

June 30, 2017

Metropolitan Government Clerk's Office
Metropolitan Courthouse
1 Public Square, Suite 205
Nashville, TN 37201

Dear Honorable Members of the Metropolitan Government of Nashville & Davidson County Council:

In accordance with Section 16.60.110 of the Metropolitan Code, the Department of General Services is herewith providing an annual report for calendar year 2016 describing the environmental performance and operation of the 20 LEED® (i.e., "high performance") buildings.

The annual report requirements for LEED® buildings include:

1. The LEED® building's energy and water use compared to a non-LEED® building of similar size and use within the area of the metropolitan government;
2. The LEED® building's estimated energy and water cost savings compared to a non-LEED® building of similar size and use within the area of the metropolitan government.

The high performance buildings that are presented in this annual report are those for which a minimum of one year of energy data is available and include the following:

High Performance Building	Opening Date	LEED® level
Fire Station #3	October 2012	LEED® Gold
Fire Station #11	January 2014	LEED® Gold
Fire Station #19	December 2015	LEED® Platinum
Fire Station #20	October 2015	LEED® Silver
Fire Station #21	November 2013	LEED® Silver
Fire Station #30	June 2013	LEED® Silver
Fire Station #31	September 2012	LEED® Gold
Fire Station #33	April 2013	LEED® Silver
Fire Station #35	September 2011	LEED® Silver
Midtown Hills Police Precinct	August 2014	LEED® Gold
West Police Precinct	December 2011	LEED® Gold
Madison Police Precinct/Crime Lab	January 2014	LEED® Silver
Howard Office Building	December 2010	LEED® Silver
Lindsley Hall	April 2010	LEED® Silver
MAC - Douglass Head Start School	February 2014	LEED® Silver
Highland Heights School	August 2014	LEED® Silver
Bellevue Library	January 2015	LEED® Gold

High Performance Building	Opening Date	LEED® level
Southeast Davidson Regional Community Center	October 2014	LEED® Gold
Lentz Health Center	July 2014	LEED® Silver
Ford Ice Center	September 2014	LEED® Gold

Metro General Services did not construct or renovate a LEED® building during calendar year 2016.

The Energy Use Intensity (EUI) of each LEED® building was calculated and compared to both Metro non-LEED® buildings and national benchmarks. The EUI is expressed as energy consumed in one year (measured in thousands of British thermal units or kBtu) divided by the total gross floor area of the building. A building's EUI varies due to factors such as age, use, controls, envelope efficiency, climate, etc. Generally, a low EUI signifies good energy performance, but certain property types will always have a higher EUI than others. For example, Police Precincts that operate 24/7 will have a higher EUI than office buildings.

The EUI of each Metro LEED® building was also compared to a national benchmark for that type of building. National benchmark EUI data was obtained from the U.S. Department of Energy's 2012 Commercial Building Energy Consumption Survey (CBECS). CBECS is a national sample survey of U.S. commercial buildings which does not take into account varying climate, but does provide an average EUI by building type for all buildings surveyed.

In 2016, General Services poly-lined all buildings under its management. The poly-line process allows for an exact calculation of a building square footage using advanced computerized drafting tools. As a consequence, the square footage used for the buildings changed from the 2015 High Performance Buildings report. The change in square footage will affect EUI values for some of the facilities.

In summary, for the 20 high performance buildings reviewed in this report, Metro General Services in 2016 avoided energy costs of more than \$777,700 compared to the non-LEED® comparable buildings.

Of the 18 facilities where non-LEED® comparable buildings with water consumption readings were available, the high performance buildings saved a total of more than 4,400,000 gallons of water.

Please feel free to contact me with any questions.

Sincerely,



Nancy Whittenmore
Director, Department of General Services

Metro Department of General Services' Summary Report

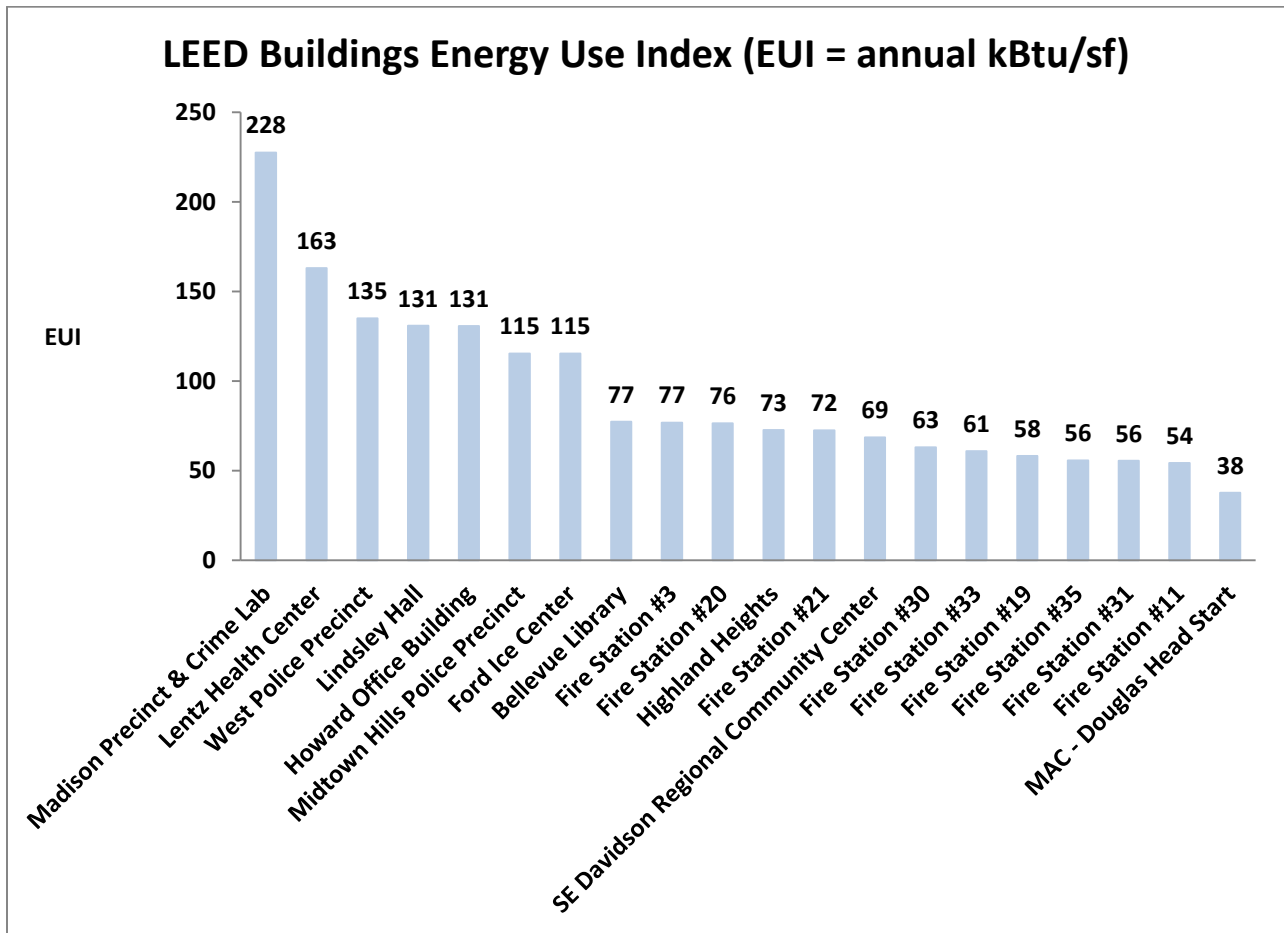
Metro Department of General Services worked with a third party consultant Facility Diagnostics to conduct ASHRAE Level I energy audits of the 20 LEED® buildings that General Services manages, with a focus on identifying energy efficiency project investments. This report draws from those energy audits.

