



# MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

*Rely on us.*

TO: Commissioners Schlossberg, Brown, Carlson, Barofsky, and McRae  
FROM: Sarah Gorsegner, Support Services Operations Manager  
DATE: November 24, 2021  
SUBJECT: 2020 EWEB Operational Greenhouse Gas Inventory  
OBJECTIVE: Information Only

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## **Issue**

EWEB has been tracking operational (internal) greenhouse gas (GHG) emissions since 2009. Included with this correspondence is the 2020 annual report.

## **Background**

Sources of operational GHG emissions include natural gas, fleet fuel, electricity, and fugitive releases of refrigerants and insulating gas (SF<sub>6</sub>).

## **Discussion**

The purpose of the 2020 GHG report is to track progress towards EWEB's emissions reduction goals. It will also be posted on the EWEB website so that it may be easily viewed by the public.

## **Requested Board Action**

None. This memorandum is provided for informational purposes only.

EUGENE WATER & ELECTRIC BOARD  
2020 OPERATIONAL GREENHOUSE GAS  
INVENTORY



## Executive Summary

Between 2009 and 2020, the Eugene Water & Electric Board's (EWEB) cumulative operations-based emissions (Scope 1 and 2) have decreased by 4,225 metric tons of carbon dioxide equivalent (MT CO<sub>2</sub>e), or 37%, using location-based accounting for electricity. This decrease is primarily due to a 67% reduction in fossil fuel fleet emissions and a 25% reduction in electricity-based emissions, which is largely the result of a reduction in the location-based emissions factor for electricity consumption (Figure 1). Using the significantly lower market-based emissions factor (first made available in 2010), EWEB has reduced operations-based emissions by 1,397 MT CO<sub>2</sub>e, or 40% (Figure 2). Using either of the two emissions factors, EWEB has achieved its goal of reducing operations-based emissions by 25% by 2020.

Despite EWEB's electricity consumption in 2020 being the lowest during the reporting period, the emissions associated with electricity consumption increased by almost four times from 2018 levels, due to the significant increase in the market-based emissions factor in 2019. This phenomenon underscores the relative importance of maintaining a low carbon power portfolio when compared to modest reductions in electricity consumption to achieve meaningful reductions in emissions. There was a 19% reduction in natural gas consumption in 2020, as compared to 2019, likely due to the significant proportion of EWEB's workforce that worked remotely in 2020 due to the COVID-19 pandemic.

EWEB's fleet continues to be the component in EWEB's operations that offers the most tangible and effective emissions reduction potential. Primarily due to the almost eleven-fold increase in biofuel use since 2009, there has been a 65% decrease in fossil fuel consumption, well ahead of the 50% goal, as well as a 67% decrease in emissions. As a result, fleet-based emissions in 2020 were the lowest in the entire reporting period. As the electrification of the fleet becomes more feasible in the coming years, even further reductions in emissions become possible.

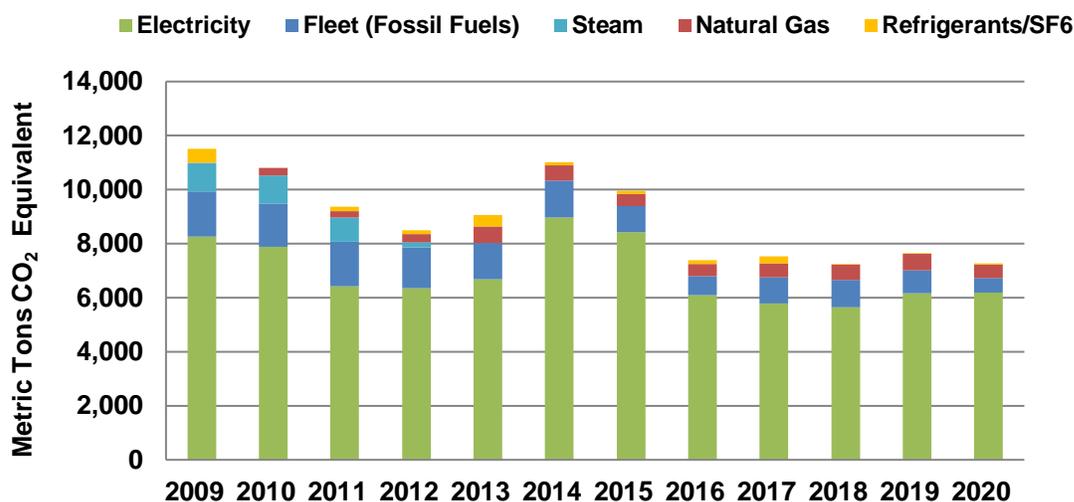


Figure 1. Scope 1 and 2 emissions using location-based emissions factor, 2009-2020.

