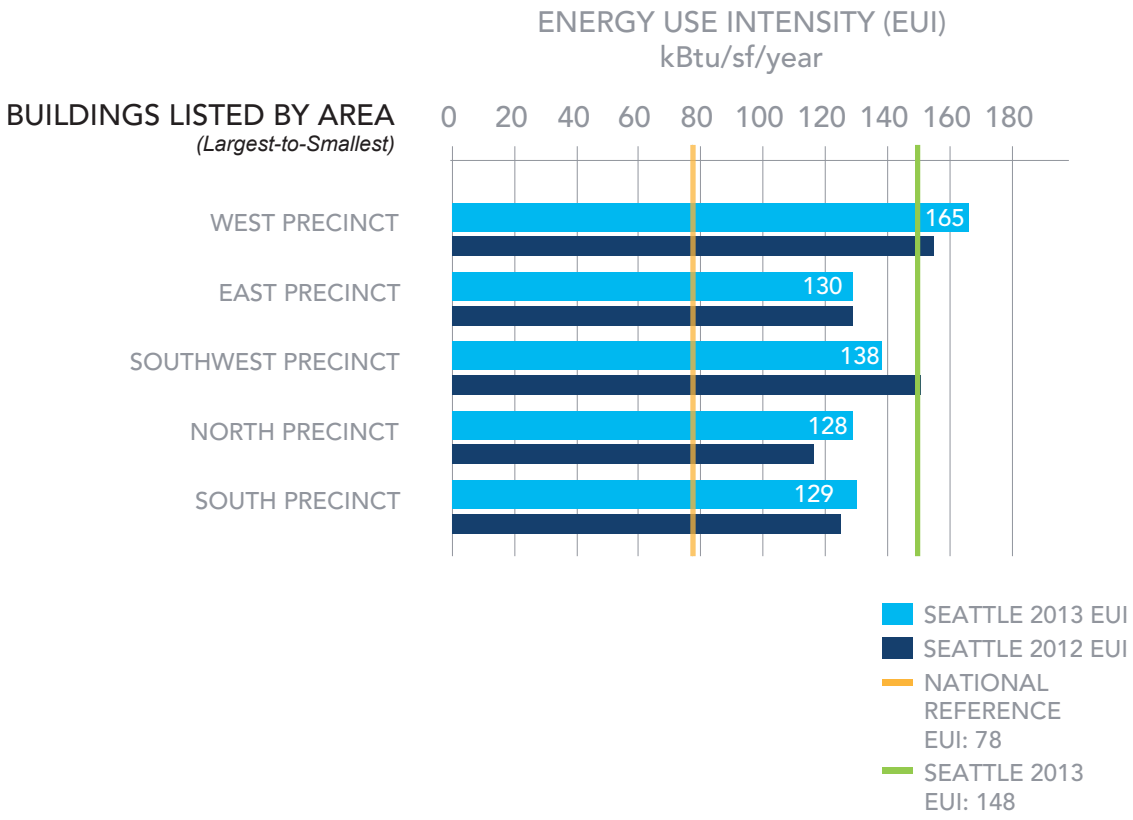
Fire Stations



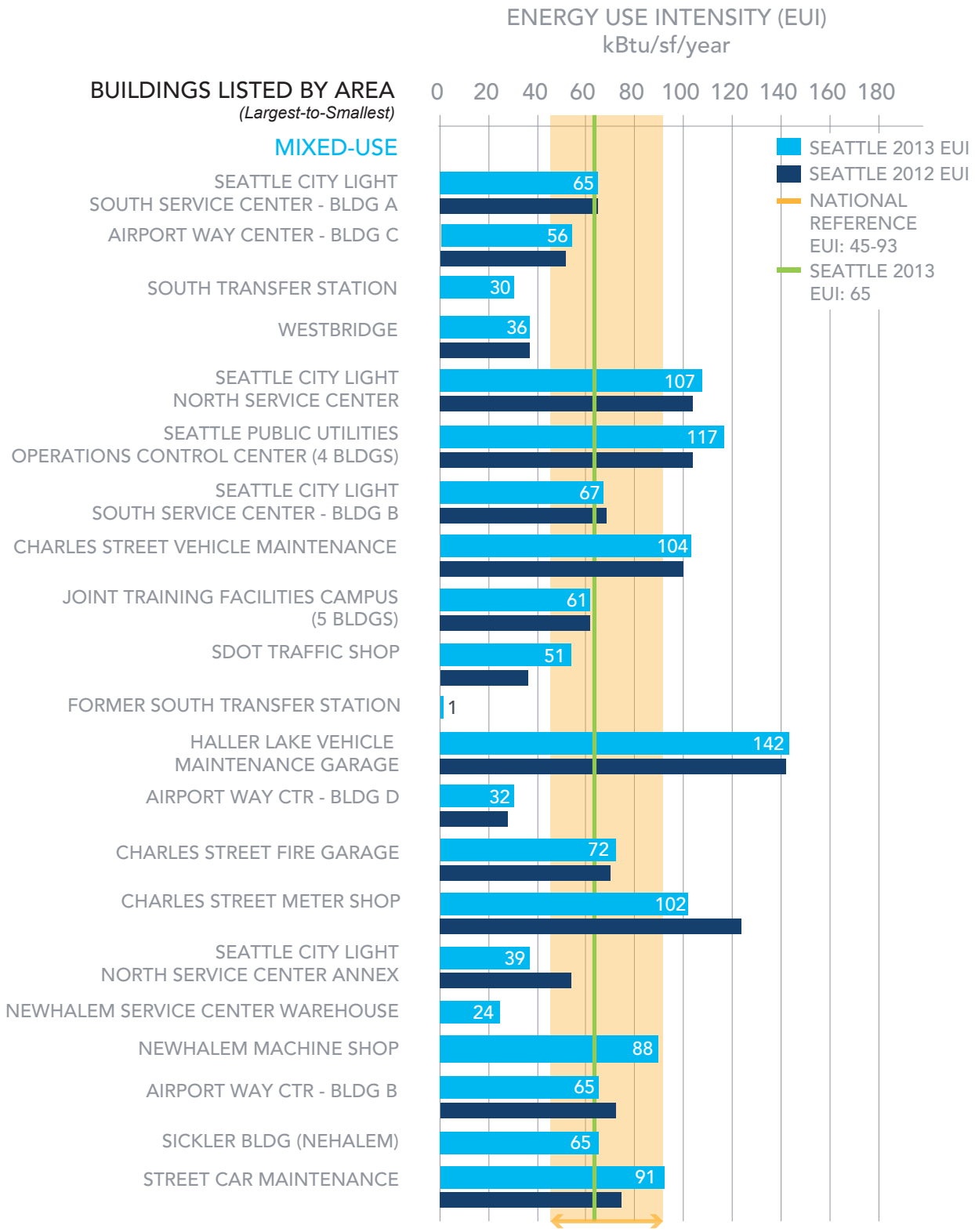
Fire Stations
Continued



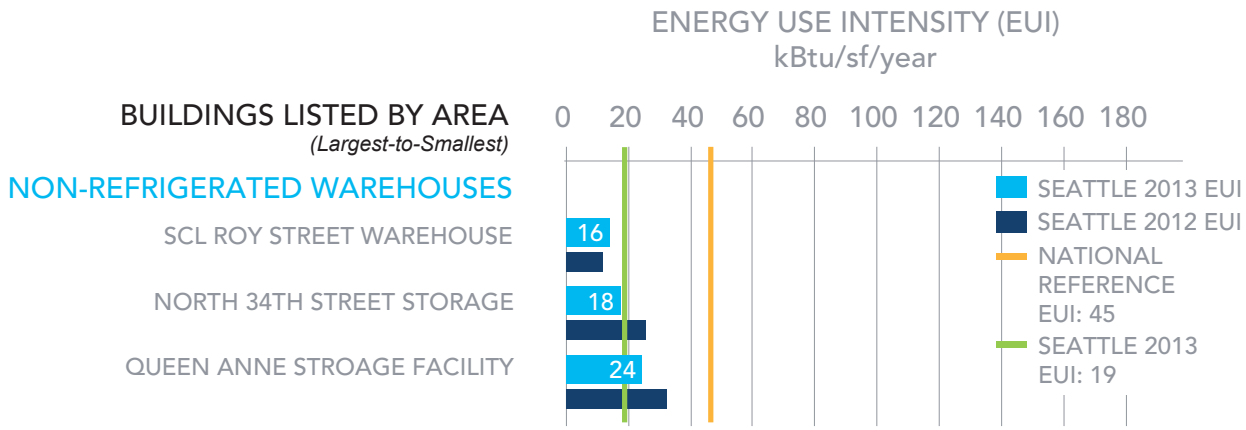
Police Stations



Operations Support



Operations Support



Other

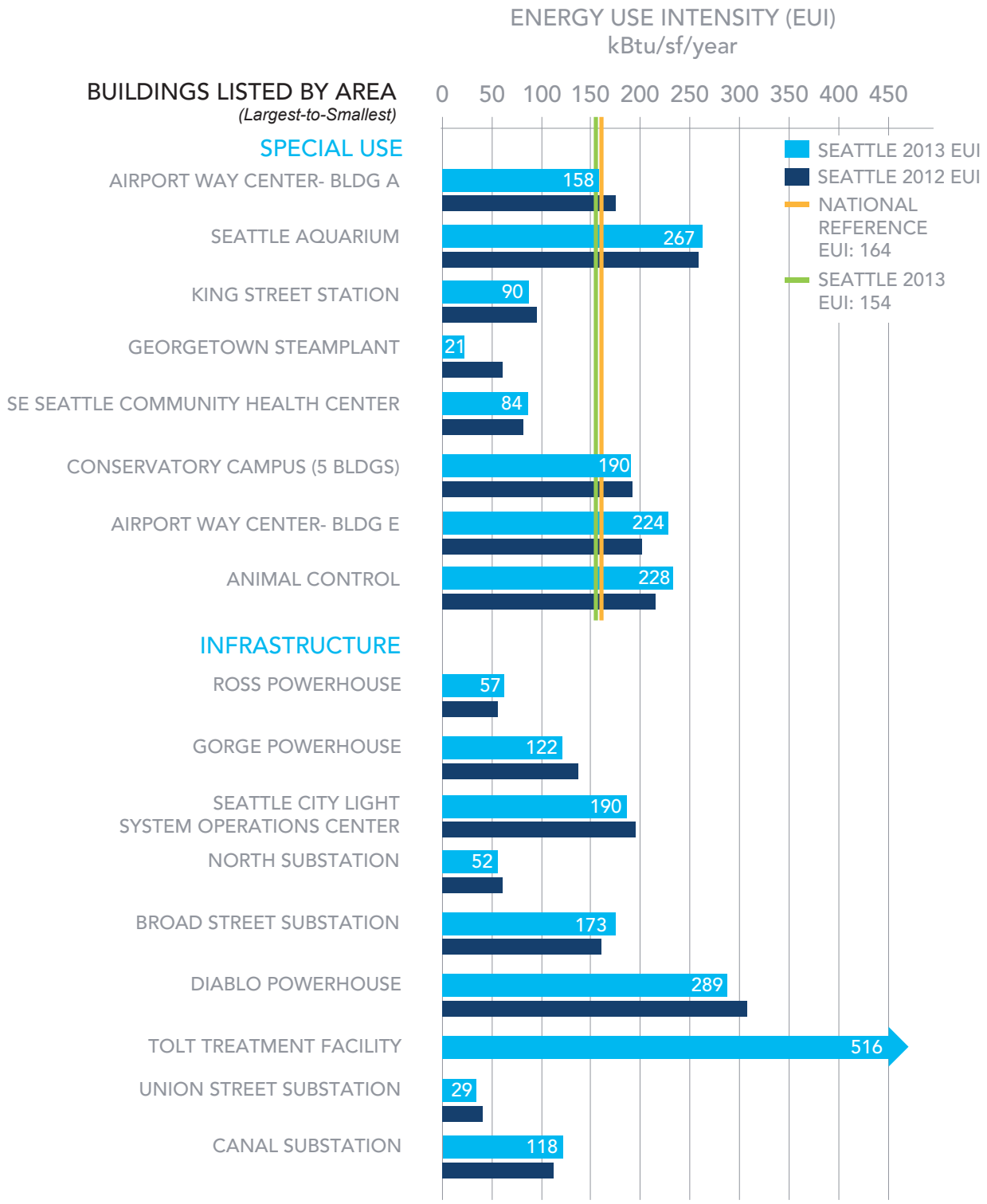

ENERGY USE INTENSITY (EUI)
kBtu/sf/year
BUILDINGS LISTED BY AREA
(Largest-to-Smallest)
0 50 100 150 200 250 300 350 400 450
SEATTLE 2013 EUI
SEATTLE 2012 EUI
NATIONAL REFERENCE EUI: 164
SEATTLE 2013 EUI: 154
SPECIAL USE
AIRPORT WAY CENTER- BLDG A 158
SEATTLE AQUARIUM 267
KING STREET STATION 90
GEORGETOWN STEAMPLANT 21
SE SEATTLE COMMUNITY HEALTH CENTER 84
CONSERVATORY CAMPUS (5 BLDGS) 190
AIRPORT WAY CENTER- BLDG E 224
ANIMAL CONTROL 228
