



SALT LAKE CITY CORPORATION

2016 MUNICIPAL BENCHMARKING & GREENHOUSE GAS EMISSIONS REPORT



JULY 2017

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EXECUTIVE SUMMARY

This annual report details greenhouse gas emissions across all Salt Lake City Corporation operations. The report also includes detailed energy benchmarking performance for certain facilities within each department.

Detailed energy benchmarking complies with the Comprehensive Energy Management Executive Order of Salt Lake City. City facilities must adhere to the below internal requirements:

Salt Lake City is committed to the efficient use of resources and leading by example through our municipal operations. The City owns and operates numerous facilities and buildings, many of which are significant contributors to our emissions footprint and ongoing City operational costs. This Executive Order identifies and requires the implementation of energy management best practices for these facilities and buildings.

All City departments can be positive contributors to internal and community-level energy goals and are subject to the rules specified in this Order. The Order addresses all aspects of City operations that require the use of electricity, natural gas or other energy resources in order to operate buildings, facilities or other fixed assets other than fleet and mobile equipment.

Through implementation of this Executive Order, Salt Lake City Corporation will enhance interdepartmental coordination, reduce energy waste and better ensure the responsible use of City resources. By using less energy and simultaneously deploying clean and renewable energy resources the City will mitigate pollution associated with regional air quality issues and cross-cutting challenges such as climate change.

Executive Order requirements addressed in this report:

Benchmarking: Annual benchmarking of the energy consumption of all Tier 1 - 3 and Other Tier City facilities through an industry-recognized tool such as ENERGY STAR Portfolio Manager or comparable tools approved by the Steering Committee.

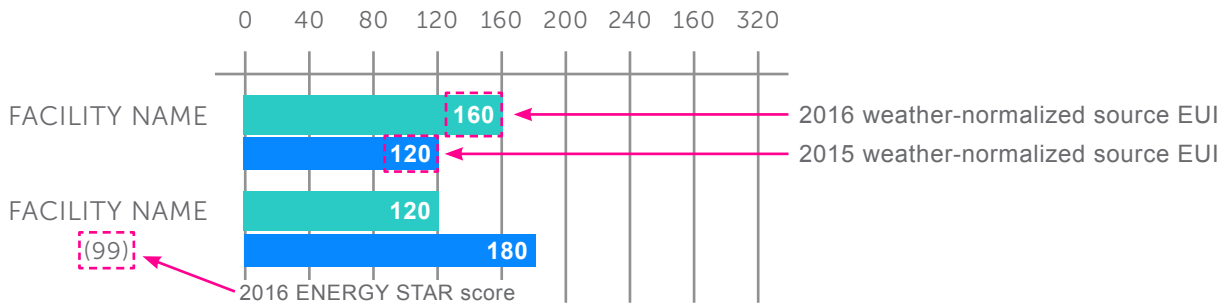
Transparency of facility energy performance: Energy performance information, including an ENERGY STAR score if available, for all Tier 1 - 3 City facilities shall be made available to City employees and the public. These details will be published on an annual basis pursuant to the rules developed by the Steering Committee.

This report identifies the large municipal buildings in Salt Lake City and tracks energy use as the City makes progress toward its climate and energy-related goals. Building energy use data will be used to identify energy-related opportunities and to develop energy management strategies to reduce consumption and associated emissions, while improving energy efficiency and City operations.

UNDERSTANDING THIS REPORT

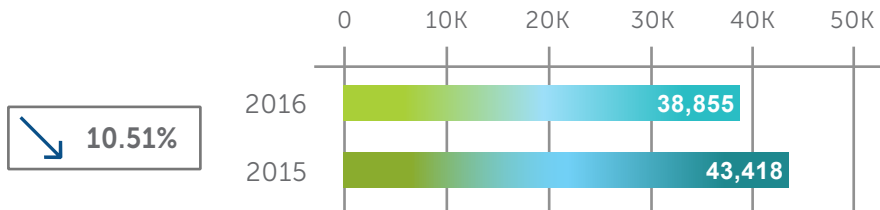
Annual benchmarking of City facilities is broken down by department. First, the 2016 annual greenhouse gas emissions are given, with a percent increase or decrease from 2015. Under each department heading, applicable Tier 1-3 facilities are listed. For each facility, the weather-normalized source EUI is given for the two most current years (2015 - 2016). Represented graphically are both year-over-year fuel data and the 2016 emissions mix for each department.

TIER 1 - 3 FACILITY EUI

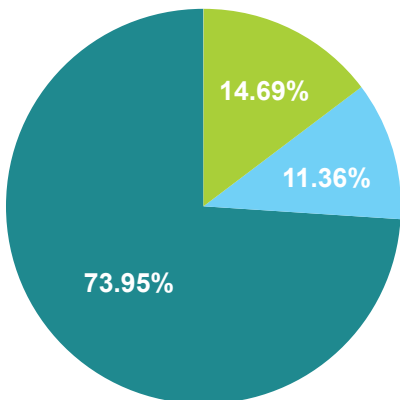


Facilities are listed for each department that are considered Tier 1-3 in size (greater than 3,000 square feet); each facility's EUI for years 2015 and 2016 are listed beside the facility name. The higher the EUI, the more energy intensive a building is, based on several variables. EUI takes into account electricity and natural gas consumption for each facility. The current year (2016) ENERGY STAR score is listed under the facility name, where available.

EMISSIONS: ELECTRICITY, NATURAL GAS, OR FLEET






Under each Department Summary, three charts detail year-over-year emissions for electricity, natural gas, and fleet, following the color guide above. The units listed on the horizontal axis are metric-tonnes CO2-equivalent, the standard measure for greenhouse gas emissions. To the left of the chart is a percentage that describes the change in emissions from 2015 to 2016, denoted with a directional arrow.