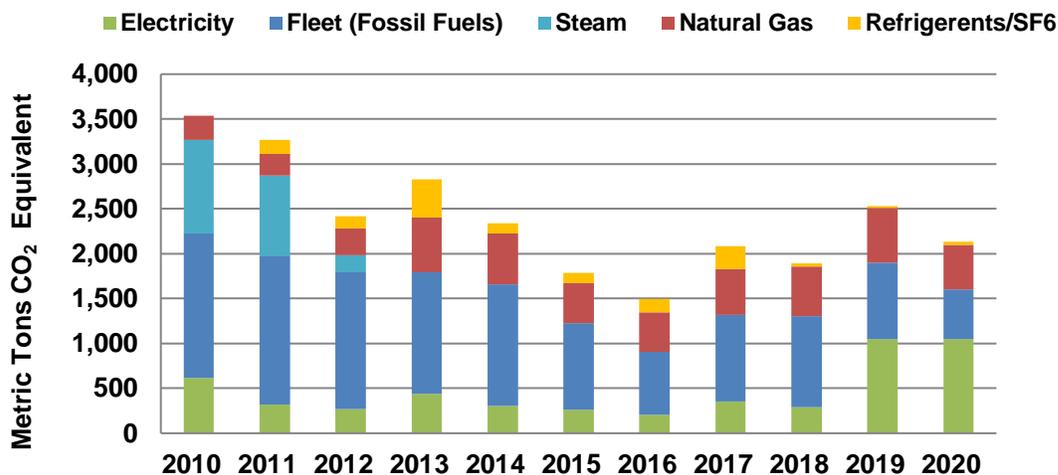


Figure 2. Scope 1 and 2 emissions using market-based emissions factor (first made available in 2010), 2010-2020.

## Overview

In order to better understand our contribution to global climate change and to measure our progress in reducing our climate impacts, EWEB annually prepares a greenhouse gas (GHG) inventory. The focus is on the GHG emissions associated with core business operations, such as fleet fuel consumption, electricity, and natural gas use. In 2011, EWEB developed GHG emission reduction goals to set a target for reductions within our own operations. The goals are:

- By 2020 achieve greenhouse gas levels 25% below 2009 levels in all EWEB operations
- By 2030, reduce fossil fuel use by 50% (compared to 2009 levels)
- By 2050, EWEB operations will be carbon-neutral (i.e. reduce net carbon to zero)

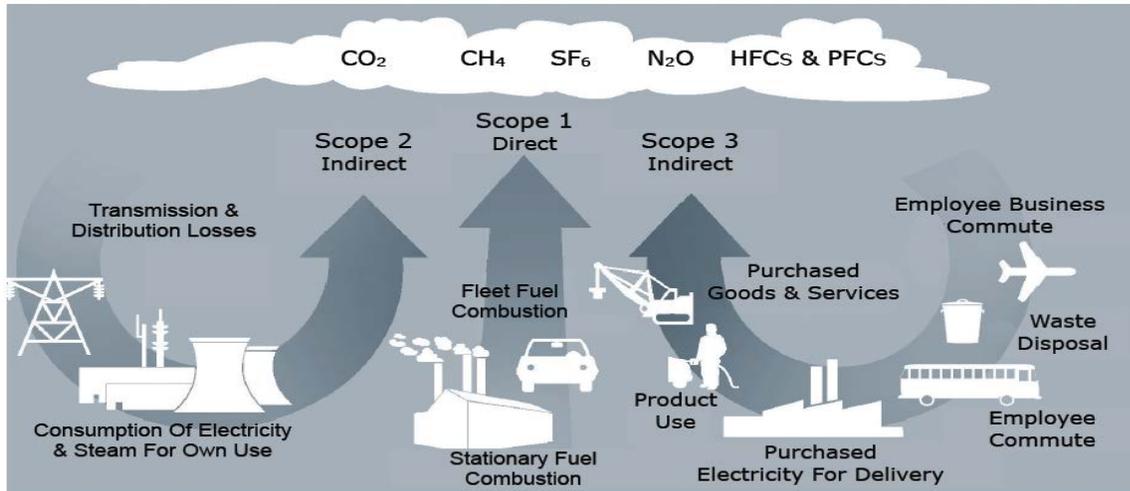
In quantifying our operational emissions, EWEB follows the guidelines of The Climate Registry's General Reporting Protocol. Per The Climate Registry's protocol, emissions sources are divided into three reporting scopes (see Figure 3 below).

Scope 1 – This includes direct GHG emissions that originate from operations-based equipment and facilities owned or operated by EWEB, such as the stationary and mobile combustion of fossil fuels, including vehicles and generators. This also includes the fugitive release of sulfur hexafluoride (SF<sub>6</sub>) from the operation of high voltage equipment used in electricity transmission and distribution.

Scope 2 – This includes indirect GHG emissions associated with the purchase of electricity and steam for internal consumption<sup>1</sup>.

