CITY OF MELROSE COMMUNITY GREENHOUSE GAS INVENTORY

BASELINE YEAR – 2013

Final Report
Melrose Energy Commission
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Principal author: Susan Murphy, smurphy@cityofmelrose.org
Review committee: Jeff Doody, Martha Grover and Tim Mikus

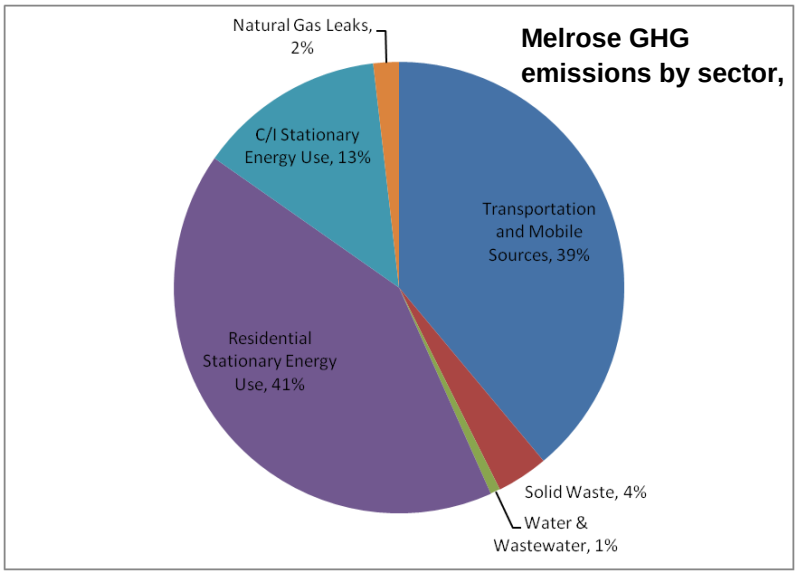
Introduction

Greenhouse gases (CO_2, methane and N_2O, *inter alia*) are produced by fossil fuel combustion and other human activities and are responsible for global warming. A community GHG inventory is an accounting of emissions of greenhouse gases within the geographic limits of or attributable to a community. Emissions are reported in terms of CO_2 equivalents (CO_2e) that account for the different gases' persistence in the atmosphere and intensity of greenhouse effect.

Community GHG inventories are an important tool to help assess the current state of emissions, prioritize targets for GHG reduction efforts and track progress toward reduction goals. The City of Melrose is a signatory to the Metro Mayors Climate Commitment, pledging to reach net zero carbon emissions by 2050.

City of Melrose 2013 Baseline Emissions

In 2013, the City of Melrose emitted 196 thousand metric tons (MT) of greenhouse gases (GHGs) from energy use in buildings and other facilities, transportation, water and waste management and natural gas leaks. A breakdown of emissions by sector is shown in the pie chart below (more detail is provided in Table 1). The vast majority of emissions from Melrose are from residential sources: residential building energy represents 41%, residential transportation is ninety percent of transportation emissions, or another 36% of the total, and the majority of water, wastewater and solid waste services are for residential usage.



Total GHG Emissions from Melrose sources, Base Year 2013:

