



City of Eugene, Oregon 2013 Operational Greenhouse Gas Inventory



Report prepared by Good Company, February 2017



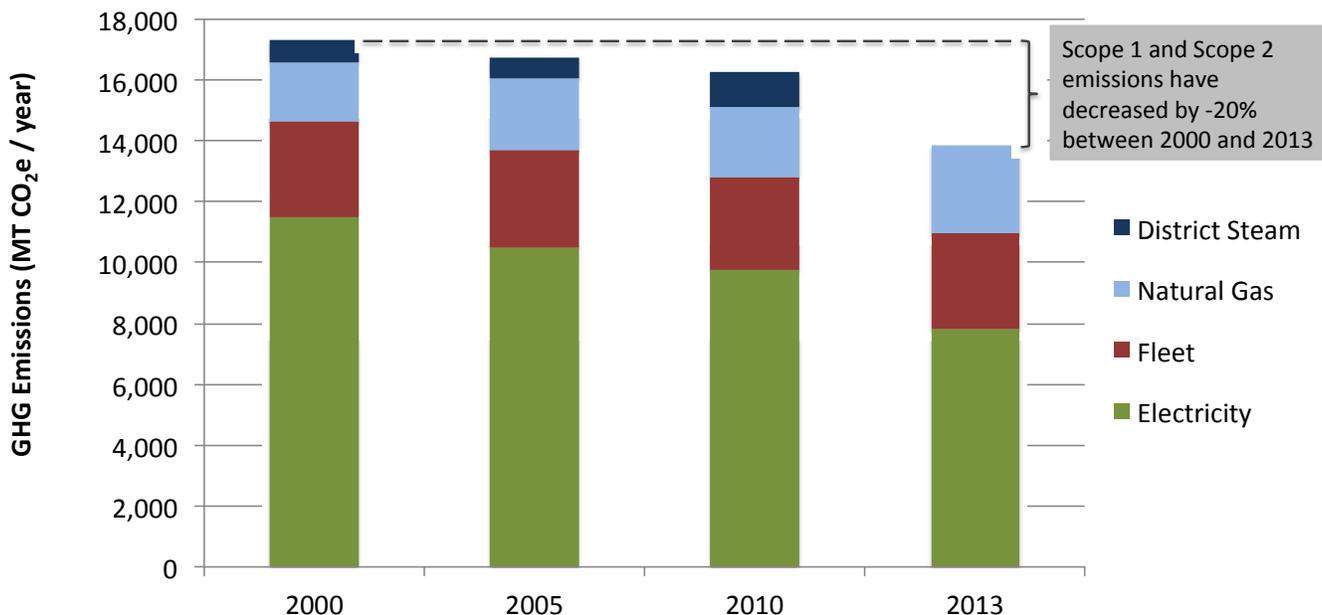
Introduction

The City of Eugene previously conducted operational greenhouse gas (GHG) inventories based on 2000, 2005, and 2010 data. This inventory, based on 2013 data, provides an update to allow the City to assess its progress towards meeting its operational GHG goal of carbon neutrality by 2020 for Scope 1 and Scope 2 emissions. The sources of emissions include: natural gas combustion by buildings; gasoline and diesel combustion by City-owned vehicles and equipment; and electricity and district steam use by buildings.¹

Summary of Findings

Between 2000 and 2013, the City's Scope 1 and Scope 2 emissions have decreased by -3,539 MT CO₂e, or -19.8% compared to emissions in 2000.² This decrease is overwhelmingly the result of electricity-related emissions, which have gone down by almost -32%. Emissions from the City's fleet have remained relatively consistent over the 13-year period, decreasing by about -1%. Emissions from natural gas and district steam used to heat air and water at City facilities have increased by 10% since 2000, but decreased by -16% since 2010. City operational emissions have continued to *decrease* even as Eugene's population *increased* by 14% over the same time period. As a result, City operational emissions per resident served (MT CO₂e / person) has gone down by -30% since 2000.

Figure 1: Summary of Scope 1 and Scope 2 emissions, 2000 – 2013.



¹ Fugitive refrigerant leakage, a Scope 1 emissions source included in previous inventories, is excluded from this update because these emissions were previously found to be relatively small in scale and data is time intensive to collect.