INFRASTRUCTURE
ROSS POWERHOUSE 57
GORGE POWERHOUSE 122
SEATTLE CITY LIGHT SYSTEM OPERATIONS CENTER 190
NORTH SUBSTATION 52
BROAD STREET SUBSTATION 173
DIABLO POWERHOUSE 289
TOLT TREATMENT FACILITY 516
UNION STREET SUBSTATION 29
CANAL SUBSTATION 118

Table 1: National Reference & City EUIs

Reference Building Category	Site EUI (kBtu/sf)	City Building Category	2013 Site EUI (kBtu/sf)
Office*	93	Office & Administrative	66
Public Assembly**		Community Buildings	
Entertainment/Culture	95	Entertainment/Culture Performance Venue	73
Social/Meeting	52	Social / Meeting Public Assembly	60
Recreation	65	Community Center / Recreation	79
	N/A	Pools (and Community Centers with Pools)	308
Library	104	Library	60
Fire Station / Police Station**	78	Fire Station + Police Station	114
		Fire Stations	99
		Mixed Use Fire	119
		Neighborhood Fire Stations	90
		Police Stations	148
Use Varies: office, service, warehouse, storage	45 - 93	Operations Support	61
		Mixed-use	65
Storage / Shipping / Non-Refrigerated Warehouse*	45	Non-Refrigerated Warehouse	19
Other *	164	Other	145
		Special Use	154
		Infrastructure	133
All Buildings*	90	All Benchmarked City Buildings	83

Reference Mean EUI's from:

*Energy Information Administration 2003 Commercial Building Energy Consumption Survey (CBECS, Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003 (http://www.eia.gov/consumption/commercial/data/archive/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003html/c3.html).

