



**Building
Services
Department**

AUGUST 2022

ANNUAL CITY OF DALLAS MUNICIPAL BUILDINGS

*ENERGY BENCHMARKING
REPORT – 2021 ENERGY USE*

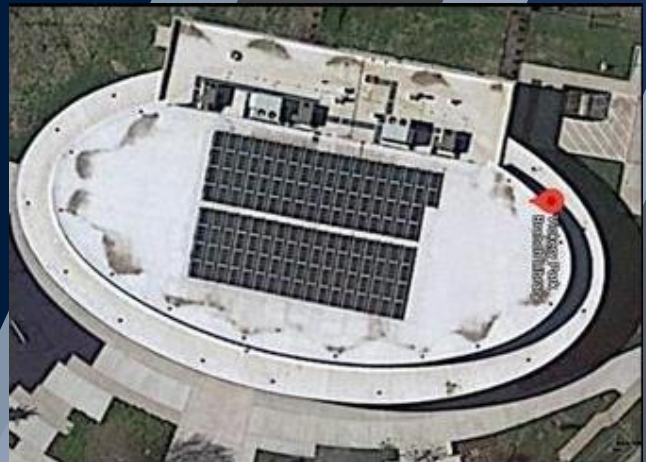


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Introduction

In May 2020, Dallas City Council approved the “Comprehensive Environmental & Climate Action Plan (CECAP)” which provides a comprehensive roadmap that outlines the activities that the City will undertake to improve quality of life, to reduce greenhouse gas emissions, to prepare for the impacts of climate change, and to create a healthier and more prosperous community. Under this plan, the City aims to reduce greenhouse gas emissions by 43% below 2015 levels by 2030 and 100% by 2050 to achieve carbon neutrality.



Buildings



Energy



Transportation



Solid Waste



Water Resources



Ecosystems /
Greenspace



Food / Urban
Agriculture



Air Quality

For 2021 the total City electricity consumption was 666,946 MWh at a cost of \$44.4 million. For the year 2021 City has 2,877 active electricity accounts of these 387 are classified as buildings. Electricity cost for 307 buildings is funded through general funds and 80 buildings are funded through enterprise funds. For 2021 the total electricity consumption for 307 buildings was 97,782 MWh at a cost of \$5.6 million.

To reach these goals, the City must address carbon emissions from City owned and operated buildings. Recognizing this the City is

in the process of tracking energy use in municipal buildings with an emphasis on how to better improve City’s building energy performance. This process is known as energy benchmarking.

The City currently tracks 140 buildings in ENERGY STAR Portfolio Manager™. This free online tool is developed by the Environmental Protection Agency (EPA) to assist building owners in tracking energy use over time. In addition, Portfolio Manager calculates a building’s energy use intensity (EUI), which is how much energy a building consumes relative to its area (square footage/sqft). ENERGY STAR Portfolio Manager then compares the building’s EUI to the national median EUI of buildings of similar uses.

Energy management program at the City has been established in 2020 to oversee the energy usage in City buildings, for benchmarking purposes 2019 has been selected as the baseline year to track energy performance of City buildings.

This report is the first annual building energy benchmarking report for municipal buildings owned and operated by the City of Dallas.



City Energy Use

For 2021 the total City electricity consumption was 666,946 MWh at a cost of \$44.4 million. Figure 1 and Figure 2 show the electricity consumption and for all the City accounts from 2019 - 2021.