MUNICIPAL GREENHOUSE GAS EMISSIONS BREAKDOWN

The graphic at the left describes annual GHG emissions mix at the department level for 2016. The three energy fuel types are electricity, natural gas, and vehicle fuel. Vehicle fuel data totals emissions from the City's vehicle fleet that operate using compressed natural gas, diesel, biodiesel, unleaded gasoline, and premium gasoline. The fleet considers automobiles as well as light- and heavy-duty equipment.

-  Electricity
-  Natural Gas
-  Vehicle Fuel

GLOSSARY & DEFINITIONS

Carbon dioxide equivalent (CO₂e) - Carbon dioxide equivalent is a measure used to compare the emissions from various greenhouse gases (carbon dioxide, methane, and nitrous oxide) based on their global warming potential.

Dekatherm - A dekatherm (dth) is a unit of energy used primarily to measure natural gas. It is equal to 10 therms or 1,000,000 British thermal units (MMBtu).

Emissions Mix - The energy mix is represented by a tri-color chart for each department and for municipal totals. The three energy fuels represented are electricity, natural gas, and vehicle fuel. The energy mix is expected to change from year to year and represents departmental energy use at a high level.

EUI (energy use intensity) - Expresses a building's energy use as a function of its size or other characteristics. For most properties, EUI is expressed as energy per square foot per year. It is calculated by dividing the total energy consumed by the building in one year by the total gross floor area of the building. Generally, a low EUI indicates good energy performance.

GHG (greenhouse gas) - A gas that traps heat in the atmosphere is referred to as a greenhouse gas.

kWh (kilowatt hour) - A kilowatt hour (or kWh) is a unit of energy equal to 3.6 megajoules. If the energy is being transmitted or used at a constant rate (power) over a period of time, the total energy in kilowatt-hours is the power in kilowatts multiplied by the time in hours.

mT (metric tonne) - One metric tonne is equal to 2204.62 pounds; the mT is a common unit of measure to describe carbon dioxide equivalents.

Tier 1 - 3 Facility - Tier 1 through Tier 3 facilities are a categorization of facilities within Salt Lake City that cover a specific range of square footage. A Tier 1 facility means a facility between 3,000 and 21,999 gross square feet in total combined floor area that is owned and operated by the City and for which the City pays all or part of the annual energy bills; Tier 2 facilities have a gross square footage between 22,000 and 49,999; Tier 3 facilities have a gross square footage of 50,000 or more. All Facilities listed in this report are within the Tier 1 - 3 range.

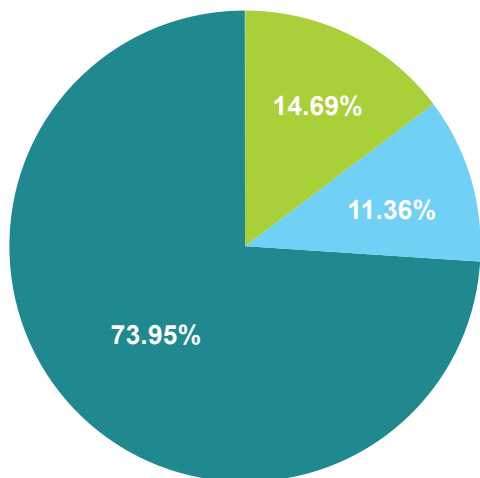
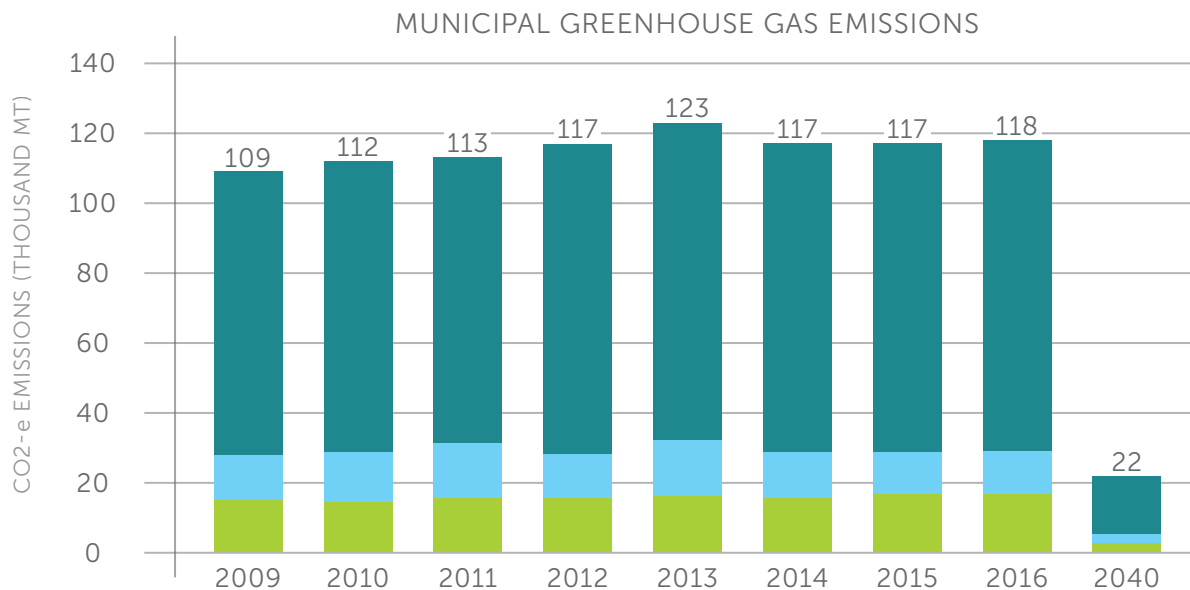
Vehicle fuel - Mix of compressed natural gas, unleaded gasoline, premium gasoline, diesel, and biodiesel. Electricity to power electric vehicles is not included in the vehicle fuel emission data, but is included as facility electricity emissions data.