**2030 Challenge Targets: U.S. National Averages (http://www.architecture2030.org/downloads/2030_Challenge_Targets_National.pdf)

Table 2: ENERGY STAR Ratings

Building	ENERGY STAR Category	City Building Category	Area (sf)	2013 ENERGY STAR Rating	2012 ENERGY STAR Rating	Change from 2012
Seattle Municipal Tower	Office	Office and Administration	1,190,145	94	91	3
Justice Center	Office	Office and Administration	298,227	70	70	0
City Hall	Office	Office and Administration	180,495	65	59	6
Seattle City Light North Service Center	Office	Operations Support	94,288	12	15	-3
Charles Street Engineering	Office	Office and Administration	20,424	29	36	-7
Densmore/NW NC HQ	Office	Office and Administration	19,246	95	93	2
Genesee/SC SE HQ	Office	Office and Administration	15,398	92	92	0
Blue Spruce	Office	Office and Administration	14,036	36	34	2
Central West HQ / Brown Bear	Office	Office and Administration	13,661	67	82	-15
Horticulture Building	Office	Office and Administration	12,294	48	52	-4
West Court Building	Office	Office and Administration	10,596	74	69	5
Fairview Building	Office	Office and Administration	8,488	94	78	-16
Dexter Building	Office	Office and Administration	7,381	2	2	0
Central East HQ	Office	Office and Administration	6,238	10	39	-29
Airport Way Ctr - Bldg C	Warehouse	Operations Support	160,447	52	53	-1
Airport Way Ctr - Bldg B	Warehouse	Operations Support	71,974	75	69	6
Airport Way Ctr - Bldg D	Warehouse	Operations Support	23,100	81	85	-4
Charles Street Fire Garage	Warehouse	Operations Support	20,000	6	9	-3
Charles Street Meter Shop	Warehouse	Operations Support	19,930	1	1	0
SE Seattle Community Health Center	Medical Office	Other	27,492	29	29	0

There have been a number of changes since last year's report, and some of the results for 2012 are different than previously reported. These changes arise from Portfolio Manager algorithm updates, revised building floor areas as a result of on-going audits, and meter data issues. Included in this year's report are a number of campus properties. These properties are reported at the "rolled-up" campus level. Single buildings that are a part of a campus are reported individually, if there are complete and meaningful metrics for that property. The only campus reporting individual buildings in this report is Seattle Center.

Table 3: Benchmarked City-Owned Buildings

Managment Group & Tenant Key

CEN - Seattle Center
FAS - Financial and Administrative Services
Parks - Seattle Parks and Recreation
SCL - Seattle City Light
SDOT - Seattle Department of Transportation
SFD - Seattle Fire Department
SPD - Seattle Police Department
SPL - Seattle Public Libraries
SPU - Seattle Public Utilities

Mixed - Multiple City Departments
Other - Multiple Non-City Tenants

OFFICE & ADMINISTRATION							
Building	Mgmt Group	Tenant	Area (sf)	2013 EUI (kBtu/sf)	Change from 2012	Year Built/ Renovated	Comments
Seattle Municipal Tower	FAS	Multiple	1,190,145	60.1	-8.9%	1989	FAS Setpoint Pilot
Justice Center	FAS	Multiple	298,227	77.8	-3.4%	2001	FAS Setpoint Pilot
City Hall	FAS	Multiple	180,495	85.7	-3.5%	2003	FAS Setpoint Pilot
Charles Street Engineering	FAS	SDOT/ SPU	20,424	153.3	13.1%	1972	HVAC Control Issues
Densmore/NW NC Headquarters	Parks	Parks	19,246	35.8	-14.4%	1929	
Genesee/SC SE Headquarters	Parks	Parks	15,398	28.6	2.5%	1960	
Blue Spruce	CEN	CEN	14,036	27.3	-5.9%	1955	
Central West Headquarters / Brown Bear	Parks	Parks	13,661	42.6	24.9%	1952	
Horticulture building	Parks	Parks	12,294	69.0	5.0%	1990	
West Court Building	CEN	CEN	10,596	44.8	-13.3%	1962	
Fairview Building	SDOT	SDOT	8,488	30.5	-35.5%	1959	Reduced Building Use
Dexter Building	Parks	Parks	7,381	196.1	2.7%	1948	
Central East Headquarters	Parks	Parks	6,238	74.9	28.9%	1950	