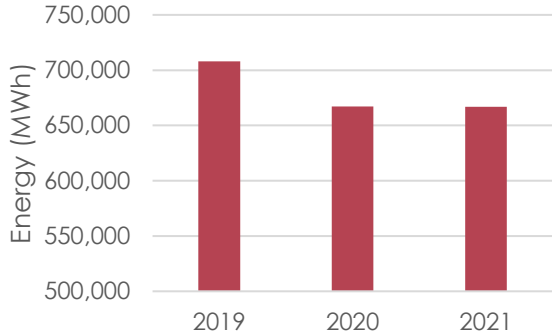


Figure 1: 2019 - 2021 Total City energy usage

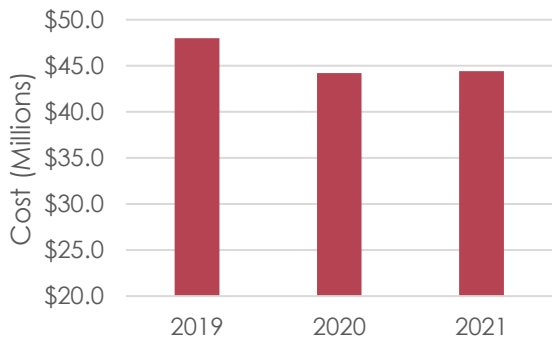


Figure 2: 2019 - 2021 Total City electricity cost

For FY2020-21 the City has a total of 2,877 active electricity accounts, of these electricity expenses for 2,381 accounts are funded through general funds and 496 accounts are funded through enterprise funds. Figure 3 through Figure 7 show the electricity usage and cost for general & enterprise funded accounts for 2021.

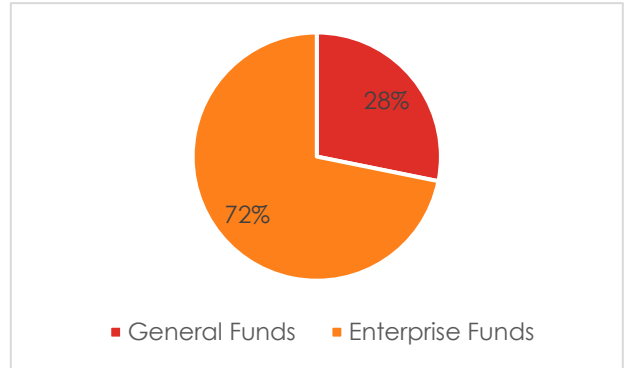


Figure 3: 2021 Total City electricity usage by fund type

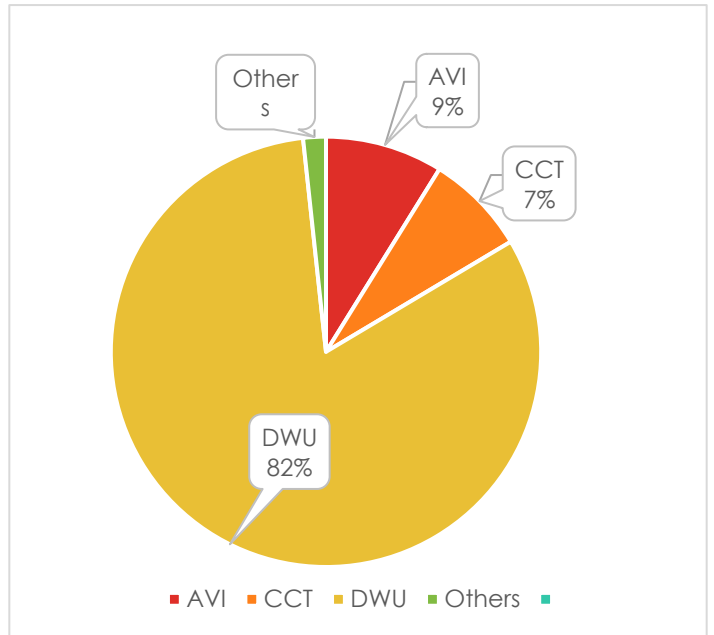


Figure 4: 2021 enterprise funded departments electricity usage

AVI - Aviation
CCT - Convention Center
DWU - Dallas Water Utilities
Others
EFM - Equipment & Fleet
SAN - Sanitation
HOU - Housing

TRN - Transportation
PRK - Park & Recreation
BSD - Building Services
OCA - Arts & Culture
LIB - Libraries
DPD - Police
DFR - Fire & Rescue
Others
DAS - Animal Shelter
Fair Park
CCS - Code

