

# **County of Monterey**

## **Local Government Operations Greenhouse Gas Emissions Inventory:**

### **2016 Inventory Update**

From: Association of Monterey Bay Area Governments Energy Watch

To: The Alternative Energy and Environment Committee, County of Monterey

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## 2005 to 2016 GHG inventory analysis

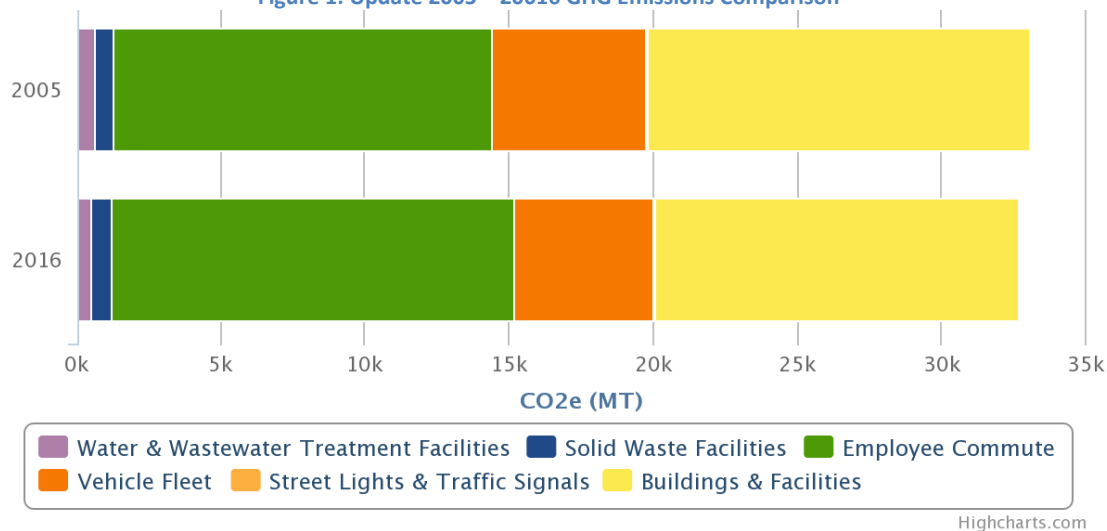
AMBAG Energy Watch staff has been assisting County of Monterey staff with the completion of the 2016 County of Monterey government operations greenhouse gas inventory. As part of this work, the 2005 baseline GHG inventory was also updated. From 2005 to 2016 the County of Monterey expanded its operations, adding new facilities such as the Schilling complex and expanding the Natividad Medical Center. During that time, the county also added 705 employees to its workforce, an increase of 16%.

Table 1 and Figure 1 show a comparison between the updated 2005 baseline GHG inventory and the 2016 GHG inventory.

**Table 1**

Updated 2005 - 2016 GHG Emissions Comparison			
Sector	CO <sub>2</sub> <sup>e</sup>	CO <sub>2</sub> <sup>e</sup>	% change
Buildings & Facilities	13,288	12,637	-5.0%
Street Lights & Traffic Signals	74	56	-24.3%
Vehicle Fleet	5,301	4,814	-9.2%
Employee Commute	13,159	13,984	6.3%
Solid Waste Facilities	660	681	3.2%
Water & Wastewater Treatment Facilities	581	500	-13.8%
<b>Total</b>	<b>33,062</b>	<b>32,659</b>	<b>-1.2%</b>

**Figure 1: Update 2005 – 20016 GHG Emissions Comparison**



From 2005 to 2016 the GHG emissions from county operations decreased by 1.2%. This decrease is driven by several key drivers. First, the amount of renewable energy in the PG&E electricity mix increased, meaning cleaner electricity and fewer emissions. Second, natural gas use at the county decreased, contributing to the emissions reduction for the facilities section of the inventory. Third, an increase in vehicle fuel efficiency means the emissions for the employee commute only increased by 6%. Finally, increased fuel efficiency and a reduction in the county's vehicle fleet size resulted in a 9% reduction, in that section of the inventory.