Scope 3 – This includes all other indirect GHG emissions resulting from EWEB's operational activities that occur from sources owned or controlled by another entity, such as business travel, employee commute, embodied emissions in purchased goods and services, and emissions from land-filled solid waste.

<sup>1</sup> Natural gas consumption at the Headquarters building began in 2012, following the decommissioning of the steam plant, which had supplied steam heating for 50 years up to that point.



Source: WRI/WBCSD Greenhouse Gas Protocol, Corporate Accounting and Reporting Standard (Revised Edition), Chapter 4.

**Figure 3. Greenhouse gas accounting reporting scopes.**

This inventory estimates emissions associated with EWEB’s facility operations. It is limited to EWEB facilities in the Eugene-Springfield metropolitan area and the McKenzie River hydroelectric facilities (Leaburg-Walterville and Carmen-Smith).

From 2009-2014, the largest single source of emissions associated with EWEB’s operations were from our supply chain – those GHG emissions embodied in purchased goods and services. However, given the limitations of the method used to calculate these emissions, they should be considered estimates<sup>2</sup>. It has not been possible to estimate supply chain emissions since 2014 due to changes in accounting and asset management practices that occurred late in that year. Therefore, this report focuses on Scope 1 and 2 emissions, specifically those attributed to natural gas combustion by buildings, gasoline and diesel combustion by EWEB owned vehicles and equipment, fugitive releases of refrigerants and insulating gas (SF<sub>6</sub>), and electricity use in buildings.

EWEB’s ability to manage our GHG emissions varies considerably across emission scopes. We have specific control over some sources, such as our vehicle fleet, and actively take direct steps to minimize emissions associated with the utilization of these vehicles. Influencing emissions in our supply chain is more challenging because we do not control the energy and carbon intensity of our suppliers’ manufacturing processes. However, we can seek to mitigate our supply chain emissions by making purchasing decisions that consider the carbon intensity of products (e.g., choosing goods with high recycled content).

### **Calculating the Carbon Footprint of Electricity Use: Location vs. Market-Based Electricity Accounting**

The most widely used standard to account for Scope 2 (Electricity) emissions is the Greenhouse Gas Protocol’s Scope 2 Guidance, which directs organizations to use two methods: location-based and market-based.

<sup>2</sup> The methodology for estimating supply chain carbon is Economic Input-Output Life-Cycle Analysis (EIO-LCA). EIO-LCA, while reputable and credible as an estimation tool, lacks precision because the analysis is not built on vendor-specific data. Therefore, the estimate, while useful for “sense of scale”, is not precise.

The location-based method (or regional grid) reflects the average emissions intensity of the Northwest Power Pool (NWPP). The market-based (or utility specific) method reflects emissions from the specific utility.

EWEB’s market-based emissions factor is developed through the annual reporting process to the Oregon Department of Environmental Quality (DEQ), in which consumer-owned utilities, like EWEB, are required to report the megawatt hours of electricity distributed to end users of electricity in Oregon (i.e., our retail customers) and the source of that electricity. EWEB’s market-based emissions factor is about 6 times less carbon intensive than the regional average and about 7 times less than the national average (Table 1 & Figure 4). The ten-year average (2010-2019) market-based emission factor is 0.02 MT CO<sub>2</sub>e/MWh (Figure 5).

In 2020, 85% of the power distributed to EWEB’s retail customers was from BPA (a combination of hydroelectric, nuclear, wind, and unspecified market purchases), 9% was from EWEB’s owned hydroelectric resources, and the remaining 6% came from a combination of owned and purchased resources. The carbon intensity can fluctuate significantly from year to year based on the amount of hydroelectric power generated by BPA and EWEB’s own resources. Such was the case in 2019 and 2020, when the Leaburg Project was offline, and the Carmen-Smith Project experienced prolonged outages. These factors, combined with a divestment in Foote Creek Wind and Smith Creek Hydro, lead to an almost fourfold increase in the market-based emissions factor from 2018 to 2019, which is the highest emissions factor during the reporting period between 2010 and 2019(Figure 5). Since the 2019 market-based emissions factor didn’t become available until after the 2019 GHG report was completed, the emission data for that year has been updated in this report.

**Table 1. Comparison of location-based and market-based emission factors.**

Accounting Method	2020 EWEB Operational Consumption (MWh)	Emissions Factor (MT CO <sub>2</sub> e/MWh)	Emissions (MT CO <sub>2</sub> e)
Location-Based (NWPP) <sup>1</sup>	19,105	0.324	6,190
Market-Based (EWEB) <sup>2</sup>		0.055	1,051
National Average <sup>1</sup>		0.401	7,661
California Air Resource Board (CARB)		0.428	8,177

1. Northwest Power Pool (NWPP) and National Average emissions factors are from eGRID 2019. eGrid is the standard emissions factor in the Climate Registry’s General Reporting Protocol and has been used since the 2009 baseline year. 2019 is the most recent factor available

2. The EWEB emissions factor for 2020 was not available from the Oregon Department of Environmental Quality at the time of this report. Therefore, the 2019 emissions factor was used.

