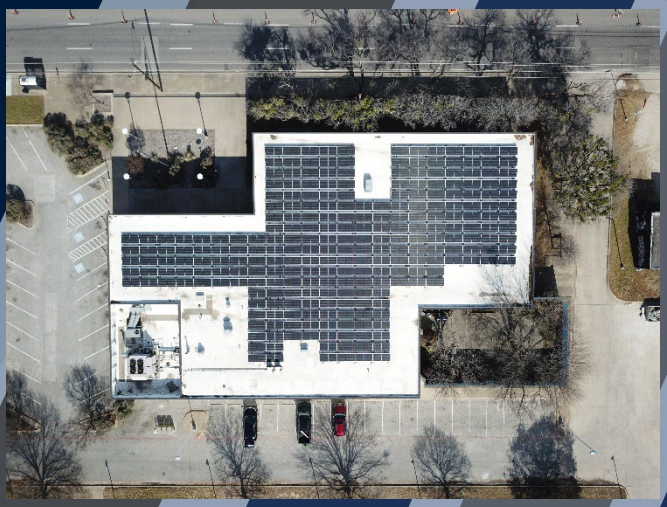
City of Dallas | Building Services Department

AUGUST 2023

ANNUAL CITY OF DALLAS MUNICIPAL BUILDINGS

ENERGY BENCHMARKING REPORT – 2022 ENERGY USE

Fretz Park Recreaction Center



Dallas West Branch Library

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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

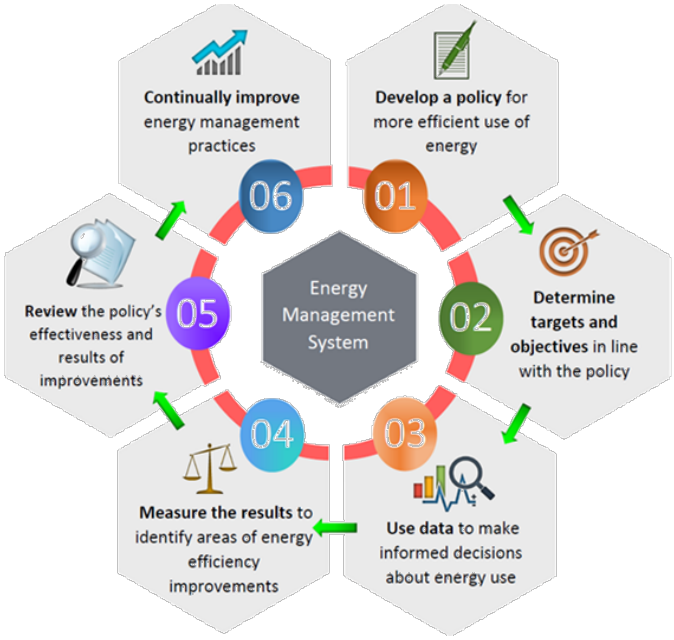
For 2022 the total City electricity consumption was 672,532 MWh at a cost of $46.5 million. For the year 2022 City has 2,929 active electricity accounts of these 366 are classified as buildings.

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 selected 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 173 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, Energy Star 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.

The Energy Management Program at the City was 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 is the 2022 annual energy benchmarking report for selected municipal buildings owned and operated by the City of Dallas.



City Energy Use

For 2022 the total City electricity consumption was 672,532 MWh at a cost of $46.5 million. Figure 1 and Figure 2 shows the electricity consumption and cost for all the City accounts from 2019 – 2022.