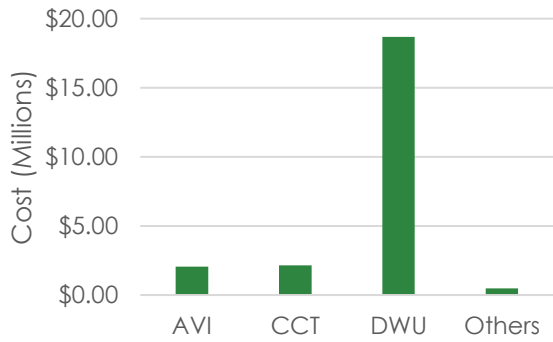


Figure 5: 2021 electricity cost for enterprise funded departments

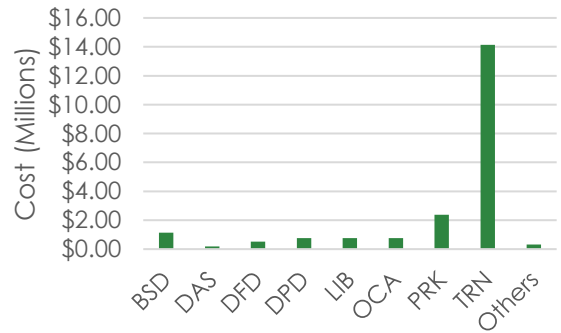


Figure 7: 2021 electricity cost for general funded and enterprise funded departments.

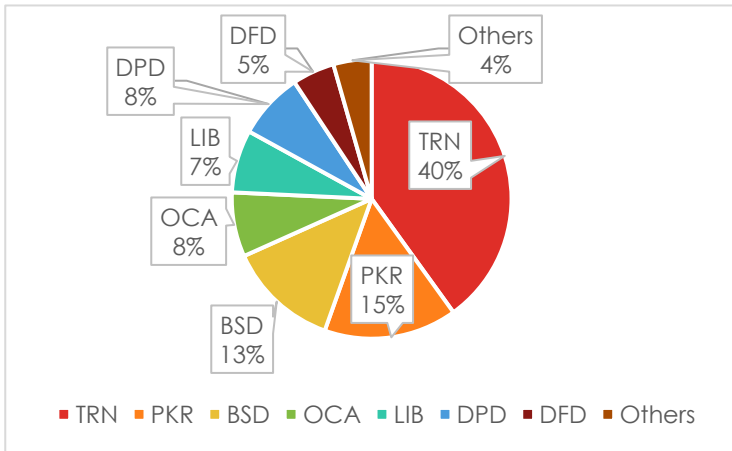


Figure 6: 2021 general funded departments electricity usage

City Energy Policy and Procurement

On April 10, 2019, City Council adopted the Green Energy Policy (CR 19-0484) documenting the City of Dallas' commitment to:

- Use clean and efficient energy
- Purchase 100 percent renewable energy
- Promote renewable energy projects and partnerships that reduce environmental impacts

City signed a new utility contract with TXU in 2019 to source 100% energy generated from wind energy. The current contract is effective until 2029 and provides a more favorable electricity rate as shown in Figure 8.

City has been recognized by U.S. Environmental Protection Agency (EPA) Green Power Partnership (GPP) organization as one of the top users of renewable energy for City buildings and facilities operation. Dallas is ranked No.2 in annual green power use in EPA's 2020 Green Power Partnership Top 30 Local Governments list and No. 22 on their Top 100 National Organizations (including local, state, and federal agencies as well as the private sector).

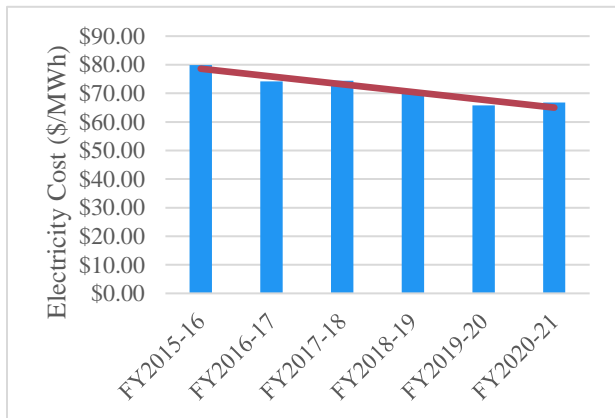


Figure 8: Electricity cost (generation plus transmission & distribution charges)



City of Dallas



RANKED NO. 2

Annual Green Power Use In EPA's 2020 Green Power Partnership Top 30 Local Governments List

RANKED NO. 22

Top 100 National Organizations (including local, state, and federal agencies as well as the private sector.)