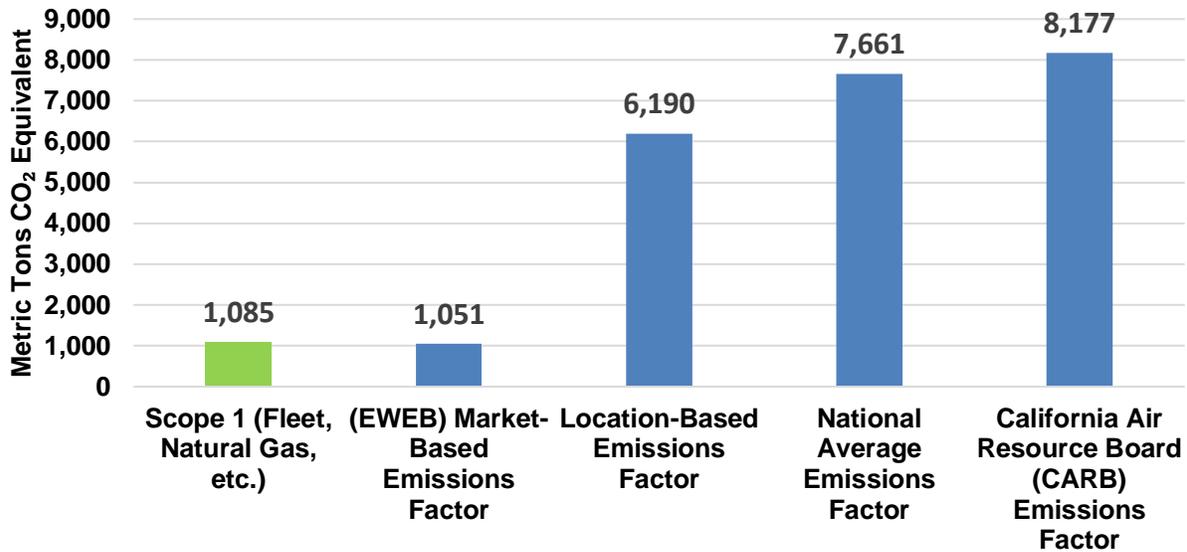


Figure 4. Comparison of market-based, location-based, and the national average emissions factors for Scope 2 (electricity) GHG emissions. Scope 1 emissions are presented for comparison purposes, 2020.

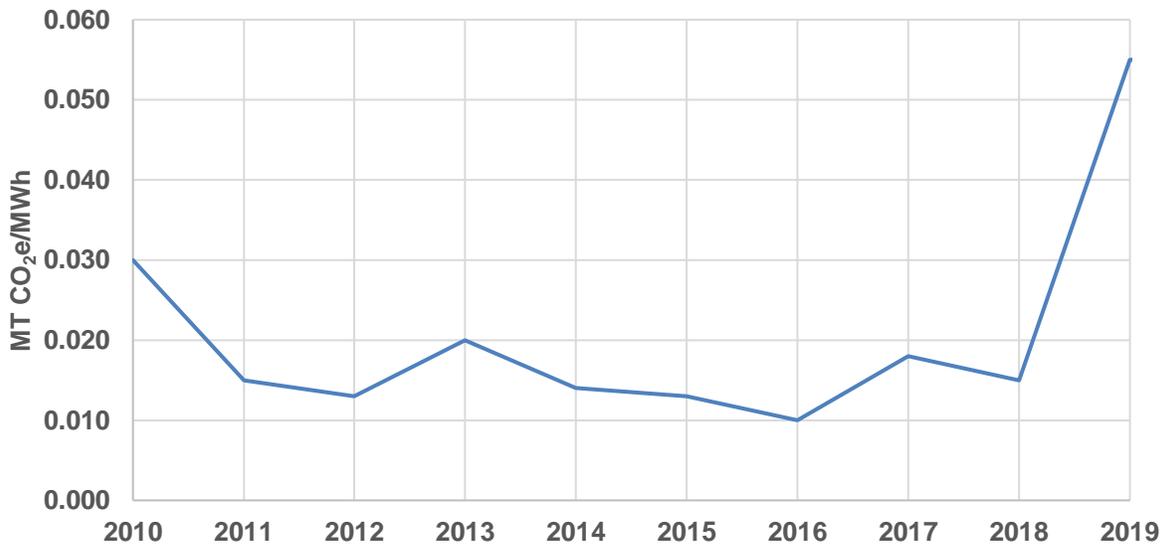


Figure 5. EWEB market-based emissions factor (2010-2019).

