



# SANTA BARBARA COUNTY

## *Climate Action Strategy*

### Phase 1 - Climate Action Study

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# Climate Action Study

## Executive Summary

California is on the forefront of developing solutions to reduce greenhouse gas (GHG) emissions. In 2005, the Governor issued Executive Order S-3-50 to reduce the State's GHG emissions by 80% below 1990 levels by 2050. Enactment of several, related pieces of climate action legislation quickly followed, including Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, Senate Bill (SB) 375 and SB 97. These laws together create a framework for GHG emissions reductions. Local governments have a vital role to play in assisting the State to meet these mandates.

In March 2009, the Board of Supervisors directed County staff "to take immediate, cost effective, and coordinated steps to reduce the County's collective GHG emissions" (BOS Resolution 09-059). Developed in response to this direction, the County's Climate Action Strategy (CAS) is a two-phase project comprised of (1) this Climate Action Study (Study), including a County-wide greenhouse gas (GHG) inventory, forecast and evaluation of potential emission reduction measures (ERMs), and (2) a Climate Action Plan (CAP), which, if adopted, would seek to reduce the County's GHG emissions through implementation of selected ERMs with the goal of achieving a GHG reduction target to be selected by the Board.

The purpose of this Study is to:

- 1) Demonstrate the County's commitment to the Climate Change Guiding Principles, as adopted by the Board of Supervisors, by identifying possible existing and future GHG reduction measures and programs.
- 2) Set the framework for the County to comply with the goals and requirements of Assembly Bill 32 and Senate Bill 97, based on an inventory of the County's current and projected GHG emissions.
- 3) Identify the next steps toward meeting the State's GHG emissions reductions target.

This Study provides a summary of policies, programs, and projects that the County of Santa Barbara can implement to reduce GHG emissions in the unincorporated County. The Study addresses GHG reduction through the County's roles as generator and regulator of GHG emissions as well as incentivizer of GHG reductions, with incentives being the priority. The Study summarizes policies that have already been put in place to reduce GHG emissions in the County as well as a list of new emission reduction measures (ERMs) that the County of Santa Barbara can implement in the future. ERMs are organized into 4 reduction categories: 1) Air and Energy, 2) Land Use and Transportation, 3) Green Building, and 4) Resource Conservation. The Study qualitatively evaluates and ranks these ERMs.

The Study also presents the results of a GHG emissions inventory, which evaluates current (2007), historical (1990) and projected (2020 and 2035) emissions County-wide and for the unincorporated County only. This Study focuses on the unincorporated County only as this is the area with respect to which Santa Barbara County maintains land use authority. The inventory calculates current GHG emissions for the unincorporated County to be 1.78 million metric tons of CO<sub>2</sub>e, based on 2007 data. A backcast inventory to 1990, conducted using a "top-down" methodology extrapolating from general statewide data rather than direct emissions data, which are not available for 1990, indicates emissions of 1.62 million metric tons of CO<sub>2</sub>e. A second 2007 inventory prepared using the same "top-down" methodology to determine the trend between 1990 and 2007, shows 2007 emissions of 1.54 million metric tons of CO<sub>2</sub>e, representing a decrease of approximately 5% over this period. Forecasts to 2020 and 2035 project a 7.3% increase from 2007 to 2020 with emissions increasing to 1.92 million metric tons of CO<sub>2</sub>e. Further growth in emissions

is forecast to 2035, with a 24.4% increase and emissions totaling 2.23 million metric tons of CO<sub>2</sub>e anticipated. All forecasts assume a business-as-usual scenario.

The second phase of the CAS will be to develop a Climate Action Plan (CAP) which, if adopted by the Board, would implement selected GHG reduction strategies from the Study in the County. The development and adoption of the CAP would provide a system for implementing the ERMs identified in the Study. Specifically, the CAP would set an emissions reduction target and a plan to meet the target through implementation of the ERMs. The CAP would quantify expected reductions and costs and benefits of each ERM. Additionally, the CAP would establish County-wide GHG significance thresholds for emissions from other than stationary sources. Once adopted, the CAP will provide programmatic CEQA mitigation for impacts from GHG emissions from projects in Santa Barbara County, potentially relieving applicants of having to provide mitigation on a project-specific basis..

## Acronyms

AB	Assembly Bill
BAU	Business As Usual
BOS	Board of Supervisors
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CAS	Climate Action Strategy
CEQA	California Environmental Quality Act
CHWCC	Community Hazardous Waste Collection Center
CRT	Cathode Ray Tube
EO	Executive Order
ERM	Emission Reduction Measure
GAP	Good Agricultural Practices
GHG	Greenhouse Gases
HVAC	Heating, Ventilating and Air Conditioning
IBRP	Innovative Building Review Program
ICLEI	International Council for Local Environmental Initiatives or Local Governments for Sustainability
IVMP	Isla Vista Master Plan
MPO	Metropolitan Planning Organization
OPR	State Office of Planning and Research
RDA	Redevelopment Agency
RHNA	Regional Housing Needs Allocation
RRWMD	Resource Recovery and Waste Management Division
RTAC	Regional Targets Advisory Committee
RTP	Regional Transportation Plan
RWEP	Regional Water Efficiency Program
SAP	Sustainability Action Plan
SB	Senate Bill
SBCAG	Santa Barbara County Association of Governments
SBCAPCD	Santa Barbara County Air Pollution Control District
SCRTS	South Coast Recycling and Transfer Station
SCS	Sustainable Communities Strategy
SCT	Sustainability and Conservation Team
Study	Climate Action Study
SYVRTS	Santa Ynez Valley Recycling and Transfer Station
TDM	Transportation Demand Management
VMT	Vehicle Miles Traveled





**1.0**

*Introduction*

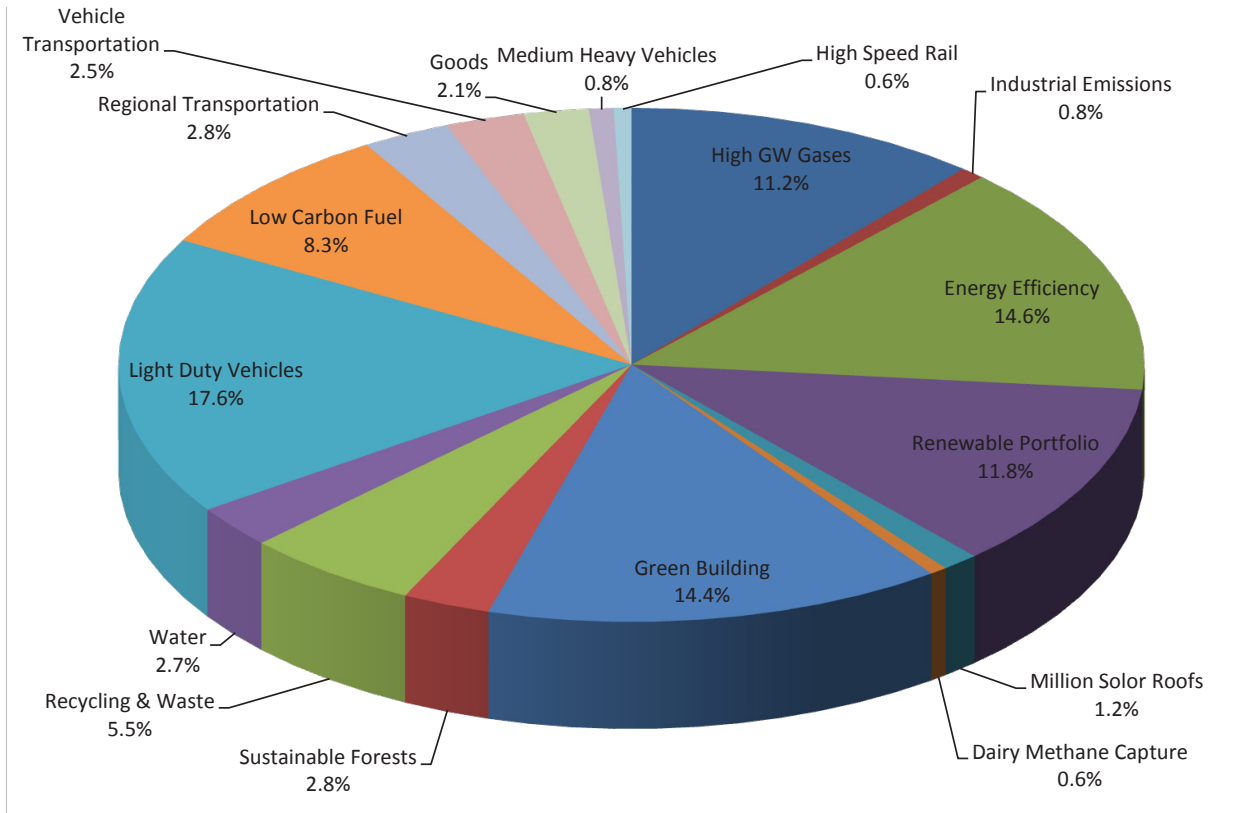
## 1.1 Key Policy and Regulatory Mandates

In 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-50 (EO) establishing greenhouse gas (GHG) emissions reduction targets for California. The Executive Order called for a reduction of GHG emissions to 2000 levels by 2010, a reduction to 1990 levels by 2020, and a reduction to 80% below 1990 levels by 2050. This EO established California as a leader in climate change policy. Multiple pieces of climate change legislation emerged following this EO and resulted in the passage of Assembly Bill (AB) 32, Senate Bill (SB) 97, and SB 375. This section highlights this legislation as it is relevant to local government action.

### AB 32

The Global Warming Solutions Act of 2006 was enacted through Assembly Bill 32. A primary component of AB 32 was the establishment of a State GHG reduction target to 1990 levels by 2020, equivalent to the EO. This target applies to all of California. Based on emissions inventories conducted by the State, this is equivalent to a 15% reduction. To achieve this target, AB 32 directed the California Air Resources Board (CARB) to develop a Scoping Plan to establish GHG emission reduction measures (ERMs) for all sectors of the economy. The Scoping Plan identifies 18 ERMs which will affect multiple sectors of the economy (Figure 1). Key ERMS include a Cap-and-Trade Program; reduction of vehicle gas emissions through a low carbon fuel standard; changing the way we build our cities and communities through better planning (SB 375); improving electricity and energy use by improving energy efficiency in appliances; requiring 33% of energy to come from renewable sources; improving water efficiency; green buildings; Million Solar Roofs; auditing the 800 largest emission sources in the industrial sector to identify GHG reduction opportunities; capturing high global warming potential gases; carbon sequestration in forest projects; improving agricultural operational efficiency; and improved waste management and recycling programs.

## AB 32 Emission Reduction Measures



**Figure 1. Scoping Plan Emission Reduction Measures Contribution to AB 32 Reduction Goals.**

Local governments are viewed as essential partners to the State in implementing many of the ERMs identified in the Scoping Plan and ensuring progress towards GHG reduction goals. In fact, the Scoping Plan encourages a GHG reduction target for local government municipal and community emissions of 15 percent from current levels by 2020 to parallel the State’s target. With local governments uniquely positioned to set an example to the community through their own actions and to develop community-specific emission reduction strategies, it makes the most sense for local governments rather than the State to implement reduction measures. Of the eighteen measures identified in the Scoping Plan, nine have potential local government actions associated with them, as illustrated in Table 1.

**Table 1. Potential Actions Applicable to Local Governments**

Measure	Potential Actions	Municipal Relevance	Community Relevance
Energy Efficiency	Increase Utility Energy Efficiency Programs	✓	✓
	Reduce/promote reduction of energy consumption	✓	✓
	Install solar water heating systems for municipal facilities	✓	
	Provide incentives for building owners to participate in the “Million Solar Roofs”		✓
Renewable Portfolio Standard	Achieve a 33% renewable portfolio standard	✓	✓
Green Buildings	Facilitate green building construction, renovation, operation and maintenance at local government owned/operated facilities	✓	
	Implement and provide training for the state adopted green building code		✓
	Transit oriented planning		✓
	Provide incentives to exceed Title 24 standards and lead by example	✓	✓
Recycling and Waste	Control landfill methane emissions	✓	
	Adopt Zero Waste and Environmentally Preferable Purchasing policies	✓	
	Increase diversion from landfills	✓	✓
High GWP (Global Warming Potential) Gases	Ensure proper maintenance of fleet vehicles	✓	
	Ensure proper handling and disposal of waste refrigerants	✓	✓
Sustainable Forests	Promote urban forests		✓
	Make land use decisions that conserve forest lands		✓
Water	Improve efficiency of municipal water system	✓	
	Increase water recycling	✓	✓
	Reuse urban runoff	✓	✓
Transportation	Promote employee transit incentive programs	✓	✓
	Transit oriented planning		✓
Vehicle Efficiency	Provide routine fleet maintenance	✓	



## SB 375

SB 375, which is an implementing measure of AB 32, addresses reducing GHG emissions from vehicles by reducing the number of vehicle miles traveled through the synthesis of transportation, land use, and jobs and housing planning. California's Metropolitan Planning Organizations (MPOs) will develop a Sustainable Communities Strategy (SCS) which would align the Regional Transportation Plan (RTP) with the Regional Housing Needs Allocation (RHNA) to create a plan to reduce vehicle miles travelled and reach regional GHG reduction targets set by CARB. The Regional Targets Advisory Committee (RTAC) is a committee that was put in place to provide recommendations to CARB on how to set the reduction targets for each MPO. The RTAC ultimately recommended that CARB set regional reduction targets that are ambitious yet achievable on a per capita metric. Draft reduction targets were set in June 2010. For the six smallest MPOs, including the Santa Barbara County Association of Governments (SBCAG), CARB staff proposed to work with these MPOs for the first target-setting cycle to set reduction targets based on the MPOs' most current greenhouse gas per capita projections. The six smallest MPOs represent only 5% of both the State's greenhouse gas emissions and vehicle miles travelled. The SBCAG Board voted for the target to be set at a zero net increase in emissions. CARB adopted this target in late September 2010.

## SB 97

SB 97 amended the California Environmental Quality Act (CEQA) to require GHG emissions be analyzed under CEQA. SB 97 allows for public agencies to analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level as part of an adopted Climate Action Plan. Once adopted, later project-specific environmental review documents may tier from and/or incorporate that existing environmental review for the analysis of cumulative impacts related to GHG emissions. The benefit of a local jurisdiction analyzing GHG emissions at a programmatic level is that it removes the burden and cost of quantifying and analyzing GHG emissions under CEQA for project applicants.

Although SB 97 does not require lead agencies to adopt significance thresholds with respect to GHG emissions, it does require lead agencies to make significance determinations for such emissions. To address this requirement, the County has promulgated interim guidelines to be used by planners in evaluating GHG emissions based on the Bay Area Air Quality Management District's (BAAQMD) adopted thresholds of significance. These guidelines will be used until the County adopts significance thresholds as part of a Climate Action Plan (CAP), as discussed in Section 4.1.

**Table 2. Legislation of Local Government Importance in California**

State Legislation	Year Approved	Summary	Implementation Milestones
<b>AB 32</b> Sets target to reduce GHG emissions	<b>2006</b>	Requires the California Air Resources Board (CARB) to develop regulations and market mechanisms to reduce California's greenhouse gas (GHG) emissions back to 1990 levels by 2020.  <b>County Impacts:</b> Specific requirements for local agencies as well as impacts associated with noncompliance are expected to be outlined by CARB by 2012.	<b>2008</b> - Baseline for mandatory GHG emissions and 2020 statewide cap adopted by CARB.  <b>2009</b> - CARB adopted Scoping Plan  <b>2012</b> - GHG rules and market mechanisms adopted by CARB take effect and are legally enforceable.  <b>2020</b> - Deadline for emission reduction target.
<b>SB 97</b> Ties GHG analysis to CEQA	<b>2007</b>	Requires the State to develop legal guidelines for analysis and mitigation of GHG emissions, pursuant to CEQA.  <b>County Impacts:</b> CEQA documents, including negative declarations, mitigated negative declarations, and environmental impact reports are required to address GHG emissions.	<b>2009</b> - Adoption of amended Guidelines.  <b>2010</b> - Amendments effective March 18, 2010.
<b>SB 375</b> Implements one portion of AB 32	<b>2008</b>	One implementation measure of AB 32 is the alignment of the Regional Housing Needs Allocation (RHNA) and the Regional Transportation Plan through development of a Sustainable Communities Strategy (SCS) that would be adopted by SBCAG.  <b>County Impacts:</b> SB 375 calls for a new regional planning process, new requirements for environmental analysis, and strengthens the Housing Element rezone mandate overseen by the State Housing and Community Development Department (SHCD).	<b>2010</b> - GHG reduction targets related to SB 375 are established by CARB and assigned to Metropolitan Planning Organizations (such as SBCAG).  <b>2013</b> - Local Regional Transportation Plan updates (2014-2021), including adoption of the SCS & RHNA.  <b>2015-2023</b> - Housing Element updates (2015-2023).

While all of this legislation is relatively new, many jurisdictions around the state have already made progress towards the goals and requirements of each bill. According to the 2010 California Planner Book of Lists, numerous California cities and counties are working on climate-related issues:

- 58 jurisdictions have already adopted a CAP or GHG Reduction Plan;
- 50 jurisdictions have adopted a community-wide greenhouse gas emission reduction target;
- 269 jurisdictions have adopted, or are in the process of drafting, policies and/or programs to address climate change and/or to reduce GHG emissions, including the City and County of San Luis Obispo, the County of Ventura, the City of Santa Barbara, and the City of Goleta.

The counties listed in Table 3 below have developed a municipal CAP, community CAP, or both. Reduction goals set by each county vary, but all are consistent with and sometimes more aggressive than the goals of AB 32.

**Table 3. Adopted and Proposed Climate Action Plans and Associated Reduction Goals**

County	Scope of Plan	Reduction Target
Alameda <sup>1</sup>	Municipal	15% below current by 2020
	Unincorporated County	80% below 1990 by 2050
Contra Costa	Municipal	50% below current by 2030
Marin	Municipal	15-20% below 2000 levels
	Countywide	15% below 2000 levels
Sacramento	Municipal	15% below current by 2020
	Countywide	15% below current by 2020
San Bernardino <sup>2</sup>	Municipal	15% below current by 2020
	Countywide	15% below current by 2020
Sonoma	Municipal	20% below 2000 by 2010
	Community	25% below 1990 by 2015
Yolo <sup>3</sup>	Unincorporated County	1990 levels by 2020
		27% below 1990 by 2030
		53% below 1990 by 2040
		80% below 1990 levels by 2050

Adopting a CAP is one action that local governments can take to create a program of solutions in concert with the goals of AB 32. As SB 375 is an implementing piece of legislation to AB 32, developing a CAP also positions the jurisdiction for compliance with SB 375. Local governments can use the CAP to lead by example to illustrate how they are going to reduce their own emissions from municipal operations. Additionally, a CAP is an avenue that can be used to develop a program of ordinances, policies, standards, codes, and incentive programs to be implemented in the community that can reduce greenhouse gas emissions. CAPs are also a tool that can be used to streamline the analysis of impacts and mitigation measures related to greenhouse gas emissions through CEQA. By using a CAP as this tool, the local government takes much of the burden associated with analyzing greenhouse gas emissions off of individual project applicants.

<sup>1</sup> Alameda County Municipal CAP has been adopted with the above reduction target. The Community CAP is in its draft final stage with adoption planned for 2011.

<sup>2</sup> San Bernardino County CAP has not yet been adopted or published; however, based on correspondence with staff, these are the reduction targets proposed.

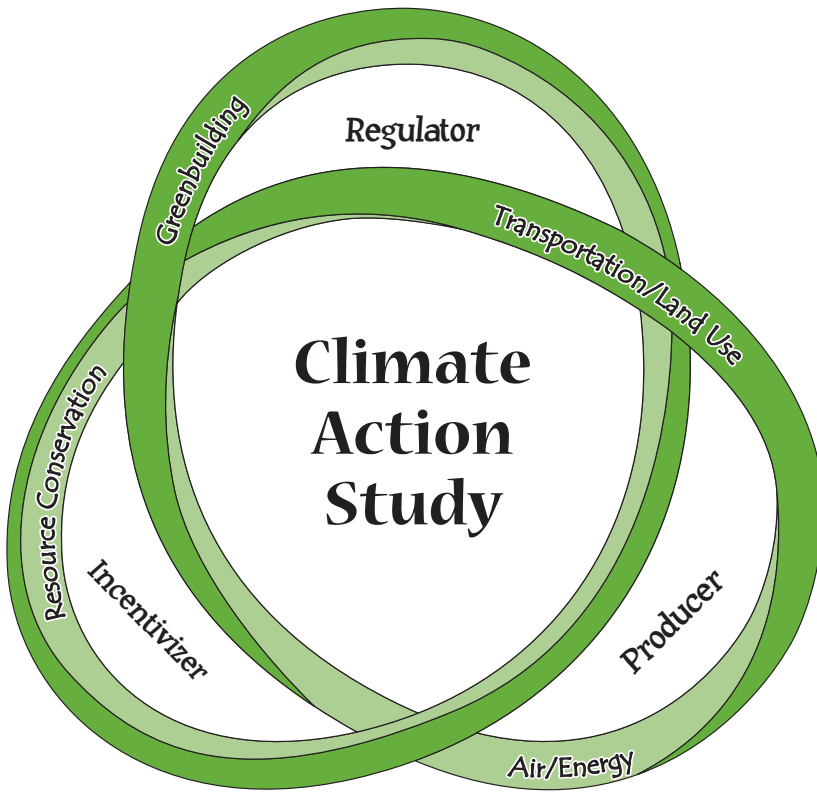
<sup>3</sup> Reduction targets from the Yolo County Draft CAP expected to be adopted Spring of 2011.

## 1.2 County of Santa Barbara's Approach

On March 17, 2009, the County Board of Supervisors adopted Resolution 09-059 which expressed the County's commitment to take immediate, cost effective and coordinated steps to reduce the County's collective greenhouse gas emissions in order to protect the community from the effects of climate change and implement programs to comply with the State of California's greenhouse gas reduction goals. The Resolution adopted the Santa Barbara County Climate Guiding Principles which recognize that investing in actions and creating a coordinated planning, measurement, evaluation, and reporting process to reduce GHG emissions can outweigh the costs. Specifically, the third Guiding Principle states "The benefits of investing in actions to reduce GHG emissions can outweigh the costs in numerous ways, including: improved economic vitality; public health and safety; natural resource protection; and infrastructure stability."

This Study serves as the first step in a coordinated approach to progress towards achieving these goals and towards regional sustainability and regulatory compliance with climate legislation. This Study covers the unincorporated county as well as municipal operations. It is a document that lays out future options the County can take to reduce GHG emissions and meet the goals of AB 32, comply with SB 97 and SB 375, and prepare for any emerging federal climate legislation through its roles as: 1) a producer of GHG emissions, 2) a regulator of GHG emitting activities, and 3) an incentivizer of GHG reductions, as illustrated in Figure 2 and described below:

- 1) **Producer of GHG Emissions** - The County can reduce its own internal municipal production of greenhouse gas emissions related to County operations. Numerous existing sustainability programs have already begun to quantify and minimize GHG emissions related to County operations. Moreover, the County's Sustainability and Conservation Team (SCT) is overseeing the implementation of measures and actions designed to enhance the energy performance of municipal buildings, improve the County's vehicle fleet, encourage water efficiency, and minimize waste. Additional staff time and resources to encourage the coordination of future County departmental efforts are needed to ensure that goals, policies, and actions are focused towards achieving the State's GHG emission reduction targets, sharing timely information among County departments, and minimizing the costs and duplication of efforts across departments.
- 2) **Regulator of GHG Emitting Activities** - The County can use new policies, ordinances, or standards to reduce GHG emissions within its jurisdiction. County departments such as Planning & Development and Public Works are involved in regulating land use and building activities, and developing community and regional plans. As a result, the County can impact the energy performance of the built environment, and is able to use the master planning and regional planning process to promote land use patterns and establish policies that reduce vehicle miles traveled.
- 3) **Incentivizer of GHG Reduction Efforts** - The County is well positioned to remove barriers and create incentives that encourage homes, farms, businesses and other institutions to take steps to reduce their GHG emissions. In addition, these incentives can stimulate the local economy and spur community economic enhancement by helping to build jobs and increase the livability of local communities throughout the County.



**Figure 2. Structure of the Climate Action Study**

The Sustainability Action Plan (SAP), adopted by the Board of Supervisors on July 13, 2010, addressed the first role as producer of GHG emissions and has been incorporated into this Study as Appendix A. By completing the SAP ahead of the Study, the County has positioned itself to provide leadership to the community demonstrating its commitment to reducing greenhouse gas emissions at the municipal level. This Study, with the incorporated SAP, provides the first steps towards completing the five recommended milestones to reducing greenhouse gases set by ICLEI, International Council for Local Environmental Initiatives or Local Governments for Sustainability, of which the County of Santa Barbara is an active member. ICLEI, founded in 1990, includes members from 1,049 local governments and their associations, representing over 300 million people in 68 countries. ICLEI provides technical assistance to members pursuing strategies for sustainable communities and reducing GHG emissions. The Cities for Climate Protection Milestone Guide developed by ICLEI establishes a five-milestone program that local governments can adopt to work towards reducing GHG emissions. Table 4 provides an excerpt of the five recommended milestones.

**Table 4. ICLEI Local Governments for Sustainability GHG Reduction Milestones<sup>3</sup>**

Milestone	Recommended Actions
Milestone #1	Conduct a baseline emissions inventory and forecast: local governments and nations across the world can only manage what they measure. The first step in managing greenhouse gas emissions, therefore, is to establish an inventory of those emissions.
Milestone #2	Adopt an emissions reduction target: provides a tangible and specific goal against which progress can be measured.
Milestone #3	Develop a Local Climate Action Plan: provides a strategy to reduce greenhouse gases and include measures already implemented.
Milestone #4	Implement policies and measures: most important part of the process, which generally involves cooperation and coordination among multiple departments.
Milestone #5	Monitor and verify results: provides a valuable tool to measure progress towards the reduction goal, allows for modification in implemented measures to increase effectiveness, and provides a quantification of emissions to be used in any emission trading mechanism that might be established in the future.

This Study completes Milestone #1 and lays the initial groundwork needed to complete ICLEI Milestones #2-5, which could be accomplished as part of the Climate Action Plan.

The Emission Reduction Measures discussed in this Study are organized using four potential reduction categories chosen to delineate a comprehensive set of Emission Reduction Measures (ERMs) that cover all greenhouse gas emission sectors: 1) Air and Energy, 2) Land Use and Transportation, 3) Green Building, 4) Resource Conservation. While this Study is the first step in a coordinated approach to reducing greenhouse gas emissions in the unincorporated County, it is not the last step in this effort. This Study focuses on assembling a cohesive program to reduce greenhouse gas emissions in the unincorporated County in its three roles as producer, regulator, and incentivizer. This Study is not a policy document and no policies will be adopted as part of this Study. Instead, the Study provides a report on the County’s efforts to date that promote GHG reductions and provides recommendations for future activities that can assist in assuring compliance with AB 32, SB 375 and SB 97. As discussed in Chapter 4, this Study is the initial step toward the completion of a CAP. The CAP will analyze the emission reduction measures identified in the Study using a greenhouse gas emissions inventory of unincorporated lands as a baseline measure. Upon adoption, the CAP will provide the County with a policy framework to reduce greenhouse gas

<sup>3</sup> ICLEI Cities for Climate Protection Milestone Guide

emissions throughout the community. It will also provide prospective development applicants with a suite of GHG emission reductions options that may be implemented as a means to reduce cumulative GHG emission impacts or provide programmatic mitigation under CEQA.

Beyond implementing the recent legislation discussed above, this Study provides multiple co-benefits to the government and the community. Climate planning provides for a number of economic, environmental, and public health co-benefits. At a municipal level, by incorporating energy efficiency measures into County operations, fiscal benefits can be derived through reduced energy costs. Community green building incentives and policies that incorporate energy- and water-efficient features provide the co-benefits of reduced energy and water consumption and decreased energy and water costs for consumers. Additionally, buildings that use products made from recycled materials may help strengthen the demand for businesses that provide recycled materials used in green building. The reduction associated with the use of recycled building materials will reduce GHG emissions through fewer materials placed in landfills for anaerobic digestion, reduction in fuel use to transport materials to landfills, and a reduction in the extraction of raw materials. Resource and water conservation efforts have the co-benefits of reducing GHG emissions and costs for goods or services. For example, conserving and/or planting shade trees that help sequester GHG emissions also serve to reduce temperatures in neighborhoods, thereby reducing the need and associated costs for air conditioning. Improving water efficiency and conservation efforts will help reduce the energy usage and GHG emissions associated with water processing and delivery. They may also improve the resiliency of a community in providing water services during years of increased drought or reduced State water allocations. GHG reduction measures that decrease combustion-generated soot can help improve air quality. This provides the co-benefit of reducing the public health impacts associated with respiratory and cardiovascular illnesses linked to air pollution.

While the County recognizes that climate adaptation planning is an emerging issue, this Study is not intended to develop an adaptation strategy focused on managing risks related to climate change. This Study only serves to identify a coordinated approach to reduce greenhouse gas emissions and increase potential carbon sinks. The California Natural Resources Agency produced the 2009 California Climate Adaptation Strategy, intended to facilitate an ongoing and committed process at the State level to adapt to climate change in relation to environmental, social, and economic changes. More specifically, it identifies impacts, risks, and strategies for public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forestry, and transportation and energy infrastructure. The County will continue to monitor State and federal actions related to climate adaptation in coordination with its efforts to reduce greenhouse gas emissions.

## 1.3 Jurisdictional Constraints and Opportunities

The County is carrying out this Study as a proactive effort to reduce GHG emissions in the County prior to a State mandate in order to position itself to influence any future mandates, assist the State in meeting its GHG emission reduction goals, and continue its leadership in environmental issues. In addition, as discussed above, the Study represents the first step toward a Climate Action Plan that could serve as programmatic CEQA mitigation of GHG emissions. The County's efforts are limited by jurisdictional constraints. The County has the ability to implement policy only in the unincorporated county where it has land use authority. State and federal lands and waters in the unincorporated county are not subject to County policies and regulations. These lands include the Los Padres National Forest, Vandenberg Air Force Base, University of California Santa Barbara, the Chumash Reservation, and the Santa Barbara Channel along with some smaller State or federally owned lands. While the County has no jurisdiction over these areas, it is committed to developing relationships with the other jurisdictions in the County and surrounding areas to create regional plans or programs. SBCAG and Santa Barbara County Air Pollution Control District (SBCAPCD), both regional agencies, have ongoing efforts related to climate change. The County is constantly monitoring these efforts and identifying opportunities for collaboration. Many of the ERMs discussed in Section 3.3 will require a collaborative effort from other agencies, such as SBCAPCD and SBCAG, and organizations to implement. Through implementation of this Study, the County can develop opportunities for collaboration and further develop functional relationships.

### SBCAG

Through the implementation of SB 375, SBCAG is developing a Sustainable Communities Strategy (SCS), which will plan how the region will meet a target of zero net increase in per capita emissions from passenger vehicles by the year 2020. This target was set by CARB in September of 2010. SBCAG is currently in the process of updating their travel model as a first step towards developing the SCS which is expected to be completed in early 2013.

### Santa Barbara County Air Pollution Control District (SBCAPCD)

The SBCAPCD is involved in climate change issues through multiple avenues. SBCAPCD included a climate protection chapter in the 2010 Clean Air Plan which was adopted in January of 2011. The chapter is informational only and provides an inventory of CO<sub>2</sub> emissions in the County. The GHG emissions inventory discussed in Section 3.1.2 uses the CO<sub>2</sub> inventory as a data source for the baseline emissions.

Additionally in January of 2011, the SBCAPCD amended their Tailoring Rules to be consistent with new Environmental Protection Agency (EPA) requirements to include GHGs as a regulated pollutant.

SBCAPCD is currently developing GHG thresholds of significance for application in CEQA review of new projects. A public workshop was held in early 2011 to discuss the approach and to present a proposed draft threshold of significance for stationary sources. The threshold of significance for stationary sources is expected to be adopted by the SBCAPCD Board later this year. Once adopted, the County will defer to the stationary threshold for its permitting actions.

Lastly, the SBCAPCD has incorporated climate change into outreach and education programs and may be involved in the implementation of GHG control rules as required by the AB 32 Scoping Plan.