For calendar year 2016, Metro spent \$2,204,932 on energy (\$1,978,024 for electricity, \$226,908 for natural gas) and \$177,490 on water for the 20 LEED® buildings with a total area of 856,362 square feet. The utility consumption and cost per building are as follows:

High Performance Building	Building Sq. Ft.	Electricity (kWh)	Electricity cost	Gas (therms)	Gas cost	Water (gallons)	Water cost
Fire Station #3	16,061	285,173	\$28,869.66	2,615	\$2,732.92	291,759	\$4,726.09
Fire Station #11	15,255	207,818	\$23,419.68	1,201	\$1,547.06	154,109	\$3,670.09
Fire Station #19	18,266	212,250	\$24,009.35	3,402	\$3,360.84	795,230	\$5,889.20
Fire Station #20	12,176	207,600	\$23,391.55	2,229	\$2,395.13	93,513	\$2,539.72
Fire Station #21	18,759	277,098	\$28,242.95	4,144	\$3,920.53	184,781	\$3,543.84
Fire Station #30	15,042	210,046	\$23,663.25	2,318	\$2,517.11	85,283	\$2,688.90
Fire Station #31	16,010	211,864	\$23,599.15	1,667	\$1,940.95	89,024	\$3,071.58
Fire Station #33	15,536	220,173	\$24,303.30	1,947	\$2,118.17	169,819	\$3,022.22
Fire Station #35	11,586	115,800	\$13,543.29	2,512	\$2,576.95	622,419	\$4,689.06
Midtown Hills Police Precinct	21,722	720,600	\$65,205.80	494	\$954.34	2,607,877	\$25,909.17
West Police Precinct	22,724	882,800	\$79,888.57	574	\$1,032.26	454,845	\$5,233.62
Madison Precinct & Crime Lab	83,006	3,634,800	\$333,962.83	64,879	\$55,753.70	887,247	\$4,250.51
Howard Office Building	139,025	2,974,205	\$350,880.88	97,499	\$33,660.41	3,471,932	\$35,820.52
Lindsley Hall	28,629	463,612	\$49,760.35	20,488	\$7,073.34	729,398	\$7,527.26
MAC - Douglass Head Start School	30,546	301,320	\$36,487.86	1,211	\$1,622.71	337,393	\$5,321.73
Highland Heights School	91,565	1,760,400	\$170,496.96	6,482	\$5,710.01	405,470	\$7,932.10
Bellevue Library	24,580	543,360	\$54,431.91	456	\$941.78	954,576	\$1,453.22
SE Davidson Regional Community Center	78,791	1,297,600	\$124,472.55	9,763	\$8,481.94	3,015,591	\$20,673.28
Lentz Health Center	106,080	2,632,200	\$262,180.92	83,123	\$70,813.69	1,514,903	\$11,125.67
Ford Ice Center	91,003	2,452,200	\$237,213.06	21,338	\$17,754.70	2,684,183	\$18,402.18

Building names are used as listed in the Department of General Services Building Operations Service Manual. Names may not always reflect the use of the building, such as SE Davidson Regional Community Center which consists of a community center and a library.

The following chart shows the energy performance of the LEED® buildings. A building's Energy Use Intensity, or EUI, varies according to factors such as age, use, controls, envelope efficiency, etc.



This report will compare the EUI of the buildings to local benchmarks as well as national benchmarks. Local comparison buildings were chosen according to the following constraints:

- Of similar size as the comparable LEED® building,
- Serve a similar function as the comparable LEED® building,
- Geographically located within Davidson County, and
- Cannot be a LEED® or high performance building.

National benchmark data was obtained from the Department of Energy's 2012 Commercial Building Energy Consumption Survey (CBECS). CBECS is a national sample survey of U.S. commercial buildings and provides the gross energy use intensity for the sum of major fuels for different building types.

The following comments pertain to the energy cost comparisons done for each group of buildings:

- Commercial electricity bills include both electricity usage charges and electricity demand charges. Best practice is to calculate *energy cost per square foot* by excluding the electricity

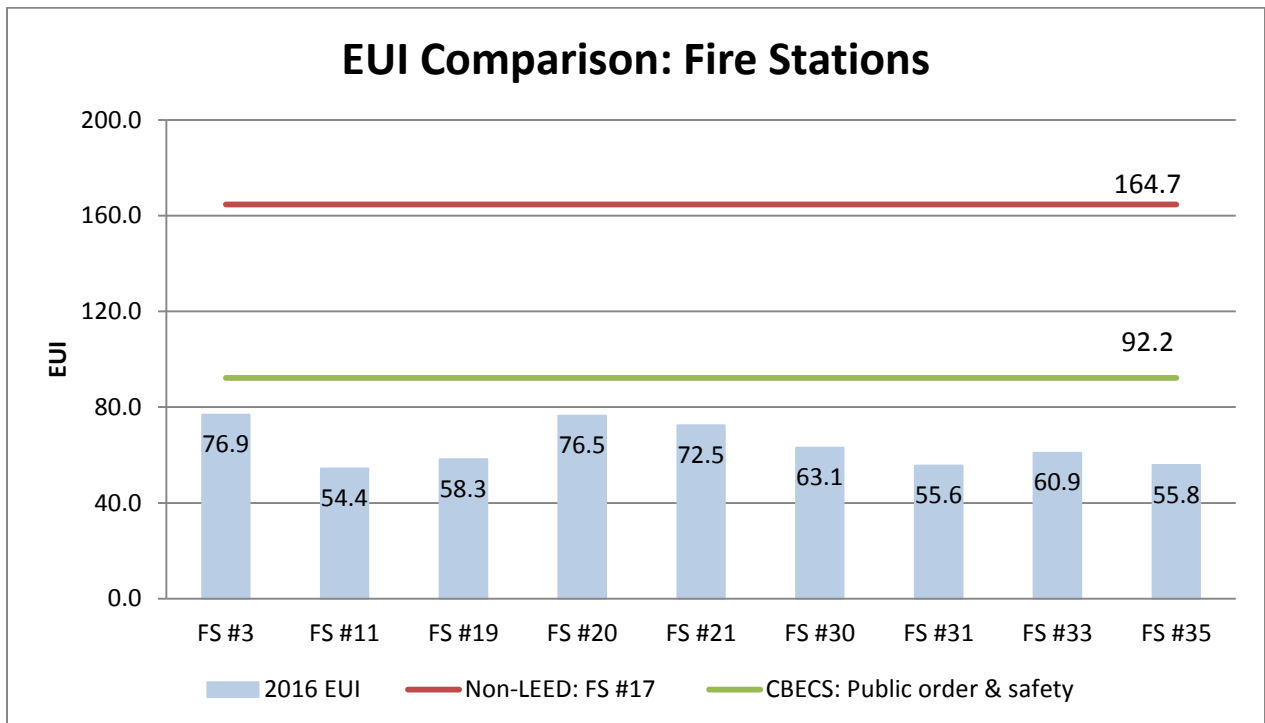
demand charges. Energy costs for this calculation thus consist of the sum of electricity usage charges and natural gas charges.