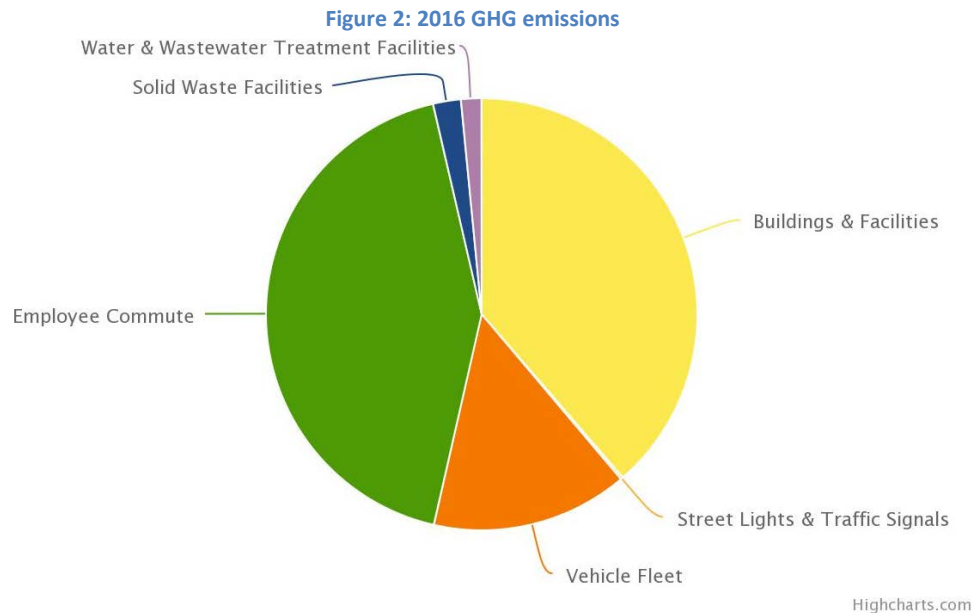
## 2016 GHG inventory

In collaboration with Dan Bertoldi, the Sustainability Coordinator at the County of Monterey, AMBAG Energy Watch staff gathered utility, solid waste and vehicle fleet fuel use data for the year 2016 in order to calculate the 2016 GHG emissions. As part of this process, an anonymous employee commute survey was also sent out all county employees. This process was made possible by county staff, who were helpful at every turn and ready to provide any information needed. This data was then analyzed by AMBAG Energy Watch staff and inputted into the ICLEI modelling software.

Table 2 and Figure 2 show the results of the 2016 inventory:

**Table 2**

<b>2016 GHG Emissions</b>		
<b>Sector</b>	<b>CO<sub>2</sub><sup>e</sup></b>	<b>% of total</b>
<b>Buildings &amp; Facilities</b>	12,637	38.7%
<b>Street Lights &amp; Traffic Signals</b>	56	0.2%
<b>Vehicle Fleet</b>	4,814	14.7%
<b>Employee Commute</b>	13,984	42.8%
<b>Solid Waste Facilities</b>	681	2.1%
<b>Water &amp; Wastewater Treatment Facilities</b>	500	1.5%
<b>Total</b>	32,672	100.0%



## Review and update of the 2005 Baseline GHG inventory

In 2009, a part time intern staff at the County of Monterey conducted the 2005 baseline GHG inventory for its government operations. This work was completed under the guidance and training provided by ICLEI staff as part of a program funded for all AMBAG jurisdiction by the AMBAG Energy Watch Program.

Table 3 shows the results of the historical 2005 baseline inventory:

**Table 3**

<b>Historical 2005 GHG Emissions</b>		
<b>Sector</b>	<b>CO<sub>2</sub><sup>e</sup></b>	<b>% of total</b>
<b>Buildings &amp; Facilities</b>	13,112	61.1%
<b>Street Lights &amp; Traffic Signals</b>	74	0.3%
<b>Vehicle Fleet</b>	5,465	25.5%
<b>Employee Commute</b>	1,635	7.6%
<b>Solid Waste Facilities</b>	643	3.0%
<b>Water &amp; Wastewater Treatment Facilities</b>	531	2.5%
<b>Total</b>	21,460	100.0%

As part of the 2016 GHG inventory process, staff first examined the methods used in the 2005 baseline GHG inventory. First, staff found a discrepancy in the employee commute data. The emissions reported in the inventory were low, and did not match the corresponding estimated amount of yearly miles travelled by commuting employees. This discrepancy was caused by a user error where an excel formula failed to be applied correctly. This error caused erroneous data to be entered into the modelling tool and emissions from the employee commute to be underestimated by a factor of ten. Second, due to changes in best practices and accepted methods, staff edited the baseline inventory to ensure it captured the most accurate and most complete picture of the 2005 emissions. Finally, ICLEI has changed the GHG modelling tool used to calculate emissions. Therefore the updated 2005 baseline inventory was recalculated using the newer model.