## Electricity Consumption

In 2020, EWEB buildings consumed 19,105 MWh of electricity and emitted 6,190 MT CO<sub>2</sub>e (using location-based accounting) and 1,051 MT CO<sub>2</sub>e (using market-based accounting). The operation of the Hayden Bridge Treatment Plant and pump stations account for the majority (66%) of EWEB’s electricity consumption, at 12,692 MWh. The Roosevelt Operations Center is the second-largest source of electricity consumption (2,690 MWh), followed by the Headquarters building (2,446 MWh). Electricity use at EWEB’s McKenzie River hydroelectric projects, substations, and other Eugene facilities accounted for (1,278 MWh) (Figure 6). There

was a 10% reduction in electricity consumption in 2020 compared to 2009 (Figure 7). EWEB's electricity consumption in 2020 was the lowest in the reporting period (2009-2020).

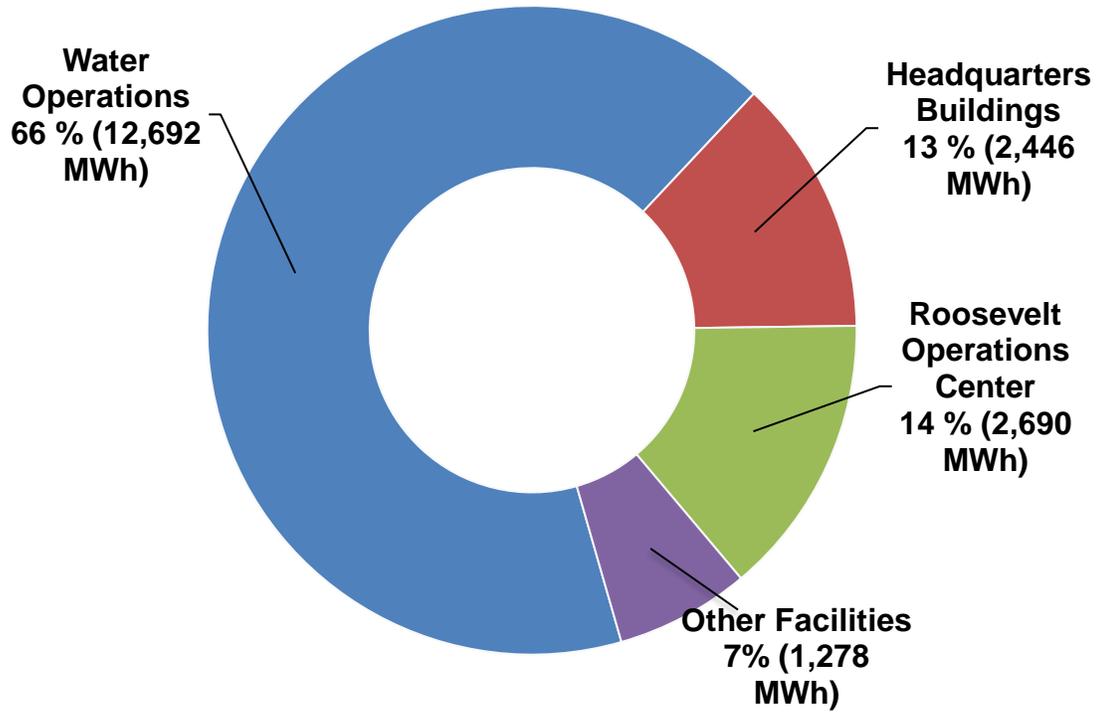


Figure 6. Electricity consumption by EWEB facilities, 2020.