- For the CBECS benchmark, the mean square footage per building is shown as a comparison. The energy cost for the CBECS benchmark is derived from the sum of the major fuel expenditures in millions of dollars, divided by the total floor space in millions of square feet for the sample group of Public Order & Safety buildings. This is not meant to be an accurate reflection of energy cost but a reference point.
- The annual savings were calculated by comparing the BTUs for the LEED® building and the comparison building (for the same square footage), and multiplying the difference by the average cost per BTU. The annual savings are thus dependent on the EUI of the buildings and do not necessarily correlate to the energy cost per square foot.

Fire Stations

Energy Consumption

Energy consumption for the nine LEED® Fire Stations is compared in the graph below to the non-LEED® Fire Station #17 as well as to the national CBECS benchmark for a similar type building. As the graph shows, General Services' LEED® fire stations performed better than both the comparable non-LEED® buildings and the national benchmark.



Energy costs for the nine LEED® Fire Stations are compared in the following table to the non-LEED® Fire Station #17 as well as to the national CBECS benchmark for a similar type building (Public Order & Safety).

	Building sf	Energy Cost/sf	EUI	Annual savings compared to non-LEED® FS#17	Annual savings compared to national benchmark
FS #3	16,061	\$1.90	76.9	\$36,111.62	\$6,304.22
FS #11	15,255	\$1.59	54.4	\$50,682.75	\$17,382.27
FS #19	18,266	\$1.46	58.3	\$49,986.69	\$15,934.63
FS #20	12,176	\$2.07	76.5	\$29,742.65	\$5,298.95
FS #21	18,759	\$1.66	72.5	\$40,910.05	\$8,743.50
FS #30	15,042	\$1.79	63.1	\$42,200.47	\$12,099.62
FS #31	16,010	\$1.56	55.6	\$50,161.99	\$16,838.36
FS #33	15,536	\$1.66	60.9	\$45,047.30	\$13,587.16
FS #35	11,586	\$1.36	55.8	\$31,473.19	\$10,522.83
Non-LEED: FS 17	6,940	\$4.19	164.7		
CBECs: Public Order & Safety	17,200	\$1.92	92.2		
Total				\$376,316.69	\$106,711.54

Water Consumption

Water consumption and comparisons to the non-LEED® Fire Station #17 are shown in the table below. The water intensity (gallons/square feet) is compared, as well as the water usage after accounting for the different sizes in buildings. For instance, if Fire Station #17 was the same size as Fire Station #3, Fire Station #3 would use 18,103 gallons less water than Fire Station #17 during calendar year 2016.

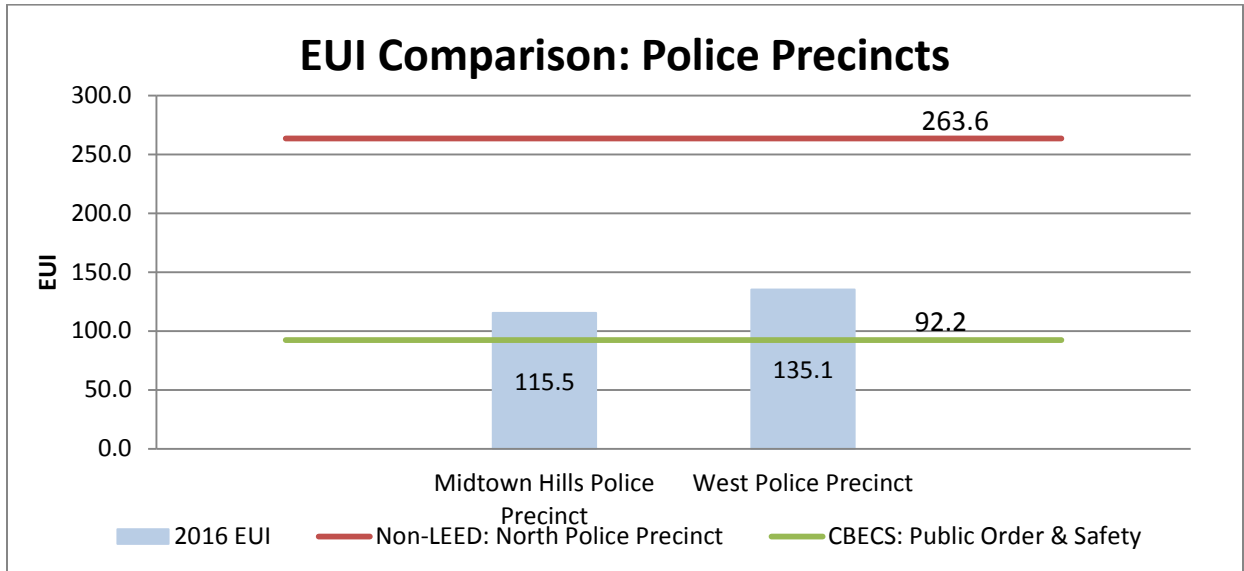
	Building sf	Water Consumption (gallons)	Water usage/sf	Water savings compared to FS #17 (gallons)
Fire Station #3	16,061	291,759	18.2	18,103
Fire Station #11	15,255	154,109	10.1	140,203
Fire Station #19	18,266	795,230	43.5	-442,828
Fire Station #20	12,176	93,513	7.7	141,396
Fire Station #21	18,759	184,781	9.9	177,133
Fire Station #30	15,042	85,283	5.7	204,919
Fire Station #31	16,010	89,024	5.6	219,854
Fire Station #33	15,536	169,819	10.9	129,914
Fire Station #35	11,586	622,419	53.7	-398,893
Non-LEED® comparable: FS 17	6,940	133,892	19.3	
Total				189,800

- Four of the Fire Stations have separate irrigation water meters: Fire Stations #11, #19, #33 and #35. 75% of Fire Station #19's water use is for irrigation, and 83% of Fire Station #35's water is used for irrigation. The internal building water use for Fire Station #19 and Fire Station #35 would be lower than for the comparable buildings if the outside irrigation was not taken into account. Since the comparable building, Fire Station #17, does not have a separate water meter for irrigation, it is difficult to compare inside water use only. Moving forward, General Services will be sub-metering irrigation for more concise water usage metrics.
- Fire Station #35 would use 398,893 gallons *more* water than Fire Station #17 if Fire Station #17 was the same square footage as Fire Station #35. The negative 398,893 demonstrates that Fire Station #35 is not saving water compared to the comparable building.