Energy Benchmarking

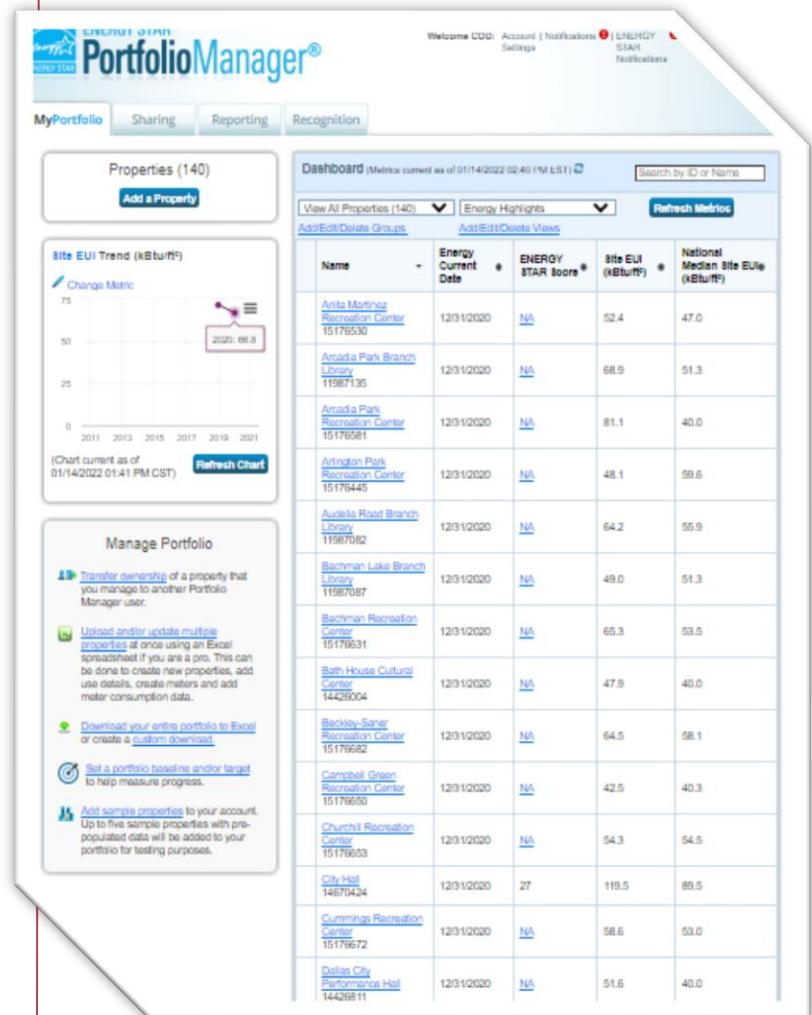
Benchmarking a building allows for review of its energy performance despite intrinsic variables such as a building's size, age, type of use, level of occupancy, and other factors such as weather. Benchmarking municipal buildings helps the City identify opportunities for energy efficiency savings, track building performance, and measure the effectiveness of energy efficiency measures. To date the City has benchmarked 140 City-owned buildings.

Energy Star Portfolio Manager is a free online building benchmarking tool developed by the United States Environmental Protection Agency (EPA). It enables users to create building profiles by entering basic site information such as year built, number of employees, working hours and total square footage. The user enters a minimum of one year's worth of energy bills for each fuel type.

Portfolio Manager then calculates the building's site energy use intensity (EUI) by dividing its total energy used in a single year, represented in kBtu, by its gross square footage. Next, Portfolio Manager uses a regression equation specific to each property type that reflects data from the US Energy Information Administration's Commercial Building Energy Consumption Survey (CBECS) to calculate predicted EUI. The resulting actual/predicted EUI ratio is what determines the building's 1-100 Energy Star score. Buildings with a score of 50 perform better than fifty percent of peer buildings, while buildings scoring 75 or above are in the top 75th percentile, making them eligible for Energy Star certification.

