

# Bren|AECOM Group Project – Community GHG Solutions

Michael Conrardy, Allison King, Gavin Feiger, Aaron Sobel, Justin Whittet

## Community Greenhouse Gas Inventory for Ventura, CA

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### Introduction

As outlined in the May 2009 Bren|AECOM Group Masters Thesis “Community Greenhouse Gas Solutions” [Proposal](#), the first step of the project was to calculate the baseline greenhouse gas (GHG) emissions for the City of San Buenaventura (Ventura), California. This document provides this baseline, or inventory, for Ventura, normalized to the year 2007, and detailed methods so that the process can be easily replicated.

### Executive Summary

The GHG inventory for Ventura was calculated as accurately as possible within the time, resource, and data constraints briefly addressed above. While the inventory is not perfect, this step is a small part of the project goals. The principle objective of the *Community Greenhouse Gas Solutions* project is to develop a model that optimizes GHG reduction strategies that will enable a given community to achieve the desired level of GHG mitigation, as a percentage from its baseline emissions level.

To ensure that the model is effective and replicable, Ventura was chosen as a case study. For the purpose of the case study, we attempted to determine the baseline emissions level as accurately as possible with data and methods available for any given city. As community GHG mitigation becomes more widespread, voluntarily or through legislative mandates, more accurate and easily accessible GHG inventories for communities will likely become available.

The baseline emissions for the year 2007, and a brief description of the data sources and methods used, for Ventura are included below.

### Methods

There is currently no single accepted method for calculating community GHG emissions, so Bren|AECOM attempted to assess baseline emissions by starting with the Local Government Operations Protocol (LGOP) and scaling the process up to the community level. LGOP was adopted in 2008 by the California Air Resources Board (CARB) and is the national standard for quantifying and reporting GHG emissions.

Methods were guided by the data available. While direct measurement of emissions would be a more accurate methodology, the scope and time frame of the project required the use of calculation-

based methodologies. Calculation-based methodologies refer to an estimate of emissions calculated based upon measurable activity data and emission factors.

While current legislation (AB 32) demands reductions from 2005 emissions levels, the most accurate data available was for 2007, so the baseline was conducted for this year. The one exception was vehicle miles traveled (VMT), the input used to determine emissions from the transportation sector. The best data available for VMT in Ventura was from 2003. To reconcile this inconsistency, population change was used to estimate VMT for 2007. While we could have back-forecasted the 2007 data to 2005, also using population, it was decided that the actual numbers for baseline emissions were not as important, in the grand scheme of the project, as the reduction scenarios. After finding data for electricity, gas, VMT, and waste, ICLEI-Local Governments for Sustainability’s CACP-2009 software was used to calculate emissions of CO<sub>2</sub>, N<sub>2</sub>O, and CH<sub>4</sub>. Using the global warming potential (GWP) of these gases, the total emissions inventory for Ventura was calculated in metric tons of CO<sub>2</sub>-equivalent. Table 1 describes where and how the raw data was collected.

Sector	Data Source	How to Acquire	Raw Data Units	CO <sub>2</sub> e emissions (metric tons)
Transportation <sup>1</sup>	SCAG	Local Metropolitan Planning Organization (MPO)	Vehicle Miles Traveled	401,259
Electricity <sup>2</sup>	SoCal Edison	Contact utility directly	Kilowatt-hours	183,975
Natural Gas <sup>3</sup>	The Gas Company	Contact utility directly	Therms	147,843
Waste <sup>4</sup>	City of Ventura	Environmental Services Division	Tons	31,189

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<sup>1</sup> Southern California Association of Governments (SCAG), [www.scag.ca.gov/modeling](http://www.scag.ca.gov/modeling). *Year 2003 Model Validation and Summary: Regional Transportation Model*, Chapter 8, pp. 7.

Daily VMT for Ventura County scaled to 2007 for City of Ventura using population data from U.S. Census at [http://factfinder.census.gov/home/en/official\\_estimates\\_2008.html](http://factfinder.census.gov/home/en/official_estimates_2008.html).