Police Precincts

Energy Consumption

Energy consumption for the two police precincts is compared in the graph below to the non-LEED® North Police Precinct as well as to the national CBECs benchmark for a similar type building. Madison Police Precinct & Crime Lab is compared separately due to the unique operations of the crime lab.



Energy costs for the two police precincts are compared in the table below to the non-LEED® North Police Precinct as well as to the national CBECs benchmark for a similar type building (Public Order & Safety).

	Building sf	Energy Cost/sf	EUI	Annual savings compared to non-LEED® North PP	Annual savings compared to national benchmark
Midtown Hills Police Precinct	21,722	\$2.48	115.5	\$84,858.95	-\$13,331.82
West Police Precinct	22,724	\$2.93	135.1	\$76,968.87	-\$25,689.09
Non-LEED: North PP	19,256	\$4.07	263.6		
CBECs: Public Order & Safety	17,200	\$1.92	92.2		
Total				\$161,827.82	-\$39,020.91

- For West Police Precinct, the square footage for the parking garage was not included in the building square footage, but the electricity consumption for the lighting in the parking garage is included in the energy metrics.

- Midtown Hills Police Precinct has a community meeting room with high usage during the workday and after hours, which can contribute to the high EUI.
- The negative \$13,331.82 shows that energy for Midtown Hills Police Precinct is costing *more* than for a national benchmark building of the same size.

Water Consumption

Water consumption comparisons to the non-LEED® North Police Precinct are shown in the table below.

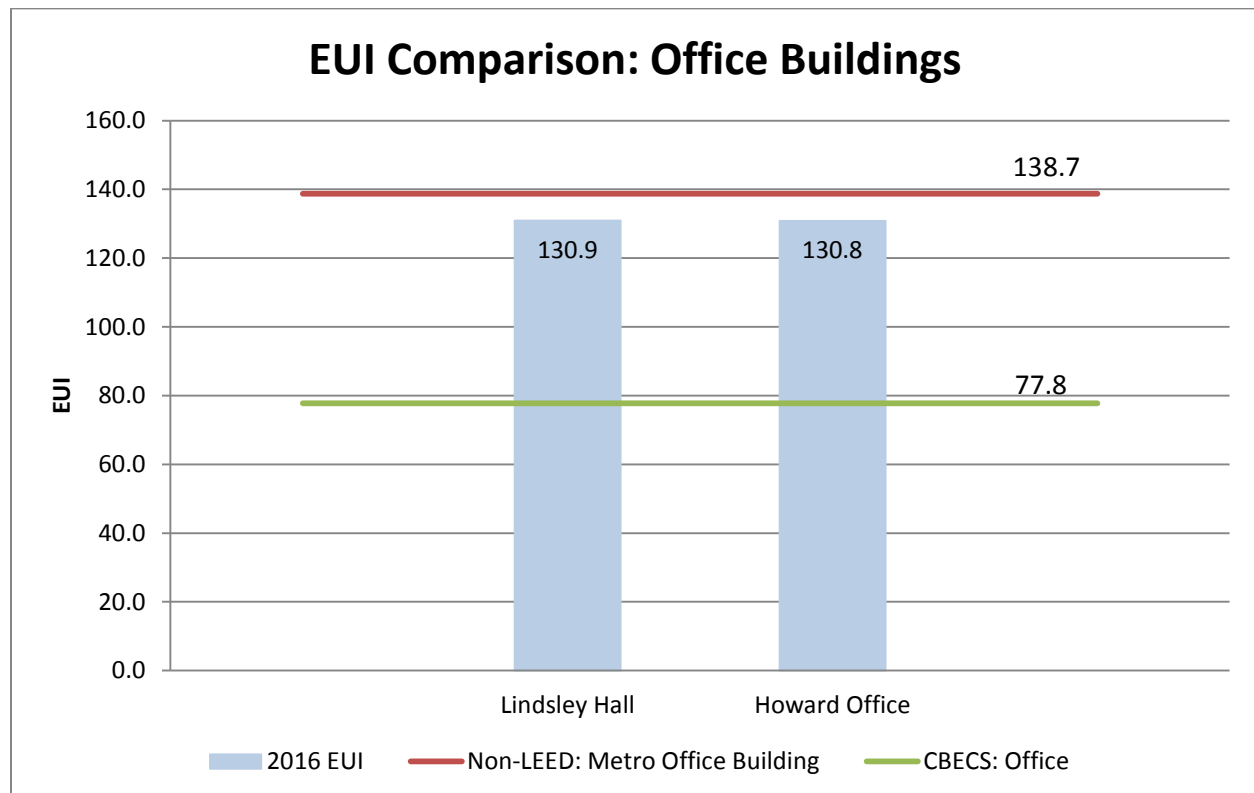
	Building sf	Water Consumption (gallons)	Water usage/sf	Water savings compared to North PP (gallons)
Midtown Hills Police Precinct	21,722	2,607,877	120.1	-1,119,230
West Police Precinct	22,724	454,845	20.0	1,102,471
Non-LEED: North PP	19,256	1,319,648	68.5	
Total				-16,758

- In early 2016, Midtown Hills Police Precinct experienced a water burst from a water valve. That burst was resolved and normal water usage was observed following the burst. The high water usage for Midtown Hills Police Precinct is attributed to the water burst.
- Midtown Hills Police Precinct also provides water for the Edgehill Community Garden. Summertime irrigation includes water for the Midtown Hills campus as well as for Edgehill Community Garden.
- Irrigation was 79% of the water usage at West Police Precinct. As noted above, moving forward General Services will be sub-metering irrigation for more concise water usage metrics.

Office Buildings

Energy Consumption

Energy consumption for the two office buildings is compared in the graph below to the non-LEED® Metro Office Building as well as to the national CBECs benchmark for a similar type building.



- Electricity usage of the data centers at Howard Office Building was not included in the calculations.
- The electricity usage of the cooling tower at Howard was not included in EUI calculations for previous years, but was included in the data for 2016. That leads to the EUI of both Howard and Lindsley being higher than the EUI calculated in previous years. The cooling tower electricity is part of the Howard Building but it contributes to Lindsley Hall too so the total energy of the cooling was divided by square footage per building.
- The EUI attributed to the Central Energy Plant, located in Howard Office Building, was split based on square footage between Howard, Lindsley and Metro Office Building since it serves all three buildings.
- Re-lamping projects towards LED conversions are under way at both Lindsley and Howard buildings. Going forward, this will lower the EUI of the buildings.