An Energy Star score is dependent on a nationally representative data set and robust analysis. Because of this technical foundation, many of the City's municipal buildings, such as fire stations, recreation centers, libraries and service buildings cannot be benchmarked with

an Energy Star score. Alternatively, these buildings are benchmarked on the basis of site EUI. For this report, site EUI for each building is compared to the site EUI of other similar type buildings represented by the national survey data.



Building Portfolio

A total of 140 City owned buildings comprising of 4,426,814 square foot of occupied space have been energy benchmarked in Energy Star Portfolio Manager since FY2020-21. Of the 140 buildings 43 are recreational centers, 27 libraries, 54 fire stations, 9 cultural centers and 7 administrative buildings.

The energy management program at the City was established in 2020 to oversee the energy usage in City buildings. For benchmarking purposes, 2019 EUI has been selected as the baseline year to track energy performance of City buildings. Figure 9 shows the 2021 EUI for all 140 buildings in relation to the 2019 EUI baseline. There has been a reduction of 8% in 2021 EUI compared to 2019 EUI baseline.

For data consistency in Energy Star Portfolio Manager all the energy usage follows calendar year and not the fiscal year. 2021 EUI will be included in the next annual report. As more buildings are added to the Energy Star Portfolio Manager the 2019 EUI base line will be updated accordingly.

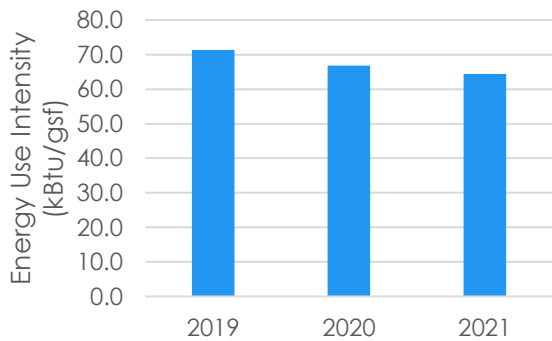
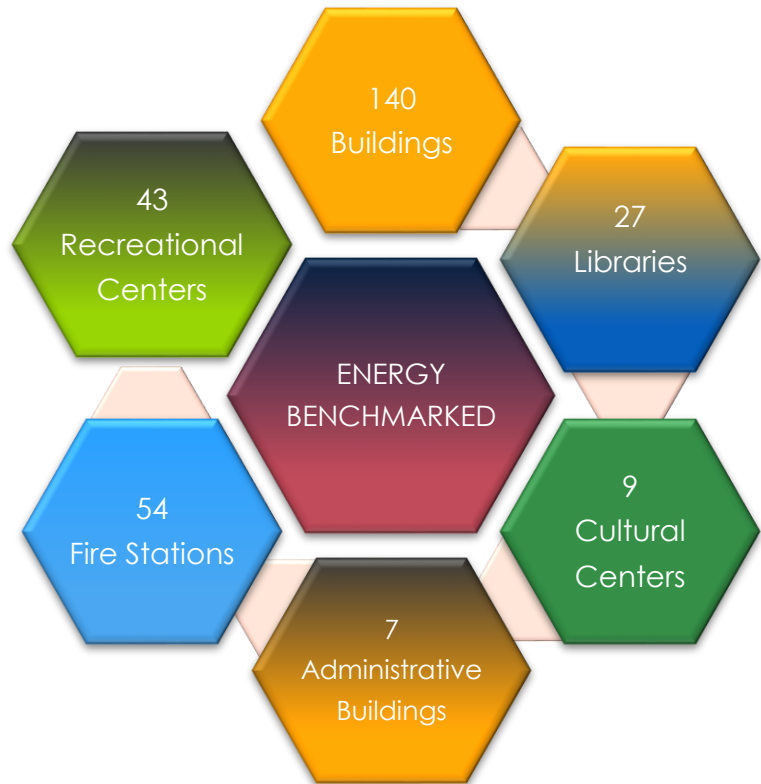


Figure 9: Benchmarked buildings portfolio EUI





Energy Benchmarking Analysis - Libraries

A total of 27 libraries comprising of 1,063,230 square foot of occupied space have been energy benchmarked in Energy Star Portfolio Manager. Based on the EUI analysis from Energy Star Portfolio Manager 8 libraries performed well, whereas 18 libraries have EUI greater than the EUI for similar benchmarked buildings and present opportunities to implement energy conservation measures to reduce energy usage. Figure 10 lists the Energy Star Portfolio Manager EUI data for all the 27 libraries.