Weather-normalized source EUI - The source energy use your property would have consumed during 30-year average weather conditions, divided by square footage of a facility. It can be helpful to use this weather-normalized value to understand changes in energy when accounting for changes in weather. Source energy represents the total amount of raw fuel required to operate a building, including fuel consumed upstream for electricity generation.

MUNICIPAL GREENHOUSE GAS EMISSIONS

SALT LAKE CITY CORPORATION

Salt Lake City Corporation primarily generates greenhouse gas emissions through electricity, natural gas, and vehicle fuel use. Three largest departments produce more than 86% of municipal greenhouse gas emissions: Airport (44.4%), Public Utilities (23.3%), and Public Services (18.9%). Greenhouse gas emissions from 2009 through 2016 are represented below, as well as the 2040 emissions target. Salt Lake City intends to achieve its 2040 goal through efforts in stride with long-term goals: 50% renewable municipal electricity by 2020, 100% renewable energy by 2032, and an 80% reduction in GHG emissions from the 2009 baseline by 2040.



2016 EMISSIONS MIX



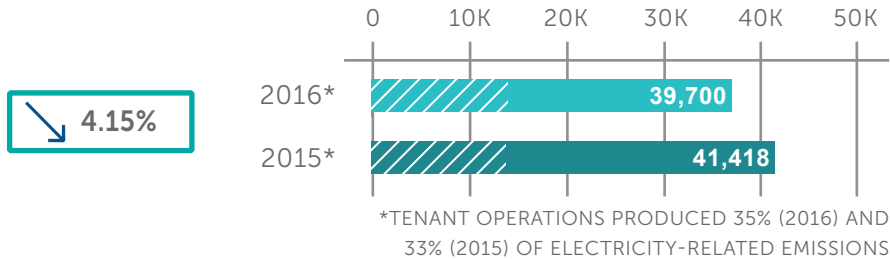
The City has a 2040 goal of reducing municipal emissions by 80%. In 2016, electricity contributed nearly 74% of total emissions from building energy for lighting, space heating and cooling, and powering electronics. The vehicle fuel is comprised of emissions from the city's vehicle fleet, which includes automobiles and light- and heavy-duty equipment. The municipal emissions mix from each department illustrates how Salt Lake City's buildings function and operate.

AIRPORTS

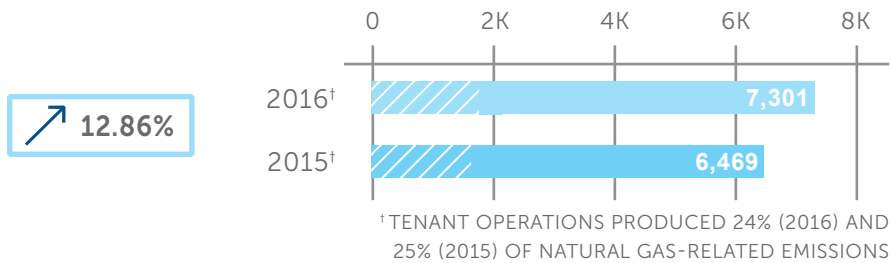
2016 DEPARTMENTAL CO₂e EMISSIONS: **52,529.07 mT**, .78% LOWER THAN 2015

[Click here to visit Airports' Community & Environment Plan.](#)

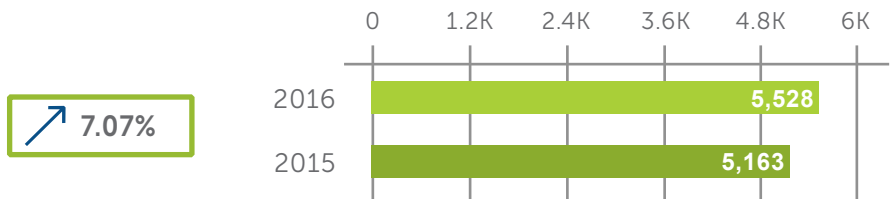
BUILDING EMISSIONS - ELECTRICITY



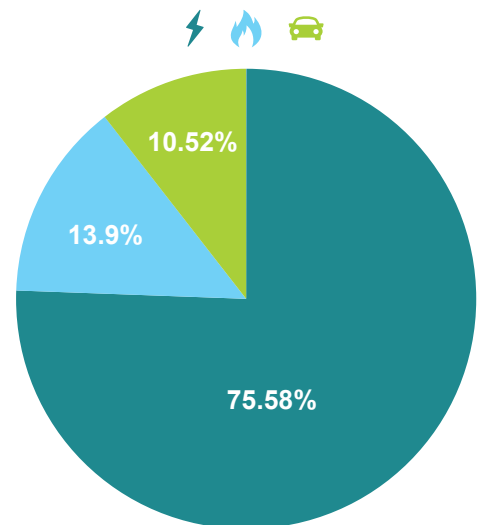
BUILDING EMISSIONS - NATURAL GAS



FLEET EMISSIONS - VEHICLE FUEL



AIRPORTS EMISSIONS MIX

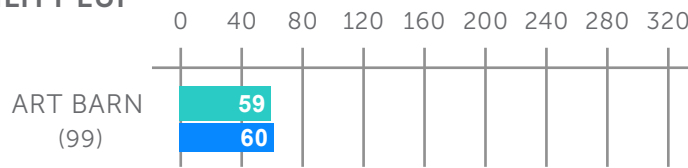


COMMUNITY & NEIGHBORHOODS

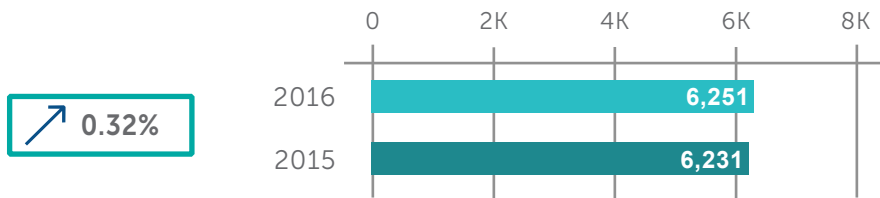
2016 DEPARTMENTAL CO₂e EMISSIONS: **6,427.94 mT**, .44% INCREASE FROM 2015

[Click here to visit the Community and Neighborhoods homepage.](#)