Energy costs for the two office buildings are compared in the following table to the non-LEED® Metro Office Building as well as to the national CBECS benchmark for a similar type building (Office).

	Building sf	Energy Cost/sf	EUI	Annual savings compared to non-LEED® Metro Office Building	Annual savings compared to national benchmark
Lindsley Hall	28,629	\$1.82	130.9	\$5,324.30	-\$21,967.85
Howard Office Building	139,025	\$2.24	130.8	-\$11,895.55	-\$175,515.78
Non-LEED: Metro Office Building	58,473	\$1.94	138.7		
CBECS: Office	15,800	\$1.93	77.8		
Total				-\$6,571.26	-\$197,483.64

- Howard Office Building spends more money per sq. ft. on energy than Metro Office Building, even though it has a lower EUI. This is due to the fact that the Central Energy Plant (CEP) for Fulton Campus is located in the Howard Office Building, which produces hot water and distributes it to Howard Office Building, Lindsley Hall, and Metro Office Building. The costs for the plant are combined with the costs to operate HOB, due to a lack of sub-metering. For this reason, Howard Office Building does not achieve energy cost savings in comparison to Metro Office Building. If the CEP costs were sub-metered out to each building, then it is likely that Howard would see cost savings.

Water Consumption

Water consumption at the two office buildings and comparisons to the non-LEED® Metro Office building are shown in the table below.

	Building sf	Water Consumption (gallons)
Lindsley Hall	28,629	729,398
Howard Office	139,025	3,471,932
Non-LEED: Metro Office Building	58,473	1,444,581

- The water meters on the Richard H. Fulton Campus are not marked properly and it is not evident which meter is serving which building. Because it is unclear how much water each building is actually consuming, for this analysis water usage is appropriated to each building solely according to square footage. Therefore, this report does not compare the water usage for Lindsley and Howard with the water usage for Metro Office Building.
- At the Richard H. Fulton Campus, a Central Energy Plant (Metro District Energy System) provides hot and chilled water to the buildings on campus in order to provide heating and cooling. The

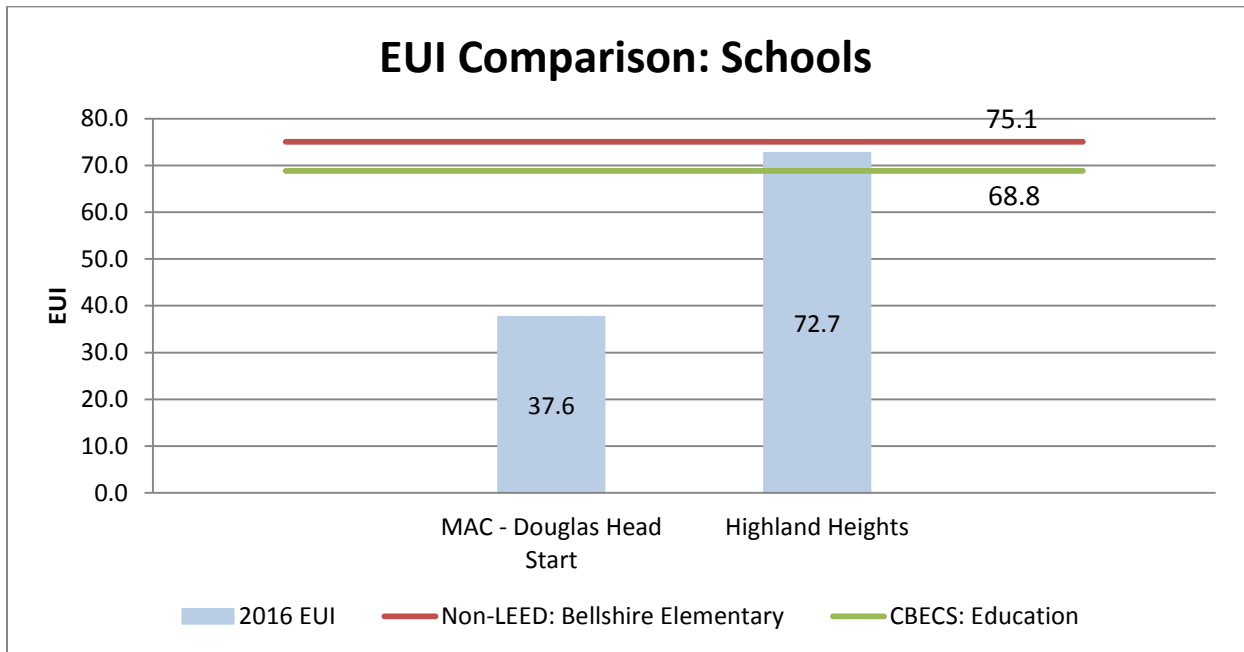
cooling tower, boiler plant, chillers and Arctic chillers all draw from the campus water supply. None of these uses are sub-metered and all are closed loops, only adding water when necessary.

- The rule of thumb for a cooling tower is that the rate of evaporation is approximately 1% of the circulation flow for each 10°F of rise between the outlet and inlet across the tower. Industry professionals say that means approximately 100 gallons per minute can evaporate in the summertime from the cooling tower.

Schools

Energy Consumption

Energy consumption for the two schools is compared in the graph below to the non-LEED® Bellshire Elementary as well as to the national CBECS benchmark for a similar type building.



- Highland Heights formally opened in August 2014. It opened with only a 9th grade class for the high school portion. Each subsequent year, more students are added. For the 2016-2017 school year, the 4th floor of the building held classes for the first time due to the increase in student population. Thus, the addition of a new floor of conditioned space increased the energy usage of the building.

Energy costs for the two schools are compared in the following table to the non-LEED® Bellshire Elementary, as well as to the national CBECS benchmark for a similar type building (Education).

	Building sf	Energy Cost /sf	EUI	Annual savings compared to non-LEED® Bellshire Elementary	Annual savings compared to national benchmark
MAC - Douglass Head Start	30,546	\$1.00	37.6	\$37,911.07	\$31,580.16
Highland Heights	91,565	\$1.39	72.7	\$5,746.14	-\$9,406.52
Non-LEED: Bellshire Elementary	58,164	\$1.78	75.1		
CB ECS: Education	31,500	\$1.37	68.8		
Total				\$43,657.21	\$22,173.64

Water Consumption

Water consumption at the two schools and comparisons to the non-LEED® Bellshire Elementary building are shown in the table below.