# 2.0

*Municipal Operations/County as Producer of GHGs*

## 2.0 Municipal Operations/County as Producer of GHGs

The County's Sustainability Action Plan (SAP) was adopted by the Board of Supervisors (BOS) on July 13, 2010. The SAP serves to identify and quantify the sources of emissions generated by County municipal operations. County municipal operations are activities performed by the County government itself such as operation of fire trucks, police cars, and County administration buildings. Determining the quantity and source of GHG emissions positions the County to establish immediate emission reductions, quantify future progress, and identify the greatest opportunities for reductions in emissions.

The SAP profiled GHG emissions according to the Local Government Operations Reporting Protocol, developed by ICLEI, CARB, The Climate Registry, and the California Climate Action Registry. The inventory includes Scope 1, Scope 2, and Scope 3 emissions. Scope 1 emissions are defined to be direct GHG emissions, i.e., the on-site combustion of fuels, Scope 2 emissions are defined as indirect emissions from electricity generation, and Scope 3 emissions are other indirect emissions. Report of Scope 3 emissions is voluntary. The inventory determined that Santa Barbara County government operations produced 134,003 metric tons of CO<sub>2</sub>, with Scope 1, Scope 2, and Scope 3 emissions representing 45%, 22%, and 33% of total emissions for the year 2008, respectively.

Also included in the SAP is a catalog, organized by energy-consuming groups, of actions and projects the County has already taken to reduce our GHG emissions and energy costs. The SAP identified 8 types of energy consuming groups: 1) Building Energy, 2) Mobile Workforce, 3) Vehicle Fuels, 4) Public Works Infrastructure, 5) Landfill Generation, 6) Resource Recovery, 7) Grounds Management and Sequestration, and 8) Printing and Reprographics. A discussion of examples of projects for future consideration is also included. With a total of \$9,759,182 spent in energy usage by County municipal operations in 2008, the SAP emphasizes that all energy saving measures also present a cost savings to the County.

By completing the SAP ahead of the Study, the County has positioned itself to provide leadership to the community demonstrating its commitment to reducing greenhouse gas emissions at the municipal level before asking the community to make the same commitment. The County should continue to work on the implementation of programs and projects outlined in the SAP to further illustrate the County's commitment to a reduction in energy use and reducing GHG emissions.



**3.0**

*County Jurisdiction/Regulator and Incentivizer of GHGs*

# 3.1 Greenhouse Gas Emissions Inventory

## 3.1.1 State Greenhouse Gas Emissions Inventory

CARB has completed a GHG emissions inventory for the State for the years 1990 to 2008. CARB has also produced a business-as-usual emissions forecast for the year 2020. The inventory covers carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs), that are the six Kyoto gases and nitrogen trifluoride (NF<sub>3</sub>). The inventory grouped these emissions by economic sector. Results of this 2008 emissions inventory per economic sector are presented in Figure 3 below.

### California GHG Emissions Inventory 2008

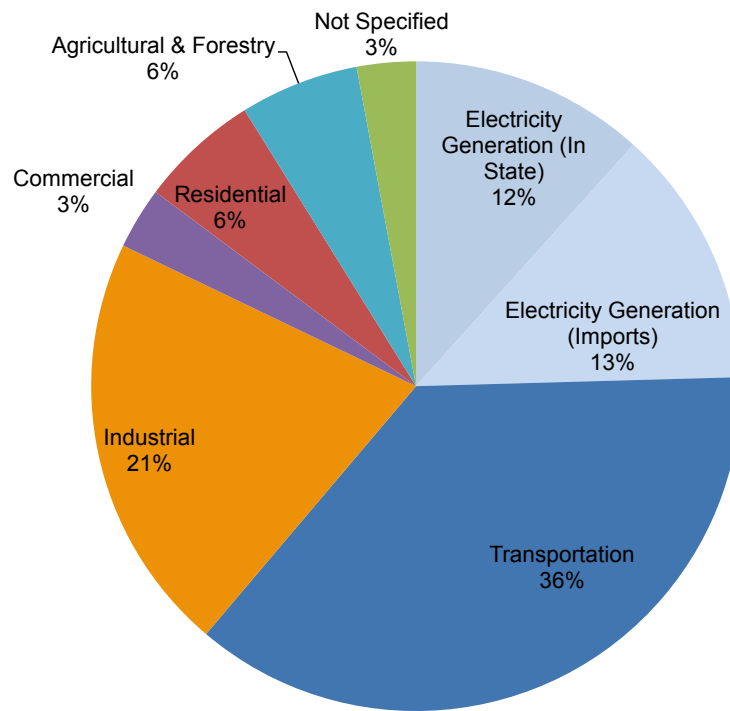


Figure 3. California 2008 GHG Emissions Inventory by Economic Sector

## 3.1.2 Santa Barbara County Greenhouse Gas Emissions Inventory

### 3.1.2.1 Scope and Methodology

A GHG emissions inventory was completed for the County of Santa Barbara (Appendix B). The inventory separately profiles emissions for all of Santa Barbara County and for the unincorporated County only. The main focus of the inventory is the unincorporated County only as this is the area which Santa Barbara County maintains land use authority. It excludes incorporated cities, the University of California (UCSB), tribal, State and federal lands. Incorporated area exclusions include the incorporated communities of Buellton, Carpinteria, Goleta, Guadalupe, Lompoc, Santa Barbara, Santa Maria and Solvang. Federal jurisdictional exclusions include Los Padres National Forest and the Vandenberg Air Force Base, as well as the offshore oil production facilities on the Outer Continental Shelf (OCS) and State waters up to the mean high water line. Tribal lands excluded are within the Chumash reservation.

The inventory includes emissions profiles for 1990, 2007, and business as usual forecasts to 2020 and 2035. The 2007 inventory represents the baseline year, while 1990 and 2020 are relevant to the goals outlined in AB 32, and the forecast year 2035 is relevant to the goals of SB 375. Detailed energy and emissions data were not available for 1990, which made it necessary to calculate 1990 emissions using an alternative method. The alternative method consisted of scaling down the Statewide Inventory. This method is referred to as the “top-down” method. For this reason, two inventories were prepared for 2007. The first is an inventory calculated using the same top-down calculation used to determine 1990 emissions. This inventory is used only to compare the growth of emissions from 1990 to 2007 and will be referred to as the “2007 top-down” method. The second 2007 inventory was prepared with a “bottom-up” method using direct energy and emissions data. This inventory is more detailed and accurate and thus is considered the baseline inventory. This inventory is referred to as the “2007 baseline inventory” or “2007 Detailed.”

Emissions forecasts for 2020 and 2035 were prepared using the bottom-up 2007 inventory. The assumptions to prepare the emissions forecast are based on SBCAG’s Regional Growth Forecast 2005-2040 (RGF 2007). The County modified the RGF 2007 population and jobs data for 2007 to reflect recent economic conditions. The adjusted baseline was then used to prepare emissions forecasts for 2020 and 2035. Additionally, the RGF 2007 is supplemented with a variety of information from other sources and discussed in detail in the Appendix B.

The emissions inventory includes two sets of emissions which are defined in the ICLEI protocol.

- Scope 1: All direct GHG emissions (with the exception of direct CO<sub>2</sub> emissions from biogenic sources), including stationary, area, and mobile sources. Agricultural activities such as dairies and vineyards are included here.
- Scope 2: Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling, water and wastewater pumping, and solid waste transport and disposal at out-of-county facilities.

Gases included in the inventory are the 6 gases recognized in AB 32 as greenhouse gases as well as a seventh gas, which was added in 2009 to the list of recognized greenhouse gases with SB 104. The gases are all expressed in terms of carbon dioxide equivalent (CO<sub>2</sub>e) and are as follows:

- 1) Carbon Dioxide (CO<sub>2</sub>)
- 2) Methane (CH<sub>4</sub>)
- 3) Nitrous Oxide (N<sub>2</sub>O)
- 4) Hydrofluorocarbon (HFCs)
- 5) Perfluorocarbon (PFCs)
- 6) Sulfur Hexafluoride (SF<sub>6</sub>)
- 7) Nitrogen Trifluoride (NF<sub>3</sub>)

### 3.1.2.2 Inventory Results

A comparison of the 1990 inventory to the 2007 top-down inventory shows a decrease in GHG emissions of approximately 5% for that period despite population growth of about 8%. The decrease in emissions was led by a 13% reduction of emissions from stationary sources, which can be explained by a significant decrease in industrial sector jobs. As seen in Figure 4 and Table 5 below, the results of the two 2007 inventories, derived using the two different methodologies, differ by about 14%. Nevertheless, while the 2007 baseline inventory is the more accurate of the two inventories in absolute terms, the 2007 top-down inventory provides for a useful trend comparison to 1990 top-down inventory emission levels. Details on this divergence are discussed in the full report in Appendix B.

#### Historic Unincorporated Santa Barbara County Greenhouse Gas Emission Inventories by Sector (Metric Tons of CO<sub>2</sub>e)

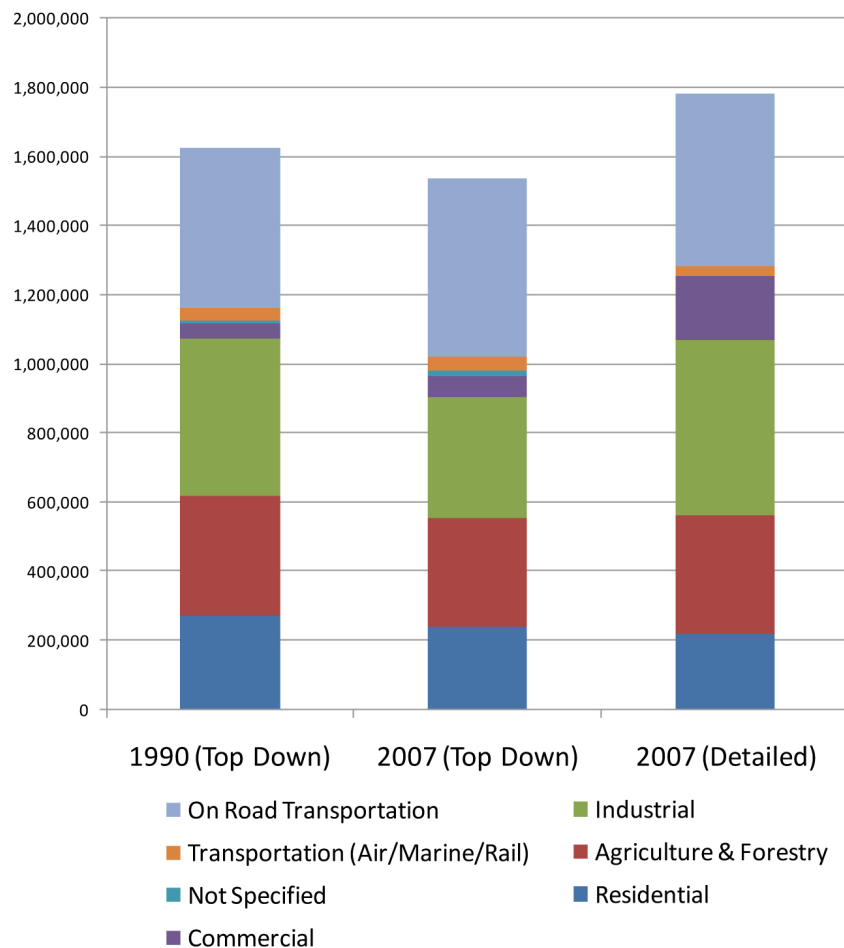


Figure 4. Comparison of 1990 Emissions to 2007.

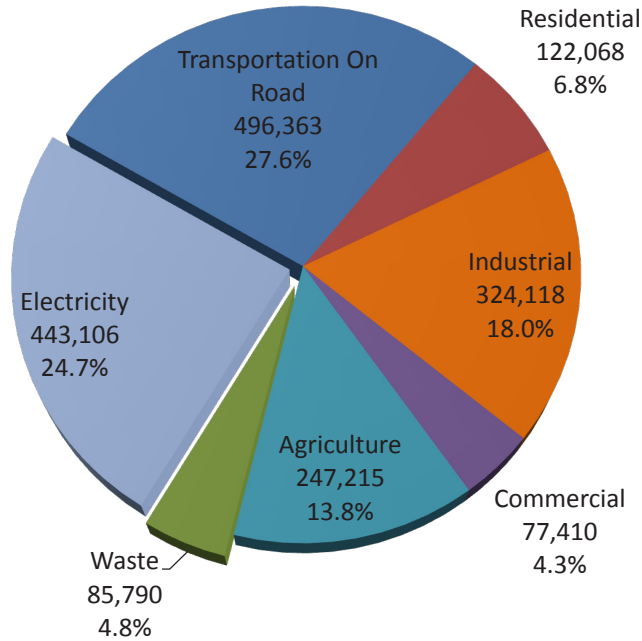
While knowing the approximate trend in emissions from 1990 to 2007 is useful information, both the 1990 and 2007 “top-down” inventories were calculated extrapolating from general statewide data requiring reliance on many assumptions because direct emissions data (i.e., actual energy use) was not available for 1990. This methodology therefore involves many uncertainties in the calculation, making the 1990 inventory much less precise and reliable than the detailed, “bottom-up” 2007 inventory.

**Table 5. GHG Emissions for 1990 and 2007 for the Unincorporated Santa Barbara County.**

Unincorporated County GHG Inventory	1990	2007	2007
<i>Method / Source</i>	<i>Top Down</i>	<i>Top Down</i>	<i>Detailed</i>
Residential	272,171	239,518	220,327
Agriculture & Forestry	345,145	314,380	340,582
Industrial	457,383	349,425	507,009
Commercial	42,270	59,795	186,647
Not Specified	6,441	18,919	NA
Transportation (Air/Marine/Rail)	36,143	39,374	29,637
On Road Mobile	463,498	516,407	496,363
<b>Total</b>	<b>1,623,051</b>	<b>1,537,819</b>	<b>1,780,565</b>

A profile of GHG emissions for the year 2007 with the detailed bottom-up inventory (the baseline inventory) are shown in Figure 5 below. Total emissions are reported to be 1.78 million metric tons of CO<sub>2</sub>e. The emissions profile diverges from the State’s with transportation accounting for 27.9% of the unincorporated County emissions compared to the State’s 36%. The proportion of agricultural emissions in the unincorporated County is 13.9%, which is much greater than the State’s of 6% for agriculture and forestry. This result is expected given that Santa Barbara County is an agriculturally intensive region with approximately 80% of the unincorporated County zoned for agricultural uses.

## 2007 Unincorporated Santa Barbara County GHG Emissions by Sector - All Scopes



**Figure 5. GHG Emissions by Sector for the Unincorporated County.**

Table 6 below provides the results of the 2007 baseline inventory and forecasts to 2020 and 2035 with comparison to population and employment growth rates for the unincorporated County. Total emissions are forecasted on a business-as-usual scenario to grow from 1.78 million metric tons of CO<sub>2</sub>e in 2007 to 2.23 million metric tons of CO<sub>2</sub>e in 2035. This represents an overall growth over this period of 25%.

**Table 6. Baseline and Projected GHG Emissions for the Unincorporated County.**

Unincorporated County GHG Emissions	2007	2020	2035
Scope 1 Direct	1,336,290	1,561,588	1,839,428
Growth		16.9%	37.7%
Scope 2 Indirect	444,275	357,851	387,419
Growth		-19.5%	-12.8%
Total	1,780,565	1,919,439	2,226,848
Growth		7.8%	25.1%
Population (SBCAG)	138,176	145,934	153,993
Growth		5.6%	11.4%
Employment (SBCAG)	19,663	22,188	24,005
Growth		12.8%	22.1%



**Table 7. Santa Barbara County 2008 County Municipal Operation Emissions**

Municipal Operations Inventory	CO <sub>2</sub> e (metric tons)	% of 2007 Unincorporated County Community Inventory <sup>4</sup>
Scope 1	60,601.60	4.8%
Scope 2	29,454.10	6.3%
Scope 3	43,947.50	N/A <sup>5</sup>
<b>Total</b>	<b>134,003.20</b>	<b>7.8%</b>

Forecasts of emissions by scope are illustrated in Figure 6. Scope 1, or direct emissions, increases at a rate of 1.1 % annually, while Scope 2, or indirect emissions, decreases by 0.5% annually out to 2035. The dip visible at the year 2020, illustrates the decline in Scope 2 emissions. Scope 2, which largely represents electricity emissions, falls due to a combination of lower emission rates per kilowatt-hour (due to an increase in renewable energy production and use) and reduced employment in electricity-intensive industries forecasted by SBCAG. A detailed profile of current and forecasted emissions by sector is provided in Figure 7 with details of the 2020 forecast by sector in Table 8. Residential and commercial are projected to increase most quickly, which is largely due to a switch in a substitution of ozone depleting substances for HFCs in coolants and refrigerants and PFCs in manufacturing. Figure 7 further illustrates that GHG emissions from electricity are expected to decline as a change to renewable energy occurs.

<sup>4</sup> Some emissions from municipal operations occur within the incorporated areas, such as emissions from the SB County Bowl and the County Administration Building, both located within the City of SB. However, GHG reductions from all County municipal operations, regardless of geographic location, would be credited to SB County.

<sup>5</sup> Scope 3 emissions for the 2007 Unincorporated County Community Inventory were not calculated.

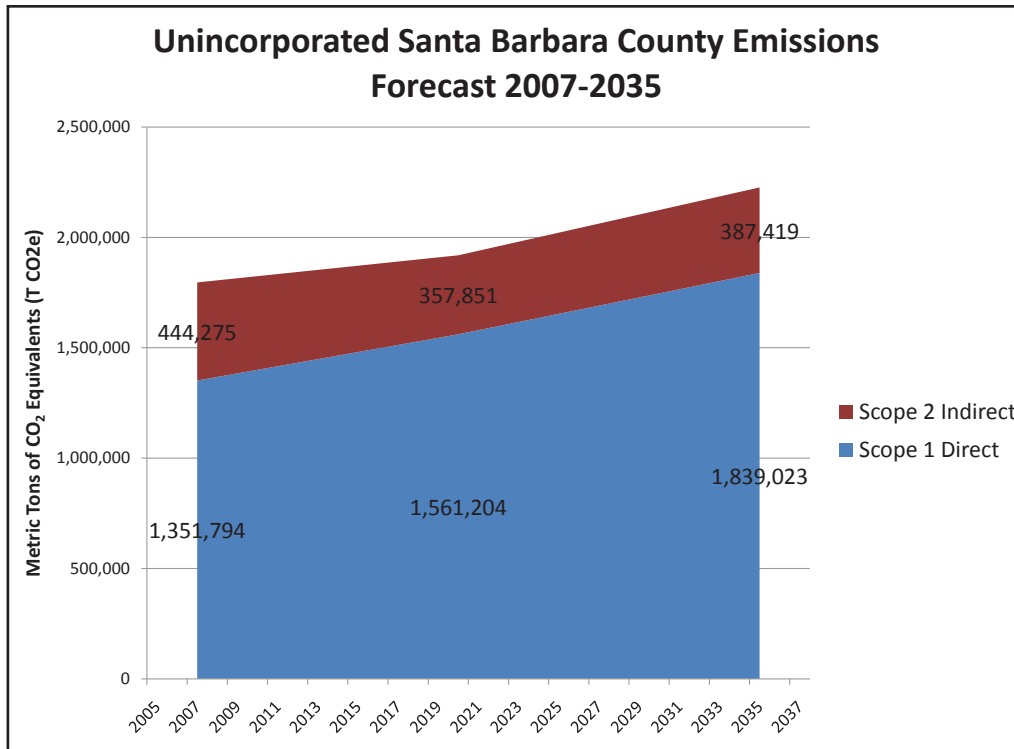


Figure 6. 2007 GHG Emissions for the Unincorporated County by Scope.

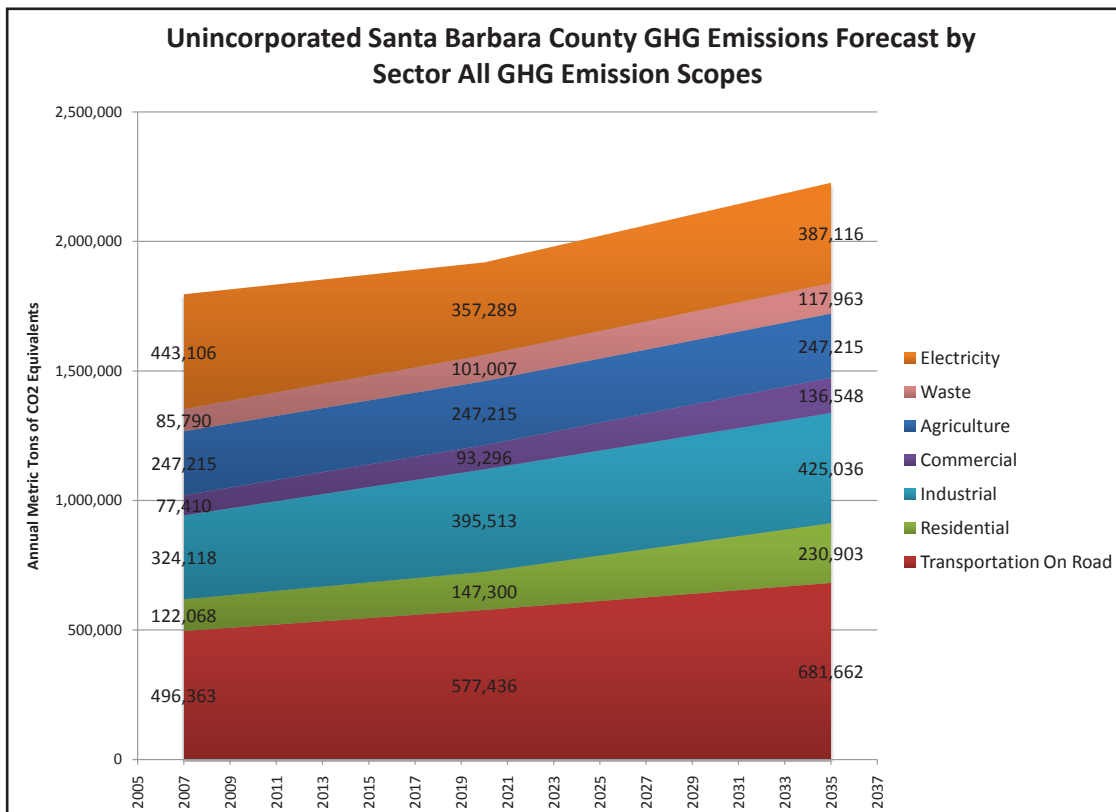


Figure 7. GHG Emissions Forecasted to 2035 by Sector.

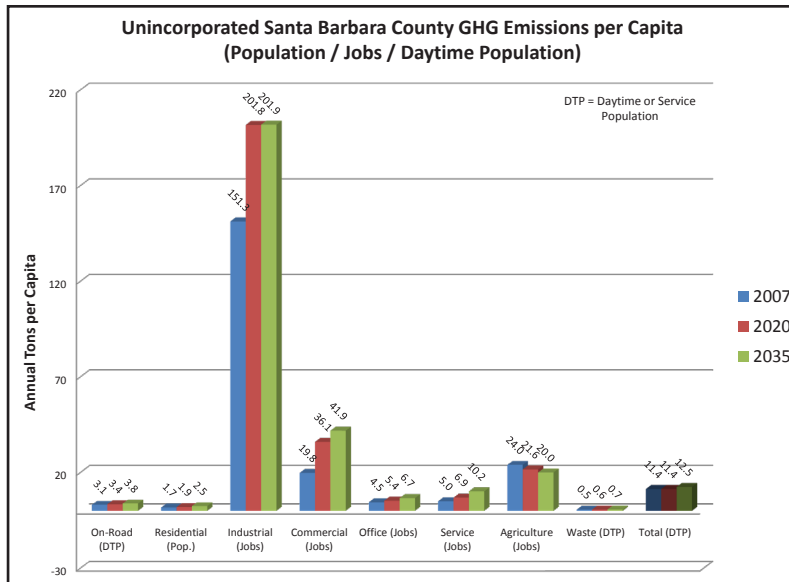


Figure 8. 2007 Per Capita GHG Emissions for the Unincorporated County.

Per capita emissions were analyzed by sector and calculated per resident, employee or daytime service population (DTP), depending on the sector. Results of this analysis are shown in Figure 8. The industrial sector provides the largest emissions per capita and is dominated by oil and gas production facilities in the unincorporated County. These facilities have large emissions from electricity generation and flared gas, and relatively few employees, which is why the emission rates are so high. Total emissions per capita are predicted to grow from 11.3 tons per DTP in 2007 to 12.5 tons in 2035.

Table 8. Santa Barbara County 2020 Forecast By Sector

End Use Sector	2020 Emission Forecast (MTCO <sub>2</sub> e)	% of 2020 Forecast
On Road Transportation	577,436.0	30.1%
<i>Passenger Vehicles</i>	422,014.0	22.0%
<i>Heavy Duty</i>	155,422.0	8.1%
Electricity	357,289.0	18.6%
Residential	147,300.0	7.7%
Commercial	93,371.0	4.9%
Waste	101,007.0	5.3%
Agriculture	247,497.0	12.9%
Industrial	395,538.0	20.6%
<b>Total</b>	<b>1,919,438.0</b>	<b>100.0%</b>

### 3.1.3 Reduction Targets

While AB 32 did not place a mandate on local governments to reduce GHG emissions, CARB has identified local governments as essential partners in achieving California’s goals and encourages that local governments adopt reduction targets that parallel the States. Furthermore, per Resolution 9-059, which adopted the County’s Climate Change Guiding Principles, the County is committed to seeking GHG emission reductions to protect the community from the effects of climate change and recognizes that investing in actions to reduce GHG emissions can provide improved economic vitality, public health and safety benefits, natural resource protection, and infrastructure stability. In pursuing a CAP, the BOS will have the task of setting a GHG reduction target. There are two main available options:

- 1) Set a reduction target of 15% from current emissions by the year 2020. This target would follow the recommendation provided to local governments by CARB in the AB 32 Scoping Plan.
- 2) Set a unique reduction target at the discretion of the BOS. There is no specific State or federal mandate at this time for local governments with respect to GHG reduction and the BOS has wide latitude to determine a reduction target unique to Santa Barbara County.

Reductions in the County will be realized from both its own efforts and through the State’s implementation of emission reduction measures identified in the AB 32 Scoping Plan. Using an assumed overall reduction target of 15% of current emissions.

Figure 9 illustrates how GHG emission reductions from both local and State efforts will be additive. GHG emission reductions realized by the State efforts, any reductions realized by SBCAG through implementation of the SCS, and all reductions realized by the County will all work in concert to achieve an overall reduction.

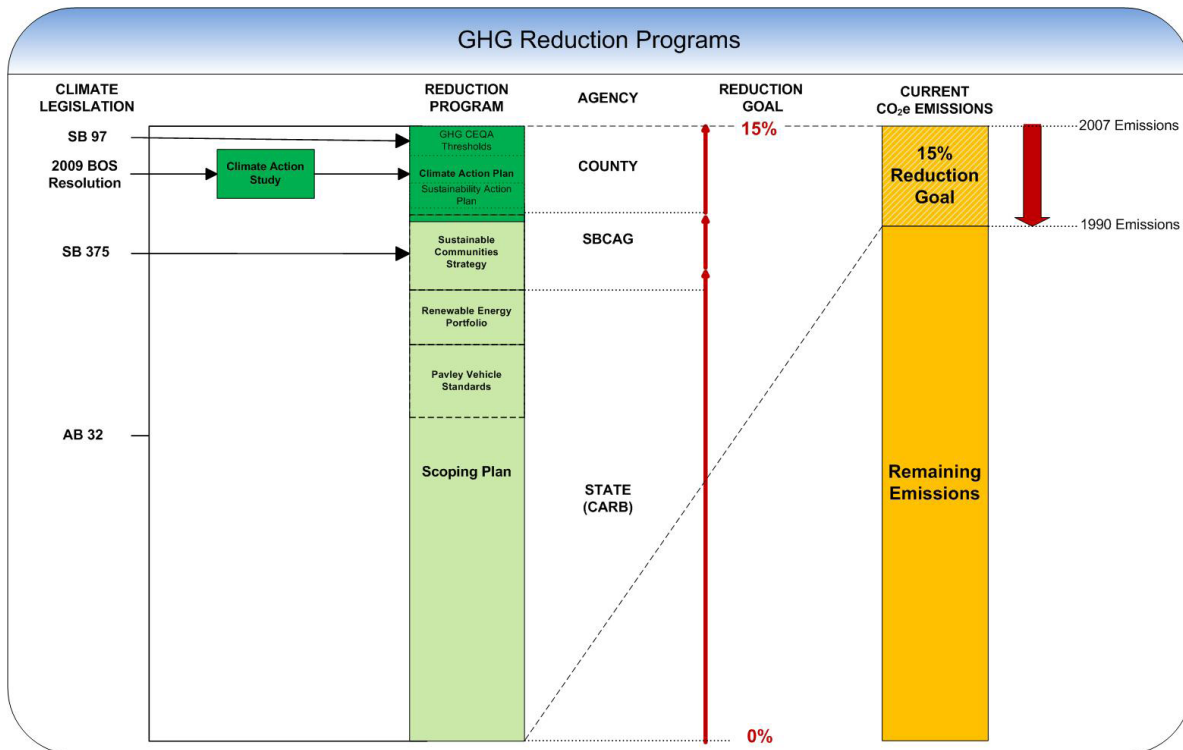


Figure 9. State and Local GHG Reduction Programs<sup>6</sup>

<sup>6</sup> Figure 9 assumes a 15% reduction goal is adopted by the BOS as suggested in CARB’s guidance through the AB 32 Scoping Plan.

Table 9 summarizes the quantity and percentage by which the County would need to reduce emissions from the 2020 forecast based on different reduction target scenarios. A reduction target of 13.3% was chosen as it represents the reductions that would be achieved in the unincorporated County through the State’s implementation of the Scoping Plan only. This is illustrated in more detail in Table 11. A target of 15% below 2007 baseline emissions represents the recommendation CARB gives to local governments in the Scoping Plan. The target of 20% below 2007 is shown to illustrate what a more aggressive target would actually mean for the County. Following CARB’s guidance, a target of 15% below 2007 baseline emissions would be the equivalent of a 21.1% reduction from the 2020 forecast due to the increase in GHG emissions from 2007 to 2020. This overall reduction figure does not take into account the reductions that will be realized from the State’s implementation of the AB 32 Scoping Plan or SBCAG’s program under the Sustainable Communities Strategy.

**Table 9. Community Emission Reduction Target Scenarios**

Reduction Target	2007 Emissions (metric tons)	2020 BAU Emissions (metric tons)	Emission Goal (metric tons)	Reduction Needed from 2020 Forecast (metric tons)	% Reduction Needed From 2020 Forecast
13.3 % < 2007 by 2020	1,780,565.0	1,919,439.0	1,543,229.0	376,210.0	19.6%
15% < 2007 by 2020	1,780,565.0	1,919,439.0	1,513,480.3	405,958.8	21.1%
20% < 2007 by 2020	1,780,565.0	1,919,439.0	1,424,452.0	494,987.0	25.8%

As discussed above, the County would not be solely responsible for meeting the reduction target as actions taken by the State through implementation of the AB 32 Scoping Plan will count towards reductions realized in the unincorporated areas of Santa Barbara County. These reductions will be realized with no additional local action. Land use-related AB 32 Scoping Plan measures have been incorporated into the reduction target to determine the County’s additional responsibility once State measures have been realized. This approach is a best-case scenario and assumes all measures in the AB 32 Scoping Plan are implemented on time and achieve the estimated reductions reported in the AB 32 Scoping Plan. Table 10 quantifies the percentage by which each land use-related AB 32 Scoping Plan measure reduces emissions in the sector it affects on a statewide basis. Using this information in combination with emissions data by sector from the Santa Barbara County 2020 Forecast, reductions realized by State efforts in Santa Barbara County can be quantified.