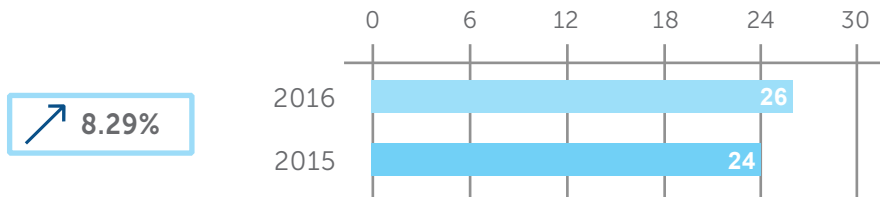
TIER 1 - 3 FACILITY EUI



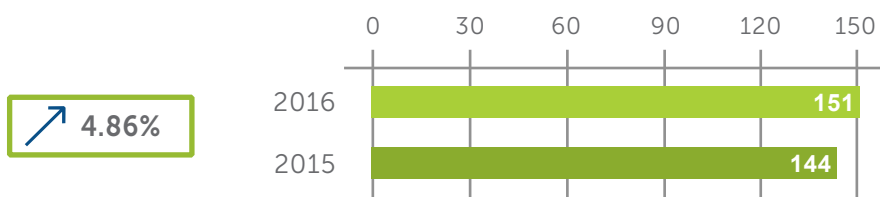
BUILDING EMISSIONS - ELECTRICITY



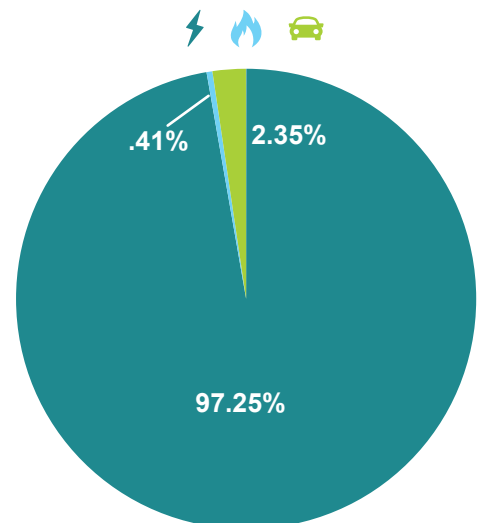
BUILDING EMISSIONS - NATURAL GAS



FLEET EMISSIONS - VEHICLE FUEL



CED EMISSIONS MIX

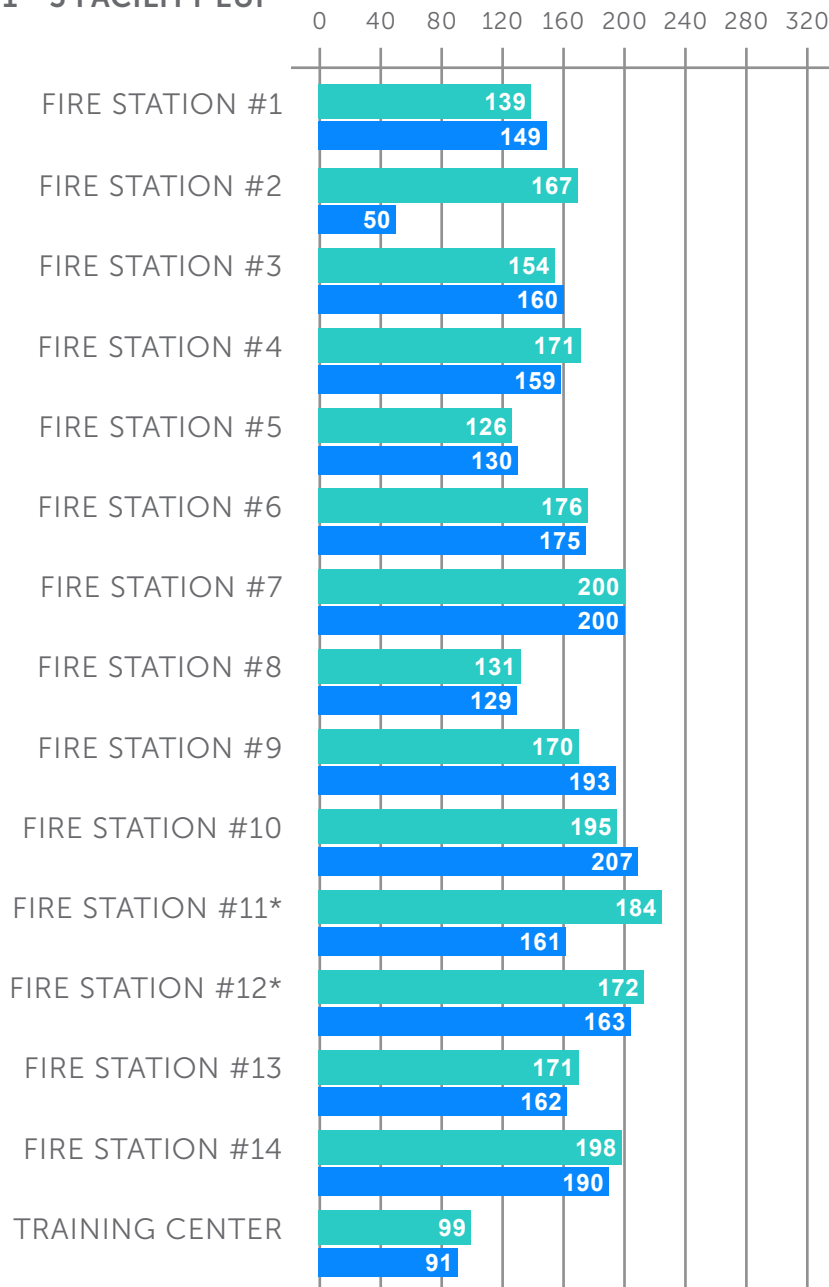


FIRE

2016 DEPARTMENTAL CO₂e EMISSIONS: **2,196.98 mT**, 6.73% INCREASE FROM 2015

[Click here to visit the SLC Fire homepage.](#)

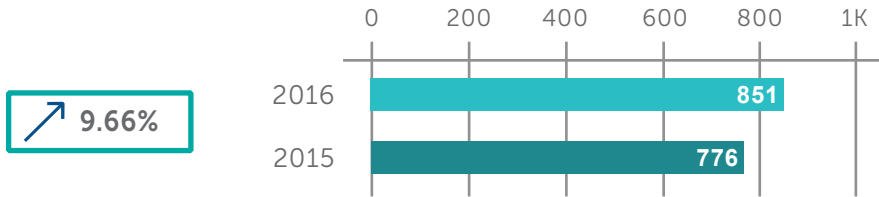
TIER 1 - 3 FACILITY EUI