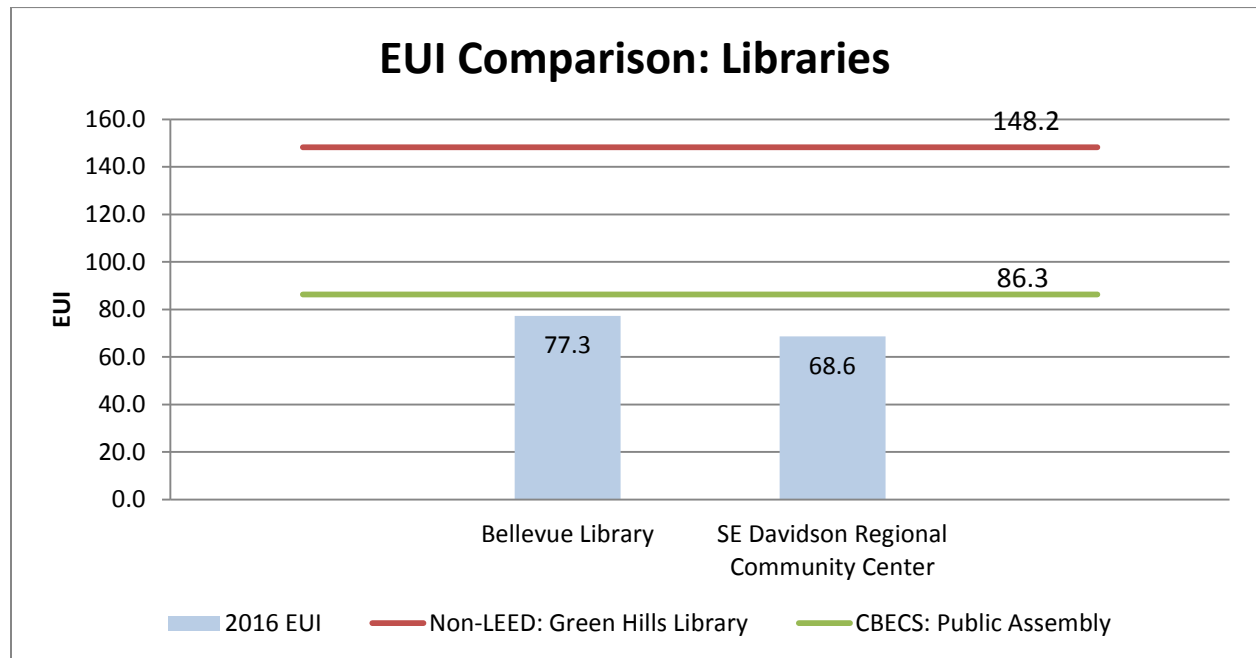
	Building sf	Water Consumption (gallons)	Water usage/sf	Water savings compared to Bellshire (gallons)
Douglass Head Start	30,546	337,393	11.0	-205,778
Highland Heights	91,565	405,470	4.4	-10,940
Non-LEED: Bellshire Elementary	58,164	250,614	4.3	
Total				-216,718

Libraries

Energy Consumption

Energy consumption for the two libraries is compared in the graph below to the non-LEED® Green Hills Library as well as to the national CBECS benchmark for a similar type building.

The Southeast Davidson Regional Community Center houses a community center as well as a library. For this report, the building is compared to a non-LEED® library.



Energy costs for the two libraries are compared in the table below to the non-LEED® Green Hills Library as well as to the national CBECS benchmark for a similar type building (Public Assembly).

	Building sf	Energy Cost /sf	EUI	Annual savings compared to non-LEED® Green Hills Library	Annual savings compared to national benchmark
Bellevue Library	24,580	\$1.85	77.3	\$50,804.95	\$6,460.56
SE Davidson Regional Community Center	78,791	\$1.28	68.6	\$154,316.37	\$34,340.71
Non-LEED: Green Hills Library	25,540	\$2.39	148.2		
CBECS: Public Assembly	15,800	\$1.84	86.3		
Total				\$205,121.33	\$40,801.26

Water Consumption

Water consumption at the two library buildings and comparisons to the non-LEED® Green Hills library are shown in the table below.

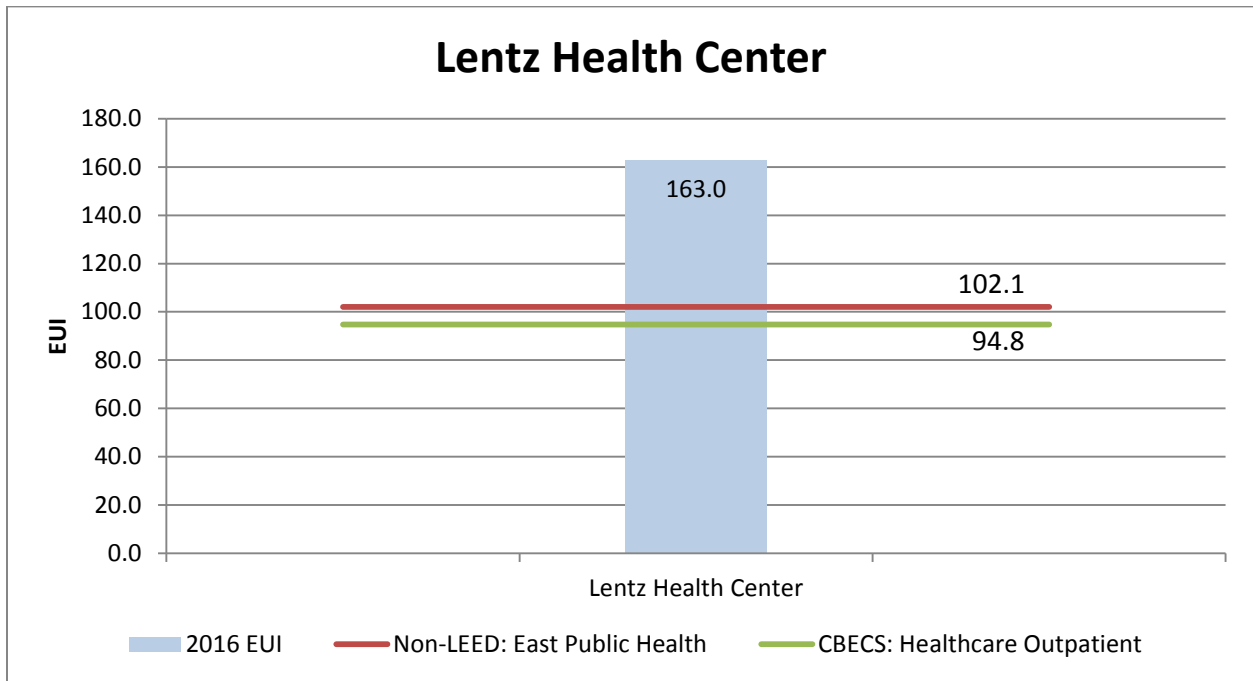
	Building sf	Water Consumption (gallons)	Water usage/sf	Water savings compared to Green Hills (gallons)
Bellevue Library	24,580	954,576	38.8	-301,641
SE Davidson Regional Community Center	78,791	3,015,591	38.3	-922,613
Non-LEED: Green Hills Library	25,540	678,436	26.6	
Total				-1,224,254

- The water meter at SE Davidson Regional Community Center is combined with Ford Ice Center. The water usage was split between the two buildings according to square footage. This is not accurate, since water use intensity differs between a community center/library and an ice rink. Without sub-metering, it is difficult to draw an accurate picture of water consumption between the buildings. As stated above, moving forward General Services will be sub-metering irrigation for more concise water usage metrics.