Benchmarked City-Owned Buildings

COMMUNITY							
Building	Mgmt Group	Tenant	Area (sf)	2013 EUI (kBtu/sf)	Change from 2012	Year Built/ Renovated	Comments
PERFORMANCE VENUES: ENTERTAINMENT / CULTURE							
Key Arena	CEN	CEN	368,000	71.8	6.8%	1995	
McCaw Hall	CEN	Arts Group	296,000	74.2	12.8%	2003	2013 an Opera Ring Cycle Year
Benaroya Hall	Arts Group	Arts Group	189,750	84.4	7.9%	1998	
Mercer Arena	CEN	Arts Group	108,000	18.8	22.9%	1927	No Public Assembly Use
Seattle Repertory Theatre	CEN	Arts Group	65,000	78.5	-5.4%	1982	
Phelps Center	CEN	Arts Group	49,680	54.0	-4.3%	1962	
Playhouse	CEN	Arts Group	36,314	115.8	-4.5%	1962	
Seattle Children's Theatre	CEN	Arts Group	33,000	54	-1.3%	1992	
Langston Hughes Performing Arts Center	Parks	Arts Group	30,890	161.5	42.4%	1913	
SCT Technical Pavilion	CEN	Arts Group	25,100	118	10.1%	1999	
Seattle Center Central Plant Campus (14 Bldgs)	CEN	Mixed	1,376,664	75.4	3.6%	2000	
PUBLIC ASSEMBLY: SOCIAL / MEETING							
Armory	CEN	CEN	278,500	95.4	8.3%	1939	
Exhibition Hall	CEN	CEN	52,000	45.5	-12.5%	1962	
Northwest Rooms	CEN	CEN	49,847	90.9	0.4%	1962	
Fisher Pavilion	CEN	CEN	21,018	73.7	-10.8%	2002	
Central Area Motivation Program	FAS	Community Group	18,637	65.4	3.3%	1925	
Magnuson Campus	Parks	Mixed	564,258	28.8	-10.3%	1952	
Seattle Asian Art Museum	Arts Group	Arts Group	53,776	80.6	7.8%	1933	
Museum of History and Industry	Parks	Community Group	43,000	188.5	NA	1941	
Magnuson, Building 67, mountaineers	Community Group	Community Group	29,275	60.3	-1.8%	1941	

Benchmarked City-Owned Buildings

COMMUNITY CENTERS: RECREATION							
Building	Mgmt Group	Tenant	Area (sf)	2013 EUI (kBtu/sf)	Change from 2012	Year Built/ Renovated	Comments
Amy Yee Tennis Center	Parks	Parks	66,597	21.3	3.4%	1978	
Northgate Campus	Parks/SPL	Parks/SPL	30,498	106.4	-0.2%	2005	
Loyal Heights Community Center	Parks	Parks	29,732	51.6	-19.2%	1950	Lighting, HVAC Controls Upgrade
Rainier Community Center	Parks	Parks	28,384	119.2	-15.9%	1995	New Control System
Queen Anne Community Center	Parks	Parks	25,809	84.7	36.6%	1948	
Yesler Community Center	Parks	Parks	22,347	97.2	-5.7%	2005	
Bitter Lake Community Center	Parks	Parks	20,595	126	-19.4%	1965	
Garfield Community Center	Parks	Parks	20,050	112	6.8%	1994	
Miller Community Center	Parks	Parks	19,273	89.6	-1.9%	1957	
High Point Community Center	Parks	Parks	18,261	56.6	-10.4%	2004	
Van Asselt Community Center	Parks	Parks	18,258	76.9	-0.8%	1938	
Delridge Community Center	Parks	Parks	17,693	112	-6.0%	1985	
Hiawatha Community Center	Parks	Parks	17,190	70.8	-9.6%	1949	Lighting Upgrade
Ballard Community Center	Parks	Parks	16,795	93.1	34.7%	1911	
Jefferson Community Center	Parks	Parks	16,447	195.3	25.4%	1929	Added Load
International district/ Chinatown Community Center	Parks	Parks	16,000	53.1	-1.3%	2004	
Ravenna-Eckstein Community Center	Parks	Parks	15,814	53.5	-3.4%	1986	
Montlake Community Center	Parks	Parks	14,174	79.1	8.4%	2006	
South Park Community Center	Parks	Parks	14,101	54.6	-0.5%	1912	
Laurelhurst Community Center	Parks	Parks	11,003	60.9	-2.6%	2007	
Belltown Community Center	Parks	Parks	6,480	27.9	7.3%	1919	

Benchmarked City-Owned Buildings

COMMUNITY (CONTINUED)							
Building	Mgmt Group	Tenant	Area (sf)	2013 EUI (kBtu/sf)	Change from 2012	Year Built/ Renovated	Comments
POOLS							
Rainier Beach Community Center and Pool	Parks	Parks	53,775	156.9	NA	2013	
Southwest Pool & Community Center	Parks	Parks	39,333	212.3	2.1%	1975	
Green Lake Community Center and Pool	Parks	Parks	35,143	344.3	-4.4%	1929	
Meadowbrook Community Center/Pool	Parks	Parks	34,639	268.3	-11.6%	1957	
Medgar Evers Pool	Parks	Parks	20,740	434.9	-0.8%	1971	
Helene Madison Pool	Parks	Parks	17,407	628.8	5.9%	1970	
Queen Anne Pool	Parks	Parks	13,157	447.3	-2.9%	1974	
Ballard Pool	Parks	Parks	12,769	458.5	-2.6%	1972	