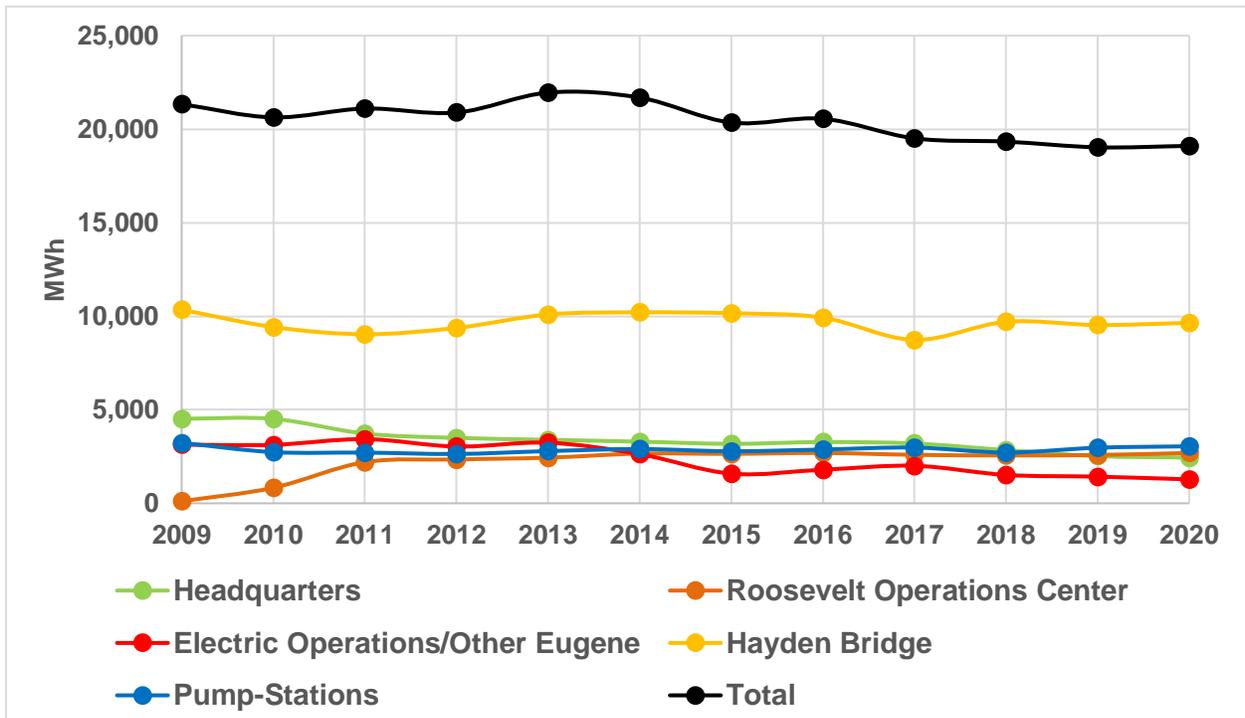
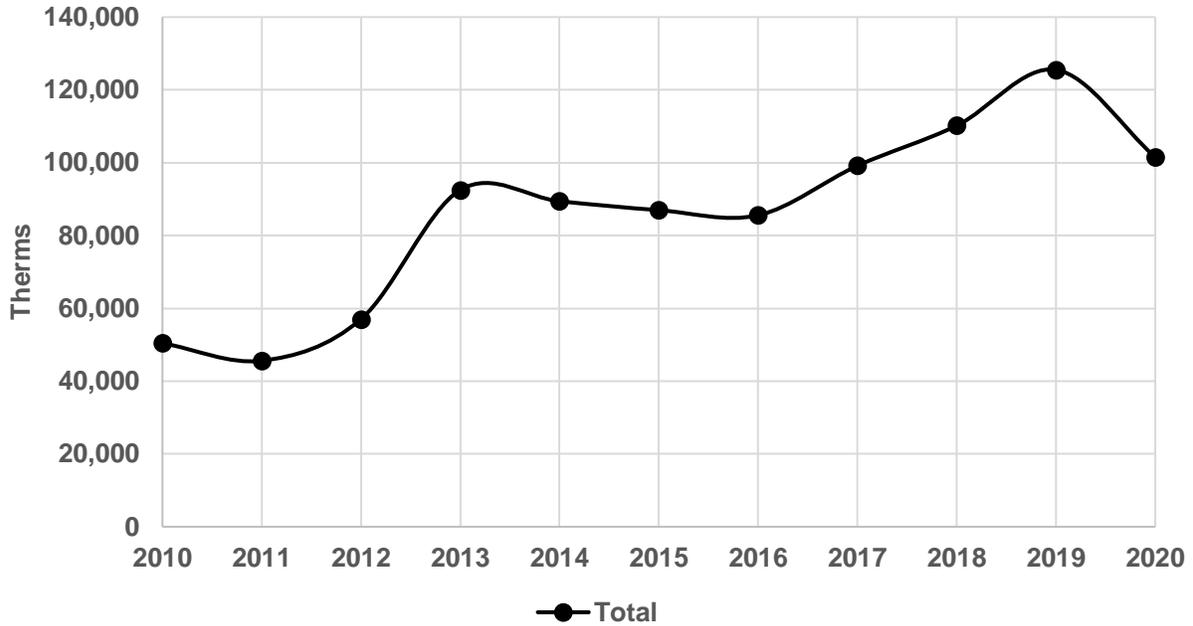


Figure 7. Electricity consumption by EWEB facilities, 2009-2020.

### Natural Gas Consumption

EWEB facilities consumed 101,512 therms of natural gas in 2020 and emitted 496 MT CO<sub>2</sub>e. Natural gas consumption at the Headquarters building and the Roosevelt Operations Center were 58,091 and 43,421 therms, respectively. Natural gas consumption at the Headquarters building began in 2012 following the decommissioning of the steam plant, which had supplied steam heating for 50 years up to that point. There was an 19% reduction in natural gas in 2020 from 2019 (Figure 8).