**Table 10. State Scoping Plan Reductions**

Affected Emissions Source	AB 32 Scoping Plan Measure	Reductions Counted Towards 2020 Target (MMTCO <sub>2</sub> e)	2020 Emissions Forecast (MMTCO <sub>2</sub> e)		% Reduction from 2020 State GHG Forecast
Mobile	Light Duty Vehicle Standards (Pavley I and II)	31.7	Passenger Vehicle On Road Emissions	127	25.0%
	SB 375	5	Passenger Vehicle On Road Emissions	127	3.9%
	Low Carbon Fuel Standard	15	1On Road Transportation- Total	168	8.9%
	Vehicle Efficiency Measures	4.5	Passenger Vehicle On Road Emissions	127	3.5%
	Medium/Heavy Duty Vehicles (Aerodynamic Efficiency and Vehicle Hybridization)	1.4	Heavy Duty Trucks	41.2	3.4%
Area	Energy Efficiency Measures	4.4	Residential and Commercial	45.3	9.7%
Indirect	Renewable Portfolio Standard (33% by 2020)	21.3	Electrical Power	110	19.3%
	Energy Efficiency Measures	21.9	Electrical Power	110	19.8%
	Million Solar Roofs	2.1	Electrical Power	110	1.9%

Table 11 applies the anticipated State Scoping Plan reduction percentages by Scoping Plan measure to the County’s 2020 Forecast inventory. This table includes all measures implemented by the State related to land use, as well as SB 375 which is being implemented by SBCAG in this region. The reductions expected from SB 375 have been calculated using the reduction target adopted by CARB, zero net increase in emissions by 2020, which SBCAG is responsible for meeting through the development of a Sustainable Communities Strategy (SCS). A successful SCS would thus limit passenger vehicle emissions to current levels in both incorporated and unincorporated areas throughout the County. Projected reductions from other State Scoping measures affecting passenger vehicle emissions would continue to apply to current vehicular emissions in the 2007 baseline inventory.

As shown in Table 11, the land use-related measures implemented by the State will result in an 19.6% reduction in emissions from the Santa Barbara County 2020 Forecast. This value assumes all measures in the AB 32 Scoping Plan are implemented on time and achieve their full estimated reduction reported in the AB 32 Scoping Plan. This leaves a gap of 1.5% of emission reductions needed from the 2020 forecast to meet the Scoping Plan recommended reduction goal of 15% below 2007 emissions. If Santa Barbara County were to adopt this reduction target, which equates to a 21.1% reduction from the 2020 forecast, then remaining emissions reductions of 1.5% from the 2020 forecast would have to be achieved in order to meet the target, over and above what the State Scoping Plan measures are projected to realize. If the AB 32 Scoping Plan does not realize all the reductions which have been estimated, the responsibility of those reductions would be transferred to the County.

A 1.5% reduction is equivalent to 29,319.4 metric tons of CO<sub>2</sub>e. A reduction of 29,319.4 metric tons of CO<sub>2</sub>e is equivalent to removing 5,330 passenger vehicles from the road based on the Environmental Protection Agency’s estimate that a passenger vehicle emits 5.5 metric tons of CO<sub>2</sub>e annually.

7 From the 2020 Emissions Forecast updated October 29, 2010 by CARB.

8 In September 2010, CARB adopted a specific reduction target of zero net increase in per capita emissions to be achieved within the Santa Barbara County metropolitan planning area through the Sustainable Communities Strategy being prepared by SBCAG. The relationship of this distinct regional planning commitment to County reduction targets is addressed in Table 11.

**Table 11. State Scoping Plan Reductions Realized in Santa Barbara County**

Affected Emissions Source	AB 32 Scoping Plan Measure	% Reduction from 2020 State GHG Forecast <sup>9</sup>	End Use Sector	Emissions (MTCO <sub>2</sub> e) - End Use Sector (2007 Unincorporated County Inventory)	Emissions (MTCO <sub>2</sub> e) - End Use Sector (2020 Unincorporated County Forecast) <sup>10</sup>	Emissions Reduced (MTCO <sub>2</sub> e), Scaled to Unincorporated County	Santa Barbara County Emissions Reduced from 2020 Forecast <sup>11</sup>	Total
Mobile - Passenger Vehicles	Light Duty Vehicle Standards (Pavley I and II)	25.0%	Passenger Vehicle	376,276.0	422,014.0	93,920.9	4.9%	
	Low Carbon Fuel Standard	8.9%	Passenger Vehicle	376,276.0	422,014.0	33,576.1	1.7%	
	Vehicle Efficiency Measures	3.5%	Passenger Vehicle	376,276.0	422,014.0	13,332.6	0.7%	
	SB 375 <sup>12</sup>	NA	Passenger Vehicle	376,276.0	422,254.8	45,961.8	2.4%	
Mobile - Heavy Duty Vehicles	Low Carbon Fuel Standard	8.9%	Heavy Duty Vehicle	120,087.0	155,422.0	13,868.7	0.7%	
	Medium/Heavy Duty Vehicles (Aerodynamic Efficiency and Vehicle Hybridization)	3.4%	Heavy Duty Vehicle	120,087.0	155,422.0	5,281.3	0.3%	
				<b>All Mobile Subtotal</b>				<b>10.7%</b>
Area	Energy-Efficiency Measures	9.7%	Residential	NA	147,300.0	14,307.3	0.7%	
			Commercial	NA	93,371.0	9,069.1	0.5%	
				<b>Area Source Subtotal</b>				<b>1.2%</b>
Indirect	Renewable Portfolio Standard (33% by 2020)	19.3%	Electricity	NA	357,289.0	68,933.5	3.6%	
	Energy Efficiency Measures	19.8%	Electricity	NA	357,289.0	70,875.3	3.7%	
	Million Solar Roofs	1.9%	Electricity	NA	357,289.0	6,796.3	0.4%	
				<b>Indirect Subtotal</b>				<b>7.6%</b>
NA	NA	NA	Waste	NA	101,007.0	-		
	NA	NA	Industrial	NA	395,538.0	-		
	NA	NA	Agriculture	NA	247,497.0	-		
				<b>Total of all Sectors</b>				<b>1,919,678.8</b>
				<b>Total Credits Given to AB 32 Scoping Plan</b>				
				SB County Reductions Need to meet 1.5% < 2007 by 2020				
				<b>Remaining Emission Reductions Needed</b>				
				<b>29,429.4</b>				<b>1.5%</b>

<sup>9</sup> % Reduction from 2020 State GHG Forecast is calculated in Table 2, Column 4 (State Scoping Plan Reductions)

<sup>10</sup> Emissions by Sector for the SB County GHG 2020 Forecast is from Table 3, Column 2 (Santa Barbara County 2020 Forecast by Sector)

<sup>11</sup> Scaled % Emissions Reductions are the product of % Reduction from 2020 State GHG Forecast and End Use Sector Emissions

<sup>12</sup> The 2020 goal set by SB 375 was zero net increase in per capita emissions from passenger vehicles, making the 2020 goal to keep emissions at 2007 value on a per capita basis. The value calculated here was done using per capita emissions based on daytime service population.

Table 12 translates the reductions needed to the 2007 baseline inventory. The AB 32 Scoping Plan land use-related reduction measures would supply the County with 13.3% of the reductions needed to reach a 15% reduction from current emission levels, leaving an remaining 1.7% of emission reductions to be achieved by other measures. Additional County reduction measures would be needed to absorb the remaining 1.7% of current emissions

**Table 12. Reductions Realized by State Scoping Plan and County within the Unincorporated County for 2007 and 2020**

Inventory Year	% Reductions Needed	% Reductions by State	% Reductions by Santa Barbara County
2007	15.0%	13.3%	1.7%
2020	21.1%	19.6%	1.5%

When setting a reduction target, the BOS should consider the potential implications of Executive Order S-3-50, issued by the Governor. The Executive Order set a goal to reduce the State’s GHG emissions by 80% below 1990 levels by 2050.

The next section of this Study reviews emission reduction measures available to the County to achieve the emission reduction target, once it is determined. The second phase of this program, the Climate Action Plan will more precisely quantify the expected reductions from these measures and the costs of implementing them.



## 3.2 Existing GHG Reduction Measures, Programs, and Policies

While the requirements of AB 32 and climate planning are relatively new, the County has already set into motion many programs and policies which reduce greenhouse gas emissions. It is important to identify existing programs and policies to understand whether these activities can be leveraged through expansion or modification to implement new measures to reduce GHG emissions. In addition to the discussion below, Appendix C provides a compendium of all policies that relate to a reduction in greenhouse gas emissions in the County's existing (or current) Comprehensive Plan.

### 3.2.1 Air and Energy

The Air and Energy category describes existing measures, programs, and policies which seek to reduce energy consumption through energy efficiency or the production of renewable energy. GHGs released through electricity generation accounts for 25% of the GHG emissions in both the State and the unincorporated areas of the County. Promoting and achieving more efficient use of energy promises to offer one of the most readily achievable and cost-effective means of GHG reduction.

#### Comprehensive Plan

The Energy Element of the Comprehensive Plan is replete with policies and implementation measures geared towards greater energy efficiency, reduction of transportation-related GHG emissions, and education and incentive programs to achieve energy efficiency. Additionally, the Housing Element contains policies encouraging energy efficient home construction.

#### Consolidated Plan

The 2010-2015 Consolidated Plan, a planning guide for jurisdictions developed by the County Housing and Community Development Department, sets a priority to support and promote projects that incorporate innovative energy efficiency and conservation through the HOME Investment Partnership and Community Development Block Grant funding opportunities.

#### emPowerSBC

Launched on Earth Day 2010, emPowerSBC uses a voluntary, market-based approach to generate demand for energy efficiency, water conservation, and renewable energy improvements in existing homes throughout the County. emPowerSBC is a true public-private partnership that builds upon national best practices in municipal energy financing. By pairing public credit enhancements with private lending capital, emPowerSBC will provide homeowners with accessible and attractive means to finance energy and water improvements, thereby alleviating the upfront costs usually associated with property retrofits. When combined with the state's new Energy Upgrade California program, emPowerSBC will provide a uniform approach in enabling efficiency by helping homeowners overcome the two main entry barriers to upgrading existing homes by 1) providing access to upfront capital with attractive terms and 2) helping homeowners navigate a new home performance market of services and incentives. With a goal of driving at least 1,300 upgrades by 2013, emPowerSBC will save property owners money, improve comfort levels of homes, enhance property values, create local jobs, and substantially reduce local GHG emissions and energy use.

emPowerSBC is one of two jurisdictions in California to be granted competitive funding by the US Department of Energy's Better Buildings program. The program is funded solely through \$3.2 million in state and federal American Reinvestment and Recovery Act Energy Efficiency and Conservation Block Grant (EECBG) funding.

### 3.2.2 Land Use and Transportation

The Land Use and Transportation category discusses programs and policy which seek to affect land development patterns to influence where jobs and housing are placed and how people move from their houses to work and commercial centers every day. Designing communities with well thought-out land use patterns can dramatically decrease the number of vehicle miles travelled and therefore have a direct effect on GHG emissions. Moreover, a well-developed multi-modal transportation infrastructure which is convenient and user friendly can also decrease vehicle miles travelled. Public transit, walking, cycling, telecommuting, flex scheduling, ride-sharing, and car sharing are all programs which could decrease greenhouse gas emissions.

#### Comprehensive Plan

The Land Use Element contains a rural and urban boundary demarcation policy which limits urban development and growth to lands zoned for urban uses. Agriculturally zoned lands, which represent 86% of all County lands within the rural boundary, are designated for low density, agricultural uses with policies documented in the Agricultural Element. This rural/urban boundary serves to focus urban development in specific geographic areas reducing sprawl and associated vehicle miles traveled (VMT) in rural unincorporated areas. Both the Housing Element and the Air Quality Supplement of the Land Use Element contain policies focused on minimizing VMTs. The Air Quality Supplement encourages alternative transportation and discourages land uses that can lead to auto-dependent facilities. The Housing Element contains policies promoting housing near job centers, encouraging alternative transportation, preventing urban sprawl and protecting rural land and resources through enforcement of the existing urban-rural boundary.

#### Isla Vista Master Plan

The Isla Vista Master Plan (IVMP) contains many goals, policies, and development standards that promote infill development and alternative forms of transportation such as cycling, walking, and public transit. IV is located adjacent to the biggest job center within the County, the University of California Santa Barbara. Promoting infill development in IV assists in placing new housing adjacent to the largest job center and keeps commuting down. The IVMP contains specific policies that address limiting parking options, encouraging the use of bicycles and walking as alternative modes of transportation, maintaining reduced automobile speeds to promote a safe environment for cyclists and walkers, public transit services that encourage ridership, and promoting a car share program (recently implemented). Two significant implementing actions of the IVMP already in place include the development of a new parking lot and a pilot Car Share program, as discussed below.

### Isla Vista Redevelopment Agency (RDA) Parking Lot

RDA constructed a parking lot on Pardall and Embarcadero del Mar with the goal of encouraging private development by providing short-term paid parking for commercial users and off-site parking for nearby residential housing units. This lot has a solar photovoltaic installation which powers both the night lighting of the parking lot and Pardall Road.



Isla Vista Redevelopment Agency Parking Lot

### Isla Vista Car Share Program

In April 2010, the RDA launched a 3-year Car Share pilot program in partnership with Zipcar in Isla Vista. The program makes cars available on an hourly rental basis to individuals who do not need a car for everyday travel. Individuals gain access to a car by joining an organization that maintains a fleet of cars in a network of locations. Beyond the benefits provided to members of the car share program, the community benefits as a whole by the existence of a transportation alternative for occasional and/or short trips. This use of this transportation alternative has the effect of encouraging a greater use of complimentary transportation modes such as walking, cycling and public transit. Car share programs provide well-maintained, late model vehicles that tend to be safer and less polluting. Accordingly, these programs produce the co-benefit of encouraging people to take older, often less-efficient vehicles out of service. Furthermore, according to recent studies, at least five private vehicles are replaced by each shared car. The resulting reduced vehicle ownership facilitated through the use of car share programs can lead to significant cost savings for participating individuals as well as increased parking availability and less need for new parking. Similarly, successful car share programs result in less congestion and an overall decrease in greenhouse gas emissions.

## **3. 2. 3 Green Building**

The Green Building category discusses certain practices that can be implemented to decrease GHG emissions through energy efficiency, water efficiency, a reduction in the waste involved with building construction and operation, and the types of building materials that are used.

### Innovative Building Review Program

The Planning and Development Department administers the Innovative Building Review Program (IBRP), which provides assistance and advice to development applicants on the methods which they can employ to increase energy efficiency in development projects. The IBRP Committee is made up of local design professionals, contractors, architects, engineers, energy consultants, and solar experts available to work directly with applicants in the project review process. The Committee has a tremendous amount of knowledge and interest in innovative, energy-efficient features that can be implemented locally.

Applicants can request design guidance on cost-effective methods to exceed California Energy Standards (Title 24) to meet one of the target levels established in the IBRP's target levels:



Photograph provided courtesy of Allen Associates

- Target 1 – Exceed Title 24 by 20% for Residential and 5% for Nonresidential and earn 5 points from the energy-efficient menu;
- Target 2 – Exceed Title 24 by 30% for Residential and 15% for Nonresidential and earn 12 points from the energy-efficient menu;
- Target 3 – Exceed Title 24 by 40% for Residential and 25% for Nonresidential and earn 30 points from the energy-efficient menu.

Participation in the IBRP program is free and voluntary. Incentives to participate are in place in the form of expedited plan check (Target 1), a fee reduction on the energy plan-check fees through Building and Safety Division (Target 2), and a Resolution of Commendation from the Board of Supervisors (Target 3). Projects which reach Target 2 receive the incentive for both Target 1 and Target 2. Furthermore, projects which reach Target 3 receive all three incentives. As an implementing action of this Strategy, the IBRP is proposed to be enhanced to include green buildings in addition to energy efficiency, provide more attractive incentives, provide linkages to emPowerSBC, and expand developer participation through various forms of outreach.

### 3.2.4 Resource Conservation

The Resource Conservation category describes the measures, programs and policies which help to conserve resources, such as agriculture, open space, forests, and other areas that act as carbon sinks by sequestering carbon from the atmosphere. It also profiles existing programs which reduce greenhouse gas emissions through improved waste management, such as reuse, recycling, and compost practices. Lastly, water efficiency and conservation are discussed in the Resource Conservation category. Since the transportation of water from the source to the user requires considerable energy, water efficiency and conservation will save energy and in turn reduce GHG emissions.



#### Comprehensive Plan

Both the Agricultural Element and the Conservation Element contain polices related to protecting agricultural resources, ecological systems, and open space. Protection of these resources acts to preserve the existing urban and rural boundary and sequester carbon, both of which are GHG emissions reduction activities.

### **Tajiguas Landfill Gas Collection System**

This County has installed a landfill gas collection system at the Tajiguas Landfill. The system collects methane which off-gases from the landfill. The methane is converted into power through the use of an on-site generator. The system creates 3 megawatts of power, which is enough to power 2,500 homes locally. This program is also included in the SAP as it is relevant to both municipal operations and the community.

### **Conversion Technology Study**

Santa Barbara County Resource Recovery and Waste Management Division (RRWMD) is conducting a study on conversion technology in conjunction with the Cities of Santa Barbara, Goleta, Solvang, and Buellton. The goal of this project is to establish a long-term plan for the disposal of community waste. Conversion Technology may be a way to reduce the environmental impact of our communities' waste, reduce our landfill dependence and provide green energy for our communities.

### **Santa Barbara County Regional Water Efficiency Program (RWEP)**

RWEP promotes the efficient use of urban and agricultural water supplies County-wide, and provides information and assistance to the eighteen local water purveyors within the County. Through the RWEP, the County Water Agency coordinates cooperative water conservation efforts among purveyors, co-founds projects and programs, acts as a clearinghouse for information on water efficiency, manages specific projects and programs, and monitors local, state and national legislation related to efficient water use.

### **Curbside Commingled Collection of Recyclables**

The RRWMD of the Public Works Department calculated a reduction of 23,761 metric tons of carbon equivalent in GHG emissions for calendar year 2009 as a result of the County's processing of various recyclable materials. This figure is based on the recyclables transported to the two companies that process our recyclables and the recyclables collected and processed by the County's transfer stations. Recyclables included in this calculation are aluminum cans, glass containers, numbers 1 and 2 plastics, corrugated cardboard, newspaper, mixed paper, mixed metals, mixed plastics, mixed recyclables, and tires. This program is also included in the SAP as it is relevant to both municipal operations and the community.

### **California Coastal Cleanup Day**

Every September the RRWMD coordinates Coastal Cleanup Day for Santa Barbara County by soliciting volunteers to clean the various beaches and creeks in Santa Barbara County. During the 2009 Coastal Cleanup Day, 862 volunteers collected 14,268 pounds of trash and 1,475 pounds of recyclables from 21 beaches, ranging from Guadalupe Beach in the north to Rincon Beach in the south, 1 site on the Santa Ynez Chumash reservation, 5 creeks, and 1 waterway in the City of Santa Maria.

### **Christmas Tree Recycling Program**

Each December, the RRWMD reminds people in Santa Barbara County to recycle their Christmas trees. Advertisements are placed in newspapers and on radio and television stations advising people where they can recycle their Christmas trees. Over half of the County's Christmas trees are processed at a County solid waste management facility.

### **Commercial Recycling Program**

Since September 2003, a mandatory commercial recycling program encompassing businesses, apartments, condominiums, and mobile home parks, has been in effect for the unincorporated areas of the County. Under this program, owners of these types of entities may not throw conventional recyclables (e.g., aluminum foil and pie plates that are clean, cardboard, glass containers, metal cans, newspapers, paper, paperboard, and hard plastics numbers 1 through 7) into the trash. Through the use of newspaper and radio advertisements and the distribution of brochures, pamphlets, posters, and magnets, commercial owners were informed about the components of the program. County staff also met with commercial customers to determine their needs and to offer technical assistance to address issues. Since 2005, over 95 percent of commercial customers in the unincorporated County have recycled these materials either through recycling service provided by a franchise waste hauler or by collecting and self-hauling their recyclables.

### **Backyard Composting Program**

Since 1992, the RRWMD has administered a residential composting program to encourage households to compost their yard waste, garden trimmings, and food residuals and thereby reduce the amount of trash that they generate. Composting bins are offered for sale year-round for \$40.00, a savings of over 50 percent off the retail price. The RRWMD also publishes a composting booklet that discusses such topics as the different composting systems and choosing the right one, building a composting system, using one's compost, and describing other types of yard waste reduction. Finally, composting workshops are conducted every spring for people who want to learn how to compost or need a refresher on composting methods. During fiscal year 2009-10, five composting workshops were held, attracting almost 100 attendees. In addition, 355 composting bins were sold with another 4 bins donated.

### **Construction and Demolition Debris Recycling**

In Santa Barbara County, construction and demolition waste represents 31 percent of the waste generated in the unincorporated areas of the County. Through pricing and the recycling practices of local businesses, as well as the County-owned and operated recycling facilities, our community recycles over 75 percent of all construction and demolition waste. To ensure continued success in construction and demolition recycling, the following policies were enacted in 2008 by the RRWMD:

- New thresholds were established to define a significant impact of construction and demolition waste in the Planning & Development Department Thresholds & Guidelines Manual. Any project generating more than 350 tons of construction and demolition waste would be regarded as significant and its impacts would have to be mitigated through recycling efforts.
- To prevent existing construction and demolition recycling facilities from being overwhelmed by large scale development projects and thereby be forced to landfill recyclable material, the Planning and Development requires that a developer's Solid Waste Management Plan be coordinated with local recyclers and approved by the RRWMD to mitigate the effects of the activities.
- Under Chapter 17 of the County Code, unscheduled haulers are required to divert at least 50 percent of all collected construction and demolition waste. Since the vast majority of small and medium construction projects across the County use roll-offs for the collection of construction and demolition waste, this requirement ensures that unscheduled haulers continue their existing recycling practices and that they are held to the same recycling standards as our franchised haulers. An unscheduled hauler failing to meet this requirement will lose its permit.

### **Electronics Recycling Program**

Households may drop off all types of electronic equipment for free at the County's two transfer stations, the South Coast Recycling and Transfer Station and the Santa Ynez Valley Recycling and Transfer Station. Businesses may drop-off electronic equipment containing a cathode ray tube (CRT), e.g., computer monitors, televisions, and laptop computers, for free. For a fee, businesses may drop off all other types of electronic equipment at these facilities. Every April and October, the RRWMD also holds one-day collection events in the Santa Ynez Valley for the collection of hazardous waste (including sharps and pharmaceuticals) and electronic waste. In addition, every October, a one-day event for the collection of hazardous waste and electronics is held in New Cuyama.

For calendar year 2009, 413,734 pounds of electronic equipment containing a CRT and 422,598 pounds of other electronics were collected at our Transfer Stations and during our one-day collection events. This program is also included in the SAP as it is relevant to both municipal operations and the community.

### Green Business Program, Santa Barbara County

The RRWMD administers the Green Business Program of Santa Barbara County, a certification program that recognizes businesses that go beyond complying with applicable environmental regulations and that make voluntary changes in their facilities and operations in the key areas of energy and water conservation, solid and hazardous waste reduction and recycling, pollution prevention, and transportation. This is a multi-jurisdictional program designed to educate businesses on how to incorporate resource conservation into their practices, make the public aware of businesses that are environmental stewards, and foster a positive relationship among governmental agencies, the business community, and the public. Currently, businesses in the sectors of office/retail, restaurants, lodging establishments, automotive shops, and wineries are eligible to apply. Eventually, the program will be available to all types of businesses.

### Hazardous Waste

The RRWMD administers the Community Hazardous Waste Collection Center (CHWCC), located on the campus of the University of California, Santa Barbara for the acceptance of small quantities of hazardous waste. Businesses that qualify as a Conditionally Exempt Small Quantity Generator, as well as households, may dispose of a variety of hazardous waste such as antifreeze, batteries, motor oil, paints, solvents, cleaners, and fluorescent lights. Antifreeze, batteries, motor oil, and latex paint are accepted at the Santa Ynez Valley Recycling and Transfer Station (SYVRTS), while batteries are accepted at the South Coast Recycling and Transfer Station (SCRTS). The RRWMD also holds a one-day event for the collection of hazardous waste and electronics in the Santa Ynez Valley every April and October and in New Cuyama every October.

For calendar year 2009, the following amounts of hazardous waste were collected:

- 593,193 pounds at the CHWCC;
- 83,200 pounds at the SCRTS;
- 9,695 pounds at the SYVRTS; and
- 53,790 pounds during three one-day collection events.

This program is also included in the SAP as it is relevant to both municipal operations and the community.



### **Green Waste**

The RRWMD oversees the collection and diversion from the landfill of approximately 40,000 tons of green waste every year. RRWMD regulates Solid Waste & Recycling Collection franchises that require the curbside collection of residential green waste throughout the County, and which encourages the collection of commercial green waste as well. The division has also established preferential pricing for green waste at its landfill and transfer stations so as to discourage the treatment of this reusable commodity as trash. Marketing the end product from municipal green waste collection in California is typically a huge challenge. Many jurisdictions simply apply the ground material as Alternate Daily Cover (ADC) on top of a landfill. It would be easy to take this route, insofar as the County operates its own landfill, but it would not meet the higher intent of AB 939, the State's recycling mandate. Therefore RRWMD made the decision in 1992 to seek a local reuse for the collected green waste. In the North County, the material is transformed into compost by Engel & Gray. On the South Coast, the material is turned into mulch. Overall, the 40,000 tons of green waste which are collected each year find a new home as compost and mulch in local gardens, orchards, farms, and vineyards.

### **School Recycling Program**

The RRWMD works with schools in the unincorporated County and the Cities of Goleta and Solvang to foster waste prevention, reduction, and recycling. Waste audits, recycling containers, outreach materials, presentations, and tours of the South Coast Recycling and Transfer Station and the Tajiguas Landfill are among the services offered to schools. During fiscal year 2009-10, 268 recycling containers were provided to schools, and 6 presentations were given to 124 students. The RRWMD also contracts with Art from Scrap (AFS), a nonprofit agency, to provide the following services to schools in the Cities of Goleta and Solvang and the unincorporated County.

- Teaching students the concepts of Reduce, Reuse, and Recycle through presentations in classrooms and at the AFS facility;
- Taking students on tours of the Tajiguas Landfill and the SCRTS;
- Describing the process of composting and its benefits; and
- Holding workshops whereby students make arts and crafts using used scrap materials.

Approximately 65 public and 40 private schools are eligible to receive these services under the County's program.

### **Outreach Efforts to Promote Reduce, Reuse, and Recycle**

RRWMD publishes a Recycling and Resource Guide for Santa Barbara County in both English and Spanish. Additionally, an English version of the guide can also be found on the RRWMD's website: [LessIsMore.org](http://LessIsMore.org). A discussion of recycling outreach is also included in the SAP as it is relevant to both municipal operations and the community.

### 3.2.5 Community Case Studies

There are multiple examples around the County of business and individuals who are incorporate energy efficiency practices, renewable energy development, or other green measures into their business plans and daily lives. Examples range from larger private companies incorporating green practices into their business, such as MarBorg Hauling and Recycling (MarBorg) and described below, to individuals designing their new home to LEED standards, or an individual simply installing solar panels on their roof. This section provides examples of businesses that have incorporated some of these principles into their practice and illustrates the success of doing so. These businesses have experienced both cost savings and reduced GHG emissions.

#### Marborg Hauling and Recycling

MarBorg has achieved a 19.11% reduction in GHG emissions since 2007. This value has been reported to The Climate Registry and is currently being verified by a third-party verifier. The reduction in GHG emissions from MarBorg's operations was achieved through the implementation of multiple measures.



1) Solar Panels – In 2004 MarBorg installed solar panels to help offset their operational electricity usage. These solar panels have helped to offset approximately 30% of the electricity for each meter. The use of solar panels offsets approximately 51,011 kWh of electricity or 32 metric tons of CO<sub>2</sub>e each year.

2) CNG Fleet – MarBorg operates 16 Compressed Natural Gas (CNG) vehicles in its on-road collection fleet. The use of CNG has been successful with MarBorg's own on-site CNG fueling station. With the use of their own CNG fueling station, MarBorg intends to completely transition to CNG for all on-road vehicles. Additionally, MarBorg has added biodiesel 20% to its fuel mix to assist in emission reduction of its diesel vehicles.

3) LEED Certified Headquarters – MarBorg is currently seeking LEED Platinum status for Existing Building: Operations and Maintenance for its headquarters. Through this process MarBorg was able to benchmark building performance, which has resulted in the following:

- MarBorg Headquarters is scoring an 82 out of 100 in Energy Star Portfolio Manager;
- MarBorg is purchasing 98% Green Seal Certified green cleaning chemicals and paper products;
- MarBorg has put a program in place to promote alternative transportation by carpooling, biking or using the bus for the entire staff;

- MarBorg Headquarters is 30% above its baseline for water efficiency; and,
- MarBorg Headquarters installed drip irrigation to reduce water usage; installed an irrigation meter to measure outdoor water use.

4) Recycling and Diversion Rates - MarBorg specializes in achieving high recycling and diversion rates. Using the EPA WARM Model, MarBorg has estimated a total tonnage of 248,871 diverted, which translates into 78,978 metric tons of CO<sub>2</sub>e avoided.<sup>13</sup>

### **Teixeira Farms**

Teixeira Farms installed a solar array on their property in 2006 to provide the energy to pump water for irrigation at their facility. When the pumps are not in use, the power generated is sent back into the electric grid adding enough power to supply approximately 180 homes. At the time this report was written, the solar array at Teixeira Farms was estimated to have generated 819,369 kWh of electricity and 1,016,018 lbs of CO<sub>2</sub> avoided.

Teixeira Farms participates in a Good Agricultural Practices (GAP) program which addresses site selection, adjacent land use, fertilizer usage, water sourcing and usage, pest control and pesticide monitoring, and cooler operations. Measures such as fertilizer and water usage have the ability to decrease GHG emissions from the agricultural activity while the other measures have public health benefits. A GAP program is discussed in proposed Resource Conservation Incentive Measure #4 in Section 3.3.5.<sup>14</sup>

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<sup>13</sup> Edgar & Associates, Comment Letter. May 25, 2005

<sup>14</sup> Teixeira Farms. June 9, 2011 <[www.teixeirafarms.com](http://www.teixeirafarms.com)>

## 3.3 Proposed GHG Emission Reduction Measures

In order to meet the goals of AB 32 either existing programs will need to be expanded and/or additional programs, measures, and policies will need to be set in place. Section 3.2 identified existing programs and policies that can be expanded or modified to increase GHG emission reductions. Section 3.3 identifies a set of ERM measures that can be used to modify the existing program or to develop new programs and policies for additional GHG emission reductions.

### 3.3.1 Emission Reduction Measures Ranking Methodology

A database of ERM measures was compiled from multiple governmental and non-governmental organizations. A total of 311 measures were identified, which were synthesized down to 33 final measures through grouping measures into common themes and rephrasing them into one measure and deleting measures which were not applicable to the County. These measures were categorized into the four GHG reduction categories: 1) Air and Energy, 2) Land Use and Transportation, 3) Green Building, and 4) Resource Conservation. These categories have been chosen to create a comprehensive strategy for the County to reduce GHG emissions through multiple methods in all emission sectors.

The Air and Energy categories primarily focus on how the community can reduce energy consumption or switch energy use from traditional forms of energy to alternative energy. The Land Use and Transportation category discusses how to reduce greenhouse gases by reducing the overall number of vehicle miles travelled through the strategic design of communities and providing access to multi-modal transportation that is cheap and convenient for the public to use. The green building practices reported in the Green Building category can reduce GHG emissions by using energy-efficient building design, construction techniques, and sustainable operation and maintenance practices. The Resource Conservation category describes the measures being proposed to help conserve resources, such as agriculture, open space, forests, and other areas that act as a carbon sink by sequestering carbon from the atmosphere. Additionally, it profiles methods to reduce greenhouse gas emissions through improved waste management such as reuse, recycling, and compost practices.

ERM measures have been ranked based on a scoring mechanism that ranked the ERM measures based on five criteria: 1) GHG Reduction Potential, 2) Cost Effectiveness/ Fiscal Impact, 3) Simplicity of Administration, 4) Local Control, and 5) Associated Co-benefits. Each ERM received a qualitative score for each criterion and each criterion has been given a different weight based on its level of importance in determining an effective GHG reduction strategy. The greater the total score an ERM received, the higher it was ranked. ERM measures presented in Sections 3.3.2 to 3.3.5 are ordered with the highest ranking ERM being presented first for each category. Incentive measures were ranked separately from regulatory measures. As such, if a regulatory measure received a higher total score than an incentive measure, it is not necessarily given a higher priority and vice versa. Given that the scoring system is qualitative and somewhat subjective, the rankings should be understood as a limited analytical tool and one method of prioritization, but not be taken as a final or definitive ranking or measurement. The selection of the ERM ranking is ultimately a policy question that could be determined based on a number of factors.

Thus, while the ranking methodology provides a mechanism to determine which ERM measures are the most effective, it is not the only factor in determining what ERM measures are selected for implementation. An ERM that received a high score could be determined to be infeasible to implement and ultimately not selected. Alternatively, an ERM that receives a low score could be recommended for implementation given available funding or other available opportunities, such as partnerships with other organizations, that make the low-scoring ERM more likely to be successful, or simply because the low-scoring ERM complements

other ERMs selected as part of a coherent, well-planned emission reduction program that seeks to address multiple emission sources simultaneously.