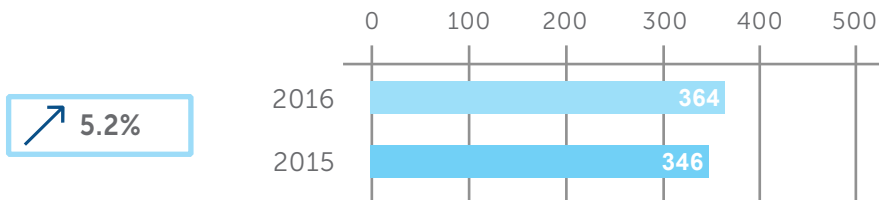
*FINANCED BY AIRPORTS

FIRE SUMMARY

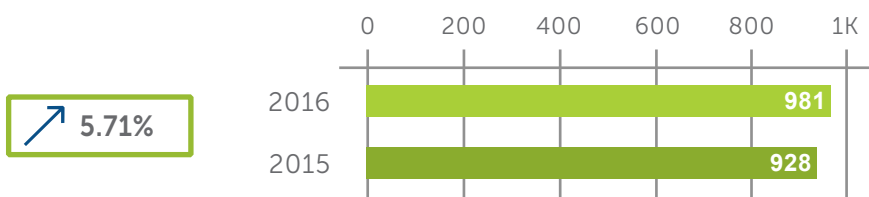
BUILDING EMISSIONS - ELECTRICITY



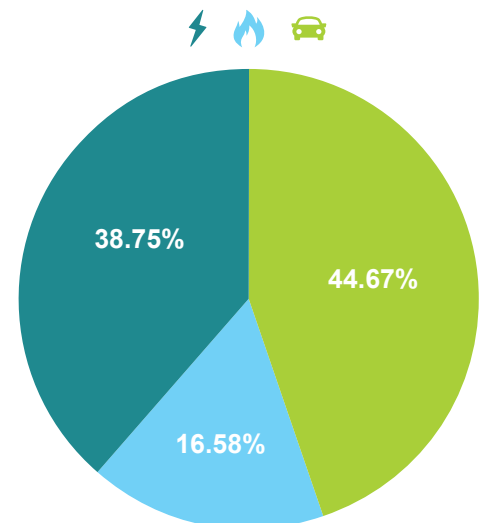
BUILDING EMISSIONS - NATURAL GAS



FLEET EMISSIONS - VEHICLE FUEL



FIRE EMISSIONS MIX

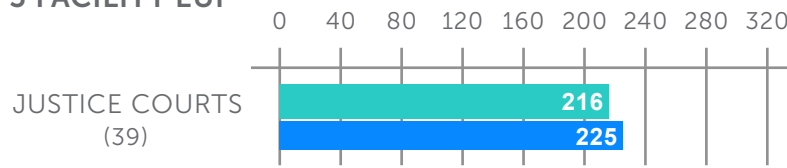


JUSTICE COURTS

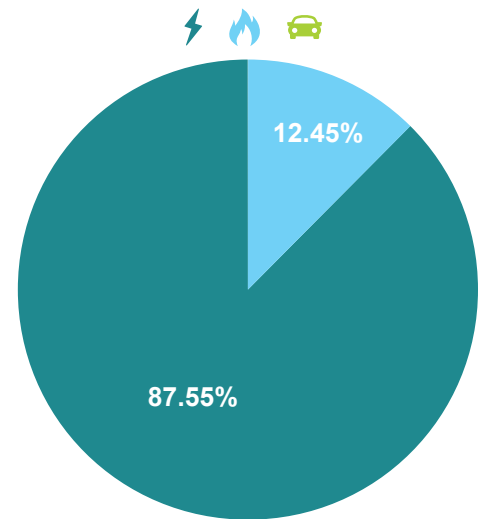
2016 DEPARTMENTAL CO₂e EMISSIONS: **324.84 mT**, 2.56% LOWER THAN 2015

[Click here to visit the Justice Courts homepage.](#)