**Figure 8. Natural gas consumption at the Roosevelt Operations Center and Headquarters Building combined, 2010-2020.**

### Fleet Fuel Consumption

In 2020, EWEB’s fleet consumed 175,756 gallons of fuel, 35% of which was fossil fuels (gasoline and diesel) and 65% was biofuels (ethanol and renewable diesel) (Figure 9). Fossil fuel consumption accounted for 548 MT CO<sub>2</sub>e of emissions. There has been a roughly eleven-fold increase in biofuel use since 2009, which has resulted in a 65% decrease in fossil fuel consumption and 67% decrease in emissions during this time period (Figure 10). Continuing the trend from 2019, EWEB increased its blend ratios of alternative fuels in 2020 by 21% over the prior year. As a result, fleet-based emissions were the lowest in the reporting period (2009-2020).

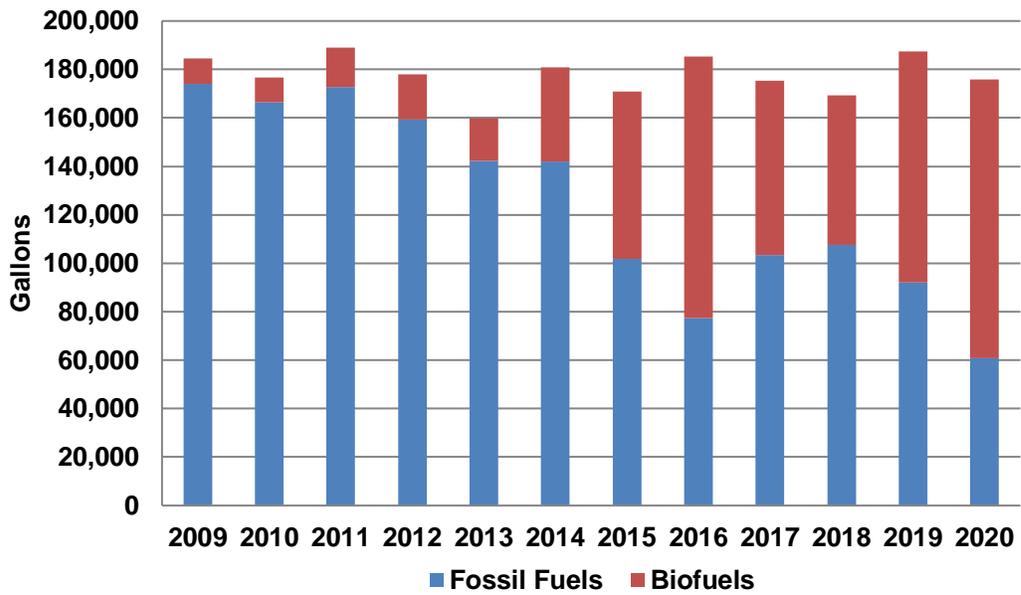


Figure 9. Fuel consumption by EWEB's fleet, 2009-2020.

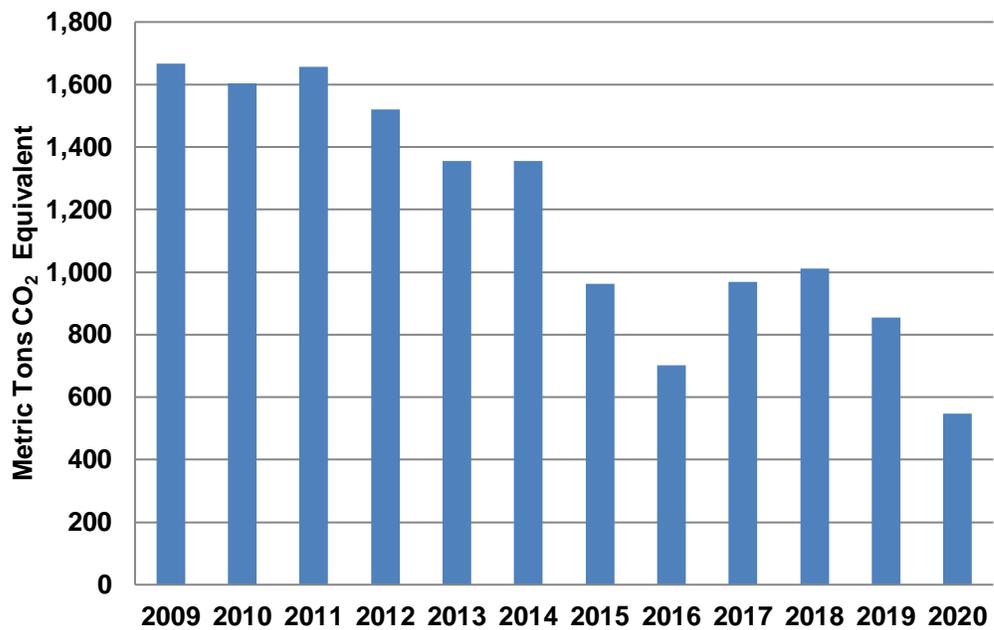


Figure 10. EWEB fleet emissions (fossil fuels), 2009-2020.