With the exception of mitigation measures required under the CEQA review process, the County will lead GHG emission reduction efforts with incentive-based measures first. Only if incentive measures have been exhausted and GHG emission reductions are still necessary to meet the goals of AB 32, will the County pursue implementing regulatory measures. In the case of reducing GHG emissions to comply with CEQA, the County will provide a menu of options, through the Climate Action Plan, for developers to choose.

The scoring mechanism applies the following five evaluation criteria and associated weighting as follows:

**Table 13. GHG Reduction Potential Scoring**

Category	Scores
Low	1
Moderate	2
High	3

**i. GHG Reduction Potential**

This criterion considers the amount of GHG reductions a particular measure will achieve and how quickly the particular measure will achieve them. Measures that are believed to achieve the highest reductions in the least amount of time are given a greater preference. Each measure was assigned a rank of Low, Moderate, or High. This criterion was weighted at 30%.

**ii. Cost Effectiveness/Fiscal Impact**

This criterion considers what measures have the lowest monetary cost per unit of GHG emission reduction. This criterion was weighted at 30%.

**Table 14. Cost Effectiveness/Fiscal Impact Scoring**

Category	Scores
Low	1
Moderate	2
High	3

**Table 15. Simplicity of Administration Scoring**

Category	Scores
Easy	3
Moderate	2
Challenging	1

**iii. Simplicity of Administration – 15%**

This criterion addresses a non-monetary cost or other indirect costs, since the more complex a measure is to administer, the more staff time and effort associated with it and the less likely it is to be effective. Factors affecting how complex a measure is to administer include things such as monitoring, staff training, coordination among departments, and whether there is an already established program or division to oversee the measure. This criterion was weighted at 15%.

**iv. Local Control -15%**

This criterion takes into account whether the County has control over implementation of the measure. Measures that require approval or cooperation from multiple government bodies or both public and private organizations would be considered to have a low local control ranking and therefore may be more difficult to implement. Measures that can be implemented solely through County efforts would be considered to have high local control ranking and therefore easier to implement. This criterion was weighted at 15%.

**Table 16. Local Control Scoring**

Category	Scores
Low	1
Moderate	2
High	3

**Table 17. Associated Co-benefits Scoring**

Category	Scores
Many	3
Some	2
No	1

**v. Associated Co-benefits -10%**

This criterion is a catch-all category intended to capture other benefits of a measure not otherwise categorized such as public health benefits, environmental justice, economic benefits, etc., associated with a measure. This criterion was weighted at 10%.

The ERMs discussed in the Study for each of the four GHG reduction categories: 1) Air and Energy, 2) Land Use and Transportation, 3) Green Building, and 4) Resource Conservation are presented in order of the ranking prioritization applied to each ERM and discussed above. As such, ERMs ranked as the highest priority have been given a #1. Those with the second highest priority #2, third highest priority #3, etc. The ERMs also contain a summary information statement that identifies: the measure as either incentive based, regulatory based, or a hybrid of potential incentives and regulations; the GHG reduction potentials as either low, moderate, high, or a combination thereof; a determination as to the ability to quantify the reduction; a cost estimate of low, moderate or high associated with the cost to the County for implementation.

As discussed in Section 4.0, these ERMs can be further analyzed and refined for inclusion in a CAP. The CAP will provide a quantitative analysis using the greenhouse gas emissions inventory presented in Section 3.1 as a baseline. A cost-benefit analysis will be applied to selected measures included in the CAP guided by an approach to economic efficiency.

### 3.3.2 Air and Energy

Energy consumption, both gas and electric, by businesses and homes represents a significant source of GHG emissions in California at 9% of the total emissions. Where electricity from public utilities is produced by burning fossil fuels (e.g., oil or coal), the combustion process releases GHGs. GHGs released through energy generation accounts for 25% of the GHG emissions in the State as well as the unincorporated County. Even where the electricity is generated outside of the State, it is counted as indirect emissions of the activities of the electricity consumer. Similarly, the burning of natural gas or propane in the home or business for heating and cooking results in direct emissions. Promoting and achieving more efficient use of energy promises to offer one of the most readily achievable and cost effective means of GHG reduction. Shifting to the use of renewable energy sources also avoids emission of GHGs otherwise generated during energy production. Reduction in energy use through greater efficiency and shifting to renewable energy sources both have the additional advantage that the associated GHG emissions reduction is directly and precisely measurable.



With the AB 32 Scoping Plan identifying energy efficiency as one of the measures with the greatest GHG reduction potential, the County of Santa Barbara has placed a heavy focus on energy efficiency. Not only do energy efficiency improvements have the potential to greatly reduce greenhouse gas emissions, but energy efficiency can also play a role in decreasing the County's operational costs. Wiser use of energy resources has both economic and social benefits. Increasing energy efficiency can lead to cost savings through lower energy bills, reinvestment in the local economy, improved quality of life and public health,

increased compliance with State and federal goals, and a more secure future.

The Santa Barbara County Economic Outlook (USCB, 2010) indicates Santa Barbara County has averaged a population growth rate of 0.92% from 2000 to 2009, which is lower than the State of California average at 1.4% for that same period. With such a low growth rate, new development provides only limited opportunity to effectuate change and GHG reduction efforts should focus on retrofitting structures within the existing built environment. As such, the identification of strategies that encourage increased energy efficiency in the existing built environment are needed to compensate for the historically marginal population growth rate that results in limited new development in the County.

## Incentive Measures

**Air and Energy Incentive Measure #1** - Adopt a policy or program that offers incentives (such as streamlined permitting, permit waivers, or fee waivers) to encourage a switch in electricity generation from fossil fuels to renewable sources through small-scale renewable electricity generation.

This measure strives to encourage small-scale on-site generation of power through wind and solar by creating incentives that lower costs and simplify the permitting process. Renewable energy production at this scale is typically sized to meet on-site energy needs of the residence or facility where the renewable energy generation equipment is installed. If adopted in a wide-spread manner, small-scale renewable energy production has the ability to achieve significant reductions in GHG emissions within a reasonably short period of time (5-10 years).

Recent California legislation, AB 45, requires jurisdictions to adopt ordinances to allow for the installation of small wind generation systems outside the urbanized area with the issuance of a conditional use permit. Adopting these ordinances should facilitate the installation of the systems statewide. The goal of the bill is to assist in meeting the California Renewables Portfolio Standard Program which requires utilities to increase procurement of eligible renewable energy sources until they reach 33% by 2020. The County adopted an ordinance to comply with AB 45 in December 2010. The Planning and Development Department is in the process of analyzing potential amendments to the ordinance which will be presented to the BOS in Spring of 2011. These amendments could provide for the additional installation of small wind generations systems.

The County already has ordinances in place which require no or a low review level permit to install either roof-mounted or freestanding solar energy systems. Opportunities exist for the County to couple these ordinances with incentives encouraging the development of these projects. Some possible incentives include waiving permit fees or providing expedited permit processing, depending on the size and nature of the proposed installation.

### ***Implementation***

Development permit-related incentives to encourage renewable power production can be implemented easily by local legislative action. Permit fees and requirements can be changed by local government ordinance.

<b>Measure Type</b>	Incentive
<b>GHG Reduction Potential</b>	High
<b>Reduction Quantifiable</b>	Yes
<b>Cost Estimate</b>	Low

**Measure Type**  
Hybrid

**GHG Reduction Potential**  
High

**Reduction Quantifiable**  
Yes

**Cost Estimate**  
Moderate



**Measure Type**  
Incentive

**GHG Reduction Potential**  
High

**Reduction Quantifiable**  
Yes

**Cost Estimate**  
Moderate

**Measure Type**  
Incentive

**GHG Reduction Potential**  
High

**Reduction Quantifiable**  
Yes

**Cost Estimate**  
Moderate

**Air and Energy Incentive Measure #2** - Promote the use of clean alternative energy production (renewable energy sources, methane recovery at landfills, waste-to-energy production) by encouraging development of larger-scale renewable electrical generation facilities.

This measure seeks to promote larger-scale electricity generation from renewable sources by encouraging development of renewable production facilities such as wind farms, solar fields, ocean wave and tidal current generators, landfill gas, and solid waste conversion. The measure could include a number of specific components, including mapping lands and ocean areas suitable for renewable energy generation, establishing zoning overlays designating where certain utilities are allowed, and establishing specific permitting paths for particular energy production facilities.

**Implementation**

This measure could be put into effect as part of a Planning and Development Department work program item and long-range planning effort. The planning effort could undertake necessary research and mapping and then propose necessary Comprehensive Plan amendments and ordinances for BOS adoption to establish the energy production overlay and permit paths.

**Air and Energy Incentive Measure #3** - Maximize energy efficiency throughout the unincorporated County through incentivizing energy efficient retrofits of existing structures.

Some of the most cost-effective reductions in GHG emissions can be attained by more efficient use of energy. In combination with other measures promoting alternative energy production, energy efficiency measures can dramatically reduce GHG emissions. New development represents only a small percentage of the overall building stock on an annual basis. To achieve meaningful energy efficiency gains, retrofits of existing structures must be targeted. Incentives for such energy efficiency retrofits could include direct subsidies, tax rebates, special financing (as through the AB 811 such as emPowerSBC) as well as permit fast-tracking or permit waivers for such projects.

**Implementation**

Direct financial incentives for energy efficiency retrofits such as property tax rebates or direct subsidies could be accomplished by County legislation, with dedication of funding or consideration of revenue implications.

**Air and Energy Incentive Measure #4** - Support or provide tax credits, grants, loans and other incentives to assist the public, businesses and local agencies for the purchase of energy efficient equipment.

Financial incentives that are intended to encourage replacement of existing, energy inefficient appliances and equipment with new, more energy efficient models can achieve significant reductions in energy use and associated GHG emissions. The County recently implemented emPowerSBC, discussed in Section 3.2.1, which is a voluntary program that provides financial assistance in the form of loans for the installation of



eligible energy efficiency, water efficiency, or renewable improvements. Owners will repay emPowerSBC financing through an assessment levied against their property. Other incentives to assist the community in pursuing energy efficient upgrades could also be established such as tax credits/rebates and grants.

**Implementation**

Similar to incentives for energy efficient retrofits, financial incentives for more energy efficient equipment and appliances could be created through County legislation to establish credits or grants. The County could work with the local Chambers of Commerce, the South Coast Energy Efficiency Partnership, Energy Watch, and the local utilities to develop and implement programs.

**Air and Energy Incentive Measure #5** - Establish public outreach (elementary school component, public workshops, etc.) and employee education mechanisms to teach about energy efficiency and other climate-related initiatives.

Education and information about energy efficiency, renewable energy and GHG reduction helps broaden awareness of climate issues and can be one of the most effective tools to achieve reduction in non-renewable energy use. Complemented by this measure is an ongoing public outreach program that would reach out to schools and community groups through a series of trainings and lectures combined with a publicity campaign through advertisement. The outreach program could cover the importance of GHG emission reduction, options and methods to achieve greater energy efficiency at home and work, and renewable energy programs. The program could include a component to provide information on resources available through the County, local utilities companies, and the State and federal governments for energy efficient projects.

The City of Cincinnati recently established an outreach program to increase the impact of their locally adopted CAP. The program includes marketing through a private firm, creating and distributing toolkits for local schools on climate change and reduction measures, and holding an annual event to discuss the success of their climate change initiatives in the Cincinnati area. It is estimated that the program will reduce their GHG emissions by 6% over the course of 3 years.

**Implementation**

Establishment of a public outreach program could happen as a departmental work program item with dedication of funding and specification of scope and timeframe.

<b>Measure Type</b>	Incentive
<b>GHG Reduction Potential</b>	High
<b>Reduction Quantifiable</b>	No
<b>Cost Estimate</b>	Low

## Regulatory Measures

**Measure Type**

Regulation or Hybrid

**GHG Reduction Potential**

Low-moderate

**Reduction Quantifiable**

Yes

**Cost Estimate**

Moderate

**Air and Energy Regulatory Measure #1** - Maximize energy efficiency throughout Santa Barbara County through energy efficient upgrades on all development projects.

This ERM could set energy efficiency standards for all new development projects. The measure could encompass all energy-using appliances and could complement Green Building measures that address building materials and insulation. Under a hybrid approach, builders and property owners could be able to select the preferred technology and energy efficiency measures to meet efficiency standards. The regulatory approach could also be paired with incentives to encourage property owners to go beyond minimum standards. Given the relatively slow rate of new development and the small percentage of the total building stock that new building represents, this measure is likely to achieve only low to moderate GHG reductions overall. Although reductions on individual projects may be great, the cumulative GHG reductions of this measure would be relatively small for at least ten years from implementation.

### *Implementation*

Requiring energy efficiency measures can be achieved through ordinance, for example, through amendment of the Building Code. Compliance with heightened energy efficiency standards could be achieved through building inspection prior to occupancy.

**Measure Type**

Regulation or Hybrid

**GHG Reduction Potential**

High

**Reduction Quantifiable**

Yes

**Cost Estimate**

Moderate

**Air and Energy Regulatory Measure #2** - Replace inefficient appliances, such as natural gas and propane space and water heating with more efficient and/or alternative fuel appliances, such as electric heat pump and solar water heaters.

The replacement of certain inefficient appliances with more efficient or alternative fuel appliances as part of remodels and renovation projects over a certain size is one way to achieve broad-based energy efficiency. For example, replacing traditional tank water heaters with gas on-demand water heaters or solar water heaters can result in significant energy savings. Additionally, simple upgrades such as installing insulation to attic piping can also result in energy savings. Remodels and renovation projects that are above a set threshold, such as over 500 square feet, could trigger energy efficiency upgrades.

### *Implementation*

Energy efficiency measures can be achieved through ordinance amendments, for example, through amendment of the Building Code. Compliance with heightened energy efficiency standards could be achieved through building inspection prior to final inspection.

**Air and Energy Regulatory Measure #3** - Maximize end-user water efficiency throughout Santa Barbara County by requiring upgrades on all development projects.

Since the transportation and treatment of water requires energy, reducing water consumption results in energy savings and hence GHG emissions reductions. Simple water efficiency measures, such as low-flow toilets and showers, as well as more involved measures, such as gray water and rainwater capture systems, both can result in energy and emissions savings to the degree that energy used to treat and move water is from non-renewable sources. This measure could require new development projects to incorporate minimum water efficiency measures. The intent of this measure would be to achieve a minimum standard for all development. The measure could be paired with incentive measures that target higher reductions. Given the relatively slow rate of new development and the small percentage of the total building stock that new building represents, this measure is likely to achieve only low to moderate GHG reductions overall in the near and mid-term.

***Implementation***

Minimum water efficiency measures can be achieved through ordinance, for example, through amendment of the Building Code. Compliance with heightened energy efficiency standards could be achieved through building inspection prior to occupancy.

<b>Measure Type</b>	Regulation
<b>GHG Reduction Potential</b>	Low
<b>Reduction Quantifiable</b>	Yes
<b>Cost Estimate</b>	High

**Table 18. Air and Energy Emission Reduction Measure Summary Table**

Air and Energy	Measure Type	GHG Reduction Potential	Reduction Quantifiable	Cost Estimate
<b>Incentive Measures</b>				
<b>Air and Energy Incentive Measure #1</b> - Adopt a policy or program that offers incentives (such as streamlined permitting, permit waivers, or fee waivers) to encourage a switch in electricity generation from fossil fuels to renewable sources through small-scale renewable electricity generation.	Incentive	High	Yes	Low
<b>Air and Energy Incentive Measure #2</b> - Promote the use of clean alternative energy production (renewable energy sources, methane recovery at landfills, waste-to-energy production) by encouraging development of larger-scale renewable electrical generation facilities.	Regulation or Hybrid	High	Yes	Moderate
<b>Air and Energy Incentive Measure #3</b> - Maximize energy efficiency throughout the unincorporated County through incentivizing energy efficient retrofits of existing structures.	Incentive	High	Yes	Moderate
<b>Air and Energy Incentive Measure #4</b> - Support or provide tax credits, grants, loans and other incentives to assist the public, businesses and local agencies for the purchase of energy efficient equipment.	Incentive	High	Yes	Moderate
<b>Air and Energy Incentive Measure #5</b> - Establish public outreach (elementary school component, public workshops, etc.) and employee education mechanisms to teach about energy efficiency and other climate-related initiatives.	Incentive	High	No	Low
<b>Regulatory Measures</b>				
<b>Air and Energy Regulatory Measure #1</b> - Maximize energy efficiency throughout Santa Barbara County through energy efficient upgrades on all development projects.	Regulation or Hybrid	Low-moderate	Yes	Moderate
<b>Air and Energy Regulatory Measure #2</b> - Replace inefficient appliances, such as natural gas and propane space and water heating with more efficient and/or alternative fuel appliances, such as electric heat pump and solar water heaters.	Regulation or Hybrid	High	Yes	Moderate
<b>Air and Energy Regulatory Measure #3</b> - Maximize end-user water efficiency throughout Santa Barbara County by requiring upgrades on all development projects.	Regulation	Low	Yes	High

### 3.3.3 Land Use and Transportation

The State’s GHG emissions inventory has determined that 36% of GHG emissions in the state are tied directly to transportation. These emissions can be reduced through three basic measures: producing more fuel efficient vehicles, requiring stricter fuel standards, and by decreasing the number of vehicles miles travelled. To reduce GHG emissions from transportation, the State is actively working to implement the first two measures through Pavley standards (placing stricter tailpipe emission standards on vehicles), implementing a low carbon fuel standard, and increasing vehicle efficiency (sustainable tire practices, reduction on engine load). The development of a SCS through the regional MPOs, as required by SB 375, is one implementing action that works to reduce GHG emissions by reducing vehicle miles travelled. However, local governments are uniquely positioned to create and implement measures to reduce vehicle miles travelled through their local land use authority. The measures presented in this section are designed to affect where jobs and housing are placed and how people get from their homes to work and to commercial centers every day. Designing communities with well thought out land use patterns can dramatically decrease the amount of vehicle miles travelled and therefore have a direct effect on GHG emissions. Moreover, a well developed multi-modal transportation infrastructure that is convenient and user friendly can also decrease vehicle miles travelled. Public transit, walking, cycling, telecommuting, flex scheduling, ride-sharing, and car sharing are all programs could decrease greenhouse gas emissions.



### Incentive Measures

**Land Use and Transportation Incentive Measure #1** – Create additional, or improve existing, car-sharing and ride-sharing programs.

The County already provides opportunities for car-sharing and ride-sharing programs which help reduce GHG emissions. In the category of car-sharing, the RDA recently launched a 3-year car share pilot program in partnership with Zipcar in Isla Vista (discussed in Section 3.2.2). The County has also recently approved developments within downtown Isla Vista with reduced parking requirements in exchange for the provision of dedicated shared vehicles for the use of onsite residents.

Ample ride-share opportunities exist in the County. The County has worked cooperatively with CalTrans and other transit organizations to provide strategically placed ride-share parking lots throughout the County, including the rideshare program promoted by SBCAG in their Traffic Solutions division. Additionally, Traffic Solutions in coordination with the Community Environmental Council (CEC) is beginning to conduct a dynamic ridesharing pilot project. This cutting edge project will use cell phones and internet technology to organize real time, on demand

<b>Measure Type</b>	Incentive
<b>GHG Reduction Potential</b>	Low
<b>Reduction Quantifiable</b>	No
<b>Cost Estimate</b>	Low

ridesharing. The project expands on current successful carpool matching efforts that work well with 9-5 commuters and makes it easier for those with complex schedules to find carpooling partners. The pilot project will target two congested corridors on Highway 101, between Isla Vista/UCSB and SBCC, and Ventura and the South Coast. It will use preferential parking and financial incentives to encourage a critical mass of people to use the system, so that commuters can tap into the thousands of vehicles travelling back and forth on these two routes. If the pilot is successful, Traffic Solutions is interested in expanding the pilot to other routes across the County.

While all of these program and projects are already in place, there is opportunity for improvement with both car-sharing and ride-sharing. The County should continue to work with local jurisdictions to further improve ride-sharing facilities. If the dynamic ride-share pilot project being conducted by the CEC and Traffic Solutions is successful, the County could work with Traffic Solutions to expand the program throughout the County. The County can also expand the allowance of car-sharing programs in exchange for parking reductions and/or other development incentives, if ongoing monitoring indicates that car-share programs already approved by the County in Isla Vista result in tangible reductions in local vehicle trips.

***Implementation***

Study the effectiveness of the car-share program recently launched in Isla Vista. Determine the success of the program and develop a method to launch additional programs in other communities or in the region through coordination with SBCAG.

Monitor the dynamic ridesharing pilot project being undertaken by Traffic Solutions and the CEC. If the pilot project is found to be successful, the County should work with Traffic Solutions and the CEC to expand the program to accommodate those interested in ride-share all over the County, especially commuters traveling between North County and the South Coast.

**Land Use and Transportation Incentive Measure #2** –Work cooperatively with major local employers to offer incentives and services which decrease auto commuting.

Single-occupant auto commuting is a major contributor to total GHG emissions throughout the County and the nation. The County has instituted some programs to incentivize other forms of transportation. For example, existing County policy as well as the County’s Memorandum of Understanding with the labor unions provides two additional vacation days a year for municipal employees who use an alternative form of transportation (such as biking, walking, public transit, or carpooling). Chapter 23A of County Code, Transportation Demand Management (TDM) Program, was adopted as a joint coordinated program with the

**Measure Type**  
Incentive

**GHG Reduction Potential**  
Moderate

**Reduction Quantifiable**  
No

**Cost Estimate**  
Low

City of Santa Barbara to reduce traffic congestion and improve air quality. The TDM program requires employers who have 20 or more employs to implement a TDM program and achieve and maintain certain employee participation and vehicle occupancy rates. The current program only includes the unincorporated County and South Coast private businesses. The County offers additional vacation time to employees who commute to work in a method other than single-occupant vehicles. Additionally, some departments offer their employees the option to work flexible schedules. The expansion of such programs may result in significant reductions in GHG-emitting vehicle commutes. Such programs could be rewarded by County policies to allow reduced parking or other benefits for employers who meet or exceed the goals of the TDM or other related GHG reduction programs.



**Implementation**

Improve on outreach to employers in the unincorporated County to facilitate increased participation in programs that encourage alternative forms of transportation to and from work or provide alternative work schedules, which reduce the number of days employees commute in single occupancy vehicles.

**Land Use and Transportation Incentive Measure #3 –Enhance bicycle paths and connections to promote the use of bicycles as an alternative to vehicular transportation.**

The use of bicycles as an alternative to automobile transportation is a primary method by which the County can quickly and substantially reduce its GHG emissions. For example, in 2008, 6.4% of commuters in the City of Portland, Oregon used bicycles.

Currently, the County requires the development of new roads to include the provision of bicycle lanes and through the community plan process encourages the development of community-wide bicycle connections. The County could consider the use of more aggressive promotion of critical bicycle route connections. For instance, the County could offer development incentives such as reduced fees, reduced parking, reduced setbacks, tax breaks and other benefits for property owners who provide publicly accessible bicycle rights-of-way across their properties; that offer their employees biking facilities such as secure and covered bike storage areas, maintenance tools, or locker rooms for showering and changing clothes; or that have programs to promote bike use such as increased vacation leave, guaranteed ride homes, or a fleet of bikes at work.

**Implementation**

Review policies in the Comprehensive Plan and ordinances related to bicycle paths, connections, storage and services, and strengthen such policies if need.



<b>Measure Type</b>	Incentive
<b>GHG Reduction Potential</b>	High
<b>Reduction Quantifiable</b>	No
<b>Cost Estimate</b>	Low

<b>Measure Type</b>	Incentive
<b>GHG Reduction Potential</b>	High
<b>Reduction Quantifiable</b>	No
<b>Cost Estimate</b>	Moderate

**Land Use and Transportation Incentive Measure #4** –Promote the use of alternative fuel vehicles and plan for the development of alternative fuel infrastructure.

The recent proliferation of hybrid drive vehicles, and the expected increase in commercially viable electric vehicles (EVs), should provide a substantial opportunity for communities to reduce GHG emissions from vehicle use. The Santa Barbara area has been established as one of a few early target markets for electric vehicles, with the first new battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEV) on the market in late 2010. The vehicles are estimated to produce up to 70% less GHG emissions than traditional internal combustion engine vehicles.

In an effort to reduce its own carbon footprint, as well as reduce fleet fuel costs, the County already operates several hybrid drive vehicles as part of its fleet. The County can further reduce its carbon footprint through replacement of older, less fuel efficient vehicles in the County fleet with EVs. Installation of EV charging stations in employee parking lots could allow commuters from neighboring communities to use EVs. Additionally, the County could also consider allowing alternative fuel vehicles to park in municipal parking facilities at no or reduced cost.

In the future the County can encourage private organizations and citizens to use such alternative fuel vehicles, including EVs. The promotion of such vehicles could be achieved by the use of policies which offer development incentives for the design of projects with preferential parking for alternative fuel vehicles and charging stations for electric vehicles. Additionally, the County could consider amending the Building Code to require the installation of proper infrastructure on new residential projects. If EV infrastructure cannot be sufficiently supplied to the community through development incentives, the County could consider development and building standards for certain projects. For example, the Building Code could be amended to require new single-family residences to install the necessary electrical infrastructure (generally a dedicated 220V circuit) in garages for at-home charging. Multi-family or mixed-used developments over a certain size could be required to provide a certain number of parking spaces with EV chargers.

Similarly, the County could work with businesses to encourage the use of alternative fuel vehicles for both employees and customers through preferential parking and providing charging stations. Additionally, the County can begin to plan for alternative fuel infrastructure by identifying land use needs and appropriate sites for such facilities.

***Implementation***

There are many options to promote the use of alternative fuel vehicles and develop the infrastructure for electric vehicles. As a first step, the County should consider joining Project Get Ready, an initiative led by



the Rocky Mountain Institute to prepare cities for the introduction of the PHEV. Joining Project Get Ready, provides jurisdiction with support and information sharing on best practices related to developing and promoting the use of PHEV.

To start, the County could develop policies for inclusion in the CAP that provide incentives to developers who include preferential parking or charging stations for electric vehicles on their projects; and work to identify land use needs and locations for future alternative fuel infrastructure. The County could also lead by example by adding EVs to its vehicle fleet and identify opportunities to install charging stations on County-owned property. Charging stations installed by private vendors on leased County property which is open to the public also could provide the County with a revenue stream.

**Land Use and Transportation Incentive Measure #5** –Promote the development of commuter rail connections between employment centers.

One of the most efficient methods of providing high capacity public transit is through the use of commuter rail systems. Such facilities have been used throughout Western Europe, Asia, and within major US cities to provide public transit opportunities with relatively low per capita carbon emissions. Opportunities for the development of such commuter rail systems within the County have been explored and found to be preliminarily feasible as part of the 101 in Motion project headed by SBCAG. Utilizing the existing tracks, the 101 in Motion project proposes to add commuter rail service from Camarillo/Oxnard to Goleta with stops in Carpinteria, Santa Barbara and Goleta. There are still numerous hurdles to complete before the commuter rail service can be installed. Additionally, the proposed commuter rail system would terminate in Goleta and provides for opportunities to explore expanding the system towards the North County and San Luis Obispo County.

**Implementation**

Support and encourage the efforts by SBCAG to implement adding commuter rail service from Camarillo/Oxnard to Goleta. Continue to work with SBCAG and neighboring regions, such as Ventura County and San Luis Obispo County to get the proposed commuter rail system implemented and determine interest and feasibility of expanding to San Luis Obispo or North County.

**Land Use and Transportation Incentive Measure #6** –Work to enhance public transportation routes and options.

Within Santa Barbara County and the greater Tri-County area, buses currently provide the most widespread network of public transportation. In FY 2006-2007, a total of 9,739,272 rides were provided by public transit operators. Of this total number, approximately 7.5 million rides

<b>Measure Type</b>
Incentive
<b>GHG Reduction Potential</b>
High
<b>Reduction Quantifiable</b>
No
<b>Cost Estimate</b>
High

**Measure Type**

Incentive

**GHG Reduction Potential**

High

**Reduction Quantifiable**

No

**Cost Estimate**

High

were provided by The Santa Barbara Metropolitan Transit District and 1.5 million rides from the North County transit agencies. Express commuter bus routes have been established between Ventura, Santa Barbara, the Santa Ynez valley, Lompoc, Santa Maria, Vandenberg Air Force Base, and San Luis Obispo. The use of these express buses provides an attractive alternative to single-occupant vehicle commuting. The County should consider programs which could increase the ridership of buses by expanding their service area, offering more flexible pick-up and drop-off times and locations, and improving transit stop facilities and connections. The County could review the need for multimodal connection hubs that allow access from one form of transportation to another, such as providing ample bike parking near transit hubs. The County should also explore the feasibility of transportation options such as the use of high-speed rail or dedicated bus lanes as changes in technology, economic conditions, and population distribution affect the viability of such transportation methods.

**Implementation**

Work with local public transportation providers to expand their services and offer more flexible and convenient routes and pick-up times. This effort could also include completing a study to determine the interest from the public in certain bus routes and times.

**Regulatory Measures**

**Land Use and Transportation Regulatory Measure #1** – Encourage urban development either as infill or adjacent to existing urban development.

**Measure Type**

Regulation

**GHG Reduction Potential**

Low

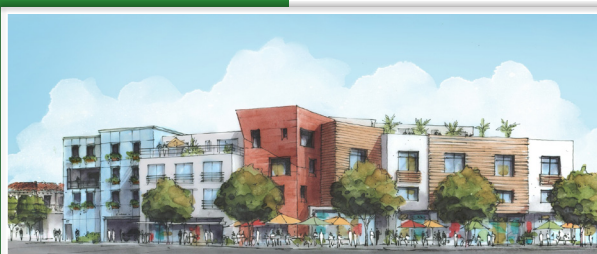
**Reduction Quantifiable**

Yes

**Cost Estimate**

Low

One of the most effective ways to decrease the County’s GHG emissions over a long term planning period is to limit urban development patterns to existing urban areas. By encouraging compact growth that is within or adjacent to existing compact urban areas, vehicle commute distances are reduced, alternate forms of human-powered transportation (e.g., bicycle, walking, etc.) become more feasible, and it becomes physically easier and more fiscally sound to provide mass transit connections between urban nodes. Additionally it is easier and more efficient to build and maintain basic services, such as water, sewer, schools, and fire protection, to development within the existing urban boundaries. The County’s land use maps already define designated areas for urban, semi-rural, and rural development. In compliance with the Study future development within urban areas could be encouraged while new development adjacent to urban areas would only occur if inventories indicate a need for more land, and semi-rural and rural areas would be reserved for agriculture and open spaces uses.



Visualization of project The Loop in Isla Vista

**Implementation**

Maintain and strengthen the existing policies in the Comprehensive Plan that encourage development within or adjacent to the urban boundary.

**Land Use and Transportation Regulatory Measure #2 – Adopt CEQA thresholds for greenhouse gas emissions.**

Recent State Legislation, SB 97, requires local jurisdictions to analyze impacts related to GHG emissions under CEQA review. In response to SB 97, the State Office of Planning and Research (OPR) promulgated new regulations on March 18, 2010 amending the CEQA Guidelines to address evaluation of GHG emissions in CEQA documents. Although the new regulations do not require lead agencies to adopt significance thresholds with respect to GHG emissions, they do require lead agencies to make significance determinations for such emissions.

In absence of Santa Barbara County inventory data, the Planning and Development Department has promulgated interim guidelines for use by planners in evaluating GHG emissions based on the BAAQMD’s adopted thresholds of significance. These guidelines will be used until Santa Barbara County GHG emissions inventory data is available and significance thresholds are developed and formally adopted. Once the GHG emissions inventory has been completed, the County will possess the analytical resources necessary to develop a Santa Barbara County specific threshold of significance. This threshold could be adopted as part of the CAP, discussed in Section 4.1.

***Implementation***

Monitor activity by other jurisdictions throughout the state in anticipation of the development and adoption of thresholds of significance for GHG emissions. Complete research on GHG emission levels for development projects in the unincorporated County. Using the GHG emissions inventory as a baseline, determine a CEQA threshold for GHG emissions that is low yet reasonable at attain. Include the proposed threshold of significance in the Climate Action Plan.