Lentz Health Center

Energy Consumption

Energy consumption for Lentz is compared in the graph below to the non-LEED® East Public Health as well as to the national CBECS benchmark for a similar type building.



Lentz has a high energy usage for operations, since there are multiple clinics within the building, special coolers to keep vaccines, and specialized air handling equipment to accommodate tuberculosis areas. It is difficult to find a comparable public service building in Davidson County of similar size.

The energy cost for Lentz is compared in the table below to the non-LEED® East Public Health as well as to the national CBECS benchmark for a similar type building (Healthcare Outpatient).

	Building sf	Energy Cost /sf	EUI	Annual savings compared to non- LEED® East Public Health	Annual savings compared to national benchmark
Lentz Health Center	106,080	\$2.33	163.0	-\$124,466.32	-\$139,356.82
Non-LEED: East Public Health	13,800	\$0.90	102.1		
CBECS: Healthcare Outpatient	12,100	\$2.08	94.8		

Water Consumption

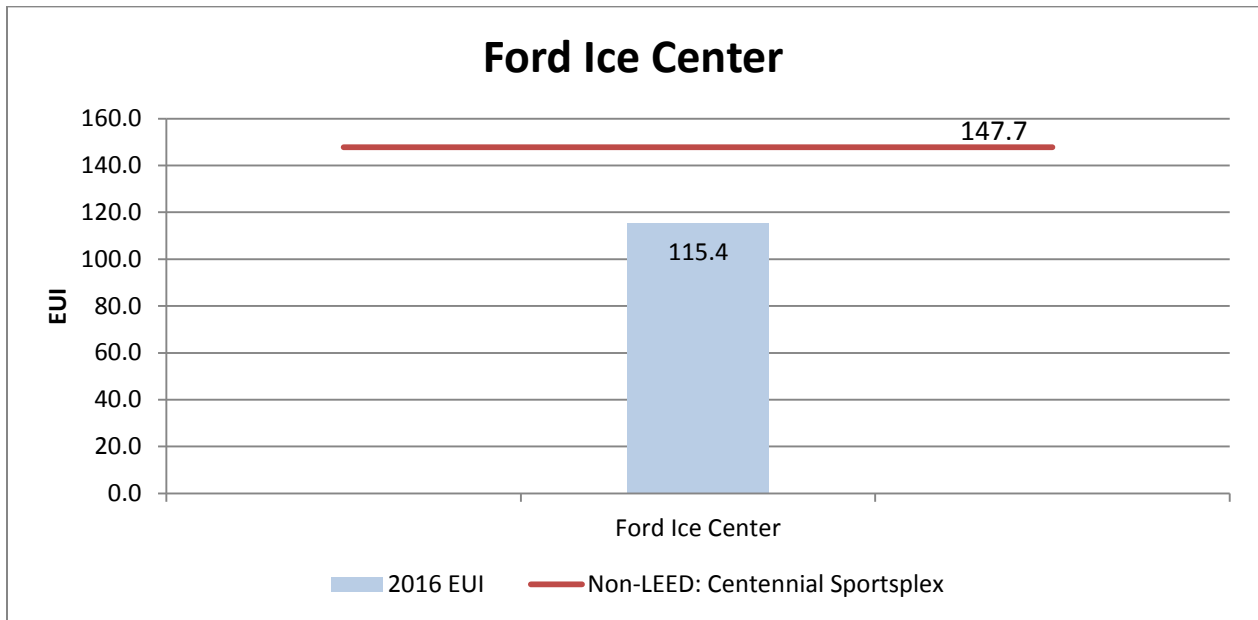
Water consumption at Lentz and a comparison to the non-LEED® East Public Health water usage are shown in the table below.

	Building sf	Water Consumption (gallons)	Water usage/sf	Water savings compared to East Public Health (gallons)
Lentz Health Center	106,080	1,514,903	14.3	601,324
Non-LEED: East Public Health	13,800	275,301	19.9	
Total				601,324

Ford Ice Center

Energy Consumption

Energy consumption for the Ford Ice Center is compared in the graph below to the non-LEED® Centennial Sportsplex (ice rink only). There is no national CBECs benchmark for a similar type building.



The energy cost for Lentz is compared in the table below to the non-LEED® Centennial Sportsplex (ice rink only).

	Building sf	Energy Cost /sf	EUI	Annual savings compared to non-LEED® Centennial Sportsplex
Ford Ice Center	91,003	\$2.08	115.4	\$71,474.33
Non-LEED: Centennial Sportsplex	61,000	\$3.11	147.7	

Water Consumption

Water consumption at the Ford Ice Center and a comparison to the non-LEED® Centennial Sportsplex water usage (estimated to only reflect the ice rink usage) are shown in the table below.

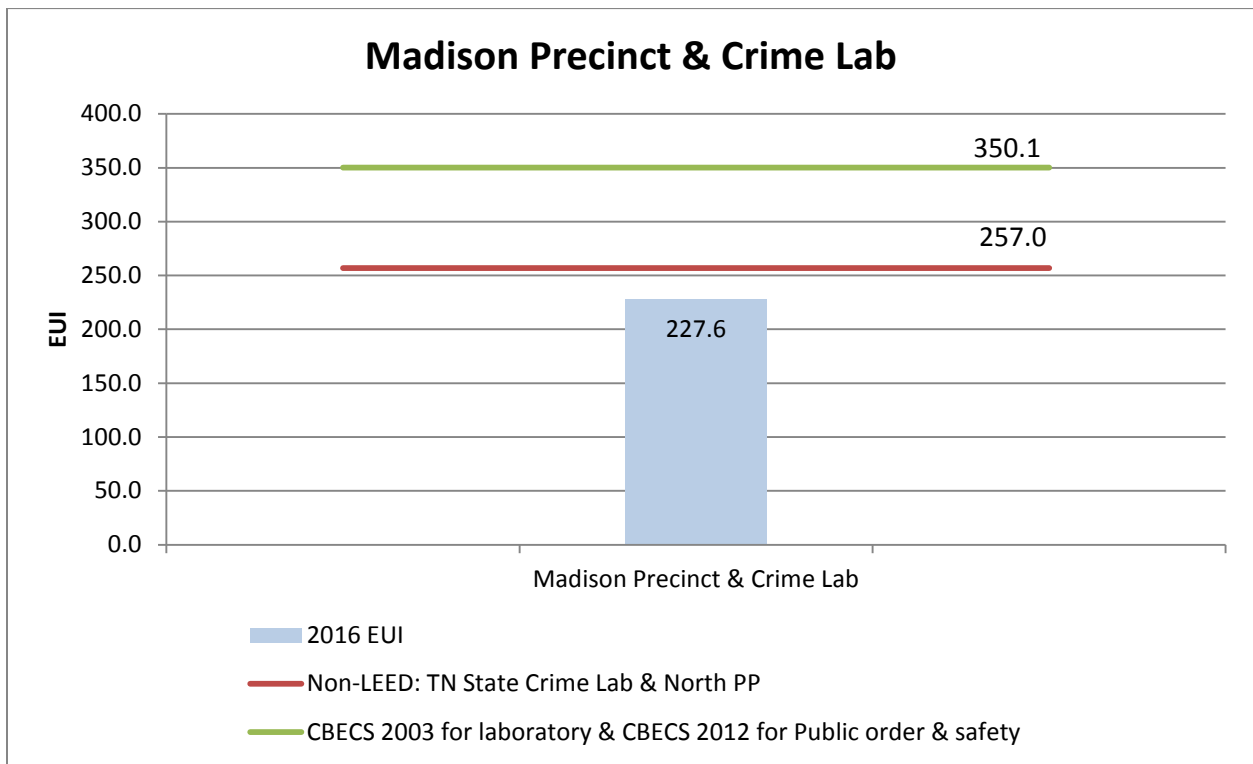
	Building sf	Water Consumption (gallons)	Water usage/sf	Water savings compared to Centennial (gallons)
Ford Ice Center	91,003	2,684,183	29.5	2,974,215
Non-LEED: Centennial Sportsplex	61,000	3,792,867	62.2	
Total				2,974,215