TIER 1 - 3 FACILITY EUI



JUSTICE COURTS EMISSIONS MIX

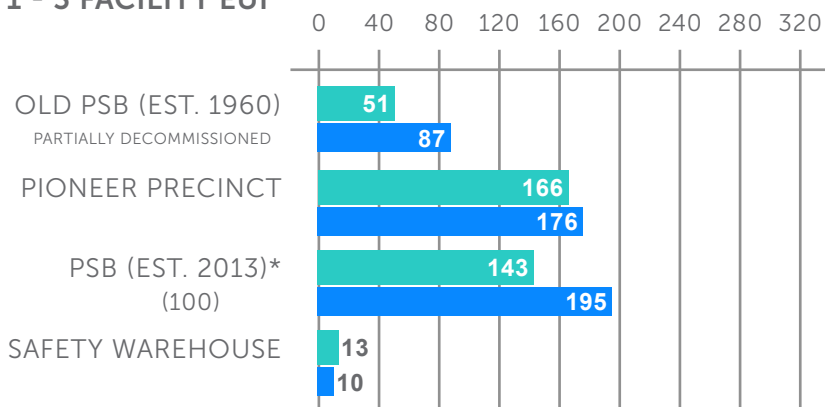


POLICE

2016 DEPARTMENTAL CO₂e EMISSIONS: **6,172.27 MT**, 13.43% LOWER THAN 2015

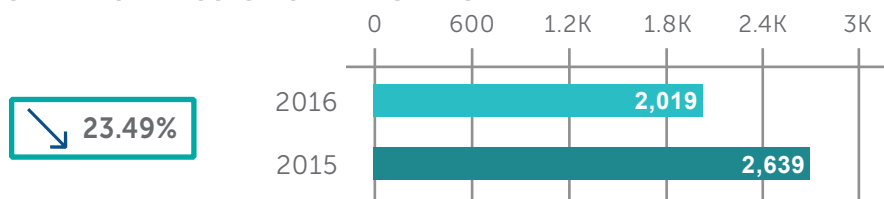
[Click here to visit the Police Department homepage.](#)

TIER 1 - 3 FACILITY EUI

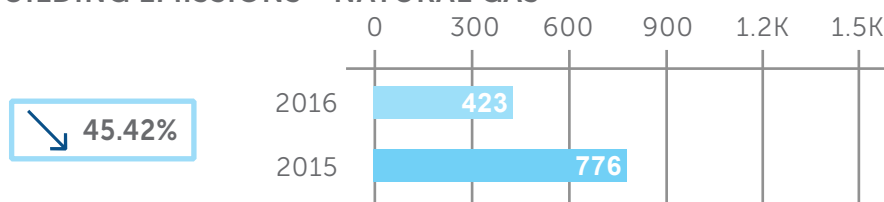


* SERVICED BY SOLAR FARM. FIGURES REPRESENT REMAINING ENERGY USE NOT OFFSET BY PRODUCTION.