**Land Use and Transportation Regulatory Measure #3 – Review the Comprehensive Plan to determine the extent to which it promotes GHG emission reductions. Recommend amendments to improve policies and implementation measures to promote GHG emission reductions.**

The County’s Comprehensive Plan has evolved over the last thirty years to include: thirteen Elements, eight Community Plans, and four “supplemental” stand-alone documents adopted as amendments to various Elements. Several Elements were originally adopted in 1979/1980 while others have been developed and adopted throughout the 1980s and 1990s. Additionally, several Community Plans, adopted as amendments to the Land Use Element or Coastal Land Use Plan, were completed in the 1990s and 2000s. Accordingly, much of the Comprehensive Plan was developed well before the causes and effects of global climate change were well researched and understood. As a result, it is necessary to review the Comprehensive Plan to ascertain which policies may or may not assist in the reduction of GHG emissions. Ultimately, the basic tenets of the

<b>Measure Type</b>	Regulation
<b>GHG Reduction Potential</b>	Moderate
<b>Reduction Quantifiable</b>	Yes
<b>Cost Estimate</b>	Moderate

<b>Measure Type</b>	Regulation
<b>GHG Reduction Potential</b>	Moderate
<b>Reduction Quantifiable</b>	No
<b>Cost Estimate</b>	Moderate/High

Comprehensive Plan that encourage development within urban boundaries and the preservation of rural agricultural areas provides a foundation well suited to the reduction in GHG emissions. However, the specific policies found throughout the various Comprehensive Plan Elements should be reviewed and possibly amended in response to emerging Climate Change legislation and best practices. Amendments could include strengthening existing policies which already promote GHG emission reductions and deleting or modifying policies which hinder GHG emission reductions.

***Implementation***

Review the current Comprehensive Plan and develop recommendations for amendments to each element to be completed as part of the Climate Action Plan.

**Land Use and Transportation Regulatory Measure #4 – Reduce GHG emissions from new development by adopting principles and policies which encourage and expedite the permitting of mixed-use, infill, and transit-oriented development with jobs and housing co-located together where feasible or in close proximity (walking/biking distance) to transit facilities.**

As previously mentioned, the encouragement of compact urban development is a critical tool in minimizing GHG emissions from local commuting trips. One of the most compact forms of urban development is vertical mixed-use, with commercial space on the lower floors and residential units provided above. The County has already taken significant steps to encourage the development of such mixed-use projects. For example, the County’s IVMP and proposed form-based code for the Bell Street Corridor in Los Alamos both provide substantial opportunities for mixed-use development. Additionally, one of the County’s most common commercial zone districts, C-2, allows for mixed-use development as well. The County can leverage this previous experience and success with mixed-use development and develop policies that further the growth of such compact development types in other areas of the region. Additionally, focusing development in close proximity to transit facilities creates a dynamic by which transit facilities will access a greater customer base with fewer facilities, making such facilities more feasible economically. Additionally, the County could encourage new development contain transit facilities, such as park and rides or bus stops. Specifically, the County can utilize the community plan update process as an opportunity to create additional mixed-use, infill, and transit-oriented development opportunities.

***Implementation***

Develop policies that encourage and promote mixed-use and transit-oriented development as part of the Climate Action Plan and include these policies in the community planning process.

<b>Measure Type</b>	Regulation
<b>GHG Reduction Potential</b>	Moderate
<b>Reduction Quantifiable</b>	No
<b>Cost Estimate</b>	Moderate/High

**Table 19. Land Use and Transportation Emission Reduction Measure Summary Table**

Land Use and Transportation	Measure Type	GHG Reduction Potential	Reduction Quantifiable	Cost Estimate
<b>Incentive Measures</b>				
<b>Land Use and Transportation Incentive Measure #1</b> – Create additional, or improve existing, car-sharing and ride-sharing programs.	Incentive	Low	No	Low
<b>Land Use and Transportation Incentive Measure #2</b> – Work cooperatively with major local employers to offer incentives and services which decrease auto commuting.	Incentive	Moderate	No	Low
<b>Land Use and Transportation Incentive Measure #3</b> – Enhance bicycle paths and connections to promote the use of bicycles as an alternative to vehicular transportation.	Incentive	High	No	Low
<b>Land Use and Transportation Incentive Measure #4</b> – Promote the use of alternative fuel vehicles and plan for the development of alternative fuel infrastructure.	Incentive	High	No	Moderate
<b>Land Use and Transportation Incentive Measure #5</b> – Promote the development of commuter rail connections between employment centers.	Incentive	High	No	High
<b>Land Use and Transportation Incentive Measure #6</b> –Work to enhance public transportation routes and options.	Incentive	High	No	Moderate/High
<b>Regulatory Measures</b>				
<b>Land Use and Transportation Regulatory Measure #1</b> – Encourage urban development either as infill or adjacent to existing urban development.	Regulation or Hybrid	Low	Yes	Low
<b>Land Use and Transportation Regulatory Measure #2</b> – Adopt CEQA thresholds for greenhouse gas emissions.	Regulation	Moderate	Yes	Moderate
<b>Land Use and Transportation Regulatory Measure #3</b> – Review the Comprehensive Plan to determine the extent to which it promotes GHG emission reductions. Recommend amendments to improve policies and implementation measures to promote GHG emission reductions.	Regulation	Moderate	No	No
<b>Land Use and Transportation Regulatory Measure #4</b> – Reduce GHG emissions from new development by adopting principles and policies which encourage and expedite the permitting of mixed-use, infill, and transit-oriented development with jobs and housing co-located together where feasible or in close proximity (walking/biking distance) to transit facilities.	Regulation	Moderate	No	Moderate/High



### 3.3.4 Green Building

This section discusses measures that can be implemented regarding building design, construction, operation and maintenance. There are certain practices that can be implemented that can decrease GHG emissions through energy efficiency, water efficiency, a reduction in the waste involved with building construction and operation, and the types of building materials that are used.

#### Incentive Measures

**Green Building Incentive Measure #1** –Promote and facilitate the installation of energy efficient materials and equipment which substantially exceed the requirements of Title 24 for all remodels/retrofits.

<b>Measure Type</b>	Incentive
<b>GHG Reduction Potential</b>	High
<b>Reduction Quantifiable</b>	No
<b>Cost Estimate</b>	Low

Similar to the Air and Energy Regulatory Measure #1 discussed above, the County could consider providing incentives and assistance for developers and property owners who choose to provide energy efficiency improvements above and beyond what is already explicitly required by the County. This would represent a higher tier of energy efficiency upgrades that, due to the elevated cost, would not be explicitly required by County ordinances or Building Codes. Instead the County could provide assistance or incentives for property owners and developers who have the interest and ability to pursue such upgrades. These could include projects which did not trigger the set threshold discussed in Air and Energy Regulatory Measure #1 below, i.e. below the threshold square footage, or which further exceed energy efficiency requirements. Such assistance could involve such simple steps as increasing public awareness of rebates and tax benefits for energy efficiency upgrades or provide permit streamlining through the Innovative Building Review Program. Additionally, the County’s emPowerSBC program provides property owners with low interest loans for the home energy retrofits and solar system installations.

#### *Implementation*

Amend existing County Code to include Reach Codes for energy efficient upgrades that go beyond the minimum energy standards. Provide incentives for property owners and developers who pursue these higher standards.

**Green Building Incentive Measure #2** –Consider establishing permit streamlining or incentive programs for projects that are LEED certified or equivalent.

The County already provides a streamlined permit process for developments which include energy efficiency improvements above Title 24 and other energy efficient features outside the purview of Title 24. This incentive is currently administered through the County’s IBRP. The County should consider expanding the existing IBRP to include incentives for projects which achieve LEED certification and other sustainable standards.

***Implementation***

Expand the existing IBRP program to provide incentives for all types of green or sustainable development including developers who pursue Reach Codes, an adopted code that is above the minimum requirements, or as discussed in Green Building Incentive Measure #1.

**Green Building Incentive Measure #3** – Encourage the use of alternative, energy efficient construction types (straw bale, insulated block, rammed earth, pumice-crete, etc.), especially using locally available materials.

Since the early 1900s, the vast majority of the nation’s housing stock, especially detached single-family homes, has been constructed with traditional wood-frame techniques. This method incorporates the use of wood framing supported by concrete footings or slabs and sheathed in plywood. However, as the technology of home building techniques has evolved, several new construction methods and materials present unique opportunities to achieve remarkably higher energy efficiency at relatively low cost. Specifically, the use of straw bale walls, insulated block, and rammed earth provides a thermal mass which achieves a level of insulation that cannot be achieved by conventional wood framing. In addition, such materials are often available locally so that they cost less and require less energy to transport to the building site. Some of these materials provide associated co-benefits in that they may seem more attractive as well as are more durable and longer lasting than wood-frame construction. The County should encourage the use of such alternative construction techniques.

***Implementation***

Amend the Innovative Building Review Program to provide incentives for the use of alternative, energy efficient construction types.

**Measure Type**  
Incentive  
**GHG Reduction Potential**  
High  
**Reduction Quantifiable**  
No  
**Cost Estimate**  
Moderate

**Measure Type**  
Incentive  
**GHG Reduction Potential**  
Moderate  
**Reduction Quantifiable**  
Yes  
**Cost Estimate**  
Low

**Measure Type**

Incentive

**GHG Reduction Potential**

Moderate

**Reduction Quantifiable**

No

**Cost Estimate**

Low

**Green Building Incentive Measure #4** –Consider providing incentives for native, drought-tolerant landscaping (requiring less water, fertilizers and pesticides, and hence less energy to transport).

While substantial focus for energy efficiency is centered on improvements to existing and proposed structures, changes to the methods by which landscaping is installed and maintained can provide substantial energy usage reductions. This is a direct result of the fact that a significant proportion of the State’s total energy consumption is devoted to the treatment and transportation of water. Therefore, any reduction in the usage of water would also result in a reduction of statewide energy consumption. Reductions can be made through the installation or replacement of landscaping with drought-tolerant species, low-flow irrigation systems, rain sensors, rainwater harvesting systems, and other water conserving measures. The County already requires native landscaping on new projects, to some extent, through policies in the Comprehensive Plan and Board of Architectural Review Guidelines, but there is ample opportunity to strengthen these policies or provide incentives for project applicants who exceed minimum requirements.

The State adopted the Water Conservation in Landscaping Act (AB 1881) in 2006 for the purpose of implementing landscape maintenance practices that foster long-term landscape water conservation that include initial landscape plan design, performing routine irrigation system repair and adjustment, conducting water audits and prescribing the amount of water applied per landscape acre. In adopting the Act, the policy of the state is to promote the conservation and efficient use of water and to prevent the waste of this valuable resource. To implement this policy, in 2009 the Department of Water Resources developed a model water efficient landscape ordinance for use by local agencies throughout the state. As of January 1, 2010, the model ordinance became effective in each local agency unless that agency had completed the following: 1) adopted their own water efficient landscape ordinance, 2) this ordinance is at least as effective in conserving water as the model ordinance, and 3) the local agency had documented their action with the Department of Water Resources.

As of January 2010, the state model ordinance became effective in Santa Barbara County for new and rehabilitated landscape projects associated with certain development proposals as defined under the model ordinance. The County Planning and Development Department is preparing to adopt a County ordinance to tailor the model ordinance to local rules and development review processes for both coastal and inland areas, including applicability to all Community Plans. The ordinance will be reviewed by both the County Planning Commission and Montecito Planning Commission before adoption by the BOS, anticipated in Spring 2011. The County should consider establishing incentive programs which encourage project applicants to go beyond the minimum requirements.



**Implementation**

Provide permit streamlining incentives, rebates, or other incentives to landowners and developers who landscape with native, drought-tolerant landscaping or other landscaping methods that are proven to use less water.

**Green Building Incentive Measure #5** –Consider adoption and implementation of a green building ordinance, with a voluntary component, for all new construction with carbon neutrality as a primary goal.

As previously mentioned the County could consider the adoption of a green building ordinance which provides a local program for the development of energy efficient building stock. While a portion of this ordinance could include elements that are requirements, another portion of the ordinance could provide voluntary green building improvements with net Carbon neutrality as the ultimate achievement. Since the development of carbon neutral homes and buildings can be a costly endeavor given the market rate for current power generation technology (e.g., photovoltaic solar panels) this portion of the ordinance would only be voluntary and could include incentives and assistance for interested developers and property owners. Assistance could include access to low-interest financing through the County’s emPower program, public information about emerging energy efficiency technologies, etc.

**Implementation**

Develop a green building ordinance that includes standards for voluntary improvements. Provide greater incentives through the IBRP program to property owners and developments who achieve this higher standard.

**Regulatory Measures**

**Green Building Regulatory Measure #1** –Consider requiring the installation of energy efficient materials and equipment which substantially exceed the requirements of Title 24 for all remodels/retrofits which exceed a given threshold.

While the State has systematically increased the efficiency of new homes through the application of Title 24 energy conservation requirements, much of the County’s existing housing stock lacks modern energy efficiency upgrades. The County of Santa Barbara, like much of the State, has a significant amount of housing that was built prior to 1980. The construction of these homes preceded the application of Title 24 requirements and most have little to no insulation, antiquated heating, ventilating and air conditioning (HVAC) systems, and high energy consumption incandescent lighting. The County should consider local amendments to the Building Code to require some level of energy efficiency improvements to existing buildings when applications for remodels or retrofits are received which exceed a given threshold, for example 500 square feet. It should be recognized that the cost of these mandatory improvements be proportionate

<b>Measure Type</b>	Incentive
<b>GHG Reduction Potential</b>	High
<b>Reduction Quantifiable</b>	No
<b>Cost Estimate</b>	Moderate

<b>Measure Type</b>	Regulation
<b>GHG Reduction Potential</b>	Low
<b>Reduction Quantifiable</b>	Yes
<b>Cost Estimate</b>	Moderate

to the scope of work being proposed. Otherwise, the requirements of expensive energy efficiency upgrades as a result of minor home alterations may present an undue fiscal burden upon home owners. However, ample opportunities to improve energy efficiency at low cost are available, including the replacement of incandescent bulbs with compact fluorescent, LEDs, or equivalents, installation of low-flow toilets, installation of blow-in insulation, sealing of exposed duct work, etc.

***Implementation***

Amend existing County Code to require energy standards more stringent than Title 24.

**Green Building Regulatory Measure #2** – Adopt and implement a green building ordinance for all new residential and commercial buildings.

With the emerging importance of energy efficient and environmentally sustainable construction as a contributor to GHG reduction, various methods have been developed to recognize green building techniques. This includes the development of LEED certification and Energy Star-rated buildings. While these green building verification techniques provide a foundation for the development of a more environmentally sustainable building stock, such broad programs may not address regional or community-specific priorities. To bridge this gap between local norms and values and nationwide green building programs, the County should consider a green building ordinance for residential and commercial construction. This ordinance could put standards in place to achieve the development of green building in a phased approach, which is tailored to provide sustainable building opportunities to parties of all economic spectrums.

***Implementation***

Develop and adopt a green building ordinance that could establish local standards for green building construction.

<b>Measure Type</b> Regulation
<b>GHG Reduction Potential</b> High
<b>Reduction Quantifiable</b> No
<b>Cost Estimate</b> Moderate

**Table 20. Green Building Emission Reduction Measure Summary Table**

Green Building	Measure Type	GHG Reduction Potential	Reduction Quantifiable	Cost Estimate
<b>Incentive Measures</b>				
<b>Green Building Incentive Measure #1</b> – Promote and facilitate the installation of energy efficient materials and equipment which substantially exceed the requirements of Title 24 for all remodels/retrofits.	Incentive	High	No	Low
<b>Green Building Incentive Measure #2</b> – Consider establishing permit streamlining or incentive programs for projects that are LEED certified or equivalent.	Incentive	High	No	Moderate
<b>Green Building Incentive Measure #3</b> – Encourage the use of alternative, energy efficient construction types (straw bale, insulated block, rammed earth, pumice-crete, etc.), especially using locally available materials.	Incentive	Moderate	Yes	Low
<b>Green Building Incentive Measure #4</b> – Consider providing incentives for native, drought-tolerant landscaping (requiring less water, fertilizers and pesticides, and hence less energy to transport).	Incentive	Moderate	No	Low
<b>Green Building Incentive Measure #5</b> – Consider adoption and implementation of a green building ordinance, with a voluntary component, for all new construction with Carbon neutrality as a primary goal.	Incentive	High	No	Moderate
<b>Regulatory Measures</b>				
<b>Green Building Regulatory Measure #1</b> – Consider requiring the installation of energy efficient materials and equipment which substantially exceed the requirements of Title 24 for all remodels/retrofits which exceed a given threshold.	Regulation	Low	Yes	Moderate
<b>Green Building Regulatory Measure #2</b> – Adopt and implement a green building ordinance for all new residential and commercial buildings.	Regulation	High	No	Moderate

### 3.3.5 Resource Conservation

Resource conservation is an important component of any GHG reduction strategy. Soil, trees, and other vegetation act as carbon sinks, sequestering carbon dioxide from the atmosphere. Therefore, measures could be proposed that not only seek to increase the efficiency of agricultural operations through more sustainable practices and promoting the use of energy efficient equipment, but also seek to protect lands that sequester carbon.



Furthermore, improved waste management at the local and individual level is a necessary part of a successful reduction strategy, which is why measures such as home composting education, increased recycling rates, and sustainable agricultural practices could be proposed. With increased conservation of resources through reusing and recycling materials come less demand for raw materials and less greenhouse gases generation from future production and transportation of new materials. This section describes the measures that could be proposed to help conserve resources and reduce associated greenhouse gas emissions.

### Incentivize Measures

**Resource Conservation Incentive Measure #1:** Promote the development of an urban forest.

The development of urban forests can play a vital role in reducing CO<sub>2</sub> in the atmosphere through carbon sequestration and reducing GHG emissions by conserving energy that would normally be used for heating and cooling. Urban forests also provide other benefits to air quality. The USDA Forest Service estimates that if 50 million trees were planted, it would sequester about 4.5 million tons of CO<sub>2</sub> annually.

The Climate Action Reserve has developed an Urban Forest Project Protocol which the County could utilize to develop urban forests, have their reductions verified, and then sold in a future cap-and-trade program or retired.

#### *Implementation*

Adopt policies in the Comprehensive Plan, through the Community Plans if available, promoting the development of urban forests.

**Measure Type**

Incentive

**GHG Reduction Potential**

Moderate

**Reduction Quantifiable**

Yes

**Cost Estimate**

Low

**Resource Conservation Incentive Measure #2:** Support and promote local food production and distribution.

Food produced elsewhere and imported to local stores and restaurants requires more energy due to its transportation. Local food production could minimize the energy required for food transportation with a decrease in vehicle miles travelled to get the food from the farm to the consumers table. It could also provide the co-benefits of delivering fresher food to the stores and consumer and support for local agricultural economy.

***Implementation***

Research the food distribution practices used by major grocery retailers and work to lift any impediments to local distribution currently in place. Additionally, provide education to the public about the benefits of local food production. Develop a coordinated marketing program to incentivize the use of local produce and create a recognition program for local retailers who supply their stores and restaurants with locally produced food. Implementation of this ERM should include input from the Agricultural Advisory Committee (AAC).

**Resource Conservation Incentive Measure #3:** Promote edible landscapes, neighborhood gardens, and backyard gardening.

Local edible landscapes, neighborhood gardens and backyard gardens reduce consumer reliance on produce sold in stores which has been transported into the County from other counties, states, and nations. Reducing the demand for produce obtained from outside the region could result in less produce being transported into the region and, therefore, a reduction in transportation emissions and vehicle miles travelled.

***Implementation***

Educate and encourage the use of backyard gardening to reduce consumer reliance on produce transported into the County from other counties, states, and nations.

**Resource Conservation Incentive Measure #4:** Promote the use of responsible agricultural practices such as the Good Agricultural Practices established by the United Nations Food and Agriculture Organization.

The use of responsible agricultural practices has the ability to decrease the amount of GHGs emitted from agricultural activities as well as increase carbon sequestration. Becoming more common is the use of Good Agricultural Practices (GAP) programs. Both United States Department of Agriculture (USDA) and California Department of Food and Agriculture (CDFA) have developed GAP standards which are implemented on a voluntary basis. Both the USDA and CDFA GAP standards place a heavy focus on health and safety but little focus on environmental issues. The United Nations Food and Agriculture Organization (UN FAO)

**Measure Type**  
Incentive  
**GHG Reduction Potential**  
Moderate  
**Reduction Quantifiable**  
No  
**Cost Estimate**  
Low

**Measure Type**  
Incentive  
**GHG Reduction Potential**  
Low  
**Reduction Quantifiable**  
No  
**Cost Estimate**  
Low

**Measure Type**  
Incentive  
**GHG Reduction Potential**  
Low  
**Reduction Quantifiable**  
No  
**Cost Estimate**  
Low



has developed general principles for GAP which are more comprehensive. The UN FAO GAP principles cover multiple areas including: soil; water; crop and fodder production; crop protection; animal production; animal health and welfare; harvest and on-farm processing and storage; energy and waste management; human welfare, health, and safety; and wildlife and landscape. While not all of these activities result in either a reduction in GHG emissions or an increase in carbon sequestration, many of them do. Specifically, the GAP principles promote water conservation, soil management practices that increase carbon sequestration

and decrease the need for fertilizer use, energy efficiency and alternative energy practices, and waste minimization practices.

The use of responsible agricultural practices, such as those outlined in the UN FAO's GAP principles, could serve to decrease GHG as well as provide co-benefits to health and safety, crop protection, and access to certain agricultural markets which require participation in a GAP program.

### ***Implementation***

Work with the AAC to promote the development of more comprehensive GAP standards at the State and federal level. Additionally, the County could encourage the local agricultural industry to develop and adopt its own GAP standards, which are more comprehensive and provide environmental as well as other benefits.

## **Regulatory Measures**

**Resource Conservation Regulatory Measure #1:** Strengthen zoning to protect carbon sequestering environments, to support local-resource based industries, such as agriculture, and protect open and native habitats to maximize their functions of flood protection, water quality, etc.

Land uses such as agriculture, forests, and other types of open space provide an avenue for carbon sequestration. Carbon dioxide will naturally transfer from the atmosphere to new biomass, such as forest trees, where it can be stored. Similarly, agricultural soils are known to act as an effective carbon sink.

### ***Implementation***

This measure can be achieved by adopting policies that support protection of agricultural lands and open space by discouraging residential development in rural areas, and encouraging transfer of development rights that exchange potential development in rural areas for development in urban areas.

#### **Measure Type**

Regulation

#### **GHG Reduction Potential**

Low

#### **Reduction Quantifiable**

Yes

#### **Cost Estimate**

Low

**Resource Conservation Regulatory Measure #2:** Increase reuse and recycling of goods and materials.

Landfills are a major producer of methane. The amount of methane emitted from any given landfill is tied to the amount of waste left in place to emit methane and the controls put in place at that landfill. One way to decrease methane emissions at landfills is to decrease the amount of waste sent to landfills to begin with. Recycling and the reuse of goods and materials divert those goods and materials to other uses rather than being placed in a landfill.

***Implementation***

Increasing the types of materials that can be recycled through curb side services provided in the unincorporated County, and providing education programs for both commercial and residential customers.

Summary Info

**Resource Conservation Regulatory Measure #3:** Facilitate the increased use of agriculture and open space easements through zoning, dedication of public funds, and mitigation fees.

Easements can be a means of conserving agriculture and open space. By conserving open space, a land use jurisdiction also restricts development to certain areas and limits development in the rural areas. Open spaces can also provide important carbon sequestration functions.

***Implementation***

This measure could be effectuated by enhancing zoning laws to promote cluster development to encourage greater use of easements or through the establishment of conversion mitigation fees where revenue is invested into forest-based GHG mitigation projects.

<b>Measure Type</b>	Regulation
<b>GHG Reduction Potential</b>	Moderate
<b>Reduction Quantifiable</b>	Yes
<b>Cost Estimate</b>	Moderate

<b>Measure Type</b>	Regulation
<b>GHG Reduction Potential</b>	Low
<b>Reduction Quantifiable</b>	Yes
<b>Cost Estimate</b>	Moderate

**Table 21. Resource Conservation Emission Reduction Measure Summary Table**

Resource Conservation	Measure Type	GHG Reduction Potential	Reduction Quantifiable	Cost Estimate
<b>Incentive Measures</b>				
<b>Resource Conservation Incentive Measure #1:</b> Promote the development of an urban forest.	Incentive	Moderate	No	Low
<b>Resource Conservation Incentive Measure #2:</b> Support and promote local food production and distribution.	Incentive	Moderate	No	Low
<b>Resource Conservation Incentive Measure #3:</b> Promote edible landscapes, neighborhood gardens, and backyard gardening.	Incentive	Low	Yes	Low
<b>Resource Conservation Incentive Measure #4:</b> Promote the use of responsible agricultural practices such as the Good Agricultural Practices established by the United Nations Food and Agriculture Organization.	Incentive	Low	No	Low
<b>Regulatory Measures</b>				
<b>Resource Conservation Regulatory Measure #1:</b> Strengthen zoning to protect carbon sequestering environments, to support local-resource based industries, such as agriculture, and protect open and native habitats to maximize their functions of flood protection, water quality, etc.	Regulation	Low	Yes	Low
<b>Resource Conservation Regulatory Measure #2:</b> Increase reuse and recycling of goods and materials.	Regulation	Moderate	No	Moderate
<b>Resource Conservation Regulatory Measure #3:</b> Facilitate the increased use of agriculture and open space easements through zoning, dedication of public funds, and mitigation fees.	Regulation	Low	Yes	Moderate





4.0

*Climate Action Study Implementation*

Implementation of this Study could occur through a number of existing GHG emission-related regulatory compliance initiatives as well as incentive-based program opportunities. First, this Study will serve to inform the process required to comply with SB 97, which requires the analysis of program and project level GHG emissions under CEQA. The Study can be used as a resource to identify potential GHG reduction strategies for inclusion in a CAP. Additionally, the ERMs identified in the Study could be used by the County as it works with SBCAG on the implementation of SB 375 and associated development of a regional SCS. The Study could also be used to enhance the incentive-based IBRP and in the development of a new green building ordinance. The County has secured funding from Southern California Edison to develop a CAP, a new green building ordinance and energy reach code. The funding will partially fund the development of a CAP and fully fund the development of a green building ordinance and energy reach code.

This section provides an overview of implementation actions that could be completed by the County in the short-term which maximize existing opportunities as well as, ensure compliance with State law. Long-term GHG emission efforts and initiatives may utilize the Study as a resource that provides comprehensive ERMs in the areas of air and energy, land use and transportation, green building and resource conservation. This Study and identified ERMs have been designed to provide a framework and foundation for future development and implementation of GHG emission reduction strategies in Santa Barbara County.

## 4.1 Climate Action Plan

A primary implementation component of the Climate Action Study is the development of a CAP or GHG Reduction Plan in compliance with the guidelines for a CAP in SB 97. SB 97 amended the CEQA to require GHG emissions be analyzed under CEQA. SB 97 allows for public agencies to analyze and mitigate the significant effect of greenhouse gas emissions at a programmatic level through adoption of a CAP. Once adopted, later project-specific environmental review documents may tier from and/or incorporate that existing environmental review for the analysis of cumulative impacts related to GHG emissions. The benefit of a local jurisdiction adopting a CAP consistent with these guidelines is that it removes the burden and cost of quantifying and analyzing GHG emissions under CEQA on a project specific basis for project applicants.

The CAP would further analyze the ERMs presented in the CAS and provide a program to meet the County's GHG emissions reduction goal to be set by the BOS as discussed in Section 1.2. The CAP will provide a quantitative analysis using a greenhouse gas emissions inventory of unincorporated lands as a baseline. A cost-benefit analysis will be applied to selected measures included in the CAP guided by an approach to economic efficiency. ERMs for implementation will be chosen based on the goal of reducing the most emissions for the least cost. Measures could be tiered and implemented based on different reduction targets. For example, all measures in the first tier would achieve the lowest reduction target. These measures would also be the easiest and cheapest to implement. The second tier would then reach a greater reduction target and include measures which achieve less reduction per dollar than the first tier and are more difficult to implement. Any number of tiers can be created depending on the different reduction target options.

The CAP would provide the County with the policy framework to reduce greenhouse gas emissions throughout the unincorporated County and provide prospective development applicants with a suite of GHG emission reductions options that may be implemented as a means to reduce cumulative greenhouse gas emission impacts. A CAP does not remove the requirement for an individual project to complete CEQA review; rather, it would provide a streamlined and transparent process. Without a CAP in place, each individual project would need to be analyzed for GHG emissions under CEQA. Without a CAP in place, the process would be much more burdensome to project applicants.

The CAP would become a component of the County of Santa Barbara Comprehensive Plan, likely the Energy Element or Land Use Element. The Energy Element (adopted in 1994) provides goals and policies that promote energy efficiency and energy conservation in the unincorporated County. A monitoring and evaluation protocol will be developed in conjunction with the development of the CAP. Following implementation of the CAP, monitoring and evaluation of the program would be completed in accordance with the protocol. A CAP annual report would be completed highlighting the performance and evaluation results and, where needed, present recommendations to improve the CAP. Additionally, the County would pursue obtaining the ICLEI Milestone Awards for each of the five milestones related to CAPs.

## 4.2 Enhanced Building and Energy Codes and IBRP

The County could work to pursue the development and adoption of an energy reach code, which would exceed current Title 24 requirements, and green building standards. A reach code is a code adopted by a local jurisdiction which sets standards higher than those required by Title 24. Development and adoption of both an energy reach code and green building standards would seek to achieve many of the emission reductions opportunities outlined in the Green Building ERM in this Study. Both programs could be achieved through the adoption of CALGreen, California's Green Building Standards Code, which became mandatory on January 1, 2011. Currently various elements of CALGreen are mandatory while others are voluntary. CALGreen provides minimum standards for all new development projects with increased voluntary standards at Tier 1 and Tier 2. If the County pursued adoption of CALGreen with additional requirements pulled from Tier 1 (i.e. making at least part of Tier 1 mandatory), both the goal of setting green building standards and an energy reach code could be obtained. Tier 1 requires that the energy component of the building be designed 15% above the baseline threshold. Incentives will be provided for Tier 2 and a County-specific Tier 3, to be created by the County, through expansion of the IBRP. All tiers and the prerequisites address the following areas of development and building design: planning and design (site development), energy efficiency, water efficiency and conservation, material conservation and resource efficiency, environmental quality, and environmental comfort. Prior to adoption of either energy reach code or green building standards, the County will model the additional costs of development if these new requirements were adopted. Additionally, IBRP would be expanded to include linkages to emPowerSBC. This connection would provide the community with a forum to receive advice from local experts and makes the transition towards energy efficient and sustainable development smoother.

## 4.3 SB 375 Implementation

The County will work with SBCAG on the implementation of SB 375. This would include coordination and collaboration with SBCAG and the other local jurisdictions to develop a SCS which will align the RTP with the RHNA. SBCAG has already taken action to shift the planning period housing cycle from a 5-year to an 8-year cycle. This will allow for County's regional transportation plan and housing elements to be updated concurrently. In September 2010, CARB set the emission reduction target at zero net increase in per capita GHG emissions. The first SCS is expected to be completed by SBCAG in 2012. Following the completion of the SCS, SBCAG will integrate it into the Regional Transportation Plan for 2014-2021. The next cycle of Housing Element updates will follow with certification planned for 2014 for the 2015-2023 cycle.

The SCS may shift housing allocations from rural regions which have limited employment opportunities to urban areas and cities which have established workforce centers such as large private businesses or public facilities. This shift would reduce GHG emissions that result from vehicle traffic by shortening the average commuting distance between residences and workforce centers.

## 4.4 Progress Reporting

One of the most important components to a successful greenhouse gas reduction program is to monitor progress. Without monitoring, there is no way to track whether implemented measures are successful or if they need to be improved. If results are not as predicted, monitoring and reporting on progress provides an opportunity to improve existing measures, if needed, or identify areas where new measures might need to be modified or expanded in order to have a successful greenhouse gas reduction program in place.

There are additional benefits associated with progress reporting beyond ensuring a successful program has been put in place. These include documenting emission reductions that could be used towards any future mandates to reduce greenhouse gas emissions or in a future emissions trading system. Currently California is working closely with the Western Climate Initiative, which includes involvement from six other western States and four Canadian provinces, to design a regional cap-and-trade program. Additionally, the State could place further mandates on local governments. Having taken action to reduce emissions, and having monitored and documented the emissions reductions achieved, the County would make it easier to comply with such regulations, if established. If an emissions trading system is developed in the future, it is possible that local governments will be able to offer emission reduction credits accrued from reductions that they have made for sale to buyers in the system. Local governments that have already documented reductions will have a strong advantage in this market system and may create new sources of local government revenue.

The County's monitoring program would encompass both municipal and community roles in greenhouse gas reductions. The County will build upon the databases already in place for the greenhouse gas emissions inventories for both municipal operations and unincorporated areas to monitor results. Any measure that is implemented to reduce greenhouse gas emissions would be designed, to the maximum extent feasible, in a manner that results can be measured. In certain circumstances, it will be difficult to monitor results for a given measure. However, periodic updates to the greenhouse gas emissions inventory for both municipal operations and unincorporated areas would provide the entire picture of progress made.