## Conclusion

Using the location-based (regional) emission factor, Scope 1 (fleet, natural gas, etc.) and Scope 2 (electricity) emissions were 7,275 MT CO<sub>2</sub>e in 2020. However, when using the market-based (EWEB) factor they were 71% less, at 2,136 MT CO<sub>2</sub>e. During the 2009-2020 reporting period EWEB has reduced emissions by 37% and 40%, ahead of the 25% goal, using the location-based and market-based emissions factors, respectively (Figure 11). Despite EWEB's electricity consumption in 2020 being the lowest during the reporting period (10% lower than 2009), which is likely the result of a combination of factors including a significant portion of the workforce working remotely in 2020 due to COVID-19 as well as the workforce consolidation efforts that were underway, the emissions associated with electricity consumption increased by almost four times from 2018 levels, due to the significant increase in the market-based emissions factor in 2019. For comparison, if the market-based emissions factor remained the same as 2018 in 2020, EWEB would have achieved a 61% reduction in emissions since reporting started, as well as the lowest total emissions during the reporting period, at 1,372 MT CO<sub>2</sub>e. This phenomenon underscores the relative importance of maintaining a low carbon power portfolio when compared to modest reductions in electricity consumption to achieve meaningful reductions in emissions. There was a 19% reduction in natural gas consumption in 2020 compared to 2019, also likely due to significant proportion of the workforce working remotely in 2020.

EWEB's fleet continues to be the component in EWEB's operations that offers the most tangible and effective emissions reduction potential. Primarily due to the almost eleven-fold increase in biofuel use since 2009, there has been a 65% decrease in fossil fuel consumption, well ahead of the 50% goal, as well as an 67% decrease in emissions. As a result, fleet-based emissions in 2020 were the lowest in the reporting period. As the electrification of the fleet becomes more feasible in the coming years, even further reductions in emissions become possible.

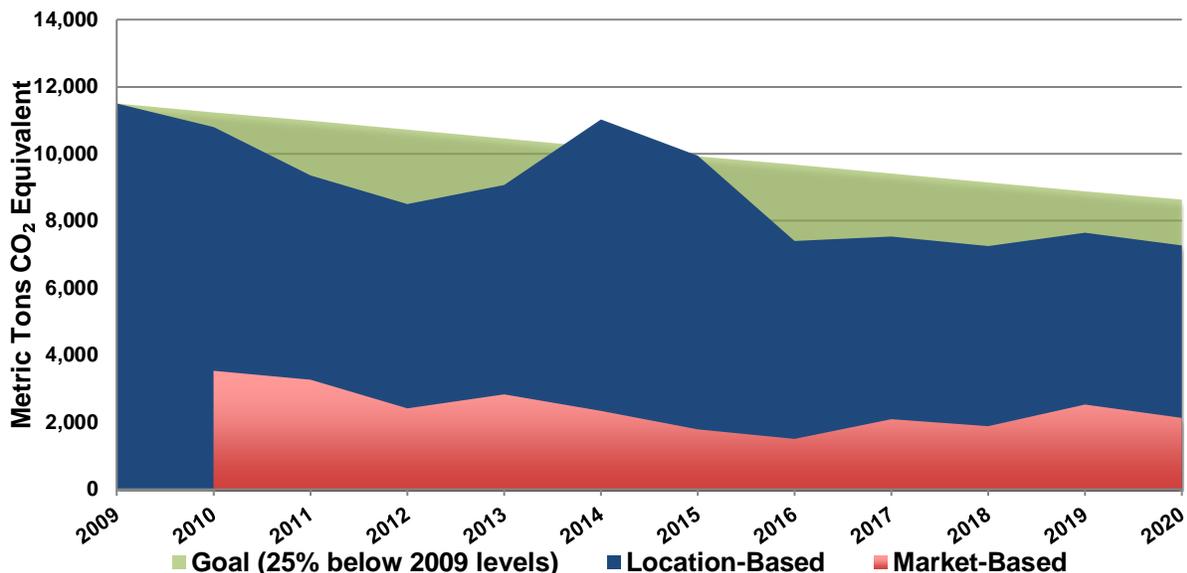


Figure 11. Scope 1 and 2 GHG emissions using the location-based (regional) and market-based (EWEB) emissions factors compared to the 25% reduction goal.

For more information, contact Sarah Gorsegner, EWEB's Support Services Operations Manager, at [sarah.gorsegner@eweb.org](mailto:sarah.gorsegner@eweb.org), or Andrew Janos, Senior Environmental Specialist, at [Andrew.janos@eweb.org](mailto:Andrew.janos@eweb.org).