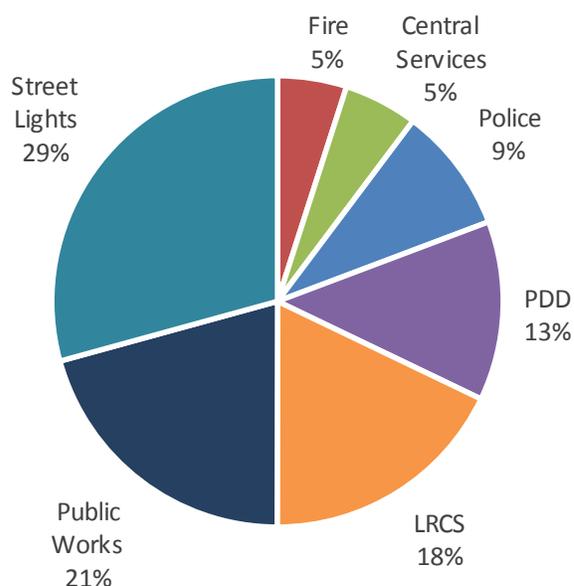
² While calendar year 2000 data was used for the first City of Eugene Operational GHG Inventory, and is included here for reference, it's important to note that the City's Climate Recovery Ordinance states that reductions should be measured against a 2005 baseline.

Detailed Findings

Electricity

In 2013, City buildings consumed 25,725 MWh of electricity and emitted 7,810 MT CO₂e (using location-based accounting) and 540 MT CO₂e (using market-based accounting). Within City operations the largest consumers of electricity include street lights, Public Works, Library, Recreation, and Cultural Services (LRCS), and Planning and Development (PDD). As is shown on Figure 1, the City's electricity emissions have been reduced by -32% since 2000 or -3,673 MT CO₂e (using the location-based method). This reduction has two components: 1) reduced use of electricity by the City, and 2) an increased supply of renewable and low-carbon electricity available on the regional electricity grid. Overall the City has reduced total electricity consumption by -8% between 2000 and 2013. The remaining emissions reductions are the result of less fossil fuel-powered electricity being used to meet the regional electricity demand.

Figure 2: Summary of 2013 electricity use, by department / service area.

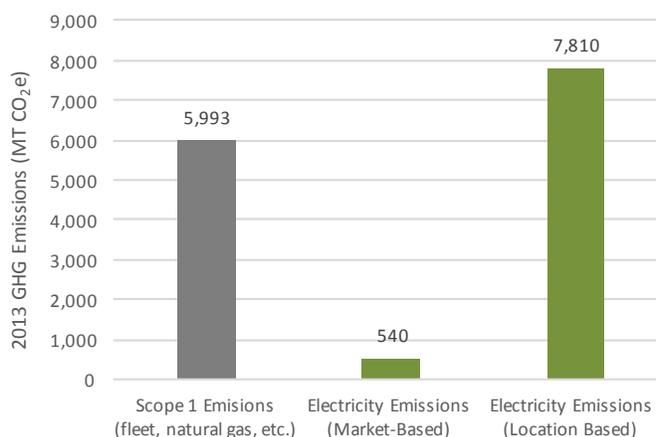


Location-Based vs. Market-Based Accounting

The most widely used standard for public agency greenhouse gas inventories is the Greenhouse Gas Protocol's *Scope 2 Guidance*, which suggests that organizations account for Scope 2 emissions using two methods - location-based³ and market-based⁴.

Figure 3 and 4 provide a comparison of emissions calculated using the location-based and market-based accounting methodologies. As is shown in Figure 4, the City purchases its electricity exclusively from EWEB and therefore market-based emissions are calculated solely using EWEB's utility-specific emissions factor. EWEB's emission factor is about 18 times less carbon intensive than the regional average. This is because EWEB is predominantly supplied through contracts with Bonneville Power Administration (BPA) who's generation supply is largely from low-carbon, hydroelectric and nuclear resources and EWEB's owned-generation resources are also low carbon (hydro and wind).

Figure 3: Comparison of the City's location-based vs. market based electricity emissions. Note: Scope 1 emissions are provided for comparison purposes.



³ **Location-based method (or regional grid)** represents the average emissions intensity of a specific electricity grid with defined geographic and temporal boundaries. It therefore represents the average GHG impacts associated with using or not using (due to efficiency or conservation) a kilowatt-hour of electricity by an organization. This method is focused on the connection between collective consumer demand and the emissions associated with supplying that demand and maintaining grid stability.

⁴ **Market-based method (or utility specific)** represents emissions from the electricity generation contracts that an organization has purposefully chosen. Related choices could include selection of a specific electricity utility (in markets with more than one); contracting with a specific supplier (in a power purchase agreement); or the purchase of renewable energy credits (RECs). This accounting method documents the carbon intensity of "contractual instruments" that convey the "environmental attributes" from a specific electricity supplier to the purchaser

Figure 4: Details of location-based and market-based emissions calculations.

| Accounting Method | Activity Data ¹ | | Emissions Factor | | Emissions MT CO ₂ e |
|-----------------------|----------------------------|----------------|--|----------------------------|-----------------------------------|
| | MWh / year | % of Total Use | Description | MT CO ₂ e / MWh | |
| Location-Based | 25,725 | 100% | Regional Grid Ave. (NWPP) ² | 0.3036 | 7,810 |
| | | | Location-Based Total: | | 7,810 |
| Market-Based | 25,725 | 100% | Utility-Specific (EWEB) ³ | 0.021 | 540 |
| | 0 | 0% | Power Purchase Agreements | - | - |
| | 0 | 0% | Renewable Energy Credits | - | - |
| | | | Market-Based Total: | | 540 |

Note 1: Activity data based on City of Eugene’s 2013 electricity consumption.

