

SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

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Staff Memorandum

DRAFT CITY OF MILWAUKEE GREENHOUSE GAS EMISSIONS SUMMARY

Revised May 23, 2025

GREENHOUSE GAS EMISSIONS INVENTORY

As part of the on-going work for the Environmental Protection Agency's (EPA) Climate Pollution Reduction Grant (CPRG) Program, Commission staff prepared the following greenhouse gas (GHG) inventory for the City of Milwaukee. The GHG inventory includes GHG emissions from the following sectors: residential, commercial, industrial, transportation, and agriculture, forestry and other land use (AFLOU). The inventory utilized the best available data from WE Energies, the U.S. EPA, the Wisconsin DNR, and transportation emissions calculated from the U.S. EPA's MOVES model by Commission staff. The data were compiled within ICLEI's ClearPath tool, which performs inventories consistent with recognized standards, such as the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions.

The updated GHG inventory indicates that in 2022, as shown in Figure 1, the City of Milwaukee produced approximately 7.6 million metric tons of carbon dioxide equivalent (MMT CO₂e).¹ The largest sources of GHG emissions in the City of Milwaukee result from transportation and mobile sources (26 percent), commercial energy (25 percent), and residential energy (23 percent). This represents a change from the 2018 GHG inventory, which found that the largest GHG emission sources were from residential energy (31 percent), commercial energy (26 percent), and transportation and mobile sources (21 percent).² Commission staff incorporated additional study sectors and usage data from WE Energies, which are likely to account for these changes.

These results utilize the best available data for the City of Milwaukee at the community level. The following sections summarize data sources and calculations conducted by sector.

Built Environment Energy

Greenhouse gas emission data for energy generation came from multiple sources. WE Energies provided the Commission with total electricity and natural gas usage data for the City of Milwaukee based on residential and non-residential customers.

¹ This value is calculated by summing the three gases and applies the global warming potential values to methane (CH₄) and nitrous oxide (N₂O) to express records in terms of CO₂ equivalent (CO₂e).

² Inventory results as presented in GHG Emissions Forecast and Wedge Analysis for City of Milwaukee, City of Milwaukee 2018 GHG Emissions (Revised), prepared by ICLEI USA, May 2021.

The non-residential electricity use data was divided into commercial and industrial sectors using the percentages of electricity used based on City Assessor's Data. The non-residential natural gas usage was divided into commercial and industrial sectors using the percentage of natural gas usage in Wisconsin for each sector based on data from the U.S. Energy Information Administration (EIA). The EIA Downscaling Estimates used State and Local Planning for Energy (SLOPE) energy consumption values from the National Renewable Energy Laboratory, combined with jobs by sector to identify emissions from sources such as wood, propane, and distillate fuel.³

Transportation and Mobile Sources

The MOVES, or Motor Vehicles Emission Simulator, model was used by Commission staff to identify total annual emissions for the City of Milwaukee in 2022 from on-road vehicles. The results from the MOVES model (annual VMT and annual CO₂e) were entered into the ClearPath Tool.

For off-road vehicle emissions, the 2020 EPA's National Emissions Inventory (NEI) GHG Data Retrieval Tool was used by Commission staff. The tool provides pollutant emission data that the Commission then entered into ICLEI's ClearPath Tool to calculate CO₂e for non-road gasoline equipment, locomotive passenger trains, or commercial marine vessels.

Wastewater

Utilizing the Milwaukee Water Works Water, Electric, or Joint Utility Annual Report 2021, Commission staff calculated estimated carbon emissions with the ICLEI ClearPath Tool. In addition, Milwaukee Water Works 2020 Utility General Information report contained additional water volume data used in the tool. Consistent with the City's 2018 GHG Inventory, the Jones Island Water Reclamation Facility was not included in the waste sector as it was assumed that this would be captured in the WE Energies consumption report.