Benchmarked City-Owned Buildings

LIBRARIES							
Building	Mgmt Group	Tenant	Area (sf)	2013 EUI (kBtu/sf)	Change from 2012	Year Built/ Renovated	Comments
The Central Library	SPL	SPL	365,987	48.3	-0.2%	2004	
Lake City Branch	SPL	SPL / FAS	20,017	79	0.1%	2005	Neighborhood Service Center
Ballard Branch	SPL	SPL / FAS	18,100	80.7	-0.5%	2005	Neighborhood Service Center, Small Photovoltaic Array
Douglass-Truth Branch	SPL	SPL	16,493	77.5	-16.2%	2006	Control changes 2nd Q 2013
Broadview Branch	SPL	SPL	15,000	73	-10.0%	2007	Control changes 2nd Q 2013
North East Branch	SPL	SPL	15,000	80.2	4.0%	2004	
Rainier Beach Branch	SPL	SPL	15,000	58.6	-8.0%	2004	
Southwest Branch	SPL	SPL	15,000	60.2	-18.4%	2007	Control changes 2nd Q 2013
Greenwood Branch	SPL	SPL	12,806	106.6	-2.1%	2005	
Columbia Branch	SPL	SPL	12,420	80.3	4.4%	2004	
Capitol Hill Branch	SPL	SPL	11,615	85	-7.5%	2003	
Beacon Hill Branch	SPL	SPL	10,800	84.5	-18.9%	2004	Control changes 2nd Q 2013
West Seattle Branch	SPL	SPL	9,460	77.6	-1.1%	2004	
University Branch	SPL	SPL	8,140	92.3	2.7%	2007	
Green Lake Branch	SPL	SPL	8,090	77	1.4%	2004	
Queen Anne Branch	SPL	SPL	7,931	62.5	4.7%	2007	
High Point Branch	SPL	SPL	7,100	90.7	4.1%	2004	
Magnolia Branch	SPL	SPL	7,000	103.2	2.8%	2008	
Fremont Branch	SPL	SPL	6,840	63.6	-0.6%	2005	
Montlake Branch	SPL	SPL	5,652	91.3	9.3%	2006	
Delridge Branch	SPL	SPL	5,600	61.1	4.3%	2002	First floor of building only
South Park Branch	SPL	SPL	5,019	58	-10.4%	2006	Failed unit repaired, control changes

Benchmarked City-Owned Buildings

FIRE STATIONS							
Building	Mgmt Group	Tenant	Area (sf)	2013 EUI (kBtu/sf)	Change from 2012	Year Built/ Renovated	Comments Note: All Facilities 24 Hour Operations/Occupancy
NEIGHBORHOOD FIRE STATIONS							
Fire Station 02	FAS	SFD	38,939	84.2	2.4%	1925	
Fire Station 17	FAS	SFD	21,886	87.5	23.2%	1927	
Fire Station 14	FAS	SFD	19,446	89.7	30.9%	1926	Reduced use during Fire Levy Project in 2012
Fire Station 25	FAS	SFD	17,991	100.8	-3.4%	1969	FAS Setpoint Pilot
Fire Station 18	FAS	SFD	16,624	92.1	2.6%	1974	
Fire Station 28	FAS	SFD	14,650	86.1	-8.3%	2009	FAS Setpoint Pilot
Fire Station 13	FAS	SFD	14,440	71.2	-2.2%	2007	
Fire Station 31	FAS	SFD	12,187	85.0	-3.8%	1973	
Fire Station 35	FAS	SFD	11,968	76.6	4.5%	2010	
Fire Station 39	FAS	SFD	11,285	68.2	9.5%	2010	
Fire Station 37	FAS	SFD	9,375	102.2	0.0%	2010	
Fire Station 38	FAS	SFD	9,137	93.4	-2.7%	2011	
Fire Station 32	FAS	SFD	8,732	125.6	-3.2%	1967	
Fire Station 08	FAS	SFD	8,273	12.6	-75.8%	1963	Fire Levy Project 2012/2013
Fire Station 16	FAS	SFD	7,441	45.7	-1.9%	1927	
Fire Station 40	FAS	SFD	6,639	80.9	24.5%	1965	Boiler control issues - resolved in 2014
Fire Station 27	FAS	SFD	6,570	135.4	5.2%	1970	
Fire Station 11	FAS	SFD	6,191	101.3	-14.4%	1971	Water heating upgrade, control changes
Fire Station 05	FAS	SFD	6,182	253.5	18.0%	1963	Fire boat Leschi on shore power
Fire Station 33	FAS	SFD	5,974	116.9	-11.8%	1971	FAS Setpoint Pilot & O+M Improvements
Fire Station 36	FAS	SFD	5,876	62.4	-3.3%	1972	
Fire Station 34	FAS	SFD	5,861	52.2	-33.6%	1971	Fire Levy Project 2012/2013
Fire Station 41	FAS	SFD	5,664	107.0	7.9%	1936	
Fire Station 26	FAS	SFD	5,427	101.2	4.1%	1973	
Fire Station 29	FAS	SFD	5,022	139.7	5.0%	1970	
Fire Station 24	FAS	SFD	4,936	102.9	6.5%	1977	
Fire Station 22	FAS	SFD	3,830	48.6	-6.9%	1964	
Fire Station 20	FAS	SFD	2,933	114.9	2.4%	1949	
FIRE MIXED - USE							
Fire Station 10 / Fire Alarm Center / Emergency Operations Center	FAS	SFD / SPD	71,974	143.3	-0.9%	2008	FAS Setpoint Pilot & HVAC control upgrade
Fire Headquarters	FAS	SFD	56,074	88.8	-2.0%	1928	

