

Municipal Greenhouse Gas Emissions Inventory, 2013

Municipal Government Inventory Methodology

Where possible, the City followed version 1.1 of ICLEI's Local Government Operations Protocol (LGOP). As advised in the LGOP, IPCC's 2nd Assessment GWPs are used in this inventory. Scope 1 emissions and heat content factors come from the LGOP, and Scope 2 electricity emission factors come from eGRID RFC east region. Emissions due to T&D losses are calculated using the given year's eGRID loss factor. In the years for which emissions and loss factors were not released, the most recent available factors from prior years are used. The local steam provider, Veolia, calculated Scope 2 steam emission factors by year. Lastly, the energy conversion factor for Philadelphia's natural gas was provided by PGW. For a complete list of emissions factors used in this inventory, see Appendix C.

All electricity, fuel oil, and steam consumption data comes from utility bills as recorded in the City's utility management database. Included under the 'Buildings' sector are emissions from the General Fund, Water Administration, and Wastewater Administration. The 'Water Treatment' sector includes all consumption related to water pumping and water treatment. The 'Wastewater Treatment' sector includes all consumption related to wastewater pumping and treatment. Included under the 'Airport Facilities' sector is all consumption by the Aviation Fund, excluding air travel.

Wastewater Treatment process emissions data was provided by PWD. Equations 10.1, 10.8, and 10.9 from the LGOP were used, respectively, to calculate the CH₄ process emissions from incomplete combustion of digester gas, N₂O process emissions from wastewater treatment without nitrification, and N₂O process emissions from effluent discharge.

Vehicle fleet data comes from the Office of Fleet Management. The 2010 Philadelphia Fleet Inventory was used to calculate emissions based on fuel type. Vehicle types were assigned to all vehicles, and fuel types were then assigned based on vehicle type. The following fuel assumptions were made: all heavy-duty vehicles use diesel; all passenger vehicles and motorcycles use gasoline; light trucks use diesel if medium-duty vehicle, ambulance, or tow-truck; light trucks use gasoline if pick-up truck, SUV, or van/wagon; 50 percent of fuel used by off road vehicles is gasoline; and 50 percent of fuel used by off road vehicles is diesel. A VMT per gallon ratio (MPG) was calculated for each fuel type using the 2010 Philadelphia Fleet Inventory data. This ratio was used to calculate the VMT by fuel type from each individual year's fuel consumption data. Emissions were then calculated based on a given year's fuel consumption and VMT using the mobile combustion CO₂, CH₄, and N₂O emissions factors provided in the LGOP.

To calculate Zip Car emissions, Zip Car provided yearly VMT data and estimated fuel consumption. The appropriate CO₂, N₂O, and CH₄ emissions factors were taken from LGOP.