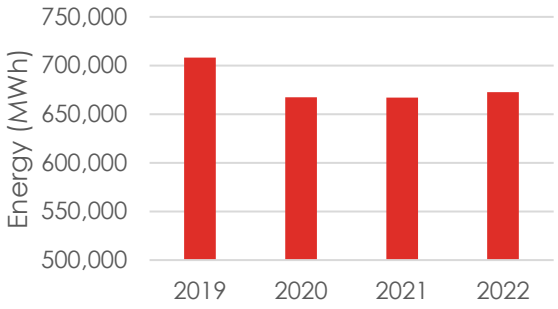


Figure 1: 2019 - 2022
Total City energy usage

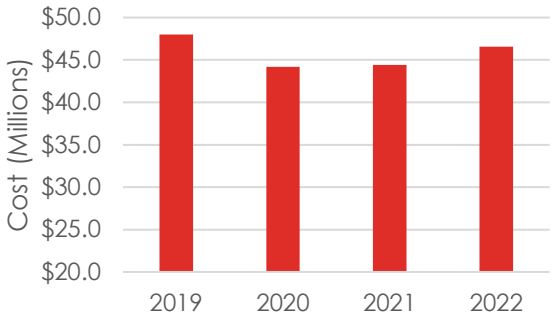


Figure 2: 2019 - 2022 Total City electricity cost

For 2022 the City has a total of 2,929 active electricity accounts, of these electricity expenses for 2,422 accounts are funded through general funds and 507 accounts are funded through enterprise funds. Figure 3 through Figure 7 shows the electricity usage and cost for general & enterprise funded accounts for 2022.