Property Name	Site EUI (kBtu/ft ²)	National Median Site EUI (kBtu/ft ²)	% Difference from National Median Site EUI
Skyline Branch Library	133.9	51.3	161
Park Forest Branch Library	152.2	64.5	136
Preston Royal Branch Library	114.6	58.9	94.4
Arcadia Park Branch Library	99.3	51.3	93.5
Mountain Creek Branch Library	110.8	61.6	79.9
Paul Laurence Dunbar Lancaster-Kiest Branch Library	101.8	61.3	66
Oak Lawn Branch Library	100.2	62.7	60
Lakewood Branch Library	111.9	70.1	59.7
Hampton-Illinois Branch Library	68.2	54.6	24.9
Skillman Southwestern Branch Library	61.8	51.3	20.4
Renner Frankford Branch Library	89.1	74.5	19.6
Audelia Road Branch Library	67.6	56.8	19.1
Bachman Lake Branch Library	58.1	51.3	13.2
Timberglen Branch Library	62.1	56	10.8

Dallas West Branch Library	75.2	69.1	8.8
Grauwylers Park Branch Library	56.6	53.5	5.6
Prairie Creek Branch Library	53.6	51.3	4.4
Highland Hills Branch Library	55.9	53.7	4
White Rock Hills Branch Library	50.5	51.3	-1.6
Kleberg Rylie Branch Library	58	60.5	-4.2
North Oak Cliff Branch Library	53.2	56.8	-6.2
Lochwood Branch Library	44	51.3	-14.2
Fretz Park Branch Library	41.7	53.1	-21.4
J. Erik Jonsson Central Library	37.3	58.5	-36.2
Pleasant Grove Branch Library	31.2	51.3	-39.2
Polk-Wisdom Branch Library	30.9	51.3	-39.8
Forest Green Branch Library	Not Available	71.6	Not Available

Figure 10: Energy Star Portfolio Manager EUI data for libraries



Energy Benchmarking Analysis – Dallas Fire & Rescue

A total of 54 fire stations comprising of 528,731 square foot of occupied space have been energy benchmarked in Energy Star Portfolio Manager. Based on the EUI analysis from Energy Star Portfolio Manager 10 fire stations performed well, whereas 44 fire stations have EUI greater than the EUI for similar benchmarked buildings and present opportunities to implement energy conservation measures to reduce energy usage. Figure 11 lists the EUI data for all the 54 fire stations.

Property Name	Site EUI (kBtu/ft ²)	National Median Site EUI (kBtu/ft ²)	% Difference from National Median Site EUI
Fire Station #25	117.8	61.7	90.9
Fire Station #37	146.6	79.7	83.9
Fire Station #38	134.9	74.5	81.1
Fire Station #18	102.6	59.2	73.3
Fire Station #17	117.7	69.8	68.7
Fire Station #56	130.7	78	67.6
Fire Station #13	114.5	68.9	66.3
Fire Station #21	121.8	75.5	61.3
Fire Station #53	91.3	58.4	56.3
Fire Station #50	93.5	60.6	54.3
Fire Station #52	107.1	69.8	53.6
Fire Station #06	102.4	67	52.7
Fire Station #11	79.2	52.2	51.8
Fire Station #43	106.2	70.5	50.6
Fire Station #20	109.2	73	49.6