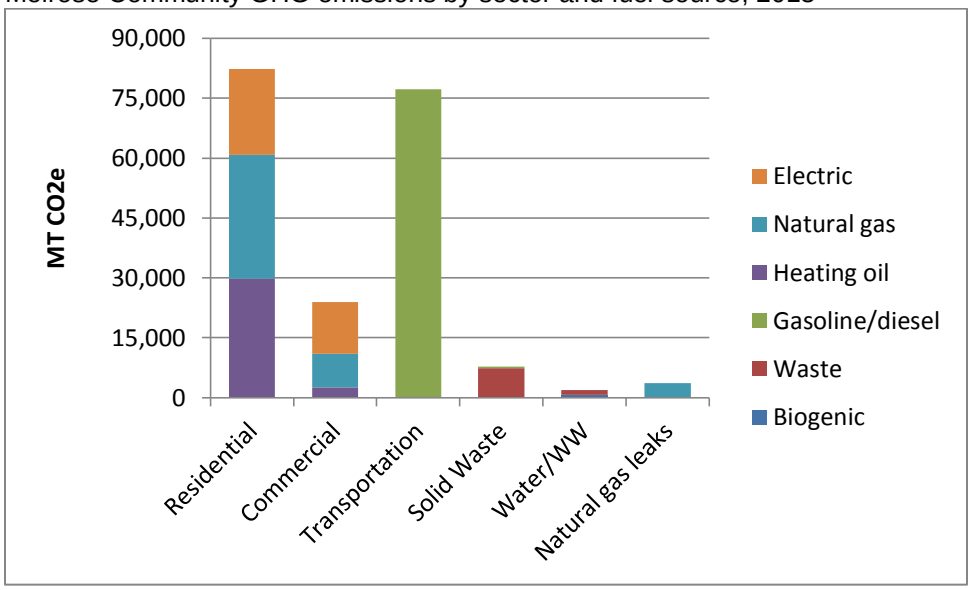
195,891 MT CO_2e

16.6 MT CO_2e/household

7.1 MT CO_2e/person

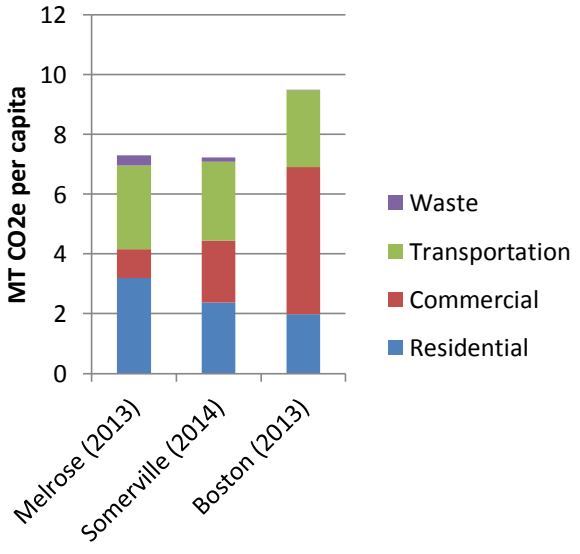
Emissions can also be broken down by fuel source, as follows:

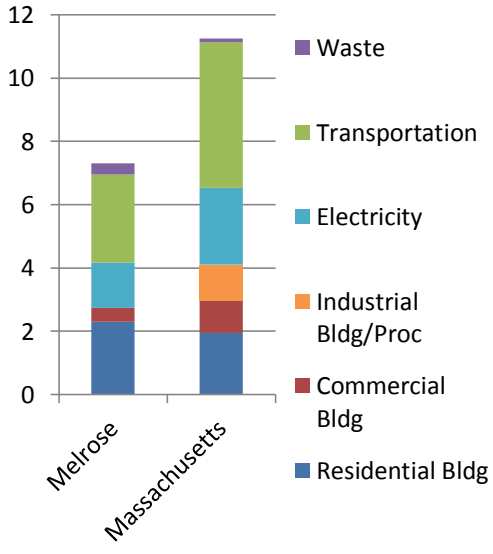
Melrose Community GHG emissions by sector and fuel source, 2013



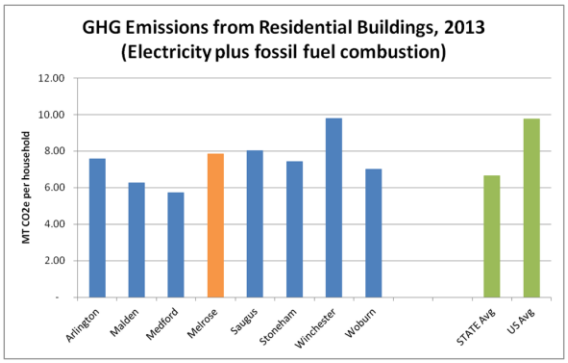
Comparisons to Other Communities

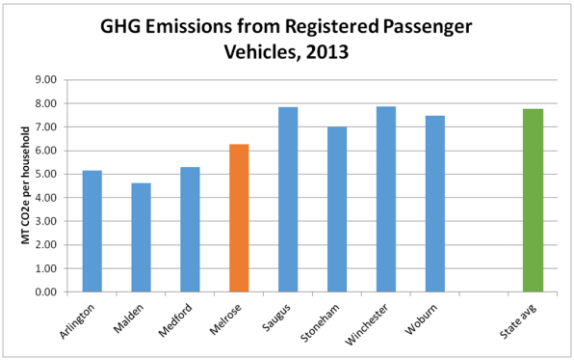
Emissions from the Melrose community are somewhat lower than the state average on a per capita basis, due primarily to the low level of commercial and industrial emissions within Melrose.





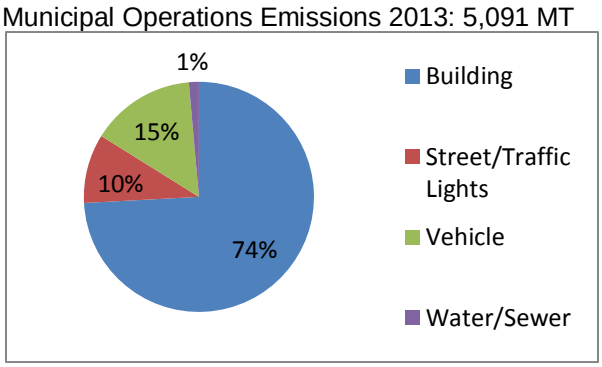
Examining residential emissions only, Melrose households use more energy on home electricity and heating than the statewide average. Residential motor vehicle emissions per household are below the state average.