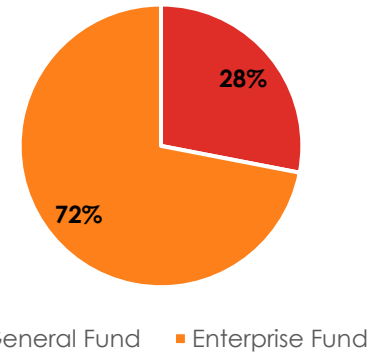


Figure 3: 2022 Total City electricity usage by fund type

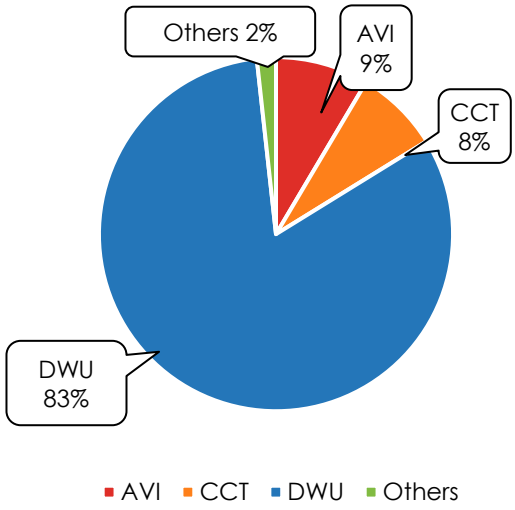


Figure 4: 2022 enterprise funded departments electricity usage

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

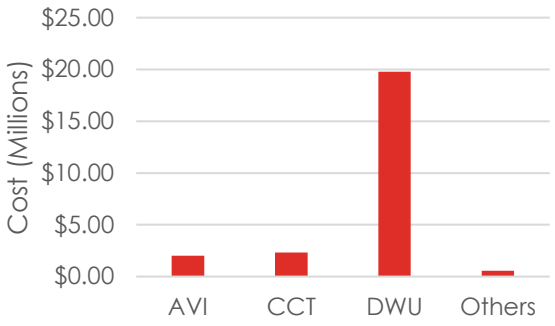


Figure 5: 2022 electricity cost for enterprise funded departments

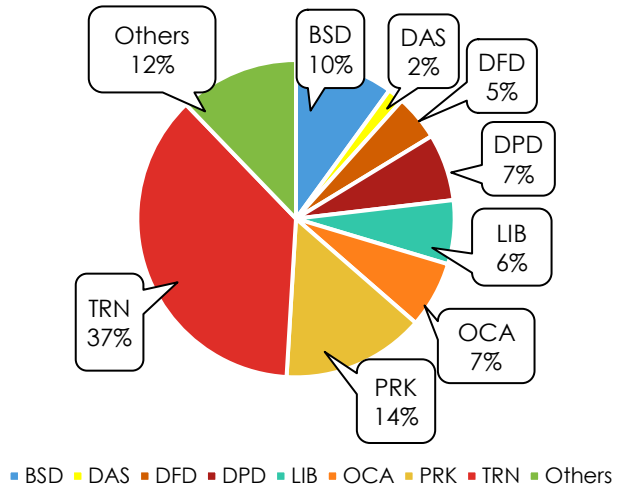


Figure 6: 2022 general funded departments electricity usage

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

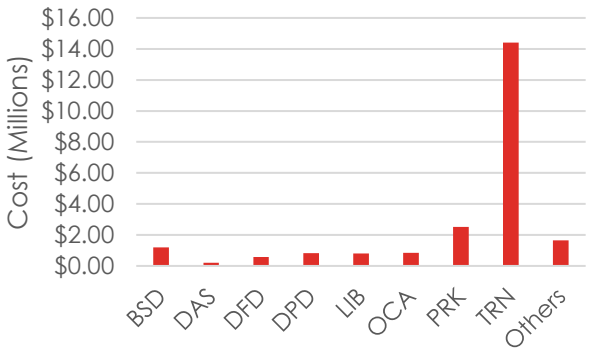


Figure 7: 2022 electricity cost for general funded departments

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 2022 Green Power Partnership Top 30 Local Governments list and No. 32 on their Top 100 National Organizations (including local, state, and federal agencies as well as the private sector).

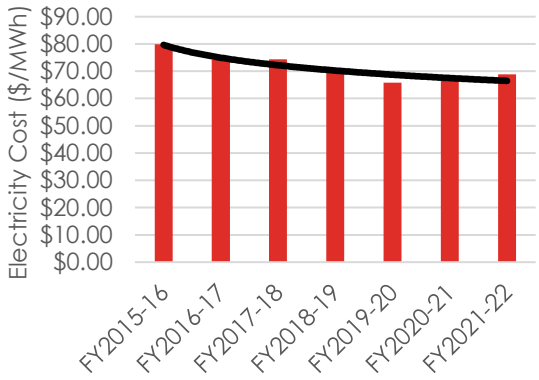


Figure 8: Electricity cost (generation plus transmission & distribution charges)

City of Dallas

EPA GREEN POWER PARTNER

RANKED NO. 2

Annual Green Power Use In EPA's 2022 Green Power Partnership Top 30 Local Governments List

RANKED NO. 32

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

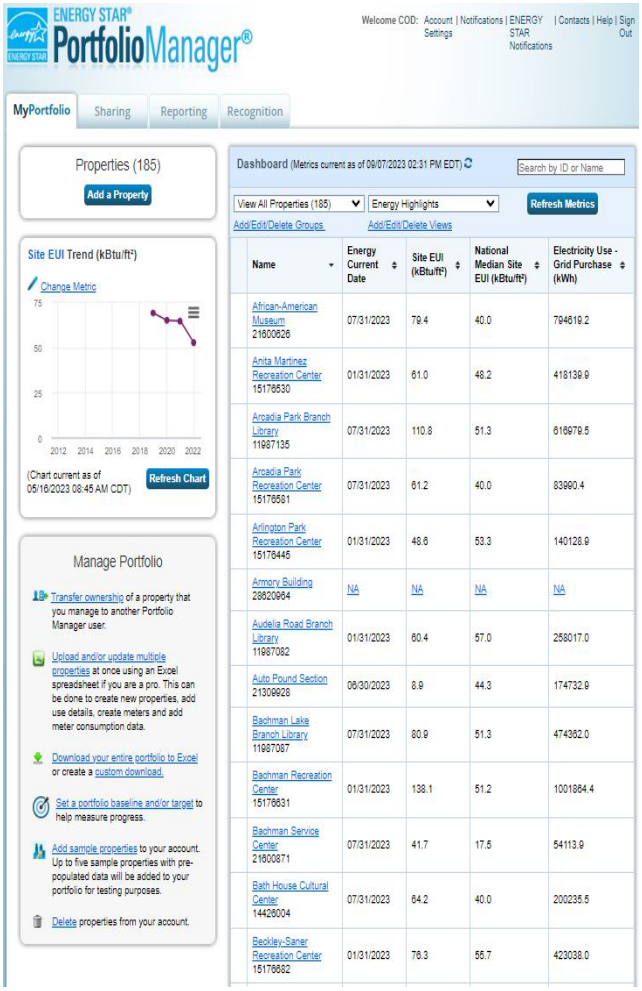
Energy Benchmarking

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 173 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.