Fire Station #02	100.3	67.4	48.8
Fire Station #08	105.8	71.6	47.7
Fire Station #33	91.7	62.2	47.5
Fire Station #24	100.2	68.7	45.9
Fire Station #47	85	59.7	42.5
Fire Station #26	94	66.6	41.1
Fire Station #44	89.7	63.8	40.5
Fire Station #40	96.3	69.3	39
Fire Station #12	109.8	79.7	37.7
Fire Station #57	89.3	66.8	33.9
Fire Station #10	90.5	68.4	32.3
Fire Station #23	86.7	66.9	29.7
Fire Station #39	72.6	57.6	26.1
Fire Station #42	85.3	67.8	25.8
Fire Station #51	88.4	70.3	25.8
Fire Station #54	75	60.1	24.9
Fire Station #14	78	62.7	24.4
Fire Station #05	85.8	69.5	23.6
Fire Station #15	76	61.5	23.6
Fire Station #27	60	49.5	21.2
Fire Station #29	89.7	74	21.2

Fire Station #31	72.4	61.2	18.3
Fire Station #35	75.1	63.5	18.3
Fire Station #36	74.4	63.6	17
Fire Station #49	77.5	67.3	15.2
Fire Station #28	77.1	67.2	14.6
Fire Station #32	56.9	50.8	12
Fire Station #34	48.7	44.6	9.2
Fire Station #01	59	58.6	0.6
Fire Station #16	69.1	70.1	-1.5
Fire Station #55	54	54.9	-1.5
Fire Station #45	69	70.5	-2.1
Fire Station #07	64.2	65.8	-2.3
Fire Station #03	57.6	59.8	-3.8
Fire Station #09	55.4	64.2	-13.7
Fire Station #48	45.9	71	-35.4
Fire Station #22	43.1	69.9	-38.4
Fire Station #30	18.2	49.7	-63.3
Fire Station #58	11.1	45.5	-75.7

Figure 11: Energy Star Portfolio Manager EUI data for fire stations



Energy Benchmarking Analysis – Parks & Recreation

A total of 43 recreation centers comprising of 789,076 square foot of occupied space have been energy benchmarked in Energy Star Portfolio Manager. Based on the EUI analysis from Energy Star Portfolio Manager 11 recreation centers performed well, whereas 31 recreation centers have EUI greater than the EUI for similar benchmarked buildings and present opportunities to implement energy conservation measures to reduce energy usage. Figure 12 lists the EUI data for all the 43 recreation centers.

Property Name	Site EUI (kBtu/ft ²)	National Median Site EUI (kBtu/ft ²)	% Difference from National Median Site EUI
Bachman Recreation Center	121.4	50.4	140.6
Marcus Recreation Center	106.5	48.3	120.4
Fretz Park Recreation Center	97.9	48.7	100.8
Juanita Craft Recreation Center	74.5	40	86.4
Arcadia Park Recreation Center	73.6	40	84
Park in the Woods Recreation Center	71.3	40	78.3
Exall Recreation Center	98.8	55.5	78.1
Harry Stone Recreation Center	92	51.9	77.2
Pleasant Oaks Recreation Center	90.8	53.4	70.1
Martin Weiss Recreation Center	78	48.9	59.5
K.B.Polk Recreation Center	75.3	48.5	55.4
Mattie Nash Myrtle Davis Recreation Center	69.2	46.6	48.5
Tommie M Allen Recreation Center	74.3	50.5	47.1
JC Phelps Recreation Center	70.6	48	46.9

Larry Johnson Recreation Center	89	61	45.9
Timberglen Recreation Center	73.2	52	40.7
Samuell Grand Recreation Center	73.4	52.2	40.6
Ridgewood Belcher Recreation Center	50.8	40	27
Janie C Turner Recreation Center	60.5	50.1	20.8
Exline Recreation Center	69	57.3	20.4
Anita Martinez Recreation Center	60.7	51.7	17.3
Cummings Recreation Center	63.5	55.5	14.4
Walnut Hill Recreation Center	62.9	55.5	13.2
Reverchon Recreation Center	52.5	46.5	12.9
Eloise Lundy Recreation Center	44.4	40	11
Grauwlyer Recreation Center	60.1	56.6	6.2
Campbell Green Recreation Center	42.8	40.6	5.4
Fireside Recreation Center	56.5	53.7	5.2
Jaycee Zaragoza Recreation Center	47.1	45	4.8
Kleberg-Rylie Recreation Center	58.3	55.7	4.7
Beckley-Saner Recreation Center	50.6	48.6	4.1
Churchill Recreation Center	55.6	56.9	-2.3
Lake Highlands North Recreation Center	43.4	45.6	-4.9
Kiest Park Recreation Center	37.4	40	-6.5
Pike/Santos Rodriguez Recreation Center	36.3	41.7	-13