## Sources

AB 32 Scoping Plan, California Air Resources Board, October 2008

Chicago's Guide to Completing an Energy Efficiency and Conservation Strategy, February 2009

Cities for Climate Protections Milestone Guide, ICLEI

Community Environmental Council Carbon Neutrality

Contra Costa County, Municipal Greenhouse Gas Reduction Toolkit

Energy Aware Planning Guide, California Energy Commission, December 2009

EPA, Emissions Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle

Institute for Local Governments, California Climate Action Network Best Practices, v5.0

Local Government Commission, Ahwahnee Principles

League of California Cities Climate Change Working Group, League Principles for Climate Change

Mayors and Climate Protection Best Practices, Mayors Climate Protection Center, 2009

National Governors Association, Growing with Less Greenhouse Gases- State Growth Management Policies that Reduce GHG Emissions

Public Policy Institute of California, Climate Policy at the Local Level: A Survey of California's Cities and Counties, November 2008

Sonoma County, Climate Action Plan

Santa Barbara County Comprehensive Plan

United States Conference of Mayors Best Practices Guide, January 2007

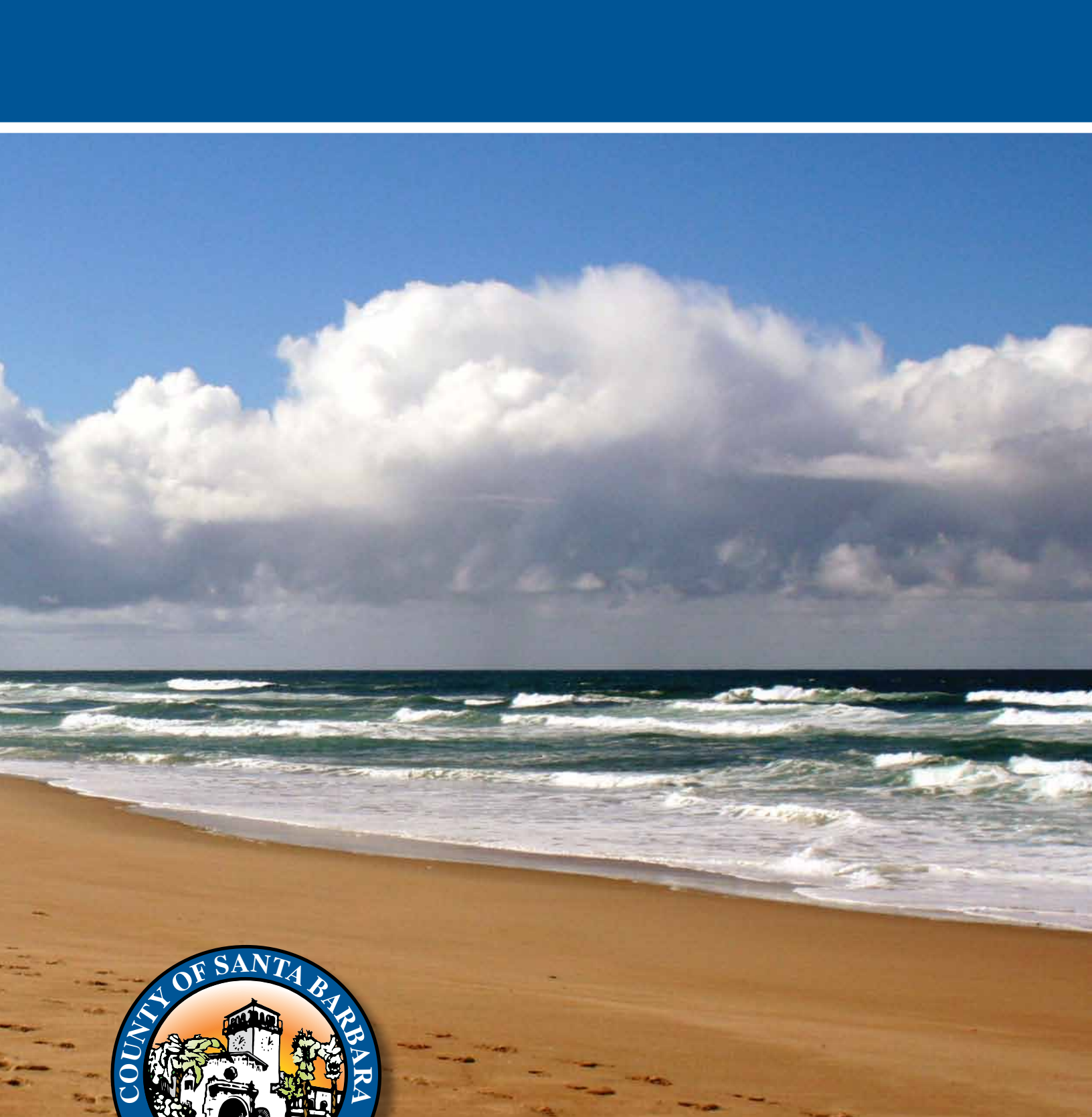
University of California Santa Barbara, Economic Forecast Project, 2010 Santa Barbara County Economic Outlook

US Mayors Handbook Climate Protection Agreement, Climate Action Handbook, ICLEI & City of Seattle & US Conference of Mayors

# Appendix A – Sustainability Action Plan

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**SANTA BARBARA COUNTY**

*2010 Sustainability Action Plan*

This document is designed to provide accurate and authoritative information in regard to the subject matter covered. The information presented in this document is subject to change. Every effort will be made to make proper notice to affected parties. This plan will be implemented with all available funds identified for those projects outlined herein, but does not represent a commitment on the part of General Services if those funds do not materialize as expected.

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## *From the County Administrator*

The County of Santa Barbara (County) recognizes that local government can play a significant role with respect to state and national policy efforts addressing the effects of Greenhouse Gas (GHG) emissions. As a producer, regulator, and incentivizer of GHG reduction efforts, the County continues implementing a multi-pronged strategy, providing leadership across the region. Through this centrally coordinated effort, the County will engender smart policy that responds to potential regulatory requirements, reduces its own energy use, and incubates cutting-edge economic development programs such as emPowerSBC.

As the County budget continues to tighten, the costs of energy continue to rise. Given current forecasts and broader community expectations, the time to focus on cutting consumptive behaviors is now. Recognizing this inter-connected environment, the Sustainability Action Plan presented here forms the basis for the County's strategic actions to reduce our own energy use. Beyond quantifying and cataloging the sources of GHG emissions associated with County Government operations, the plan also sets out a contextual framework for a number of projects that will be implemented between now and 2020.

Although the County family has taken strides towards increased resource efficiency, more can easily be done. To that end, a dedicated focus on simple solutions that reduce the amount of energy, water and pollution produced by County departments makes sense. Saving natural resources also means saving money and jobs. In combination, the actions being proposed offer a path for the County to capitalize on using newly learned behaviors to make smarter, more sustainable choices.



Mike Brown  
County Executive Officer  
June 2010

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# *Santa Barbara County Sustainable Action Plan*

## Executive Summary

On March 17, 2009, the Santa Barbara County Board of Supervisors adopted Resolution 09-059 which committed the County of Santa Barbara to take immediate, cost effective and coordinated steps to reduce the County's collective Greenhouse Gas (GHG) emissions in order to protect the community from the effects of climate change and implement programs to comply with the State of California's GHG reduction goals. The main component of AB 32 was establishing a state goal to reduce GHG emissions by 15% by the year 2020 (thereby reaching 1990 GHG emission levels), and further reduce GHG emissions by 2050 to bring the state 80% below the 1990 levels.

In order to assist the State in meeting the goals of AB 32, to comply with SB 97 and SB 375, and to prepare for any emerging federal climate legislation, the County has prepared a Sustainability Action Plan (SAP). Santa Barbara County recognizes that climate change has the

potential to dramatically affect our businesses and residents, as well as other communities around the world. Santa Barbara County also recognizes that local governments play a significant role in the efforts to reduce GHG emissions and mitigate the potential impacts of climate change. There are numerous actions that can lessen the emissions from our governmental operations, including: increasing energy efficiency in our vehicle fleets and buildings; demonstrating the use of clean, renewable energy sources; implementing vehicle transportation plans that reduce usage; encouraging waste reduction; and joining the Santa Barbara SCE and PG&E Partnerships.

The benefits from these actions include lower energy bills, improved air quality, reduced emissions, economic development, and an improved quality of life throughout the County of Santa Barbara.



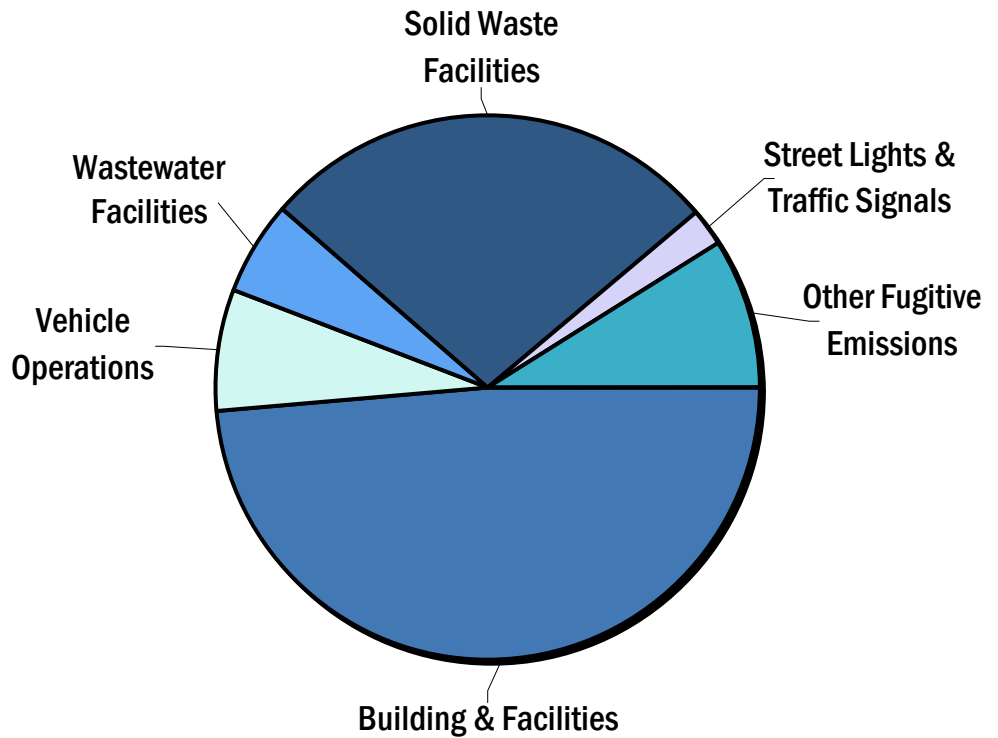
# Government Operations Greenhouse Gas Inventory

The primary purpose of a greenhouse gas emissions inventory is to identify and quantify the sources of emissions generated as a result of the Santa Barbara County governmental operations.

## Emissions Baseline

In 2008, Santa Barbara operations paid approximately 10 million dollars for energy, emitting approximately 134,003 metric tons (tons) of CO<sub>2</sub>.

Emission Category	C02e
Buildings & Facilities	64,978
Street Lights & Traffic Signals	2,949
Wastewater Facilities	7,573
Vehicle Operations	9,797
Solid Waste Facilities	36,765
Other Fugitive Emissions	11,941
<b>Total</b>	<b>134,003</b>





# SECTION 1

*Introduction*



## *1-1 Purpose of Inventory*

The primary purpose of the GHG emissions inventory is to identify and quantify the sources of emissions generated by Santa Barbara County governmental operations. This inventory serves two purposes:

1. To construct an emissions baseline against which Santa Barbara County government can establish immediate emissions reduction targets and quantify future progress.
2. To document where the greatest percentages of emissions are generated in Santa Barbara County's internal governmental operations, and thereby identify the greatest opportunities for reductions in emissions.

## *1-2 Climate Change Background*

The earth's climate has alternated several times over its life span from periods of warmth to ice ages. There are many things that we can not control that affect the earth's climate, such as; volcanoes, the sun's energy, the earth's orbit and other natural phenomena. "However, when the industrial revolution started in the 18th century, humans started contributing to changes in the earth's climate at an ever increasing rate."<sup>1</sup> We can alter these man-made changes by simply adjusting our behavior.

In the last 200 years, the consumption of fossil fuels (oil and gas), the burning of solid waste, deforestation and other activities have created significant increases in concentrations of heat-trapping "greenhouse gases" in our atmosphere. Greenhouse gases get their name because they trap heat in, like the glass of a greenhouse, preventing it from escaping into space. And similar to an agricultural greenhouse, the greenhouse gases in our atmosphere are necessary. They keep the earth's surface warm, allowing for life. The gas concentrations, however, are continuing to increase in the earth's atmosphere and, consequently, the earth's temperature has continued to increase.

"According to NASA (National Aeronautics and Space Administration) and NOAA (National Oceanic and Atmospheric Administration) data, the average surface temperature of the earth has increased approximately 1.2° to 1.4°F since 1910. The eight hottest years on record (since 1850) took place since 1998, with the hottest year being 2005. A significant amount of the increased heat over the past few decades can be attributed to a rise in GHG emitting human activities."<sup>2</sup>

"Climate models predict the earth's average surface temperature could rise 3.2° to 7.2°F above 1990 levels by the end of this century if the greenhouse gases in our atmosphere continue to increase."<sup>3</sup> Scientists know that human activities are changing the greenhouse gas composition of the atmosphere, which is changing the earth's climate.

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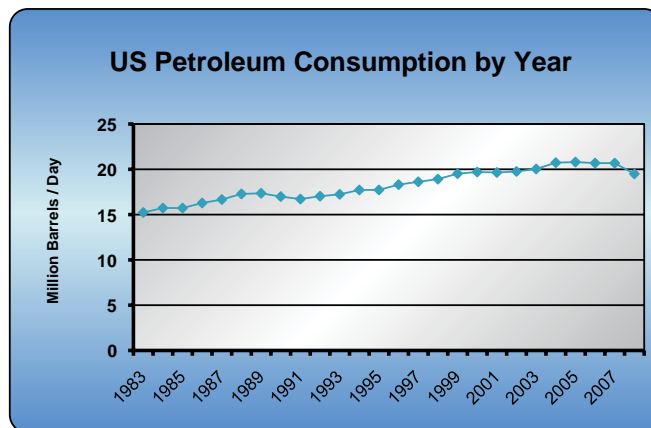
1, 2, 3 NASA and NOAA <http://www.epa.gov/climatechange/basicinfo.html>

4 <http://climate.dot.gov/about/overview/greenhouse-gases.html>

“Three-quarters of the greenhouse gas emissions in the United States come from human-generated energy-related activities, primarily carbon dioxide emissions from burning fossil fuels <sup>2</sup>.” Most of these emissions come from large power plants, and approximately one-third are generated from transportation.

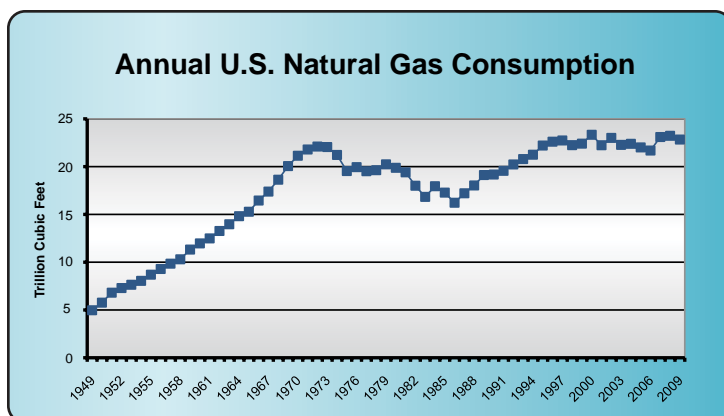
Because people, animals and plants are affected by climate change, scientists are working to better understand the future affects of climate change over time and by geographic areas. Scientific observations of climate change to the earth include: shrinking glaciers, rising sea levels, permafrost thawing, increased growing seasons, trees blooming earlier and a change in the range and distribution of plants and animals.

Local governments need to do their part in reducing greenhouse gas emissions by accepting responsibility and mitigating climate change at the local level. This is accomplished by reducing greenhouse gas emissions in government buildings organic waste decomposition in landfills released to the atmosphere, and fuel consumption of government vehicles. As the effects of climate change become more severe, the adaptation of local government policies will become extremely important in preserving the welfare of local businesses and residents.



[http://tonto.eia.doe.gov/country/country\\_energy\\_data.cfm?fips=US](http://tonto.eia.doe.gov/country/country_energy_data.cfm?fips=US)

 U.S. Energy Information Administration  
Independent Statistics and Analysis



<http://www.eia.doe.gov/dnav/ng/hist/n9140us2a.htm>

2 NASA and NOAA <http://www.epa.gov/climatechange/basicinfo.html>

# 1-3 Why the Sustainability Action Plan

## At the State Level

The Global Warming Solutions Act of 2006, enacted through Assembly Bill (AB) 32, established the State of California as a leader in the climate change policy debate. A primary component of AB 32 was establishing a state goal to reduce GHG emissions by 15% by the year 2020 (thereby reaching 1990 GHG emission levels), and further reduce GHG emissions by 2050 to bring the State 80% below the 1990 levels.

To achieve this goal, AB 32 directed the California Air Resources Board (CARB) to develop a Scoping Plan to establish GHG emission reduction measures for all sectors of the economy. Local governments are viewed as essential partners with the State in implementing strategies in the Scoping Plan and ensuring progress towards the GHG reductions. Of the eighteen measures identified in the Scoping Plan, nine have been identified to have potential local government actions associated with them.

*Climate protection helps everyone by improving economic vitality and public health and safety; by protecting natural resources, and by ensuring infrastructure stability. Local governments are uniquely positioned to set an example to the community through their own actions and to develop emission reduction strategies that make the most sense for their community*

## At the County Level

When Resolution 09-059 was adopted by the County Board of Supervisors, it committed the County of Santa Barbara to take immediate, cost effective and coordinated steps to reduce the County's collective greenhouse gas emissions in order to help reduce the community from the effects of climate change. The Resolution also calls for the implementation of programs to comply with the State of California's greenhouse gas reduction goals.

The Resolution maintains that the benefits of creating a coordinated plan (with measurements, evaluation, and reporting requirements) to reduce GHG emissions can outweigh the costs. This Sustainability Action Plan serves as the first step toward regional energy sustainability in Santa Barbara County.



# AB 32 Scoping Plan

## Measures and Potential Actions Applicable to Local Governments

Measure	Potential Actions	Municipal Relevance	Community Relevance
Energy Efficiency	Increase Utility Energy Efficiency Programs	✓	✓
	Reduce/promote reduction of energy consumption	✓	✓
	Install solar water heating systems for municipal facilities	✓	
	Provide incentives for building owners to participate in the “Million Solar Roofs”		✓
Renewable Portfolio Standard	Achieve a 33% renewable portfolio standard	✓	✓
Green Buildings	Facilitate green building construction, renovation, operation and maintenance at local government owned/operated facilities	✓	
	Implement and provide training for the state adopted green building code		✓
	Transit oriented planning		✓
	Provide incentives to exceed Title 24 standards and lead by example	✓	✓
Recycling and Waste	Control landfill methane emissions	✓	
	Adopt Zero Waste and Environmentally Preferable Purchasing policies	✓	
	Increase diversion from landfills	✓	✓
High GWP (Global Warming Potential) Gases	Ensure proper maintenance of fleet vehicles	✓	
	Ensure proper handling and disposal of waste refrigerants	✓	✓
Sustainable Forests	Promote urban forests		✓
	Make land use decisions that conserve forest lands		✓
Water	Improve efficiency of municipal water system	✓	
	Increase water recycling	✓	✓
	Reuse urban runoff	✓	✓
Transportation	Promote employee transit incentive programs	✓	✓
	Transit oriented planning		✓
Vehicle Efficiency	Provide routine fleet maintenance	✓	

## Legislation to Address Climate Change

To complement and, in some cases, implement the provisions of AB 32, additional State legislation has required local governments to address climate change. Notable examples include Senate Bill (SB) 97 and SB 375. SB 97 requires GHG emissions be analyzed and mitigated under the California Environmental Quality Act (CEQA) and provides an option for local governments to develop a Climate Action Plan to streamline the analysis. SB 375, also known as the Sustainable Communities and Climate Protections Act of 2008, can be viewed as implementing legislation to AB 32. SB 375 aims to curb GHG emissions from automobiles and light trucks through the alignment of the Regional Housing Needs Allocation (RHNA) and the Regional Transportation Plan (RTP). This alignment will be conducted through the development of a “Sustainable Communities Strategy” to be adopted by the Santa Barbara County Association of Governments (SBCAG).

### State Climate Change Legislation of Local Significance

This matrix discusses recent statewide climate change legislation. While other topic-specific bills have been adopted by the State legislature, the three discussed here present the most immediate impacts and opportunities for local agencies.

State Legislation	Year Approved	Summary	Implementation Milestones	Oversight Agency
<b>AB 32</b> Sets target to reduce GHG emissions	<b>2006</b>	AB 32 requires the California Air Resources Board (CARB) to develop regulations and market mechanisms to reduce California greenhouse gas (GHG) emissions back to 1990 levels by 2020. Mandatory caps on GHG emissions will begin in 2012 to achieve reduction targets.  <b>County Impacts:</b> Specific requirements for local agencies as well as impacts associated with noncompliance are expected to be outlined by 2012.	<b>2008</b> - Baseline for mandatory GHG emissions and 2020 statewide cap adopted by CARB.  <b>2009</b> - CARB adopted Scoping Plan indication how emission reductions will be achieved from significant sources.  <b>2012</b> - GHG rules and market mechanisms adopted by CARB take effect and are legally enforceable.  <b>2020</b> - Deadline for emission reduction target.	<b>CARB</b> <b>OPR</b>
<b>SB 97</b> Ties GHG analysis to CEQA	<b>2007</b>	SB 97 requires the State Office of Planning and Research(OPR) to develop legal guidelines for analysis and mitigation of GHG emissions, pursuant to CEQA.  <b>County Impacts:</b> Specific requirements for local agencies as well as impacts associated with noncompliance are expected to be outlined by 2012.	<b>2009</b> - Preparation of guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emission, as required by CEQA.  <b>2010</b> - Certification and adoption of guidelines.	<b>OPR</b>
<b>SB 375</b> Implements one prtion of AB 32	<b>2008</b>	SB 375 addresses one of the eighteen implementation measures called for by AB 32 Through Alignment of the Regional Housing Needs Allocation (RHNA) and the Regional Transportation Plan. This includes development of a Sustainable Communities Strategy (SCS) that would be adopted by SBCAG. Certain types of infill projects that are consistent with the SCS would receive CEQA exemptions and/or streamling under SB 375.  <b>County Impacts:</b> SB 375 calls for a new regional planning process, new requirements for environmental analysis, and strengthens the Housing Element rezone mandate overseen by the State Housing and Community Development Department (SHCD).	<b>2010</b> - GHG reduction targets related to SB 375 are established by CARB and assigned to Metropolitan Planning Organizations (such as SBCAG).  <b>2013</b> - Local Regional Transportation Plan updates, including adoption of the SCS & RHNA.  <b>2015-2023</b> - Housing Element updates.	<b>CARB</b> <b>SHCD</b> <b>SBCAG</b>



## The County's Response to Legislation

In order to assist the state in meeting the goals of AB 32, to comply with SB 97 and SB 375, and to prepare for any emerging federal climate legislation, the County of Santa Barbara has prepared this *Sustainability Action Plan* and is currently in the process of preparing the *Climate Action Strategy*. Together these two plans address the County's role as a producer of GHG emissions, and as a regulator of community wide production of GHG emissions.

The Sustainability Action Plan (SAP) addresses the first role: that of a producer of GHG emissions. This plan provides a baseline emissions inventory and will be incorporated into the Climate Action Strategy at a later date. By providing the SAP first, the County has positioned itself to provide leadership to the community. The SAP is also the first in the five (5) milestones to reduce greenhouse gases, established to by ICLEI-Local Governments for Sustainability, of which Santa Barbara County is an active member. The five milestones established for local governments to reduce their greenhouse gas emissions are:

- 1) Conduct a baseline emissions inventory. Regional governments and nations across the world can only manage what they measure. Therefore, the first step in managing greenhouse gas emissions is to establish an inventory of those emissions.
- 2) Adopt an emissions reduction target. This provides a tangible and specific goal for which progress can be measured.
- 3) Develop a local Climate Action Plan. This provides a strategy to reduce greenhouse gas emissions and includes measures already implemented.
- 4) Implement policies and measures. This is the most important part of the process and it generally involves cooperation and coordination among multiple departments.
- 5) Monitor and verify results. This milestone provides a valuable tool to measure progress towards the reduction goal. It allows for modification of the implemented measures, if they aren't working, and provides a quantification of emissions to be used should an emission trading mechanism be established.

Those Milestone 1 requirements that are not included in this SAP will be provided in the Climate Action Strategy. The Climate Action Strategy will include a community inventory, projections, and recommendations on how to effectively move towards meeting the remaining four milestones set by (ICLEI) International Council for Local Environmental Initiatives.

The AB 32 Scoping Plan identifies energy efficiency as one of the measures with the greatest GHG reduction potential. Therefore, the County of Santa Barbara has placed a strong focus on energy efficiency in its own municipal operations as outlined in this SAP. Not only do energy efficiency improvements have the potential to greatly reduce greenhouse gas emissions, energy efficiency also plays an important role in decreasing the County's operational costs. The wise use of energy resources has both economic and social benefits. Increasing energy efficiency will lead to: cost savings through lower energy bills; reinvestment in the local economy; improved quality of life and public health; increased compliance with state and federal goals; and a more secure future.





# SECTION 2

*Santa Barbara County Government*



## *2-1 Santa Barbara County Government Profile*

To better understand your local government's role in reducing greenhouse emissions, it is important to see the entity as a whole. The table below outlines the components that make up the County of Santa Barbara's government

<b>Number of County employees</b>	<b>3,875</b>
<b>Number of vehicles and equipment (e.g., cars, trucks, generators, tractors, trailers and other equipment)</b>	<b>1,378</b>
<b>Total building square footage</b>	<b>2,367,822</b>
<b>Total number of structures (e.g., buildings, garages, sheds, storage containers and other structures)</b>	<b>717</b>
<b>Total number of electric meters</b>	<b>232</b>
<b>Total number of gas meters</b>	<b>88</b>
<b>Total County recommended budget FY 2010-11</b>	<b>\$864 million</b>



## 2-2 Climate Change Mitigation Activities in Santa Barbara

The Santa Barbara County government is comprised of twenty-four (24) different departments with eight primary types of energy consuming groups.

1. Building Energy	5. Landfill Generation
2. Mobile Workforce	6. Resource Recovery
3. Vehicle Fuels	7. Grounds Management & Sequestration
4. Public Works Infrastructure	8. Printing & Reprographics

Due to the many over-lapping uses of energy among departments, this SAP will discuss the eight groups versus each individual department. Each of these groups will illustrate the different ways the County of Santa Barbara is working to save energy now, as well as provide sample projects for future consideration in its efforts to save money and protect the environment.

Santa Barbara County has worked hard to reduce greenhouse gas emissions over the last few years. The following inventory represents the first step in a systems approach to reducing Santa Barbara's emissions.



*Money Spent on Electric, Natural Gas, Gasoline and Diesel by Santa Barbara County Operations by Department*

Departments	2008	2008	2008
	Gas & Electric	Gasoline & Diesel	Total
Public Works	\$ 1,536,468	\$ 1,463,980	\$ 3,000,448
Sheriff	\$ 744,976	\$ 1,180,384	\$ 1,925,360
Fire	\$ 199,078	\$ 742,717	\$ 941,795
Public Health	\$ 550,178	\$ 155,773	\$ 705,951
Parks	\$ 369,675	\$ 171,045	\$ 540,720
Social Services	\$ 323,392	\$ 155,215	\$ 478,607
Probation	\$ 307,906	\$ 125,305	\$ 433,211
Alcohol, Drug & Mental Health	\$ 249,259	\$ 100,196	\$ 349,455
General Services	\$ 235,774	\$ 95,711	\$ 331,485
Planning & Development	\$ 84,691	\$ 61,058	\$ 145,749
Clerk Recorder Assessor	\$ 122,243	\$ 12,628	\$ 134,871
District Attorney	\$ 96,401	\$ 25,199	\$ 121,600
Agricultural Commissioner	\$ 35,323	\$ 66,442	\$ 101,765
Information Technology	\$ 63,270	\$ 32,098	\$ 95,368
Child Support Services	\$ 63,514	\$ 12,041	\$ 75,555
County Counsel	\$ 32,759	\$ 37,692	\$ 70,451
Public Defender	\$ 48,134	\$ 13,976	\$ 62,110
General County Programs	\$ 46,366	\$ 13,701	\$ 60,067
Treasurer Tax Collector	\$ 36,795	\$ 8,593	\$ 45,388
Auditor Controller	\$ 43,250	\$ 1,624	\$ 44,874
County Executive Office	\$ 33,731	\$ 1,806	\$ 35,537
Human Resources	\$ 33,784	\$ 1,193	\$ 34,977
Board of Supervisors	\$ 14,244	\$ 2,327	\$ 16,571
Housing & Community Development	\$ 6,483	\$ 783	\$ 7,266
<b>Total</b>	<b>\$ 5,277,694</b>	<b>\$ 4,481,487</b>	<b>\$ 9,759,182</b>

## 2.2.1 Building Energy

Santa Barbara County's energy goals include: the increased use of renewable energy at its various County-owned facilities; promoting clean technology or "green businesses"; and, alleviating the budgetary uncertainty that results from highly volatile electricity and natural gas prices.

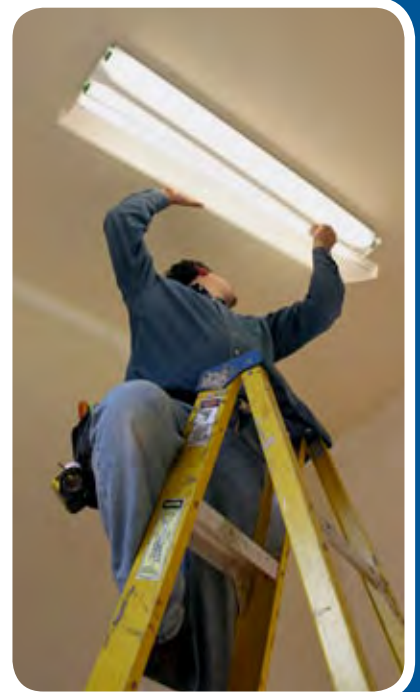
The County faces financial constraints and has limited funds for facility upgrades and routine maintenance. To save money in the long-term by reducing energy usage, investment in facility systems upgrades must be made in the short-term. Although this results in limited options, the County has completed several significant projects, including:

- An energy audit at the Veterans Memorial Building in Santa Barbara
- The replacement of T12 fluorescent lighting with energy efficient T8 lighting in County buildings
- The replacement of incandescent lighting with energy efficient compact fluorescent lights at County buildings
- The replacement of exit signs with energy-saving LED signs
- Lighting retrofit at the McDonald Building in Santa Barbara
- Variable Frequency Drive (VFD) pump motors for Santa Barbara Courthouse cooling tower
- The replacement of natural gas powered chiller in the County Administration Building with a more efficient double-effect gas absorption chiller (this improvement created a \$15,000 a year savings in natural gas costs)
- Replacement of air conditioner units in Buildings A, B & D in Santa Maria (Betteravia Government Complex) with modern units equipped with economizers and VFDs

To further ensure energy efficiency, several County Facility Maintenance (FM) staff members will be trained by the South County Energy Efficiency Partnership to become "Certified Building Operators." This training will enable the FM staff members to identify and implement energy-saving processes whenever possible.



*New high efficiency boilers in the County Mail Jail.*



*The lighting replacements alone are saving approximately 2.1 million kwh/year Countywide.*

## *Heating, Ventilation and Air Conditioning*

NOVAR 963 is a Heating, Ventilation and Air Conditioning (HVAC) controller that the County has begun implementing in the Administration building, Courthouse, Lompoc Administration building, Betteravia building# B, and # D. The software is a monitoring system developed to integrate up to 300 building control systems into one site. From there the operation of the buildings HVAC systems data can be reviewed real time.