Energy Star 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, Energy Star 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.



Name	Energy Current Date	Site EUI (kBtu/ft²)	National Median Site EUI (kBtu/ft²)	Electricity Use - Grid Purchase (kWh)
African-American Museum 21600626	07/31/2023	79.4	40.0	794619.2
Anita Martinez Recreation Center 15176530	01/31/2023	61.0	48.2	418139.9
Arcadia Park Branch Library 11987135	07/31/2023	110.8	51.3	616979.5
Arcadia Park Recreation Center 15176581	07/31/2023	61.2	40.0	83990.4
Arlington Park Recreation Center 15176445	01/31/2023	48.6	53.3	140128.9
Armory Building 26820964	NA	NA	NA	NA
Audelia Road Branch Library 11987082	01/31/2023	60.4	57.0	258017.0
Auto Pound Section 21306928	06/30/2023	8.9	44.3	174732.9
Bachman Lake Branch Library 11987087	07/31/2023	80.9	51.3	474362.0
Bachman Recreation Center 15176631	01/31/2023	138.1	51.2	1001864.4
Bachman Service Center 21600871	07/31/2023	41.7	17.5	54113.9
Bath House Cultural Center 14426004	07/31/2023	64.2	40.0	200235.5
Beckley-Saner Recreation Center 15176682	01/31/2023	76.3	55.7	423038.0

Building Portfolio

A total of 173 City owned buildings, comprising of 5,534,830 square foot of occupied space, have been energy benchmarked in Energy Star Portfolio Manager. Of the 173 buildings 57 are parks & recreational facilities, 27 libraries, 54 fire stations, 11 police facilities, 11 arts & cultural facilities and 13 administrative & other facilities.

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 2022 EUI for all 173 buildings in relation to the 2019 EUI baseline. There has been a reduction of 11% in 2022 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.

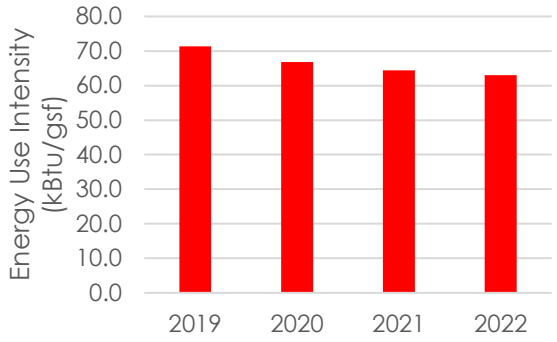


Figure 9: Benchmarked buildings portfolio EUI

City of Dallas

Energy Benchmarking Analysis - Libraries

A total of 27 libraries comprising of 1,072,200 square foot of occupied space have been energy benchmarked in Energy Star Portfolio Manager. Based on the EUI analysis from Energy Star Portfolio Manager 5 libraries performed well (highlighted in the table below), whereas 22 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/ft²)	National Median Site EUI (kBtu/ft²)	% Difference from National Median Site EUI
Arcadia Park Branch Library	89.7	51.3	74.8
Audelia Road Branch Library	61.9	55.4	11.7
Bachman Lake Branch Library	67.8	51.3	32.1
Dallas West Branch Library	70.5	64.6	9.2
Fretz Park Branch Library	44.8	52.3	-14.2
Grauwyler Park Branch Library	65.3	54.6	19.6
Hampton-Illinois Branch Library	92.6	61.7	50.1
Highland Hills Branch Library	54.4	53	2.6
J. Erik Jonsson Central Library	41.2	59.1	-30.3
Kleberg Rylie Branch Library	73.5	65.8	11.7
Lakewood Branch Library	83.8	56.3	48.8
Lochwood Branch Library	48.6	51.3	-5.3
Mountain Creek Branch Library	90.3	68.2	32.4
North Oak Cliff Branch Library	60.6	62.2	-2.6