Arlington Park Recreation Center	49.1	57.2	-14.2
Fruitdale Recreation Center	57.6	72.8	-20.9
Kidd Springs Recreation Center	30.6	53.4	-42.7
Thurgood Marshall Recreation Center	19.6	40.7	-51.8
Mildred Dunn Recreation Center	16.6	43.1	-61.6
Willie B Johnson Recreation Center	14.3	40	-64.2
Umphress Recreation Center	8.9	40	-77.7
Singing Hills Recreation Center	Not Available	50.8	Not Available

Figure 12: Energy Star Portfolio Manager EUI data for recreation centers

Energy Benchmarking Analysis – Arts & Culture

A total of 9 cultural centers comprising of 743,812 square foot of occupied space have been energy benchmarked in Energy Star Portfolio Manager. Based on the EUI analysis from Energy Star Portfolio Manager 3 cultural centers performed well, whereas 6 cultural centers have EUI greater than the EUI for similar benchmarked buildings and present opportunities to implement energy conservation measures to reduce energy usage. Figure 13 lists the EUI data for all the 9 cultural centers.

Property Name	Site EUI (kBtu/ft ²)	National Median Site EUI (kBtu/ft ²)	% Difference from National Median Site EUI
Latino Cultural Center	127.6	39.1	226
Majestic Theatre	68.6	40	71.4
Bath House Cultural Center	54.8	40	37.1
Dallas City Performance Hall	54.7	40	36.8
Dallas Museum of Art	53.2	40	32.9
Oak Cliff Cultural Center	43.5	39.1	11.1
Dallas Theater Center - Kalita Humphreys Theater	36.6	40	-8.6
South Dallas Cultural Center	28.4	40	-29.1
Dallas Theater Center - Second Thought Theater	28.3	40	-29.4

Figure 13: Energy Star Portfolio Manager EUI data for cultural centers

Energy Benchmarking Analysis – Administrative

A total of 7 administrative buildings comprising of 1,301,965 square foot of occupied space have been energy benchmarked in Energy Star Portfolio Manager. Based on the EUI analysis from Energy Star Portfolio Manager 4 administrative buildings performed well, whereas 3 administrative buildings have EUI greater than the EUI for similar benchmarked buildings and present opportunities to implement energy conservation measures to reduce energy usage. Figure 14 lists the EUI data for all the 7 administrative buildings.

Property Name	Site EUI (kBtu/ft ²)	National Median Site EUI (kBtu/ft ²)	% Difference from National Median Site EUI
West Dallas Multipurpose Center	124.1	56.9	118
EBS Roofing & Maintenance	48.9	34.6	41.2
City Hall	102.9	84.3	22.1
Eco Park	34	34.8	-2.4
Thanksgiving Square	33.3	39.1	-15
Oak Cliff Municipal Center	42.4	56.9	-25.5
Municipal Courts Headquarters	23.4	48.7	-51.8

Figure 14: Energy Star Portfolio Manager EUI data for administrative buildings

Energy management team at the Building Services Department has established the following goals for the upcoming fiscal

- Continue efforts to reduce energy use intensity at City owned buildings
- Perform additional building energy audits in collaborations with State Energy Conservation Office (SECO)

- Continue efforts to energy benchmark City owned buildings from 140 to 175 by FY2022
- Develop programs for implementing renewable energy and energy conservation measures at City owned buildings

- Monitor and communicate energy saving efforts and achievements
- Continue work on FY2021-22 CECAP action items

- Coordinate and encourage other departments to benchmark their facilities to be included in future annual energy reports