Benchmarked City-Owned Buildings

POLICE STATIONS							
Building	Mgmt Group	Tenant	Area (sf)	2013 EUI (kBtu/sf)	Change from 2012	Year Built/ Renovated	Comments Note: All Facilities 24 Hour Operations/Occupancy
West Precinct	FAS	SPD	88,830	165.4	6.6%	1999	
East Precinct	FAS	SPD	36,280	130.0	0.6%	1927	
Southwest Precinct	FAS	SPD	28,303	138.3	-6.9%	2003	FAS Setpoint Pilot
North Precinct	FAS	SPD	16,434	128.3	9.8%	1984	
South Precinct	FAS	SPD	12,603	128.9	2.7%	1983	

Benchmarked City-Owned Buildings

OPERATIONS SUPPORT							
Building	Mgmt Group	Tenant	Area (sf)	2013 EUI (kBtu/sf)	Change from 2012	Year Built/ Renovated	Comments
MIXED - USE							
Seattle City Light South Service Center - BLDG. A	SCL	SCL	180,725	65.3	0.5%	1952	
Airport Way Center - BLDG. C	FAS	SPD	160,447	56.4	3.7%	1985	
South Transfer Station	SPU	SPU	138,602	30.1	NA	2011	
Westbridge	Parks	Parks	113,780	36.1	1.7%	1955	
Seattle City Light North Service Center	SCL	SCL	94,288	107	2.6%	1978	
Seattle Public Utilities Operations Control Center Campus (4 Bldgs)	SPU	SPU	87,459	117.3	12.8%	1960	Control Issues
Seattle City Light South Service Center - BLDG. B.	SCL	SCL	70,320	66.8	-1.5%	1952	
Charles Street Vehicle Maintenance	FAS	FAS	68,359	104.3	4.2%	1975	
Joint Training Facilities Campus (5 Bldgs)	FAS	SFD/ SPD	57,952	61	-0.7%	2007	
SDOT Traffic Shop	FAS	SDOT	41,939	50.5	40.3%	1970	Operational change and equipment issues
Former South Transfer Station	SPU	SPU	38,732	1	NA	1966	Very little building use in 2013
Haller Lake Vehicle Maintenance Garage	FAS	SDOT/ FAS	26,994	141.7	0.7%	1958	
Airport Way Center - BLDG. D	FAS	FAS	22,803	31.5	2.6%	1944	
Charles Street Fire Garage	FAS	FAS	20,000	71.8	5.7%	1975	
Charles Street Meter Shop	FAS	SDOT/ SPU	19,930	102.1	-17.9%	1966	New HVAC controls
Seattle City Light North Service Center Annex	SCL	SCL	18,854	39	-27.1%	1969	Under renovation
Newhalem Service Center Warehouse	SCL	SCL	17,747	24.4	NA	1963	
Newhalem Machine Shop	SCL	SCL	17,600	87.9	NA	1968	
Airport Way Center - BLDG. B.	FAS	Multiple	16,725	65	-9.6%	1985	
Sickler Bldg (Nehalem)	SCL	SCL	14,400	64.7	NA	1978	
Street Car Maintenance	SDOT	Transit Agency	9,428	90.8	22.9%	2008	Street cars on building meter
NON - REFRIGERATED WAREHOUSES							
SCL Roy Street Warehouse	SCL	SCL	53,944	16.4	7.2%	2000	
North 34th Street Storage	SPU	SPU	30,000	18.3	-29.3%	1969	Reduced Use, to be demolished in 2014
Queen Anne Storage Facility	SPL	SPL	23,040	24.1	-26.1%	1975	Reduced building use