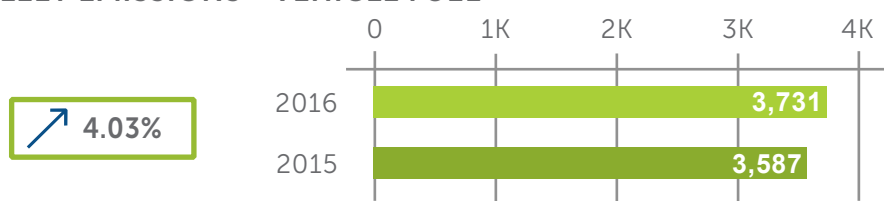
BUILDING EMISSIONS - ELECTRICITY



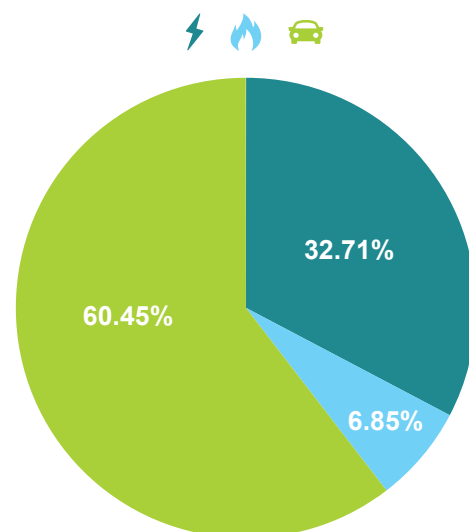
BUILDING EMISSIONS - NATURAL GAS



FLEET EMISSIONS - VEHICLE FUEL



POLICE EMISSIONS MIX

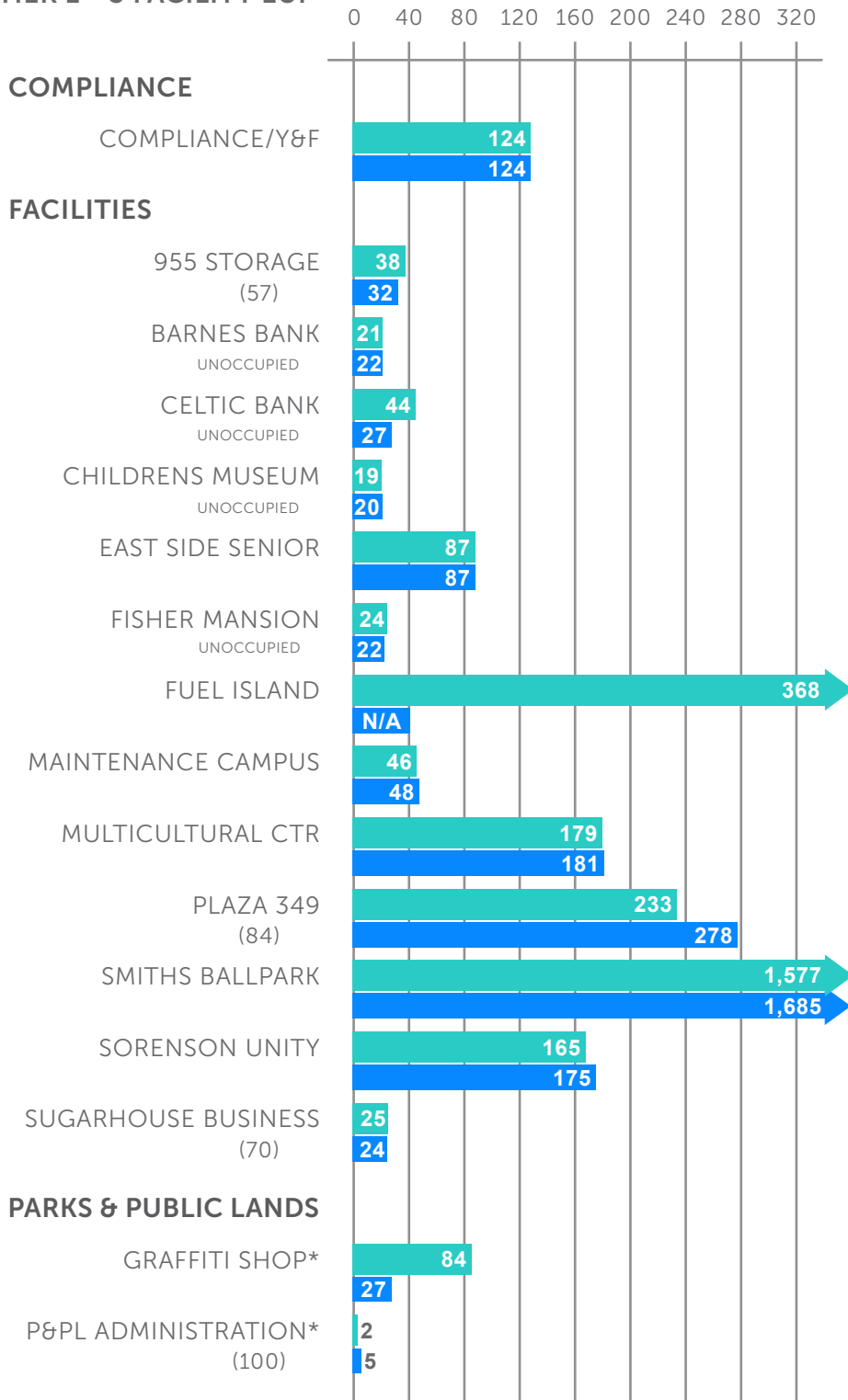


PUBLIC SERVICES

2016 DEPARTMENTAL CO₂e EMISSIONS: **22,342.46 mT**, 3.10% INCREASE FROM 2015

[Click here to visit the Public Services homepage.](#)

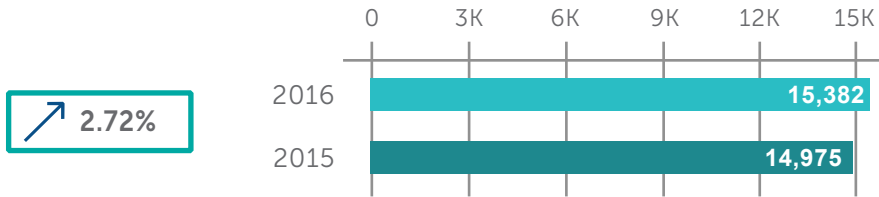
TIER 1 - 3 FACILITY EUI



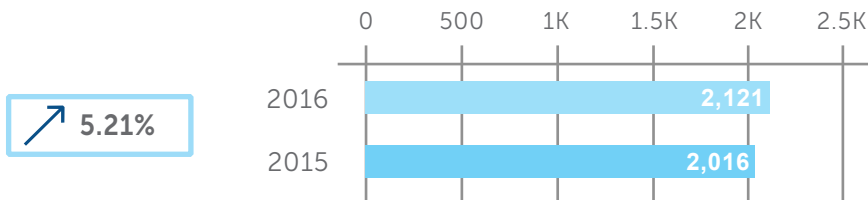
* SERVICED BY SOLAR FARM. FIGURES REPRESENT REMAINING ENERGY USE NOT OFFSET BY PRODUCTION.