Table 4 shows the results of the updated 2005 baseline inventory:

**Table 4**

<b>Updated 2005 GHG Emissions</b>		
<b>Sector</b>	<b>CO<sub>2</sub><sup>e</sup></b>	<b>% of total</b>
<b>Buildings &amp; Facilities</b>	13,288	40.2%
<b>Street Lights &amp; Traffic Signals</b>	74	0.2%
<b>Vehicle Fleet</b>	5,301	16.0%
<b>Employee Commute</b>	13,159	39.8%
<b>Solid Waste Facilities</b>	660	2.0%
<b>Water &amp; Wastewater Treatment Facilities</b>	581	1.8%
<b>Total</b>	33,062	100.0%

## Appendix A: Usage data for updated 2005 GHG inventory and 2016 GHG inventory

2005 Activity Data and Corresponding GHG Emissions		
Inventory Record	CO2e (MT)	Electricity Used (kWh)
Aggregated County Facilities	6,529	29,183,538

Inventory Record	CO2e (MT)	natural gas use (therms)
Aggregated County Facilities	6,758	1,237,613

Inventory Record	CO2e (MT)	Electricity Used (kWh)
Aggregated Public Lighting Electricity	74	333,009

Inventory Record	CO2e (MT)	Annual Fuel Use (gallons)
Aggregated Gas Fleet Use	4,596	523,484
Aggregated Diesel Fleet Use	705	69,076

Inventory Record	CO2e (MT)	Employee Annual VMT (miles)
Employee Commute Gasoline	12,867	33,241,243
Employee Commute Diesel	293	527,651

Inventory Record	CO2e (MT)	Waste Generated (wet tons)
Aggregated Waste Emissions	661	2,286

Inventory Record	CO2e (MT)	Electricity Used (kWh)
Aggregated Water Transportation/ Wastewater Treatment Electricity	183	835,026

Inventory Record	CO2e (MT)	Natural Gas Use (therms)
Aggregated Water Transportation/ Wastewater Treatment	15	1,787

Inventory Record	CO2e (MT)	Population Served
Chualar Wastewater Treatment Lagoon	384	1,444

<b>2016 Activity Data and Corresponding GHG Emissions</b>		
<b>Inventory Record</b>	<b>CO2e (MT)</b>	<b>Electricity Used (kWh)</b>
<b>Aggregated County Facilities</b>	6,640	34,568,089
<b>Inventory Record</b>	<b>CO2e (MT)</b>	<b>Natural Gas Use (therms)</b>
<b>Aggregated County Facilities</b>	5,997	1,127,829
<b>Inventory Record</b>	<b>CO2e (MT)</b>	<b>Electricity Used (kWh)</b>
<b>Aggregated Public Lighting Electricity</b>	57	294,308
<b>Inventory Record</b>	<b>CO2e (MT)</b>	<b>Annual Fuel Use (gallons)</b>
<b>Aggregated Gas Fleet Use</b>	3,955	450,092
<b>Aggregated Diesel Fleet Use</b>	859	84,171
<b>Inventory Record</b>	<b>CO2e (MT)</b>	<b>Employee Annual VMT (miles)</b>
<b>Employee Commute Gasoline</b>	13,624	36,148,725
<b>Employee Commute Diesel</b>	361	715,675
<b>Inventory Record</b>	<b>CO2e (MT)</b>	<b>Waste Generated (wet tons)</b>
<b>Aggregated Waste Emissions</b>	682	2,217
<b>Inventory Record</b>	<b>CO2e (MT)</b>	<b>Electricity Used (kWh)</b>
<b>Aggregated Water Transportation/ Wastewater Treatment Electricity</b>	196	1,018,149
<b>Inventory Record</b>	<b>CO2e (MT)</b>	<b>Population Served</b>
<b>Chualar Wastewater Treatment Lagoon</b>	305	1,190