- The water meter at SE Davidson Regional Community Center is combined with Ford Ice Center. The water usage was split between the two buildings according to square footage. This is not accurate, since water use intensity differs between a community center/library and an ice rink. Without the needed sub-metering, it is difficult to draw an accurate picture of water consumption between the buildings. As stated above, moving forward General Services will be sub-metering irrigation for more concise water usage metrics

Madison Precinct & Crime Lab

Energy Consumption

Energy consumption for Madison Precinct & Crime Lab is compared in the graph below to the non-LEED® TN State Crime Lab & North Police Precinct as well as to the national CBECS benchmark for a similar type building. The Madison building consists of a police station (first floor) and a crime lab (second floor). For the non-LEED® comparison, the data from North Police Precinct was combined with the data from the TN State Crime Lab in Nashville. The national benchmark was calculated by combining the EUI for Public Order & Safety with the EUI for a laboratory space.



The energy cost for Madison Precinct & Crime Lab is compared in the following table to the non-LEED® TN State Crime Lab in Nashville & North Police Precinct composite building as well as to the national CBECS benchmark for a similar type building (Laboratory combined with Public Order & Safety). Note that Madison Precinct has a community meeting room.

	Building sf	Energy Cost /sf	EUI	Annual savings compared to non- LEED® North PP & TN State Crime Lab	Annual savings compared to national benchmark
Madison Precinct & Crime Lab	83,006	\$3.55	227.6	\$50,383.45	\$209,744.16
Non-LEED: TN State Crime Lab in Nashville & North PP	164,000 & 19,256	\$3.21	257.0		
CBECS: Laboratory & Public Order & Safety			350.1		

- The CBECS tables do not contain the mean square footage or energy cost data for a Laboratory, thus no average building square footage or energy cost per square foot can be provided in the table for a national benchmark building but the projected cost savings are based on the EUI in the table.

Water Consumption

Water consumption at the Madison Precinct & Crime Lab was compared to the combination building of the non-LEED® TN State Crime Lab in Nashville and North Police Precinct in the table below. The water usage of North Police Precinct was adjusted to be from the same square footage as the first floor of Madison, and the water usage of the TN State Crime Lab was adjusted to be from the same square footage as the second floor of Madison.

	Building sf	Water Consumption (gallons)	Water usage/sf	Water savings compared to TN State Crime Lab in Nashville & North PP (gallons)
Madison Precinct & Crime Lab	83,006	887,247	10.7	2,151,103
Non-LEED: TN State Crime Lab in Nashville	164,000	927,644	5.7	
Non-LEED: North PP	19,256	1,319,648	68.5	
Total				2,151,103

Solar Production

The rooftop solar panels on eight Department of General Services' buildings produced 141,255 kWh during 2016, resulting in rebates of \$22,468. Fire Station #19 uses the solar energy behind the meter, thus rebates are not received for this fire station. 15.5% of the electricity consumed by Fire Station #19 was generated by the solar panels. The value of this electricity is shown in the following table.

Rooftop solar facility	Size of Array (kW)	2016 Production (kWh)	Solar Generation Revenue
Howard Office Building	29.89	31,381	\$7,185.16
Fire Station #3	8.64	11,062	\$2,600.25
Fire Station #11	10.50	9,205	\$1,845.92
Fire Station #19	33.80	38,959	\$4,908.84
Fire Station #21	7.92	5,923	\$1,192.42
Fire Station #30	18.00	25,885	\$5,197.86
Fire Station #31	8.64	7,938	\$1,913.19
Fire Station #33	7.92	10,902	\$2,533.66
Total	125.31	141,255	\$22,468.46

- General Services receives incentives on top of the retail electricity rate for all installations except Fire Station #19, which uses the solar energy behind the meter. Thus Howard Office Building received more solar revenue than Fire Station #19, even though it produced less kWh. TVA phased out these incentives so that new solar installations now only receive the retail electricity rate for energy put onto the grid.

Appendix 1: Square Footage of Buildings

The below list includes the Department of General Services LEED facilities and their non-LEED comps:

High Performance Building	Square Footage
Fire Stations	
Fire Station #3	16,061
Fire Station #11	15,255
Fire Station #19	18,266
Fire Station #20	12,176
Fire Station #21	18,759
Fire Station #30	15,042
Fire Station #31	16,010
Fire Station #33	15,536
Fire Station #35	11,586
Non-LEED: Fire Station #17	6,940
Police Precincts	
Midtown Hills Police Precinct	21,722
West Police Precinct	22,724
Non-LEED: North Police Precinct	19,256
Office Buildings	
Lindsley Hall	28,629
Howard Office	139,025
Non-LEED: Metro Office Building	58,473
Schools	
MAC - Douglass Head Start School	30,546
Highland Heights School	91,565
Non-LEED: Bellshire Elementary	58,164
Libraries	
Bellevue Library	24,580
Southeast Davidson Regional Community Center	78,791
Non-LEED: Green Hills Library	25,540
Lentz Health Center	
Lentz Health Center	106,080
Non-LEED: East Public Health	13,800
Ford Ice Center	
Ford Ice Center	91,003
Non-LEED: Centennial Sportsplex (ice rink only)	61,000
Madison Precinct & Crime Lab	
Madison Precinct & Crime Lab	83,006
Non-LEED: TN State Crime Lab/North Police Precinct	164,000