PUBLIC SERVICES SUMMARY

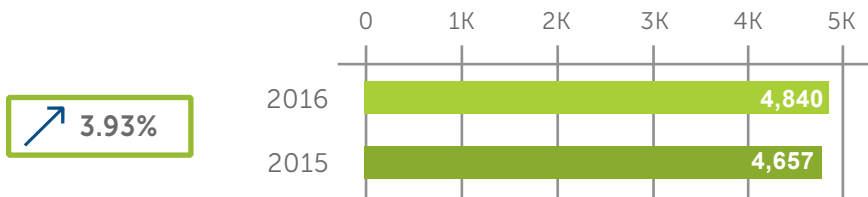
BUILDING EMISSIONS - ELECTRICITY



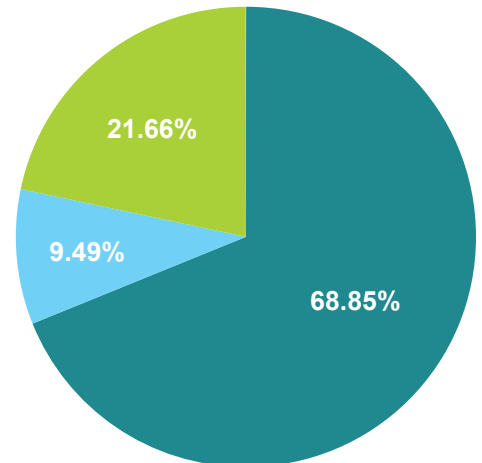
BUILDING EMISSIONS - NATURAL GAS



FLEET EMISSIONS - VEHICLE FUEL



PUBLIC SERVICES EMISSIONS MIX

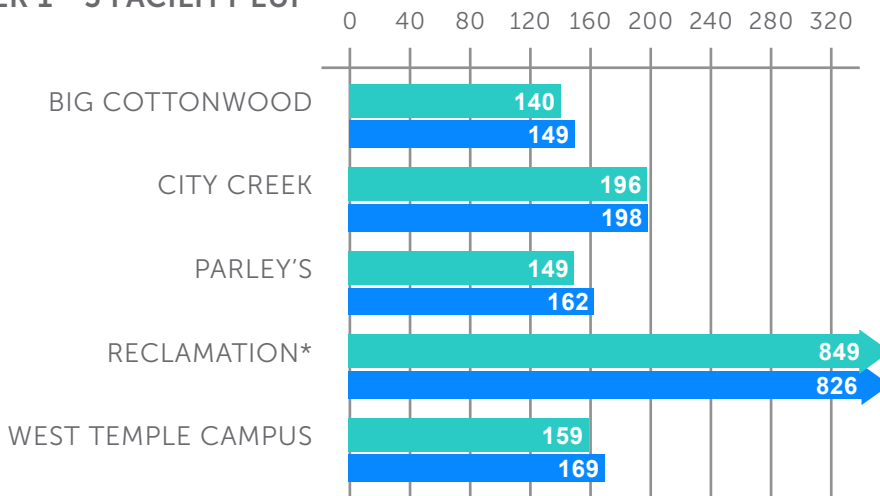


PUBLIC UTILITIES

2016 DEPARTMENTAL CO₂e EMISSIONS: **27,543.56 mT**, 4.91% INCREASE FROM 2015

[Click here to visit the Public Utilities homepage.](#)

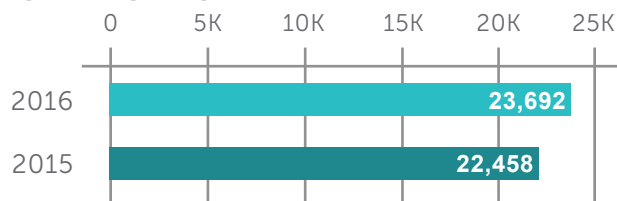
TIER 1 - 3 FACILITY EUI



*SERVICED BY BIODIGESTERS. FIGURES REPRESENT REMAINING ENERGY USE NOT OFFSET BY PRODUCTION.

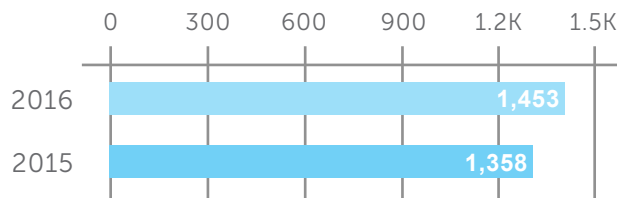
BUILDING EMISSIONS - ELECTRICITY

↑ 5.49%



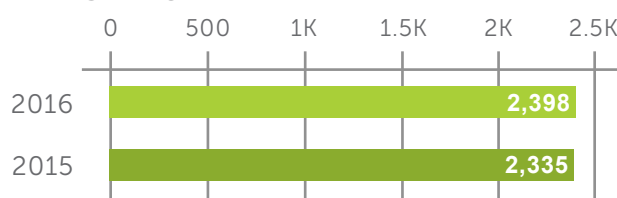
BUILDING EMISSIONS - NATURAL GAS

↑ 6.99%

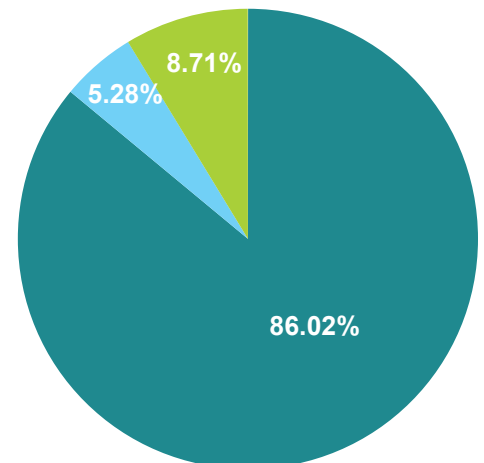


FLEET EMISSIONS - VEHICLE FUEL

↑ 2.7%



PUBLIC UTILITIES EMISSIONS MIX



CLEAN ENERGY & CLEAN VEHICLES

Salt Lake City is committed to the use of clean energy and fuel to power its facilities and vehicle fleet. Energy production projects have been installed on multiple City facilities, totaling almost 3,000 kW. Clean fuel vehicles are becoming more and more common in the City's fleet, with 188 hybrid, compressed natural gas (CNG) and electric vehicles. See below for specific facilities and vehicle types into which the City has invested clean energy and fuels.

MUNICIPAL RENEWABLE ENERGY INSTALLATIONS

Facility	Size of System (kW)
Leonardo Solar	30
Public Safety Building Solar	380
Landfill Solar	904
Plaza 349 Solar	34
Glendale Library Solar	44
Marmalade Library Solar	13.5
Public Utilities Biodigesters	1,400



View from the Public Safety Building rooftop solar installation.

ALTERNATIVE FUEL VEHICLE FLEET

Salt Lake City Corporation's fleet includes the following alternative fuel vehicles by fuel type:

Compressed natural gas	57
Electric	14
Hybrid	117



An electric vehicle from the City's vehicle fleet.

SALT LAKE CITY CORPORATION
DEPARTMENT OF SUSTAINABILITY

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JULY 2017