Solid Waste

Total tonnage of solid waste data used in the ClearPath Tool came from the 2022 DPW Annual Residential Recycling Report. The volume includes recycling materials from household (aluminum cans) and other residential (waste tires) as well as yard waste and household solid waste (dumpster service) (page 11). Wisconsin's Statewide Waste Characterization Study for 2020-2021 was not explicitly used in data collection, however the data was used in the factor sets within ClearPath. The Statewide Waste Characterization study includes composition counts for single family and multi-family residential sectors.

Fugitive Emissions

The Facility Level Information on Green House gases Tool (FLIGHT), provides information about greenhouse gas emissions from large facilities (i.e. power plants, paper and food plants, landfills etc.) in the U.S. After setting the location and filtering facilities in Milwaukee County, and entering emission data into the ClearPath Tool, Commission staff determined that over 216,000 metric tons of CO₂e was emitted in 2022. Example data in a facility review includes total facility emissions in metric tons CO₂e, a breakdown of specific air pollutants, and the types of fuels used by the facility. To avoid possible double counting of emissions,

³ State Scaling Factors were provided by ICLEI staff and applied to WE Energies data to downscale electricity and natural gas usage for non-residential energy sectors. Usage data was entered into ClearPath for CO₂e counts to be determined.

facilities like Wisconsin Electric Power Company, or Valley (WEPCO) were omitted from the fugitive emission counts.

Agriculture and Land Use

The LEARN tool identifies changes in land use to estimate the metric tons of CO₂e produced over time. Metric tons of CO₂e /year were identified based on conversion of forests and emission removals, or sinks, were quantified based on remaining forest land, undisturbed forest, or tree canopy.

COMPARISON OF 2018 AND 2022 GREENHOUSE GAS EMISSIONS INVENTORIES

As shown in Figure 2, Commission staff compared the City of Milwaukee's 2018 Inventory of Community GHG Emissions presented in the GHG Emissions Wedge Analysis⁴ to identify if any changes or reductions have occurred. Based on the comparison, the following observations can be made:

Residential energy: the 2022 inventory shows a reduction in CO₂e. This may include an improvement based on implemented policies. The residential electricity and natural gas usage came directly from WE Energies, without any downscaling or factoring.