City of Melrose Municipal Operations

Emissions from City of Melrose municipal operations are included within the total emissions listed above, but have also been calculated separately based on energy usage data collected for the state Green Communities program. Emissions from municipal sources in 2013 were 5,091 MT, or 2.6% of the total community emissions. This is consistent with results from other local inventories (e.g. Boston and Somerville).



Further information

This inventory was conducted pursuant to the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (ICLEI 2013) using the ICLEI Clearpath software. It includes all required elements under that protocol, including electricity use and building heating (residential and commercial/ industrial/institutional), motor vehicle transportation and MBTA commuting, solid waste, water, wastewater and fugitive emissions from natural gas leaks. The inventory does not include consumption-related emissions (e.g. food, products purchased by the community, services outside of Melrose, or air travel). Detailed information on data sources and methodology is provided in Technical Appendices A and B.

Table 1. Melrose Community GHG Inventory Detail - 2013

Category	Record	Fuel Source	MMBtu	CO2e (MT)		CO2 (non-biogenic) (MT)	CH4 (MT)	NO2 (MT)	Biogenic CO2 (MT)
Commercial Energy	Commercial and Institutional Electricity	Electricity	149,392	13,000		12,925	1.33	0.14	
	Commercial Natural Gas	Natural Gas	157,936	8,398		8,374	0.79	0.02	
	Municipal heating oil	Heating Oil	1,042	78		77	0.01	0.00	
	Commercial, Institutional and Industrial Oil Use based on employment share of state totals	Heating Oil	33,269	2,477		2,461	0.36	0.02	
	Biogenic Commercial and Institutional Electricity	Electricity	not calculated	0		0	0.00	0.00	1,926
	Subtotal for sector		**341,639**	**23,953**		**23,837**	**2.49**	**0.18**	
Residential Energy	Residential electricity	Electricity	247,133	21,505		21,382	2.20	0.23	
	Residential Natural Gas	Natural Gas	580,771	30,882		30,792	2.90	0.06	
	Home Heating Oil	Heating Oil	401,168	29,866		29,670	4.36	0.29	
	Residential electricity biogenic emissions	Electricity		0		0	0.00	0.00	3,186
	Subtotal for sector		**1,229,072**	**82,254**		**81,845**	**9.46**	**0.58**	
Solid Waste	Privately hauled residential trash - assumed comb	Waste	not calculated	556		529	0.42	0.05	649.68
	Commercial - assumed combusted	Waste	not calculated	2,981		2,838	2.23	0.29	3,482.81
	Collection and transport to Haverhill of all solid wa	Gasoline/diesel	not calculated	382		0	0.00	0.00	0.00
	Trash incineration	Waste	not calculated	3,326		3,167	2.49	0.33	3,885.95
	Composting at City facility	Waste	not calculated	88		0	0.65	0.24	0.00
	Subtotal for sector			**7,333**		**6,534**	**5.79**	**0.91**	
Transportation and Mobile Sources	Total travel by Melrose registered passenger vehicles (In- and Out of-boundary)	Gasoline/diesel	970,080	68,382		68,138	2.81	0.58	
	Total travel by Melrose registered commercial vehicles (In- and Out of-boundary)	Gasoline/diesel	104,537	7,735		7,729	0.02	0.02	
	MBTA Commuting	Gasoline/diesel	not calculated	1,184		1,184	0.00	0.00	
	Subtotal for sector		**1,074,617**	**77,302**		**77,051**	**2.82**	**0.60**	not calculated
Water & Wastewater	MWRA Water Supply	Waste	not calculated	153		153	0.00	0.00	0.00
	MWRA Wastewater System	Waste	not calculated	1,250		1,250	0.00	0.00	0.00
	Deer Island WWTP Biogenic CO2	Waste		0		0	0.00	0.00	730
	Subtotal for sector			**1,403**		**1,403**	**0.00**	**0.00**	
Process and Fugitive Emissions	Methane emissions from leaks in utility company	Natural Gas		3,648		0	145.91	0.00	
	Subtotal for sector		**0**	**3,648**		**0**	**145.91**	**0.00**	
									Additional Biogenic CO2:
				195,891	**MT CO2e**				**13,860**
		11,783	households	**16.6**	**MT CO2e/household**				
		27,690	population	**7.1**	**MT CO2e/person**				