Oak Lawn Branch Library	116.7	60.7	92.3
Park Forest Branch Library	150.7	58.7	156.7
Paul Laurence Dunbar Lancaster-Kiest Branch Library	83.1	56.4	47.5
Pleasant Grove Branch Library	55.4	51.3	8
Polk-Wisdom Branch Library	28.4	51.3	-44.7
Prairie Creek Branch Library	63.6	51.3	24
Preston Royal Branch Library	106.6	62.4	70.7
Renner Frankford Branch Library	121.5	76.1	59.6
Skillman Southwestern Branch Library	61.6	51.3	20
Skyline Branch Library	146.3	51.3	185.1
Timberglen Branch Library	58.9	51.3	14.7
Vickery Park Branch Library	73.7	51.3	43.8
White Rock Hills Branch Library	59.3	51.3	15.7

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 4 fire stations performed well (highlighted in the table below), whereas 50 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/ft²)	National Median Site EUI (kBtu/ft²)	% Difference from National Median Site EUI
Fire Station #01	67.5	61.5	9.8
Fire Station #02	100.1	63.5	57.7
Fire Station #03	76.2	63	20.9
Fire Station #05	87.4	68.5	27.7
Fire Station #06	146.1	71.4	104.6
Fire Station #07	87.6	70.3	24.6
Fire Station #08	122.3	73.5	66.4
Fire Station #09	61.5	66.5	-7.5
Fire Station #10	85.2	66.6	27.8
Fire Station #11	87.5	52.8	65.7
Fire Station #12	126.6	81.6	55.1
Fire Station #13	114.6	67.7	69.4
Fire Station #14	82.6	63.7	29.7
Fire Station #15	96.6	67.9	42.3
Fire Station #16	73.1	70.5	3.7

Fire Station #17	110.4	67.3	64.1
Fire Station #18	107.5	61.2	75.6
Fire Station #20	146.2	80.9	80.8
Fire Station #21	121	71.9	68.3
Fire Station #22	25.9	103.2	-74.9
Fire Station #23	93.2	65	43.4
Fire Station #24	113.1	69.2	63.3
Fire Station #25	137.9	66.3	107.9
Fire Station #26	98	65.6	49.4
Fire Station #27	68.7	46.4	48.1
Fire Station #28	61.1	59	3.7
Fire Station #29	86.5	72.8	18.8
Fire Station #30	51.2	44.6	14.8
Fire Station #31	80.2	58.7	36.5
Fire Station #32	63.6	51.7	23
Fire Station #33	80	63.9	25.2
Fire Station #34	50.4	44.6	13.1
Fire Station #35	77.2	65.2	18.3
Fire Station #36	92.2	66.5	38.6
Fire Station #37	142.9	75.3	89.7
Fire Station #38	135.8	75	81

Fire Station #39	101.5	67.5	50.3
Fire Station #40	96.8	67.6	43.3
Fire Station #42	86.2	64.2	34.2
Fire Station #43	106.6	68.5	55.5
Fire Station #44	94.2	61.7	52.8
Fire Station #45	75.8	72.4	4.6
Fire Station #47	95.3	59.3	60.5
Fire Station #48	49.2	69.8	-29.5
Fire Station #49	95.3	70.7	34.9
Fire Station #50	99.2	62	60
Fire Station #51	84.3	72.1	17
Fire Station #52	97.8	69.3	41.3
Fire Station #53	85.6	60.4	41.5
Fire Station #54	84.5	65.3	29.5
Fire Station #55	67.7	59.3	14.1
Fire Station #56	99.9	72.9	37.1
Fire Station #57	93.1	66.1	41
Fire Station #58	12	45.7	-73.8

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

Energy Benchmarking Analysis – Parks & Recreation

A total of 57 parks & recreation facilities comprising of 868,788 square foot of occupied space have been energy benchmarked in Energy Star Portfolio Manager. Based on the EUI analysis from Energy Star Portfolio Manager 13 recreation centers performed well (highlighted in the table below), whereas 44 recreation centers have EUI greater than the EUI for similar benchmarked buildings and present opportunities to implement energy conservation measures to reduce energy usage. One recreation center has EUI data incomplete. Figure 12 lists the EUI data for all the 57 parks & recreation facilities.