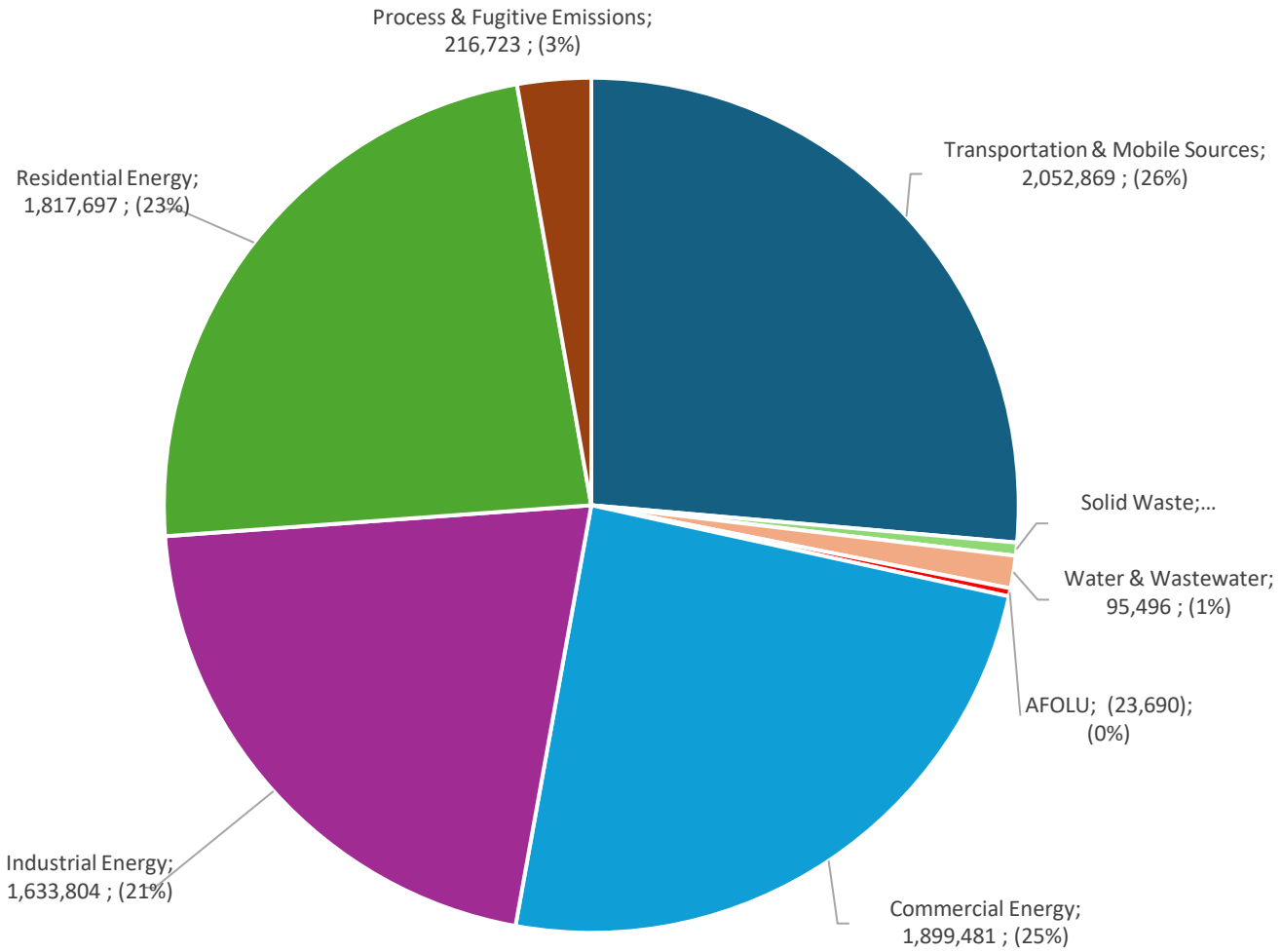
Commercial energy: the 2022 inventory shows a slight decrease, which may reflect a change in methodology. WE Energies provided non-residential electricity and natural gas usage. Commission staff coordinated with ICLEI staff to apply their downscaling methodology to desegregate commercial and industrial energy. Commercial natural gas usage was calculated by applying a downscaling factor-based ICLEI's EIA Stationary Energy Downscaling process. The downscaling process utilized EIA energy usage data for Wisconsin by sector and fuel type. This resulted in a factor that indicated 43.7% of the natural gas consumed was for commercial use. Commercial electricity usage was derived by using building square footage from the City of Milwaukee Assessor's Data, which resulted in a factor that indicated 72.6% of the non-residential electricity consumed was for commercial use.

Industrial energy: the 2022 inventory shows a slight increase, which may reflect a change in methodology. WE Energies provided non-residential electricity and natural gas usage. Commission staff coordinated with ICLEI staff to apply their downscaling methodology to desegregate commercial and industrial energy. Industrial energy was drawn by applying a downscaling factor-based ICLEI's EIA Stationary Energy Downscaling process. The downscaling process utilized EIA energy usage data for Wisconsin by sector and fuel type. This resulted in a factor that indicated 56.3% of the natural gas consumed was for industrial use. Industrial electricity usage was calculated using building square footage from the City of Milwaukee Assessor's Data, which resulted in a factor that indicated 27.4% of the non-residential electricity consumed was for industrial use.

Transportation & Mobile Sources: The 2022 inventory shows an increase in CO₂e. The increase in CO₂e may be a result of non-road sources (non-road gasoline equipment, locomotive passenger trains, or commercial marine vessels), which were not included in the City's 2018 inventory.