- The system gives the ability to monitor each mechanical components operation in the building's HVAC system, 24/7 allowing the technician to remotely make beneficial changes in operations. A technician can plug into the network anywhere in the County and instantly diagnose HVAC problems on any building in the system. This will generate savings from the reductions of labor and vehicle operation costs, by eliminating the need to physically go to each trouble call for diagnosis.
- The interface for the system allows for programming changes to any building or system component by direct or remote connection to the software. It provides a graphic representation of the building's HVAC components along with historical logs, settings and performance.
- One of the features resulting in savings is the ability to schedule multiple operational programs in a building to account for building use after hours, holiday shut downs, seasonal occupation and energy savings or "Peak Shaving" by selective shut downs of individual and multiple zones.
- With this system facilities maintenance will have the ability to audit and change building controls, programming for optimum performance using the data logging feature. This historical data feature allows for reassessment of equipment to make ongoing corrections, for optimum performance.



## Novar 963 HVAC Monitoring Software



## *Reducing Utilities and the ISF*

Two years ago the County of Santa Barbara changed the way utilities used by departments are managed. Prior to 2008 General Services paid all utility bills for almost all departments out of a single budget for which General Services was responsible. There was little incentive for departments to reduce the use of utilities because their budgets were not directly impacted by the cost of utilities. This led to the creation of an "Internal Service Fund" (ISF) and now all bills are paid centrally by General Services who in turn bills each department monthly for utilities based on square footage occupied and amount used. This has created awareness for departments to reduce use and occupy only needed square footage. The effect has been a reduction on use.

Most energy related projects that reduce use, require capital investment of some amount and now that the ISF is in place and working it is recommended that a small surcharge (2%) be placed on utilities bills to help fund future cost effective energy related projects in County buildings. The surcharge would generate approximately \$80,000 a year to be used only on future projects. Example projects are, automatic sensor controls for lighting, variable frequency drives on large motors, higher quality insulation on roofing. The rebates on energy projects will be reinvested into the utility ISF to complete additional projects. The surcharge and the rebates entering the utility program will help the County reach its goal to reduce energy costs and reduce carbon emissions.

## *Ozone System at County Jail Laundry*

The County Jail currently uses an ozone laundry support system (NuTek NT-400) for its in-house laundry needs, which includes: clothing for inmates at the County jail and overnight patients in Alcohol, Drug & Mental Health programs, uniforms for the Sheriff Deputies and County Firefighters and various linen needs.

Laundering with ozone at ambient temperatures is the only method that can be used as a total sterilizing agent, thereby eliminating the need for high temperatures. Additionally, pyrogens, the by-products of microbial growth that are toxic to humans, are oxidized (and thus removed) by ozone systems, whereas traditional laundering (with dry heat sterilization) does not eliminate these microbes.

The NuTek system that the County uses is a fully automated, flow controlled, oxygen supported, noninvasive system. It is designed to reduce energy demands, water and sewer usage. It also eliminates the need for harsh and expensive chemicals. The County's ozone laundry system is an on-demand system with an estimated life expectancy of fifteen (15) years. It requires minimal maintenance so that County personnel resources and dollars are freed-up for other projects in the County.



## *Future Solar and Projects*

A goal of Santa Barbara County is to increase the use of renewable energy at various government owned facilities, promote clean technology or “green businesses,” spur innovation for job creation in the Santa Barbara County region, and reduce budgetary uncertainty resulting from highly volatile electricity and natural gas prices.

The County is strongly committed to contributing to the growth of green industries; however, often lack the capital resources to install systems at public facilities. The County faces considerable constraints on their annual capital budgets and has limited funds allocated for facility upgrades and routine maintenance, resulting in few options for funding renewable energy generation projects. Additionally, the County currently spends over 5 million dollars for utilities expenses, of which most is attributed to electricity expenses. Generating local solar and wind energy power will offset some of these costs. Therefore, the County is pursuing third party Power Purchase Agreements (PPA) as a means to procure “green power” from Renewable Power Generating (RPG) Systems using a collaborative procurement process. The County has reviewed its property portfolio and has several possible locations as viable RPG System sites. These sites included facilities with existing electrical loads with an estimated renewable power generation yield of over one mega watt.



The County of Santa Barbara General Services department plans to solicit a Request for Proposals (RFP) for a Power Purchase Agreement (PPA) to include design engineering, permitting, installation and operation of a Solar Photovoltaic (PV) System at the Calle Real site. The County plans to reduce its carbon footprint and reduce its electricity expenses through the installation of a solar photovoltaic system.

The County owned property located 4434 Calle Real Santa Barbara, California 93101 is the first site being considered. Other sites in Santa Maria are also being considered. An aerial view of the Calle Real property is shown in Figure 2.1-1 and provides potential locations for the megawatt solar system which is highlighted in yellow (only a portion of the yellow area will be needed).

The County envisions a contractor owning and operating the system after the system is commissioned. Proposals submitted in response to this RFP should assume developer ownership. The County will consider alternate proposals to developer ownership/power purchase agreements, however funding for turnkey projects is not currently available. Any alternate proposals shall be in addition to (not in substitution for) the proposal(s) assuming developer ownership.



# Capital Maintenance Projects:

## HVAC / Building Controls Projects:

Savings are gained by replacing failing and inefficient heating and air conditioning “Package” and “Multi-Zone” units (usually 20-35 years old) with modern units that have been designed to use lower horsepower or variable speed motors. These changes will cut the electrical load used by the unit to distribute heated or cooled air in the building. The modern units also have higher efficiency natural gas burners or cooling coils which reduce the amount of energy used to raise or lower the temperature of the outside air before its distribution in the building. On each of these projects, Facilities surveys the entire building to make sure that each unit specified as a replacement is appropriately sized to meet the heat and cooling load of the building. This load is determined by the volume of the building, the number of staff occupying the building and the equipment used by that staff in each service zone. As part of this survey, Facilities also looks at the existing HVAC controls for the building to determine if an upgrade in the controls equipment would be beneficial. In most cases, additional cost savings can be gained by linking the building controls to the new 963 network software which programs and monitors performance and operations of the HVAC for the County’s largest buildings.

## Lighting and Electrical Upgrades:

County Buildings use fluorescent lighting systems for interior illumination of work spaces. With the continuing development of lower wattage / higher lumen fluorescent bulbs by the lighting industry, there are many potential cost savings to be gained by changing the existing lighting systems to a lower wattage system or to new lighting such as L.E.D’s. Facilities frequently partners with energy suppliers to take advantage of the various programs they offer to either offset the funding for these upgrades, or receive discounted or donated bulbs and other lighting system parts.

## Roofing Repairs and Replacement:

The primary function of a buildings roof is to keep the structure dry and sheltered from the elements. But, the roof is also the first line of defense in reducing the heat load in a building. When architecturally possible, Facilities repairs and replaces existing roofing on County buildings with “Cool “or reflective finished systems that meet or exceed California Title 24 Building Energy Efficiency Standards. Installation of a “Cool Roof” system can lower the surface temperature of the roof by 50 to 60 degrees in full exposure to the sun. The lower temperature of the roof reduces the heat load to the building, which in turn lowers the electrical draw for the HVAC system that is cooling the building.

## Carpentry and Insulation:

The majority of the buildings owned by the County are between 20 and 90 years old. There has been considerable deterioration of the original insulation and weather proofing used over time since County buildings were constructed. Additionally, the movement of the building, doors and windows is contributing to insulation deterioration. Gaps are created between the doors, windows and their frames, allowing heated or cooled air from the building to escape. Most older buildings were constructed with single pane windows which are relatively poor insulators, and at times it is cost effective to replace these with dual pane windows that incorporate a insulating gas between the panes.

## *2-2-2 Mobile Workforce*

A labor-management team was established in August 2009 and has been meeting since that time to develop a Countywide policy for a Mobile Workforce Program to reduce the County's and its employees "carbon footprint" in an accountable, customer-focused, and efficient manner.

The team is focusing on a wide range of strategies that could assist in reducing the carbon footprint.

Strategies being explored include:

- Strengthening the County's telecommuting policy to encourage and support expanded use of telecommuting; and,
- Reviewing and potentially changing County hours of operation to provide greater access to the public (before 8 a.m. and after 5 p.m.) while potentially closing many County services every Friday or every other Friday; and,
- Reviewing and potentially changing the manner in which departments deploy and manage field staff (i.e., reducing trips to an office or central location; maximizing the use of technology to allow a "work anywhere" approach to field work; establishing satellite office or drop-in centers, etc.)

The first phase of the project was to strengthen the County's existing telecommuting policy. Over many months, the team researched best practices and incorporated them into a draft revised policy. The policy has been reviewed by County Counsel and Risk Management and those edits are in the process of being incorporated and reviewed by the Project Team. It is anticipated that the Telecommuting Policy will be brought to the Board of Supervisors in July/August 2010.

The next phase of the Mobile Workforce Project will be to examine the County's days and hours of operation to determine if it is feasible to close every Friday or every other Friday. A scheduled and synchronized closure would not be possible for some departments; however, most would be able to participate. The advantages of a synchronized closure are many:

- Reduction of vehicle trips to and from work;
- Reduction of business-related vehicle trips on the closure days;
- Reduction in utilities on days facilities are completely closed; and,
- Expanded hours of operation the days County offices are open to the public, which allows working individuals increased access to County services.

To assess the feasibility of a synchronized closure, it is anticipated that the Project Team will conduct surveys with Department Heads as well as conduct counter surveys with clients and customers in a variety of departments that have heavy client services (ADMHS, Public Health, Social Services, Public Works, Planning and Development, etc.). An electronic survey may also be an effective tool to gather input from the community. The Team will also work with General Services to identify overhead savings that could be achieved as a result of a synchronized closure. Once all the information is gathered and analyzed, the Team will make recommendations to the Board of Supervisors. This phase of the project is anticipated to commence in July 2010 and recommendations should be finalized by Winter 2010/2011.

## *2-2-3 Vehicle Fuels*

The County's "Green Fleet" Management Plan, sponsored by the Vehicle Operations department, is a major component of the County's Sustainability Action Plan. The Green Fleet Plan is based on a series of programs to reduce greenhouse gas emissions by improving the overall efficiency of the County's vehicle fleet. The Green Fleet Plan includes policy recommendations, proactive steps towards purchasing more fuel-efficient vehicles, and strategies and goals for fuel reduction. The plan is an on-going effort as Vehicle Operations continues to research and evaluate current and future vehicle and fuel technologies.

Vehicle Operations' Green Fleet Plan has several programs currently in place that have reduced fleet emissions. These programs include:

### **Fleet "Right Sizing"**

It is a simple fact that larger vehicles require more fuel. To ensure fuel efficiency and support the County's goal to reduce greenhouse gas emissions, Vehicle Operations introduced "right sizing" for the County's vehicle fleet. Right sizing ensures, through logical planning, that the duty requirements of each vehicle matches the smallest possible vehicle for the intended task.

Vehicle Operations has made, and continues to make, considerable improvements to "right sizing" the County's vehicle fleet. Whenever possible, full-size sedans are being replaced with mid-size sedans; mid-size sedans are being replaced with compacts; and trucks are being down-sized to the smallest trucks possible for the intended task.



## The Use of Re-refined Oil in County Vehicles

Another successful program in Vehicle Operations' Green Fleet Plan includes the use of re-refined oil. Whenever possible, Vehicle Operations is replacing the virgin petroleum products used in servicing of County-owned vehicles with re-refined oil products.

Re-refined oil is an effective and cost-saving alternative to virgin petroleum products. Vehicle Operations has successfully used re-refined oil products for County vehicles for over nine years. Santa Barbara County was the first governmental fleet in the tri-county area to use this environmentally friendly product. Re-refined oil has enabled the County to achieve one of its Green Fleet goals without increasing Vehicle operational costs.





## Fully Automated Car Share System

Santa Barbara County has successfully implemented California's first fully automated "Car Share" system. Following the County's model for ride sharing, Vehicle Operations has been able to reduce the total number of County owned fleet vehicles by enabling passengers to easily connect and ride share. The Car Share reservation system has a built-in module for "Ride Share" that matches up County employees who are traveling to the same destination at the same time. This successful program has saved the County money while reducing its environmental "footprint".

### Benefits of the fully- automated motor pool "Car share" system include:

- Reduction in the total number of County owned vehicles
- Additional motor pool locations are available without the need for more staff
- County employees have 24-7 access to motor pool vehicles
- Easy access to ride sharing as the system automatically matches up employees who are traveling to a common destination



## Vehicle Anti-Idling Policy



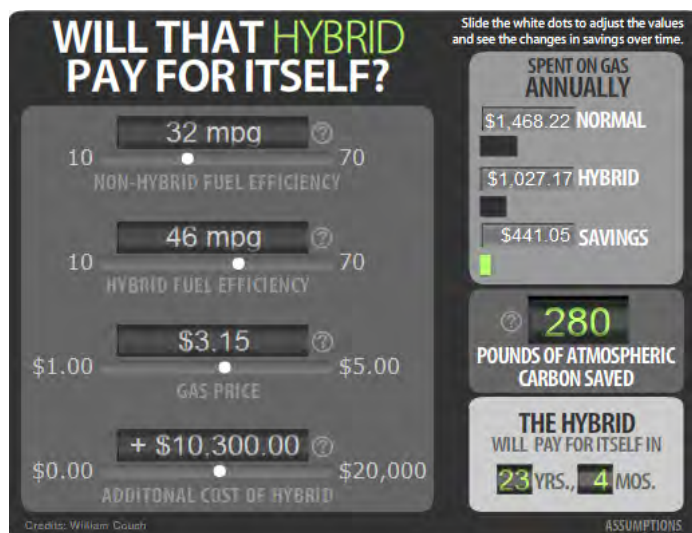
The County has established an anti-idling policy for its vehicles. An idling car uses almost as much fuel, and emits almost as much carbon dioxide, as a car in motion. Therefore, to reach County goals for fuel reductions, as well as comply with new California Air Resources Board (CARB) mandates, the County has established a vehicle anti-idling policy. The CARB (a State entity) mandate required the County to establish and enforce a policy that limited the idling time of all County-owned diesel-powered vehicles and equipment. When the County's anti-idling policy was written, the County elected to include all County vehicles and equipment regardless of fuel type.

## Hybrid Vehicles

The County purchased the first of its hybrid vehicles in 2001. Since that time the County's transition from conventional gasoline powered vehicles to hybrid powered vehicles has been conservative. The County currently operates approximately twenty-five hybrid powered vehicles. These vehicles have proven to be very reliable and have performed extremely well. To date, all hybrids originally purchased by the County are still in operation and several of these vehicles have in excess of 120,000 miles.

Part of the Vehicle Operations' conservative approach includes a careful examination of the total operating cost of all fleet vehicles. A vehicle's operational cost (cost per mile to operate the vehicle) is a primary consideration when selecting vehicle types to purchase. In its dedication to responsible vehicle purchasing, Vehicle Operations has resisted making large-quantity hybrid vehicle purchases. For example, in 2008, the County purchased several compact sedans (Ford Focus EPA; 28\36 MPG) for \$13,040.98 per vehicle. That same year the County also purchased one hybrid (Toyota Prius EPA 48\45 MPG) for \$23,337.57. The cost differential for the Prius compared to the Focus was over \$10,000.00.

At today's fuel prices, the County could never recover the additional funds required to purchase the more expensive hybrid vehicles based on the fuel cost savings alone. Vehicle Operations does recognize the environmental benefits of hybrid vehicles and attempts to strike a practical balance between fleet emission reductions and operating the County's fleet in a cost effective manner. As the price of fossil fuel rises and as hybrid vehicles become more price competitive, the operational cost gap between hybrids and conventional compact sedans will narrow.



## Other Initiative and Achievements

In its on-going efforts to fully support the County's goals for reducing fuel usage, and the greenhouse gases emitted by that fuel, the Vehicle Operations department has made other, significant changes, including:

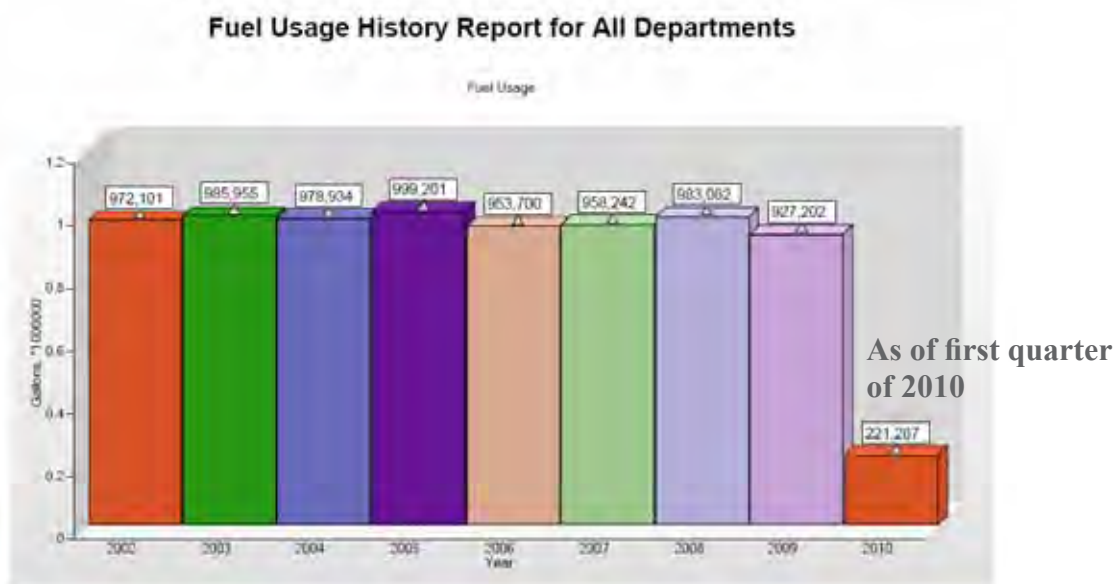
- 100% compliance with mandated smog inspection certifications
- 100% compliance of mandated diesel smoke testing and certifications
- Complete compliance with CARB-mandated on-highway and off-highway diesel particulate trap retrofit programs
- Implementation of a fleet tire inflation program
- Conversion of fleet record keeping from paper to electronic
- Comprehensive recycling programs for all Vehicle Operations facilities (recycled items include: paper, printer toners, batteries, brake linings, oils, filters, coolants, metals and various vehicle parts and components).

## County-Wide Fuel Reduction Goals

It is every County department's responsibility to participate in the County's goal to reduce fossil fuel usage, but to achieve a goal, one must first define the goal. To that end, in 2008, the County Executive Office established several fleet cost-reduction policies that included individual fuel-reduction goals for each department.

In 2009, the County used approximately 5% less fossil fuel gallons as compared to 2008. Several factors accounted for this reduction in fuel usage including: policy compliance; right sizing of the County's fleet; success of the County's Ride Share program; and, implementation of a fleet tire inflation program.

Moving forward, Vehicle Operations will continue to offer and evaluate emission-reducing ideas for County departments' vehicle needs. Vehicle Operations realizes that the County's financial resources are limited, therefore, realistic cost-benefit analyses will continue to be performed before reshaping policies or selecting future emission-reduction projects.



## Proposal for a Green Fleet Review Committee

As part of its effort to bring changes and improvements to the County's fleet of vehicles, the County's Vehicle Operations recommends a County-wide Green Fleet Review Committee be established.

The proposed Green Fleet Committee will be comprised of representatives from various County departments. The Committee will review current fleet practices, establish comprehensive Green Fleet policies, review future Green Fleet projects and make executive recommendations regarding selections. The Committee's goal will be to ensure the County's success in reducing the fleet related emissions.

### Green Fleet Committee Objectives:

- Provide a comprehensive review of current County fleet practices
- Establish comprehensive Green Fleet policies and Green Fleet best practices
- Oversee and enforce current and future fleet policies
- Oversee fleet procurement practices
- Require Green Fleet Committee approval for all vehicle purchases to ensure compliance with policy standards
- Evaluate alternative fuel programs



## Background on Alternative Fuels Biodiesel

Biodiesel is an alternate fuel made of renewable organic raw materials as opposed to fossil hydrocarbons. Santa Barbara County has carefully evaluated the use of biodiesel as an alternative to conventional fuel but has currently elected not to convert the County's diesel fleet from its ultra-low sulfur diesel to biodiesel. Although biodiesel does offer some advantages over conventional diesel fuels, there are also some considerable disadvantages, including:

- The additional cost-per-gallon of biodiesel fuels compared to conventional diesel fuels
- Energy loss. Biodiesel has approximately 2% less BTU's\* per gallon compared to conventional diesel thus requiring additional fuel consumption and costs by the County
- All or nothing conversion; County fuel sites have a single storage tank per fuel site thus requiring an all or nothing conversion. Such a significant and expensive upgrade makes that unviable at this time.

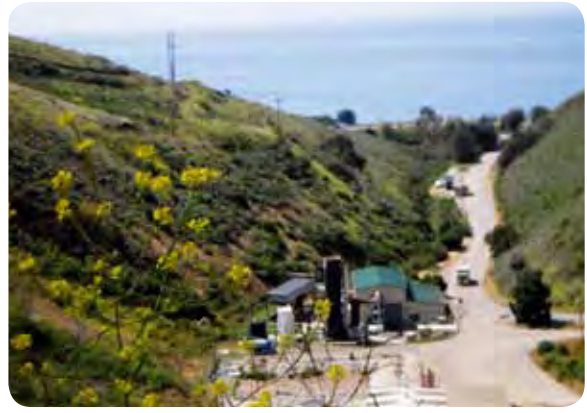
\* BTU: British Thermal Unit – a measure of the heating value of a fuel

## Ethanol

Ethanol is another alternate fuel. Ethanol is made from plants, such as corn, sorghum, potatoes, wheat or sugar cane. When combined with gasoline, it increases octane levels while promoting more complete fuel burning, thereby reducing emissions such as carbon monoxide and hydrocarbons. Although the County owns dozens of "flex-fuel" vehicles that are able to run on ethanol, ethanol fuel is not currently available in the Santa Barbara County area. The County will evaluate the option of using ethanol fuel once an ethanol fueling infrastructure is in place within our local region.



## 2-2-4 Landfill Generation



Energy is both a national and international issue, but when you get down to the realities of real-life energy need and production, it is most of all local.

With global warming, greater environmental sensitivity and the need to reduce imports of foreign energy supplies, we need every clean, renewable and local energy source we can find. Methane captured from landfills and wastewater treatment facilities are a reliable contributor to the solution.

From its landfill Gas to Energy facility at the Tajiguas landfill in Santa Barbara, the FORTISTAR Methane Group ([www.fortistar.com](http://www.fortistar.com)) has been an active participant in addressing these challenges. FORTISTAR'S facility produces 23,000 megawatt hours of electricity year after year, capable of supplying more than 2000 local homes with all their electric power needs.

Utilizing a U.S. made Caterpillar Model G3616 engine generator set, FORTISTAR'S facility consumes over 300 million cubic feet of landfill gas annually, reducing CO2 emissions the equivalent of taking nearly 20,000 cars off local streets and highways each year.

The dedicated professionals of FORTISTAR Methane Group keep the facility operating 24 hours per day, seven days a week, all while complying with stringent federal, state and local environmental regulations.

*To learn more about Landfill Gas-to-Energy and understand how it works, see the article below by the United States EPA Landfill Methane Outreach Program.*

## Plant Metrics and Environmental Benefits

Average of landfill gas consumed each month (average methane content)	26,000,000 scf (52%)
Total methane utilized (CO2 equivalent)	9,693,840 Kg (203,571 MT)
CO2 emitted from Landfill Gas-to-Energy facility (reduction of GHG emissions)	4,071 MT (98%)
Average monthly kilowatt hours produced (average monthly residential use)	1,946,000 (936 kWh)
Equivalent number of homes powered by the Tajiguas site	2,079

The emissions reduced at this facility are roughly the equivalent of:

- The annual greenhouse gas emissions from 18,767 passenger vehicles
- CO2 emissions from 535 railcars worth of coal
- CO2 emissions from 11,631,000 gallons of gasoline consumed
- Carbon sequestered annually by 26,211 acres of pine or fir forest

## Methane Emissions from Landfills

By the Landfill Methane Outreach Program, a division of the United States Environmental Protection Agency - [www.epa.gov/lmop](http://www.epa.gov/lmop) Municipal solid waste (MSW) landfills are the second-largest source of human-related methane emissions in the United States, accounting for approximately 22 percent of these emissions in 2008. Landfill Gas (LFG) is created as solid waste decomposes in a landfill. This gas consists of about 50 percent methane (the primary component of natural gas), about 50 percent carbon dioxide (CO2), and a small amount of non-methane organic compounds. Methane emissions from landfills represent a lost opportunity to capture and use a significant energy resource.

## Converting Landfill Gas to Energy

Instead of escaping into the air, LFG can be captured and used as an energy source. Using LFG helps to reduce odors and other hazards associated with LFG emissions, and it helps prevent methane from migrating into the atmosphere and contributing to local smog and global climate change. LFG is extracted from the landfill using a series of wells with a vacuum system. This system directs the collected gas to a central point where it can be processed and treated depending upon the ultimate use for the gas. From this point, the gas can generate electricity, replace fossil fuels in industrial and manufacturing operations, or be upgraded to pipeline-quality gas where the gas may be used directly or processed into an alternative vehicle fuel.

## Electricity Generation

The generation of electricity from LFG makes up about two-thirds of the current LFG operational projects in the United States. Electricity for on-site use or sale to the grid can be generated using a variety of different technologies, including internal combustion engines, turbines, micro turbines, and fuel cells. The vast majority of projects use internal combustion (reciprocating) engines or turbines, with micro turbine technology being used at smaller landfills and in niche applications. Technologies such as Stirling and organic Rankine cycle engines and fuel cells are still in development.

## Benefits of Landfill Gas Energy

Using LFG for energy is a win/win opportunity. LFG utilization projects involve citizens, nonprofit organizations, local governments, and industry in sustainable community planning. These projects go hand-in-hand with community and corporate commitments to cleaner air, renewable energy, economic development, improved public welfare and safety, and reductions in greenhouse (global warming) gases. Finding innovative ways to deal with their LFG contributes to the creation of livable communities that enjoy increased environmental protection, better waste management, and responsible community planning.

- **Directly Reduces Greenhouse Gas Emissions**

MSW landfills released an estimated 30 million metric tons of carbon equivalent to the atmosphere in 2008 alone. Given that all landfills generate methane, it makes sense to use the gas for the beneficial purpose of energy generation rather than emitting it to the atmosphere. Methane is a very potent greenhouse gas that is a key contributor to global climate change (over 21 times stronger than CO<sub>2</sub>). Reducing methane emissions from MSW landfills is one of the best ways to achieve a near-term beneficial impact in mitigating global climate change.

LFG energy projects capture roughly 60 - 90 percent of the methane emitted from the landfill, depending on system design and effectiveness. The captured methane is destroyed (converted to water and the much less potent CO<sub>2</sub>) when the gas is burned in a controlled manner to produce electricity.



- **Indirectly Reduces Air Pollution by Offsetting the Use of Non-Renewable Resources**

Producing energy from LFG reduces the need to use non-renewable resources such as coal, oil, or natural gas to produce the same amount of energy. This can avoid or reduce gas end-user and power plant emissions of CO<sub>2</sub> and criteria pollutants such as sulfur dioxide (which is a major contributor to acid rain), particulate matter (a respiratory health concern), nitrogen oxides (NO<sub>x</sub>), and trace hazardous air pollutants.

Like all combustion devices, LFG electricity generation devices emit some NO<sub>x</sub>, which can contribute to local ozone and smog formation. However, LFG electricity generation projects significantly improve the environment, because of the large methane reductions, hazardous air pollutant reductions, and avoidance of the use of limited non-renewable resources such as coal and oil that are more polluting than LFG.

- **Benefits The Local Economy**

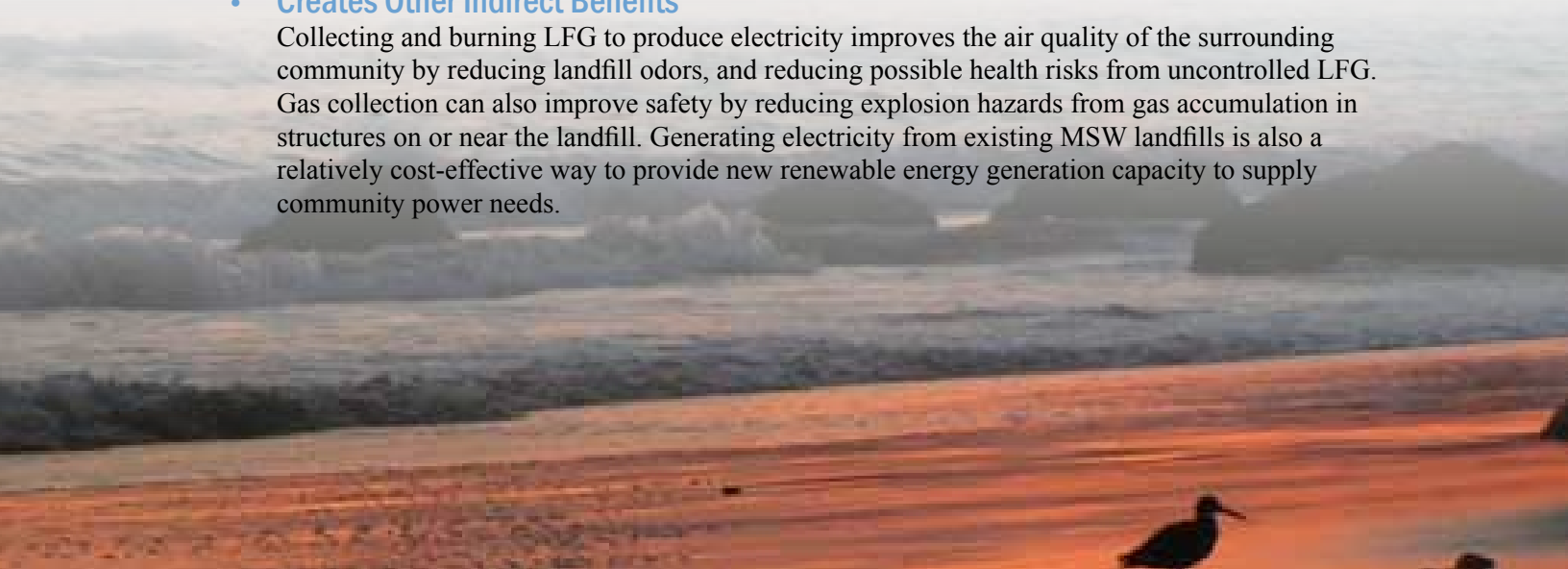
LFG energy projects generate revenue from the sale of the gas. LFG use can also create jobs associated with the design, construction, and operation of energy recovery systems. LFG energy projects involve engineers, construction firms, equipment vendors, and utilities or end-users of the power produced. Much of this cost is spent locally for drilling, piping, construction, and operational personnel, helping communities to realize economic benefits from increased employment and local sales. Businesses are also realizing the cost savings associated with using LFG as a replacement for more expensive fossil fuels, such as natural gas. Some companies will save millions of dollars over the life of their LFG energy projects. Communities that embrace this technology enjoy increased environmental protection, better waste management, and responsible community planning. For example, the Ecology Club at Pattonville High School in Maryland Heights, Missouri, came up with the idea to use gas from the nearby landfill to heat their school. The school paid \$175,000 to run a 3,600-foot pipeline between the landfill and the school's two basement boilers. In turn, the landfill owner donated the methane to the school as a way of "giving back to the community." The school anticipates that it will save \$40,000 a year and recapture its investment within five years.

- **Reduces Environmental Compliance Costs**

Current EPA regulations under the Clean Air Act require many larger landfills to collect and combust LFG. There are several compliance options, including flaring the gas or installing an LFG use system. Only LFG energy recovery gives communities and landfill owners the opportunity to reduce the costs associated with regulatory compliance by using a pollutant as a valuable community resource.

- **Creates Other Indirect Benefits**

Collecting and burning LFG to produce electricity improves the air quality of the surrounding community by reducing landfill odors, and reducing possible health risks from uncontrolled LFG. Gas collection can also improve safety by reducing explosion hazards from gas accumulation in structures on or near the landfill. Generating electricity from existing MSW landfills is also a relatively cost-effective way to provide new renewable energy generation capacity to supply community power needs.



## *2-2-5 Resource Recovery*

### **Efforts by the Public Works Department**

The Resource Recovery and Waste Management Division (RRWMD) of the Public Works Department participates in the County's goal to reduce GHG by promoting the philosophy of waste reduction, reusing products and materials, and recycling.