Property Name	Site EUI (kBtu/ft²)	National Median Site EUI (kBtu/ft²)	% Difference from National Median Site EUI
Anita Martinez Recreation Center	62.7	48.5	29.2
Arcadia Park Recreation Center	57.5	40	43.9
Arlington Park Recreation Center	48.4	53.5	-9.4
Bachman Recreation Center	138.8	51	172
Beckley-Saner Recreation Center	73.9	54.9	34.7
Big Thicket Clubhouse	18.8	40	-53.1
Campbell Green Recreation Center	38.5	40.3	-4.4
Cedar Crest Golf Course Clubhouse	3	39.1	-92.3
Cedar Crest Maintenance Barn	53.3	34.6	54
Children's Aquarium Dallas	190.7	40	376.8
Churchill Recreation Center	62.2	54.6	13.8
Cummings Recreation Center	63.6	50.4	26.2
Eloise Lundy Recreation Center	47.2	40	18.1
Exall Recreation Center	106	52.2	102.9

Exline Recreation Center	66.2	54.2	22.2
Fireside Recreation Center	63.6	55.1	15.5
Fretz Park Recreation Center	98.1	47.3	107.5
Fruitdale Recreation Center	41.9	54.7	-23.4
Grauwyler Recreation Center	64.4	55.2	16.5
Grover Keeton Cart Barn	91.1	18.9	382.4
Grover Keeton Club House	102.1	39.1	161
Grover Keeton Maintenance Barn	69.3	34.6	100.4
Harry Stone Recreation Center	86.3	47	83.6
Janie C Turner Recreation Center	73	49.8	46.7
Jaycee Zaragoza Recreation Center	57.1	47.2	21
JC Phelps Recreation Center	70.4	42.2	66.9
Juanita Craft Recreation Center	80.3	40	100.7
K.B.Polk Recreation Center	58	51	13.6
Kidd Springs Recreation Center	36.8	55.2	-33.3
Kiest Park Recreation Center	39.1	40	-2.2
Kiest Tennis Center	327.6	40	718.8
Kleberg-Rylie Recreation Center	81.7	56.8	43.9
L.B. Houston - Golf Cart Barn	90.2	34.6	160.8
L.B. Houston - Repair Shop	74.3	34.6	114.6
L.B. Houston - Tennis	218.6	40	446.6

Lake Highlands North Recreation Center	38.2	40	-4.5
Larry Johnson Recreation Center	83.6	58.8	42.1
Marcus Annex Senior Center	95.5	40	138.9
Marcus Recreation Center	107.3	47.7	124.8
Martin Weiss Recreation Center	94.8	46.7	103
Mattie Nash Myrtle Davis Recreation Center	66.3	46.2	43.5
Mildred Dunn Recreation Center	20.6	40	-48.4
New Singing Hill Recreation Center	68.7	40	71.7
Park in the Woods Recreation Center	93.2	40	133
Pike/Santos Rodriguez Recreation Center	43.1	44.1	-2.3
Pleasant Oaks Recreation Center	84.5	49.1	72.1
Reverchon Recreation Center	61.5	48.6	26.5
Ridgewood Belcher Recreation Center	52.7	40	31.7
Samuell Grand Recreation Center	76.4	48.8	56.6
Stevens Club House	125.7	39.1	221.1
Stevens Golf - Maintenance Shop Building	106.4	34.6	207.4
Thurgood Marshall Recreation Center	21.5	40	-46.4
Timberglen Recreation Center	91.4	58.9	55.3
Tommie M Allen Recreation Center	64.8	42.6	52.1
Umphress Recreation Center	13.2	40	-66.9
Walnut Hill Recreation Center	38.9	40	-2.8

Willie B Johnson Recreation Center	188.2	40	370.6

Figure 12: Energy Star Portfolio Manager EUI data for parks & recreation facilities

Energy Benchmarking Analysis – Arts & Culture Facilities

A total of 11 arts & culture facilities comprising of 855,476 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 arts & culture facilities performed well (highlighted in the table below), whereas 8 arts & culture facilities 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 11 arts & culture facilities.