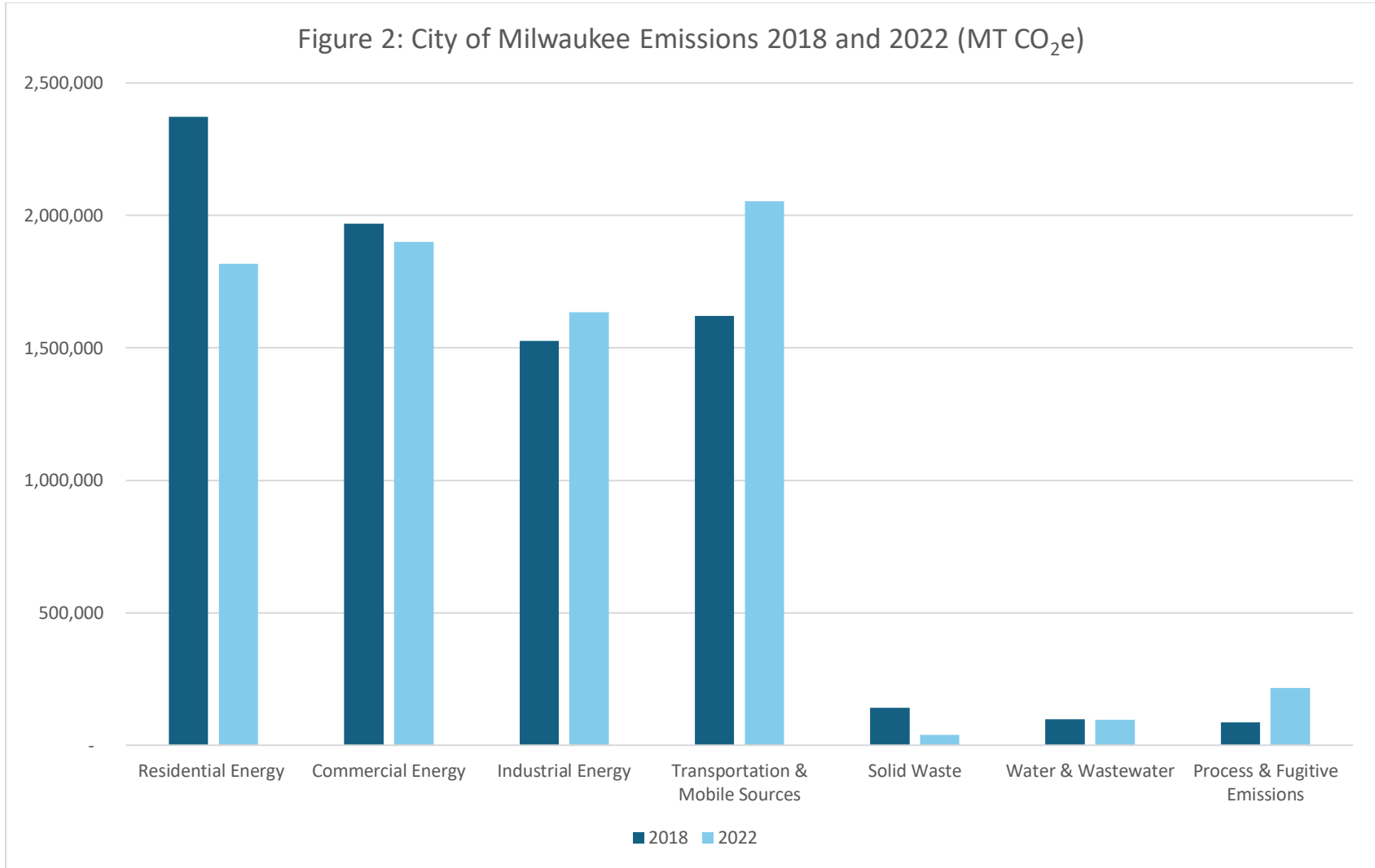
⁴ ICLEI, GHG Emissions Forecast and Wedge Analysis for City of Milwaukee, Milwaukee City 2018 GHG Emissions (revised) CO₂e, page 5.

Figure 1: City of Milwaukee 2022 Emissions (MT CO₂e)



Sources: SEWRPC and ICLEI, May 21, 2025

Figure 2: City of Milwaukee Emissions 2018 and 2022 (MT CO₂e)



Sources: GHG Emissions Forecast and Wedge Analysis for City of Milwaukee, 2018 Milwaukee Community-Wide GHG Inventory, SEWRPC and ICLEI, May 21, 2025