Benchmarked City-Owned Buildings

OTHER							
Building	Mgmt Group	Tenant	Area (sf)	2013 EUI (kBtu/sf)	Change from 2012	Year Built/ Renovated	Comments
SPECIAL USE							
Airport Way Ctr - Bldg A	FAS	SPD/Other	99,122	157.8	-5.7%	1944	Multi-year envelope retrofit ongoing
Seattle Aquarium	Seattle Aquarium	Seattle Aquarium	69,400	266.9	0.8%	1977	
King Street Station	SDOT	Transit / Vacant	65,400	90.1	-7.6%	2008	
Georgetown Steamplant	SCL	SCL	39,212	21.2	-63.5%	1906	Reduced use and hours
SE Seattle Community Health Center	FAS	Community Group	27,492	84.1	1.3%	2007	
Conservatory Campus (5 Bldgs)	Parks	Parks	23,445	189.7	-1.6%	1912	
Airport Way Center - BLDG. E	FAS	SPU	23,100	223.6	9.5%	1985	Increased operating hours
Animal Control	FAS	FAS	10,868	228.1	3.8%	1981	
INFRASTRUCTURE							
Ross Powerhouse	SCL	SCL	121,630	56.8	2.7%	1948	
Gorge Powerhouse	SCL	SCL	29,369	121.7	-12.2%	1923	
SCL System Operations Center	SCL	SCL	27,744	190.3	-2.7%	1993	
North Substation	SCL	SCL	25,978	52	-5.5%	1923	
Broad St. Substation	SCL	SCL	23,802	173.3	6.2%	1950	
Diablo Powerhouse	SCL	SCL	22,695	289.3	-4.6%	1934	
Tolt Treatment Facility	SPU	SCL	20,000	516.1	NA	2001	
Union St. Substation	SCL	SPU	16,728	29.3	-6.7%	1968	
Canal Substation	SCL	SCL	13,914	118.3	2.6%	1928	

05 Appendix

Glossary

Btu - British Thermal Unit

The amount of energy required to raise one pound of water one degree Fahrenheit. It takes about 300 Btus to raise the temperature of one quart of cold tap water from 50 to 200 degrees F. Nominal Btu content of common units of energy:

1 kWh of electricity = 3413 Btu
1 gallon of No. 2 fuel oil = 140,000 Btu
1 therm of natural gas = 100,000 Btu

CBECS

The Commercial Building Energy Consumption Survey is a national sample survey that collects information on U.S. commercial buildings, their energy-related building characteristics, and their energy consumption and expenditures.

EIA

The Energy Information Administration. An independent agency within the U.S. Department of Energy that develops surveys, collects energy data, and analyzes and models energy issues. The Agency must meet the requests of Congress, other elements within the Department of Energy, Federal Energy Regulatory Commission, the Executive Branch, its own independent needs, and assist the general public, or other interest groups, without taking a policy position. See more information about EIA at http://www.eia.gov/about.

ENERGY STAR Rating

A numeric 1 – 100 score developed by the EPA that reflects the comparable performance of the rated building to other representative buildings across the country, while accounting for differences in climate, occupancy and operating hours. A high score represents high efficiency. An ENERGY STAR score of 75 denotes that the rated building performs in the 75th percentile of buildings within its category.

EPA

Environmental Protection Agency

Energy Audit

A performance evaluation of current energy use and energy conservation potential typically involving both a site visit to the building and a review of energy consumption history.

Energy Benchmark

The measurement of energy use according to specified standards which is compared to reference measurements. Typically an EUI is used but other metrics may be more appropriate for some buildings. These include energy per unit produced or energy per unit processed or pumped.

Energy Signature Analysis
An analysis technique where billing data is converted to an average hourly value and plotted against average daily temperature for the billing period. When used in segment analysis it can identify differences in heating, cooling and base load consumption between buildings.

EUI
Energy Use Intensity (EUI) is a unit of measurement that describes a building's energy use. EUI represents the energy consumed by a building relative to its size. It is calculated by taking the total energy consumed in one year (measured in kBtu) and dividing it by the total floor space of the building (measured in square feet).

Facility Action Plan
A written action plan, based on a walk through or audit outlining operations and maintenance issues to be addressed to reduce building energy use.

Heating Degree Day
A measure of weather intensity as it affects heating loads. Heating Degree Days (HDD) are calculated with respect to a base temperature with the base temperature reflecting the average temperature at which the building requires no active heating. This temperature is less than the thermostat setting due to solar and internal gains. For a 60 degree base temperature, a day with an average temperature of 52 degrees would have 8 HDD_{60}.

kBtu
One thousand Btus

Plug Load
The amount of energy consumed by electrical devices that are plugged into outlets, such as computers and task lights.

Sources:
EIA Glossary
Energy Star website
City of Seattle Website
Assessing and Reducing Plug and Process Loads in Office Buildings NREL

05 Appendix

Photo Credits

Page	Photo	Architect	Photographer and/or Source
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12	Seattle Central Library	OMA and LMN	City of Seattle Archives: Fleets & Facilities
12	Fire Station 02	Arai Jackson Ellison Murakami, with TCA Architecture (renovation)	Ian Edelstein, via City of Seattle Archives: Fleets & Facilities
12	Seattle Police Headquarters at the Justice Center	NBBJ	Erik Stuhaug, via City of Seattle Archives
12	King Street Station	Charles A. Reed and Allen H. Stem	City of Seattle Archives

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