<sup>2</sup> Southern California Edison (SCE). Request usage data separated into all available sectors, minimum residential and commercial, for all accounts within City boundary (often based on zip codes). Data for Ventura case was acquired through Ventura County Regional Energy Alliance (VCREA).

<sup>3</sup> The Gas Company is the relevant natural gas utility. Request usage data separated into all available sectors, minimum residential and commercial, for all accounts within City boundary (often based on zip codes). Data for Ventura case was acquired through Ventura County Regional Energy Alliance (VCREA).

Municipality <sup>5</sup>	City of Ventura	Environmental Services Division	Metric tons CO <sub>2</sub> e	14,109
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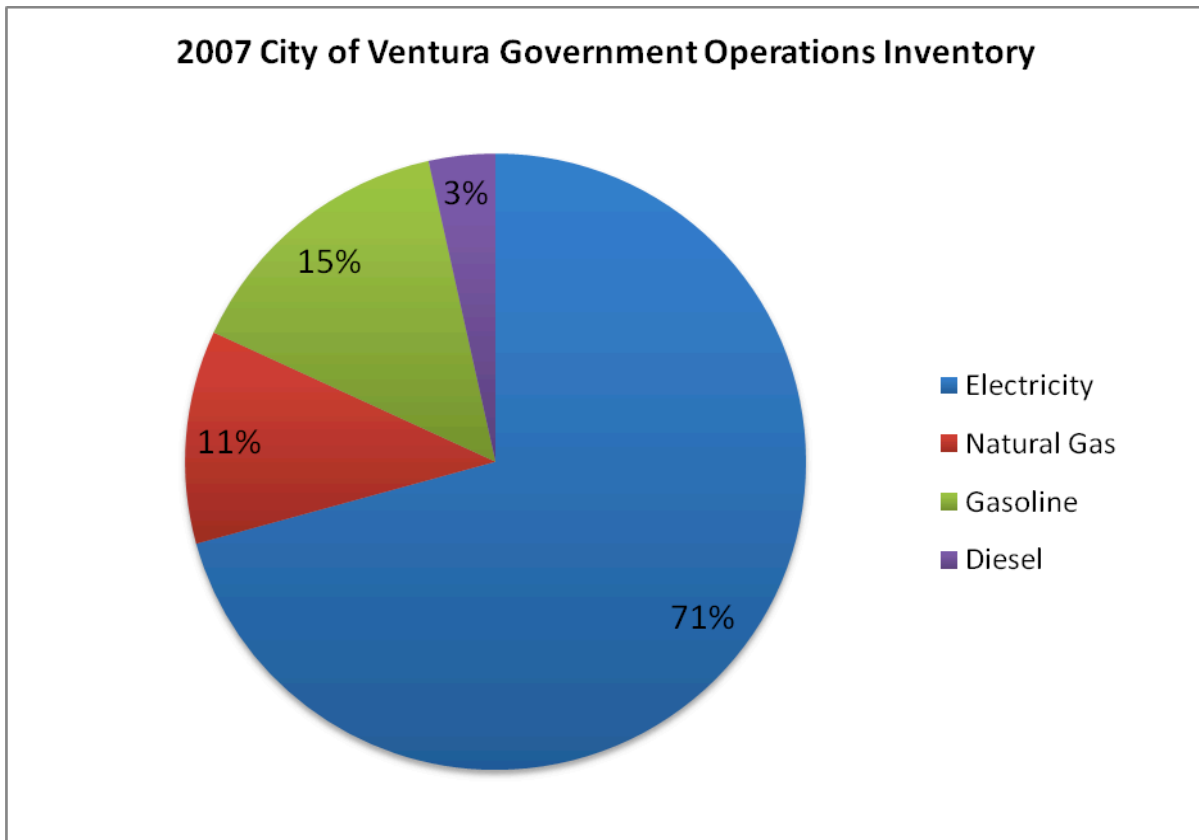
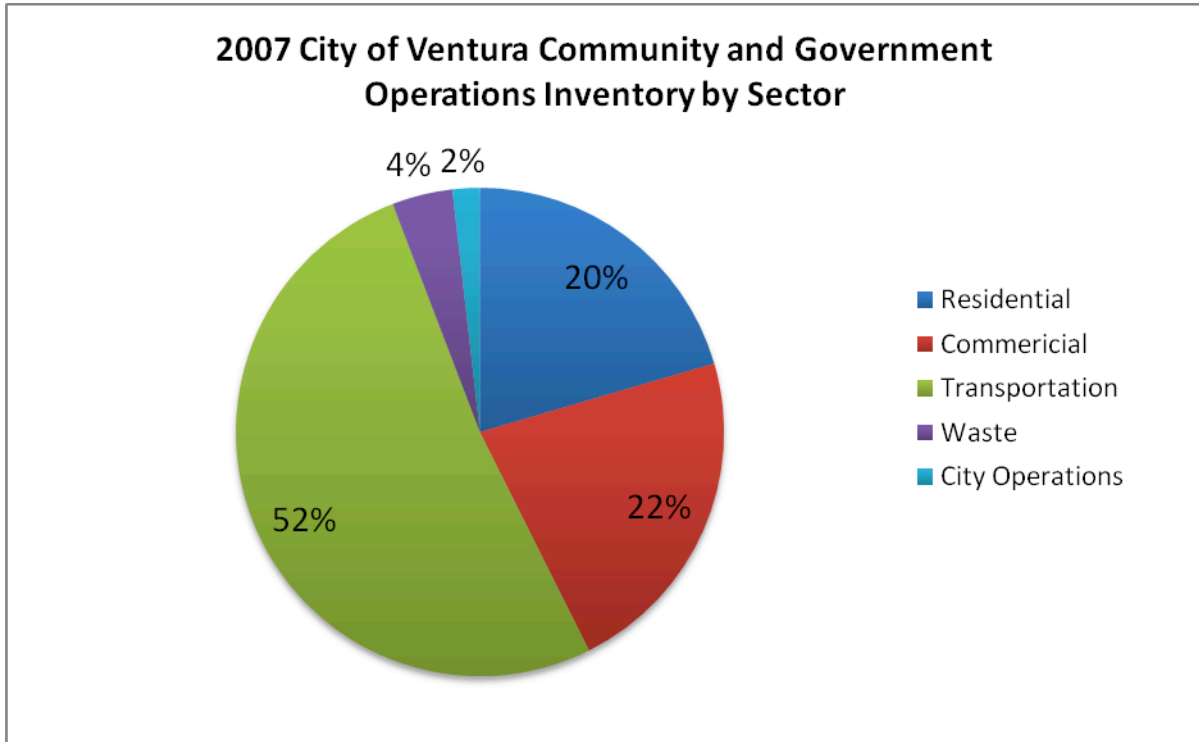
**Table 1. 2007 Greenhouse Gas Inventory for Ventura, CA**

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<sup>4</sup> Contacted City of Ventura, Environmental Services Division. Waste data was available for 2007, waste material breakdown was available for 1999 from California Integrated Waste Management Board at <http://www.ciwmb.ca.gov/Profiles/Juris/JurProfile1.asp?RG=C&JURID=430&JUR=San+Buenaventura>.

<sup>5</sup> The City of Ventura is a California Climate Action Registry (CCAR) member, reporting emissions for 2007. This is not an additional sector because emissions from City operations are contained in all above sectors.

## Inventory Results



## **Conclusions**

Like all emissions inventories, this document must rely on the best available data and calculation methodologies. Emissions estimates are subject to change as better data and calculation methodologies become available in the future. Nevertheless, the findings of this analysis provide a solid basis upon which Bren|AECOM can recommend GHG mitigation strategies for Ventura, using the model that will be developed in the coming months.

In line with State, National, and Global trends, the transportation sector is by far the largest emitter of GHGs in the city of Ventura. Electricity and natural gas are respectively the next largest emitters.

The sectors with the highest proportion of the total emissions for the community of Ventura are in line with the national trends. The Menu of GHG reduction strategies will reflect these trends, focusing on transportation, electricity, and gas.