Property Name	Site EUI (kBtu/ft²)	National Median Site EUI (kBtu/ft²)	% Difference from National Median Site EUI
African-American Museum	78.7	40	96.6
Bath House Cultural Center	66.3	40	65.7
Dallas City Performance Hall	58.7	40	46.7
Dallas Museum of Art	53.8	40	34.5
Dallas Theater Center - Kalita Humphreys Theater	50	40	24.9
Dallas Theater Center - Second Thought Theater	36.7	40	-8.3
Hall of State	29.5	40	-26.2
Latino Cultural Center	148.7	39.1	279.8
Majestic Theatre	75.4	40	88.5
Museum of Natural History	59.8	40	49.6
South Dallas Cultural Center	31.6	40	-21

Figure 13: Energy Star Portfolio Manager EUI data for arts & culture facilities

Energy Benchmarking Analysis – Police Facilities

A total of 11 new police facilities comprising of 712,616 square foot of occupied space were energy benchmarked in Energy Star Portfolio Manager since 2021. Based on the EUI analysis from Energy Star Portfolio Manager 3 police facilities performed well (highlighted in the table below), whereas 8 police facilities 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 11 police facilities.

Property Name	Site EUI (kBtu/ft²)	National Median Site EUI (kBtu/ft²)	% Difference from National Median Site EUI
Bexar Street Satellite Station	72.6	44.6	62.9
Dallas Police Academy Training Building	46.9	62.3	-24.8
DPD Property and Evidence Unit	60.8	60	1.2
Jack Evans Police Headquarters	44.8	44.9	-0.3
North Central Patrol	75.2	55.6	35.2
North East Patrol	60	49.7	20.7
North West Patrol	48.8	44.6	9.4
Quartermaster Section	37.2	44.6	-16.6
South Central Patrol	79.9	44.6	79.3
South East Patrol	58.8	46.1	27.5
South West Patrol	66.6	44.6	49.3

Figure 14: Energy Star Portfolio Manager EUI data for police facilities

Energy Benchmarking Analysis – Administrative & Other Facilities

A total of 13 administrative and other facilities comprising of 1,497,019 square foot of occupied space have been energy benchmarked in Energy Star Portfolio Manager. Based on the EUI analysis from Energy Star Portfolio Manager 6 administrative and other facilities performed well, whereas 7 administrative and other facilities have EUI greater than the EUI for similar benchmarked buildings and present opportunities to implement energy conservation measures to reduce energy usage. Figure 15 lists the EUI data for all the 13 administrative and other facilities.

Property Name	Site EUI (kBtu/ft²)	National Median Site EUI (kBtu/ft²)	% Difference from National Median Site EUI
Auto Pound Section	16.3	44.3	-63.3
Bachman Service Center	47.5	18.2	161.3
City Hall	87.1	82.3	5.8
EBS Roofing & Maintenance	53.8	34.6	55.5
Eco Park	35.7	35.6	0.2
Fair Oaks Service Center	12.5	17.1	-26.7
I.C. Harris Building	24.5	31.9	-23
Municipal Courts Heatquarters	23	49.6	-53.5
Oak Cliff Cultural Center	21.2	39.1	-45.9
Oak Cliff Municipal Center	42.6	57.8	-26.2
Park Central Service	28	18.1	54.4
Thanksgiving Square	39.8	39.1	1.6
West Dallas Multipurpose Center	129.1	56.2	129.9

Figure 15: Energy Star Portfolio Manager EUI data for administrative & other facilities

Next Steps

The Energy Management Team at the Building Services Department has established the following goals for the upcoming fiscal year:

- 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 173 to 185 by 2023
- Develop programs for implementing renewable energy and energy conservation measures at City-owned buildings such as solar PV & LED lighting

- Monitor and communicate energy saving efforts and achievements
- Continue work on FY2023 CECAP action items

- Work towards implementation of pilot solar PV + battery energy storage system project at Bachman Recreation Center

For additional information or questions, please contact;
Srinivas Vemuri at srinivas.vemuri@dallas.gov and 214-671-8392.