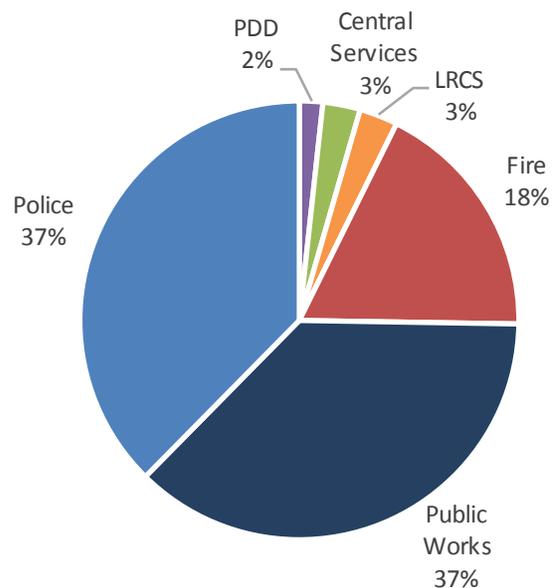
Note 2: Northwest Power Pool (NWPP) Emissions Factor is from eGRID 2012. 2012 is the most recent factor available.

Note 3: Utility-Specific factor is based on 2013 reporting by Oregon Department of Environmental Quality (ODEQ).

Fleet

In 2013, the City’s fleet consumed 387,000 gallons of fuel and emitted 3,149 MT CO₂e. The City’s fleet is made up of a variety of vehicles and equipment that are primarily fueled with gasoline blended with ethanol (E10) and diesel blended with biodiesel (B5). Figure 5 summarizes emissions, by department. Within City operations the largest consumers of fleet fuels include Police, Public Works, and fire. All other department represent 3% or less of fleet-related emissions.

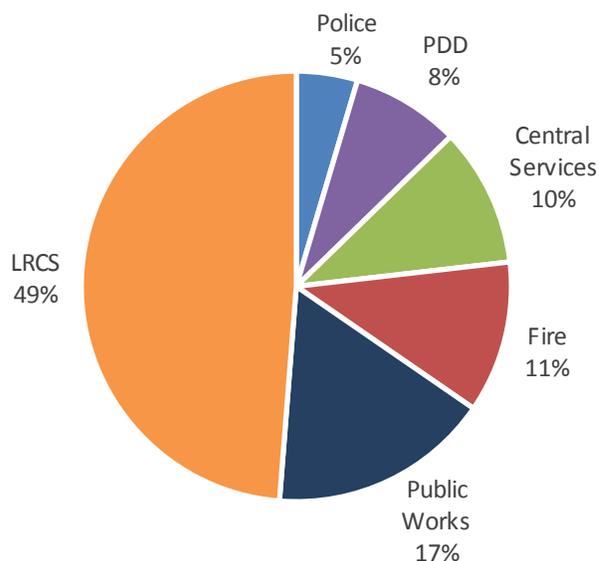
Figure 5: Summary of combined 2013 gasoline and diesel emissions, by department.



Facility Heat (Natural Gas and District Steam)

In 2013, City buildings consumed 551,000 therms of natural gas and emitted 2,922 MT CO₂e. The City's emissions from grid-supplied district steam and natural gas for facility heating needs have increased by 10% since 2000, but decreased by -15% since 2010. The recent decrease is likely due to the warmer winters we've experienced in recent years and the corresponding decrease in facility heating needs. City operations no longer use district steam as an energy source. These facilities have been transitioned to high-efficiency natural gas furnaces, which resulted in a net decrease in GHG emissions. Within City operations the largest consumers of natural gas include Fire and Emergency Services, Cultural Services, Library, Recreation, and Planning.

Figure 6: Summary of 2013 natural gas emissions, by department.



Methodology

The methodology used for this inventory follows The Climate Registry's *Local Government Operations Protocol*. Methodological details, as well as "GHG 101" information, is documented in the City's previous GHG inventory reports. The 2010 report may be downloaded at <https://www.eugene-or.gov/DocumentCenter/View/9467>.

Thanks to City of Eugene staff – Lynne Eichner (building energy) and Richard Perry (fleet fuel) – for providing data to support this inventory.

Note: Eugene's wastewater treatment plant emissions is under the management of a cooperative community partnership, Metropolitan Wastewater Management Commission (MWMC), not the City of Eugene. MWMC has completed independent GHG inventories for calendar years 2010, 2012, and 2014.