### **Commingled Recycling Program**

In 1999, the County expanded its recycling program to offer commingled recycling to all County facilities where collection was possible. Each year, more and more facilities have used this service.

With the two-fold goal of reducing the amount of waste sent to landfills each year and increasing the overall diversion rate of recycling at the County of Santa Barbara, the RRWMD is undertaking an effort to accurately determine the number of facilities that are currently participating in recycling programs and their level of participation. Prompted by the request from RRWMD, the County's three franchise waste haulers will be providing data on the trash and recycling services at each County facility. This information will allow RRWMD to help establish recycling programs in those County departments that do not already have one. The RRWMD will also work with all County departments to ensure they are recycling at an optimal level and if they are not, the RRWMD will help to improve their efforts.

To encourage and assist recycling efforts, the RRWMD will continue to offer free recycling containers to County departments. These containers are purchased using grant funds allocated to the County of Santa Barbara from the California Department of Resources Recycling and Recovery (Cal Recycle).

### **General Outreach Efforts to Promote Reduce, Reuse, and Recycle**

The RRWMD publishes its Recycling Resource Guide for Santa Barbara County in both English and Spanish. The English version is also available on the RRWMD's recycling website: [LessIsMore.org](http://LessIsMore.org). Efforts are underway to include the Spanish version on this website as well.

The Guide contains comprehensive information in such areas as the following:

- Recycling terminology
- Information on the different types of plastic
- Waste prevention tips
- A directory of materials for reuse and recycling (this directory lists various categories of materials and locations that will reuse or recycle the materials)
- Recycling drop-off and buyback centers
- How to prevent junk mail
- Composting/mulch program
- Hazardous waste collection facilities
- Used motor oil collection centers
- Places for recycling of smoke detectors
- Sharps collection program
- Directory of recycled content products
- Directions for starting a recycling program
- Green Business Program, Santa Barbara County



County employees and the general public will also find information on a variety of other topics on [LessIsMore.org](http://LessIsMore.org), such as:

- The types of materials that can and cannot be placed in commingled recycling containers in Santa Barbara County
- Tips on how to reduce waste, to reuse products and materials, and to recycle those products and materials that cannot be reused
- Answers to frequently asked questions about recycling
- Information on current and upcoming events and programs and information on the County's various recycling programs



## Efforts by the General Services Department

### Hazardous Waste Recycling

County employees utilize hundreds of batteries each year for pagers, cameras, calculators, palm pilots, and other electronic equipment. These batteries are hazardous waste and need to be disposed of properly. To address this situation, the County started a program in April 2001 to collect and recycle various types of batteries, such as: 12 volt, 6 volt, 9 volt, A, AA, AAA, C and D sized batteries, including alkaline, nickel-cadmium, and lithium batteries.

County employees are encouraged to recycle their used batteries by sending them through inter-departmental mail to the Mail Services Division. Mailroom staff members regularly drop off the batteries at the Community Hazardous Waste Collection Center, located at the University of California at Santa Barbara. For the past several years, the County has collected the following amounts of used batteries for recycling:

Fiscal Year 2006-07 (July 1, 2006 to June 30, 2007)	1,250 pounds
Fiscal Year 2007-08 (July 1, 2007 to June 30, 2008)	1,400 pounds
Fiscal Year 2008-09 (July 1, 2008 to June 30, 2009)	1,080 pounds
Fiscal Year 2009-10 (July 1, 2009 to March 31, 2010)	900 pounds

### Electronic Waste Recycling

Under the Electronic Waste Recycling Act, electronic equipment may not be thrown into the trash. Instead, it must be donated for reuse or recycling. Unused computers generated by the County are donated to Computers for Families program. Under Computers for Families program, boys at the Los Prietos Boys Camp are taught how to repair and upgrade computers. These computers are then donated to needy families who do not have a computer. The following provides a breakdown of the computers donated to Computers for Families:

Fiscal Year 2006-07 (July 1, 2006 to June 30, 2007)	75,000 pounds
Fiscal Year 2007-08 (July 1, 2007 to June 30, 2008)	85,000 pounds
Fiscal Year 2008-09 (July 1, 2008 to June 30, 2009)	71,750 pounds
Fiscal Year 2009-10 (July 1 2009 to March 31, 2010)	20,000 pounds



Other types of electronic equipment and computers, that are not donated to Computers for Families, are collected and either sold for reuse or recycled. The following provides a breakdown of the amount of electronic equipment recycled over the past several fiscal years:

<b>Fiscal Year 2006-07 (July 1, 2006 to June 30, 2007)</b>	<b>4,000 to 5,000 pounds</b>
<b>Fiscal Year 2007-08 (July 1, 2007 to June 30, 2008)</b>	<b>6,000 to 7,000 pounds</b>
<b>Fiscal Year 2008-09 (July 1, 2008 to June 30, 2009)</b>	<b>10,000 pounds</b>
<b>Fiscal Year 2009-10 (July 1, 2009 to March 31, 2010)</b>	<b>3,500 to 4,500 pounds</b>

### **Disposal of Miscellaneous Items**

Various types of miscellaneous items are stored in the County's warehouse while efforts are made to donate the material to nonprofit organizations and County departments. If specific items and equipment are not claimed (by non-profits) after several months, they are collected by a liquidator, who attempts to sell the material (generally these items and equipment have a value of \$5,000 or more). Below is a breakdown of the volume of material sold by a liquidator over the past several fiscal years:

<b>Fiscal Year 2006-07 (July 1 2006 to June 30, 2007)</b>	<b>5,000 pounds</b>
<b>2007-08 (July 1 2007 to June 30, 2008)</b>	<b>7,000 pounds</b>
<b>2008-09 (July 1 2008 to June 30, 2009)</b>	<b>10,000 pounds</b>
<b>2009-10 (July 1 2009 to March 31, 2010)</b>	<b>3,500 to 4,500 pounds</b>



## 2-2-6 County Parks Department

The Santa Barbara County Parks Department takes pride in providing people opportunities for wholesome outdoor leisure and recreational pursuits. It proactively maintains a varied landscape of 8,000 acres of parks and open spaces. At the same time, the County Parks continues to foster conservation of natural resources for present and future generations through active stewardship of public lands and energy efficiency. The Santa Barbara County Parks Department has strived to become a leader in using energy in an efficient way.



Work assignments at the Parks Department are organized to provide the right amount of staff and equipment to do the job safely and reduce vehicle usage. The On-Site Park Host Program has also helped reduce vehicle use. All staff coordinate trips to different parts of the Santa Barbara County to reduce fuel cost. Monthly meetings are held with landscape contractors to discuss and plan for water conservation in all open spaces, buildings, and parks.

Located on Mission Canyon Road, near the historic Santa Barbara Mission and Natural History Museum, is the Rocky Nook Park. Not only is Rocky Nook Park a day-use park, it is also home to the Parks Administration Office. In its commitment to conserve energy and participate in the County's goal of reducing GHG, the Parks Department has made some of the following changes:

### Energy Efficient Lighting

In 2007, full spectrum lights replaced the old fluorescents at the Parks Administration building. Full spectrum lights last significantly longer than fluorescents and are more energy efficient.



In 2008, the lights along the path at Arroyo Burro were replaced with more energy efficient LED lights. Also replaced were the sodium bulbs in the Arroyo Burro main parking lot. LED bulbs last up to 10 times longer than other lights, helping in maintenance and replacement costs. Also, these lights are quite durable; they are solid and hold up well to jarring and bumping, making them perfect for outside use.

The department is researching the use of solar lighting for the outer parking lot at Arroyo Burro Beach County Park. Solar lights use a second generation LED bulb that uses less energy and gives off more light.

### Energy Efficient Insulation

In 2009, a new roof was installed at the Parks head office to improve insulation and increase energy efficiency.

### Water Conservation

Rocky Nook, as well as other parks and open spaces, shut off irrigation systems during rainy seasons. During the drier season, irrigation systems are monitored for repairs and/or adjustments to watering times.

## Wise Energy Choices at Lake Cachuma

Lake Cachuma Recreation Area is one of two County owned camping parks in Santa Barbara County. Lake Cachuma staff are leaders in energy efficiency for Santa Barbara County Parks and have implemented the following programs and improvements:

- Filtration motors for the swimming pools were replaced with energy efficient motors. Leaking skimmers and pipes were repaired to reduce water usage. During the off seasons, one of the two filtration pumps is shut off, resulting in a 50% saving in energy costs.
- Three new lift station back-up generators were installed to replace the older units. New generators are more efficient and also meet the new particulate matter national air quality standards. These units were also retrofitted with automatic transfer switches, which automatically switch on and off in the event of a power outage, thus preventing long periods of unnecessary running. The new lift station uses new pumps and controls that are more energy efficient. Pumps and motors (high lift and low lift) were changed out at lift stations with more efficient, smaller motors. Several sewer wastewater storm infiltration leaks were repaired and self closing hose bibs were installed, resulting in less water usage.
- The Nature Center building at Lake Cachuma is equipped with on-demand water heaters in the bathrooms. The Naturalists compost their food waste as well as the Nature Center coffee grounds. They also use the clean side of used paper to print out any non-official and draft documents. The Naturalists recycle all allowable products. Staff was given permission to use the County TLC (telecommute) benefit to allow carpooling to Cachuma.
- The visitor service staff at Lake Cachuma has also pitched in to save energy. Computer monitors are turned off at the end of the day, along with unnecessary lights. Co-workers ride together to projects to save on vehicle and gas costs.

## Wise Energy Choices at Jalama Beach

Jalama Beach is the second of the two Santa Barbara County camping parks. Jalama Beach has made many “green” changes to help become more energy efficient including:

- Restrooms were retrofitted with waterless urinals
- Domestic water system was retrofitted with variable speed motors
- All the light bulbs were replaced with Compact Florescent Lights (CFL) in the restrooms, residence, lift station, office and gate houses. (CFL use 1/3 less electricity; are four times more efficient; and last up to 10 times longer than incandescent lights. Replacing a single incandescent bulb with a CFL will keep a half-ton of CO2 out of the atmosphere over the life of the bulb).

## Wise Energy Choices at Nojoqui Falls

Nojoqui Falls is known for its beautiful waterfall and ability to accommodate large groups. To be more energy efficient, Nojoqui Falls has implemented the following upgrades:

- Domestic water system and conventional pump motors were upgraded to Variable-Frequency Drives (VFD)
- The VFD has been programmed to switch to lower speeds throughout periods of low use



### Wise Energy Choices at Waller Park

Waller Park is one of the loveliest parks in Santa Barbara County. This Park has made several improvements in its efforts to meet the highest energy saving standards around. These improvements include:

- Three restrooms were upgraded to replace all incandescent lighting with CFL's
- Low flow plumbing fixtures were installed
- The well water system was updated to a VFD motor
- Drought tolerant landscaping completed (For the past fifteen years, the Parks Department has been able to utilize low water demanding plants in landscape renovation projects. California native plants, once established, require much less water than exotic species traditionally used in landscaping. These plants are watered with drip irrigation systems that deliver water only to the base of the shrubs, further enhancing water conservation. This landscape project was also implemented at Orcutt Community Park and Lake Cachuma. )
- Leaks are repaired upon discovery



### Other Upgrades for Energy Efficiency

Weather Tech irrigation controllers were installed at Falcon and Rice Ranch (in Orcutt). These units monitor Evapotranspiration (ET), soil, grasses, and weather to control the water pattern to provide the most efficient water times.



The Cuyama Joseph Centeno Aquatics Complex is a brand new facility, completed just last year. This complex was designed to be energy efficient due to water shortage issues in the area. The Cuyama pools filtration pumps were installed with VFDs to save energy and water. The landscaping contains only drought tolerant plants. The restrooms were retrofitted with waterless urinals (saving an average of 50,000 gallons of fresh water per year). The waterless urinals decrease the need for sewer treatment, making a better choice for the environment.



Day-lighting has been incorporated into the design of new or remodeled Parks buildings. The new emergency generator at the Water Treatment Plant will be running on propane fuel. Low flush toilets and fixtures have been installed to save water and pumping energy.

### Pest Management

Integrated Pest Management System promotes sustainable and eco-friendly strategies that allow for the healthy growth of plants, while preventing pests and threats to humans, animals, businesses and the



environment. These systems include the use of groundcovers for weed suppression, water conservation and building soil health, weed wacking, mowing, and manual removal, mechanical trapping for gopher and rodent removal and careful water management to reduce cost, disease and maintenance.

## Mulching

The Parks Department reduces water usage with its drought tolerant plants, by mulching planter beds and spreading chips for weed abatement. Mulch is free in Santa Barbara County and also happens to be the number one method for sustainable weed management. The mulch that is used by Santa Barbara County consists of all green materials produced by gardeners in the community. Mulch benefits are vast and include weed suppression, reduced soil erosion, conservation of water, reduction of non-point source pollution, increases the value of your property, builds soil health, increases soil porosity, increases water infiltration, and reduces stress of temperature changes. Mulch is also attractive, eliminates the need for toxic poisons and saves you money by reducing your water, fertilizing and pesticide needs.

The south County Parks operations uses two mulching lawn mowers. Mulching lawn mowers, which return grass clippings to the lawn, reduce green waste and labor as well as build soil health and fertility.

## Organic Fertilizer

Organic Fertilizer is currently being reviewed as an option for park needs. It's preferred to conventional formulas because of its soil building properties. Organic fertilizers are formulated to release slowly over a long period of time providing a consistent nutrient supply. Conventional fertilizers build up salt levels and degrade soil health over time.

One local Santa Barbara County park is experimenting with compost tea. Compost tea is a brew made by taking small quantities of biologically active compost and "brewing" it with room temperature water and air bubbles. The resulting mixture is then sprayed directly on plant foliage or on the soil. The idea behind this type of nutrient cycling is that the soil microbes in the compost will be activated and multiplied by the brewing process and when applied to plants will enhance disease resistance and increase nutrient availability.

Santa Barbara County Parks employs a holistic approach that emphasizes integrated pest management, careful stewardship of the land and its natural and cultural resources through energy efficiency. From drought tolerant plants, to water-less urinals, to carpooling and recycling, the Santa Barbara County Parks Department has shown they are the role model for going green.



## *2-2-7 Printing & Reprographics*

Since the days of Ben Franklin's Poor Richard's Almanac the printing arts have long been an environmentally unfriendly collection of practices and processes. With the widespread availability of electricity, the printing business also became a huge user of energy, with machines capable of consuming hundreds (or even thousands) of kilowatt hours each day. In the past ten years the printing industry has seen a technology revolution that can fairly be compared to Gutenberg's invention of movable type. "Old school" printing practices and processes are daily being replaced by energy efficient methods which also help reduce the massive carbon footprint traditionally associated with the printing process. The traditional aluminum plates once used at the County (and still in use elsewhere) required development in a chemical bath that generated both air and water pollution. The plate development equipment required for those aluminum plates needed labor-intensive maintenance on a weekly basis to keep the machine working smoothly and effectively.

The vacuum frame illustrated on the next page required both a high-voltage electrical circuit and a "clean room" in which to operate. Energy consumption, both direct (from high-wattage lamps) and indirect (dedicated HVAC to remove generated heat) was very high.

To replace this older energy-intensive equipment, new technology has been installed in County Reprographics. Replacing the entire collection of older, traditional plate-making equipment is a single, self-contained plate-making system. The new device requires no dedicated clean room or cooling solution, but perhaps more importantly, greatly reduces the amount of material sent into the waste stream. Interface with the unit is entirely digital - saving both materials and labor - and weekly maintenance has been reduced to one-half hour.

Green practices continue to be adopted and implemented in the day-to-day operations of County Reprographics. Current practice utilizes as much recycled paper as possible; today every copy made on 8-1/2 x 11 white bond is made on recycled paper.

Current technology high-speed copiers will be replaced with machines compatible with toner made from products other than petroleum. Though still in the development process, this new toner technology should be widely available in the next two to three years - perfect timing for replacement of the copy machines now in use.

Print on demand is a concept first used in the publishing industry when software documentation became so costly to produce. The idea is rather new to the commercial printing industry, and it's a paradigm shift. The expansion of high-speed internet connections and the proliferation of smaller more affordable printing devices make possible a new way for

the County to better use scarce resources: print only what you need when you need it.

Over the next several years, the day-to-day role of County Reprographics will change from being a provider of simple printed material to providing graphics management that will attempt to unify the “look and feel” across all types of County communication. Taken to an extreme, this graphics management will include the County’s internet communication. It may even allow clients to print the documents they need ahead of time and complete required information to receive County services. The impact of this change has enormous potential to save time, and reduce waste. It might even save an extra vehicular trip by a client to a County agency, thereby helping with traffic congestion and fuel use reduction.

The strategic goal has to be kept in mind: develop and implement Green practices. It is our intent to leave a smaller footprint on our environment, and engineer creative ways to use our finite resources to the best advantage for the constituents of beautiful Santa Barbara County.

### *Out with the old*



### *In with the New!*



## *2-3 The Santa Barbara Energy Partnerships*

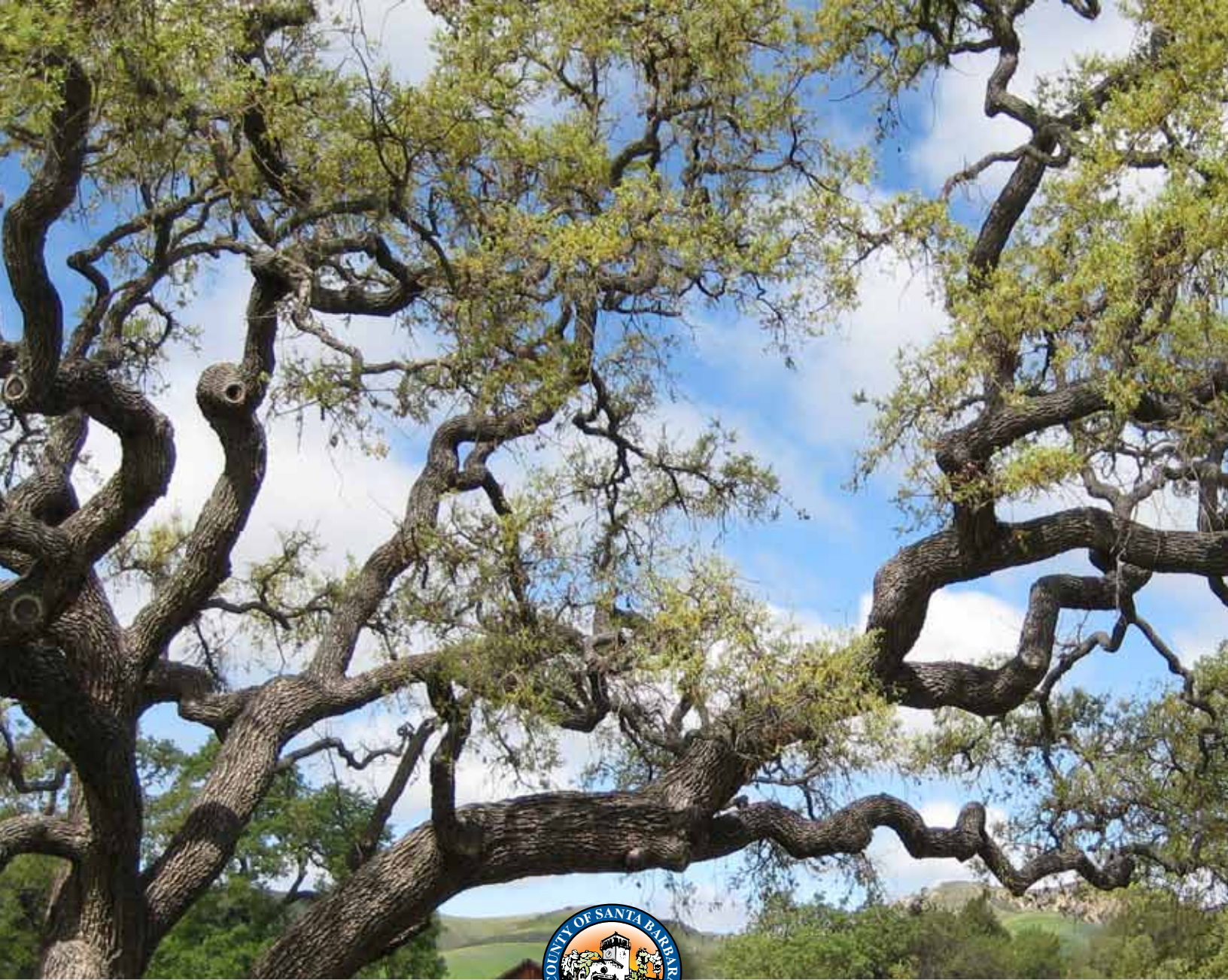
The Santa Barbara County Energy Partnership Programs are designed to assist the local governments (City of Carpinteria, City of Goleta, Santa Barbara County, City of Santa Barbara, City of Santa Maria, City of Solvang, City of Buellton, City of Guadalupe) effectively lead their communities to increase energy efficiency, reduce greenhouse gas emissions, increase renewable energy usage, protect air quality and ensure that their communities are more livable and sustainable. The

Programs, with (CEC) Community Environmental Council and the Santa Maria Valley Chamber of Commerce assisting, provide a performance based opportunity from SCE (Southern California Edison), PG&E (Pacific Gas and Electric) and The Gas Company to access all programs and incentives for the Program Participants to demonstrate energy efficiency leadership in its community through energy saving actions. These actions included the retrofitting of municipal facilities as well as providing opportunities for constituents to take action in their homes and businesses. By implementing measures in its own

facilities, the Program Participants will lead by example as the Program Participants and the Utilities work together to increase community awareness of energy efficiency and to build sustainable local government capacity in energy management practices. The Program will provide marketing, outreach, education, training and community sweeps to connect the community with opportunities to save energy, money and help the environment. The Program Participants will leverage the strengths of each other to efficiently deliver energy and demand savings.

Delivering sustainable energy savings, promoting energy efficiency lifestyles, and achieving an enduring leadership role for each Program Participant through these Programs design is rooted in an effective relationship among the Program Participants, their constituents, and the Utilities.





# SECTION 3

## *Government Operations Inventory*



## *3-1 Legislative Requirements and Greenhouse Gas Inventory Methodology*

The Governor of California signed an Executive Order in 2006 directing all California State Agencies to begin the reduction of greenhouse gases and transform their respective agencies into sustainable (green) operations. That Executive Order further directed that regulatory agencies begin to prepare for changes in the myriad of rules, regulations and policies that effect the reduction of greenhouse gases, state-wide. Within a short period of time, the California Legislator began enacting laws requiring the reduction of greenhouse gases, widely known as Assembly Bill (AB) 32. Other legislation followed, that is targeted toward land-use, energy reduction incentives and assistance for the residential market.

With respect to the governments own operations, it has been challenging to determine just how to catalog, track and report emission inventories. The California Climate Registry was formed as a result of AB 32. The registry is a non-governmental, non-profit agency, to collect, track and report on the greenhouse inventories of those entities now under the reporting regulation of AB 32 (primarily those entities that generate energy versus consumers of that energy). In recent months those regulations have broadened to include consumers of energy as well.



To achieve the consistent reporting of emission data, the California Climate Registry, with the collaboration of the State Regulatory Agencies, have developed reporting protocols. The protocols outline the framework to be used by those under the regulatory structure of AB 32 in their reporting of emissions data.

While the general reporting protocols are comprehensive, it has been determined that those protocols are exceedingly difficult to apply to government sector operations.

As reporting greenhouse gas inventories has broadened, it became apparent that a tailored set of protocols was required for governmental operations. The reasoning for this is based upon the reporting boundary used. Simply put, the reporting boundary is how the three scopes of reporting data are cataloged. In the government sector, those boundaries are complicated by the variety and diversity of the agencies that are comprised of the local government entities; as an example, not all local governments have Port, Airport or Water Distribution Operations; yet the General Reporting Protocols had no rational method for reporting on these or other agency anomalies. What resulted was the creation and adoption of the Local Government Reporting Protocols, and for the first time local governments could collect and report on their emissions data in a consistent fashion.

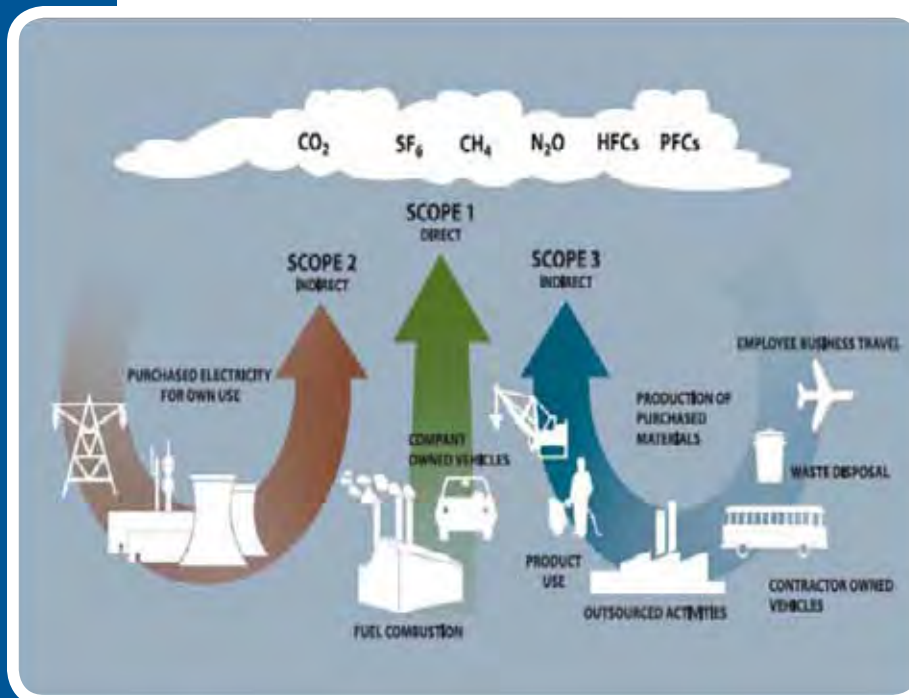
Since the creation of the Local Government Reporting Protocols and the broadening of the reporting entities, the California Climate Registry has morphed into the Climate Registry-now supporting the emissions reporting of North America and parts of South America. The broader reporting area also lends itself to a large base of potential GHG credits.



## 3-2 Quantifying Emissions

According to the EPA and the state of California, there are several internationally recognized greenhouse gases. The primary atmospheric greenhouse gases created by human activities are:

- Carbon Dioxide (CO<sub>2</sub>). Carbon Dioxide builds up in the atmosphere through the burning of fossil fuels (natural gas, oil, and coal), trees, solid waste, and plant products. It also occurs from chemical reactions (the manufacture of cement, for example, and others).
- Methane (CH<sub>4</sub>). Methane is expelled from the production of natural gas, coal, and oil. Methane emissions are created in municipal solid waste landfills as a result of the decay of organic waste. Methane is also generated by agricultural practices and livestock.
- Nitrous Oxide (N<sub>2</sub>O). N<sub>2</sub>O is generated during industrial and agricultural operations. It also occurs during combustion of solid waste and fossil fuels.
- Fluorinated Gases (HCFCs, CFCs, and halons) of perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride. These gases are synthetic, strong greenhouse gases that are generated during industrial processes. Sometimes Fluorinated gases are used as substitutes to ozone depleting chemicals. These gases are considered to have a high impact on climate change.





## *3-3 Government Operations Inventory Summary*

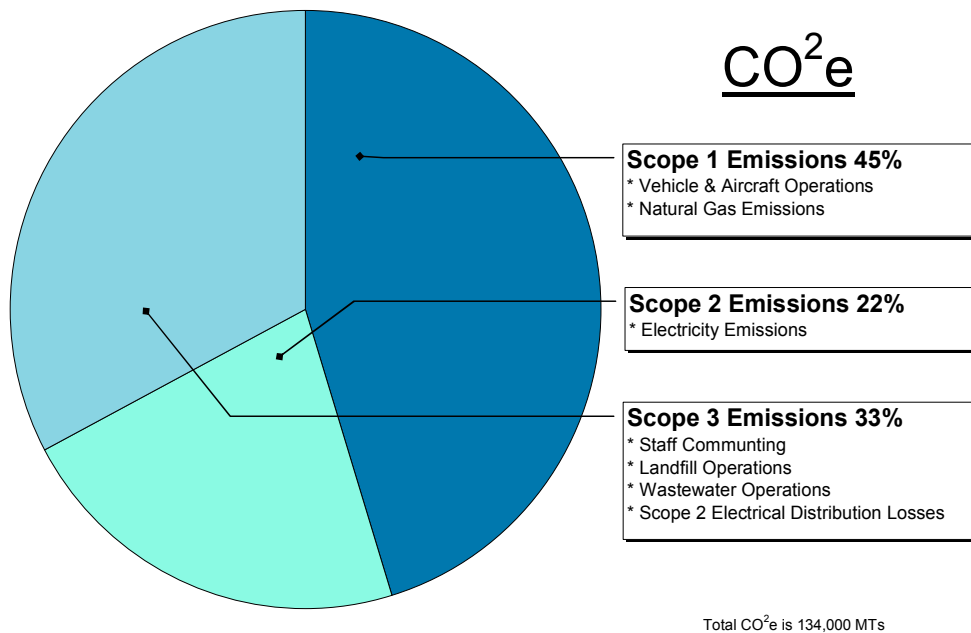
In this section a brief summary of the inventory and resulting emissions of operations by the County of Santa Barbara is provided. The tables below outline the categories of emissions as required by the Local Government Reporting Protocol. A fuller discussion and detailed report on this Inventory is included in the Appendix A.

The County of Santa Barbara, like many local governments has a diverse organization with numerous departments responsible for various aspects of operations. The General Services Department is primarily responsible for buildings and their operations. The Public Works Department is primarily responsible for public transportation infrastructure, including street and traffic lights and the public road system. They are also responsible for wastewater and landfill operations. Other departments are responsible for their individual operations, which contribute to the overall emissions footprint. To separately account for direct and indirect emissions, to improve transparency, and to provide clarity on the different types of climate policies and goals, protocols for a reporting structure were created and based around major categories as follows:

The Local Government Reporting Protocol requires the reporting of Scope 1 and Scope 2 emissions (see Appendix A). The calculated total CO<sub>2</sub> of these two scopes is 90,055.8 MT (Metric Tons). The Scope 3 emissions (see Appendix A) are voluntary and represent 33% of total emissions for the year 2008.

Santa Barbara County government operations produced 134,003 metric tons of CO<sub>2</sub>. This number includes all Scope 1 emissions which are from the on-site combustion of fuels in facilities and vehicles and other processes. Scope 2 emissions are from the purchase of electricity generated by utility companies and used by Santa Barbara County facilities. Scope 3 emissions are from waste generated by operations and employee commuting.

Total Emissions	%	CO2e	CO2	CH4	N2O	HFCs	PFCs	SF6	Unit
Scope 1	45	60,601.6	60,254,019.0	6,267.0	687.4	0.0	0.0	0.0	Metric Tons
Scope 2	22	29,454.1	29,428,882.6	144.7	74.1	0.0	0.0	0.0	Metric Tons
Scope 3	33	43,947.5	8,921,029.0	1,507,185.5	418.0	0.0	0.0	0.0	Metric Tons
<b>Total</b>	<b>100</b>	<b>134,003.3</b>	<b>98,603,930.6</b>	<b>1,513,597.1</b>	<b>1,179.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>Metric Tons</b>



Santa Barbara County government operations produced 134,003 metric tons of CO<sub>2</sub>. This number includes all Scope 1, Scope 2, and Scope 3 emissions. The emission inventory does not include Scope 3 emissions from employee business travel, production emissions of goods used by government operations, or emissions generated by contracted services. Although not included in this rollup number, these emissions are discussed in the complete report, found in Appendix A.

## *3-4 Ten Year Energy Efficiency Plans*

The current plans for the County in the up coming years to reduce greenhouse gas emissions and reduce utility costs are as follows. The project titles include the expected year that they will start if funding is realized.

### **2011 North County Parks HQ – Waller Park**

Convert previous park ranger residence to office and meeting space for the department. Energy efficient lighting will be installed, along with water saving technology. This project is currently in the planning phase.

### **2011 Solar Energy – Laguna County Sanitation District**

The goal of the Solar Energy Project at Laguna County Sanitation District is to generate sufficient electricity, to reduce or eliminate the Districts electrical needs.

### **2011 Green Fleet Committee**

The committee will review current fleet practices, establish comprehensive Green Fleet policies, review future Green Fleet projects and make executive recommendations regarding selections.

### **2011 Betteravia Building**

Replacement of all HVAC and Controls system on Betteravia Building # C in Santa Maria. Connect to 963 network controls.

### **2011 Courthouse**

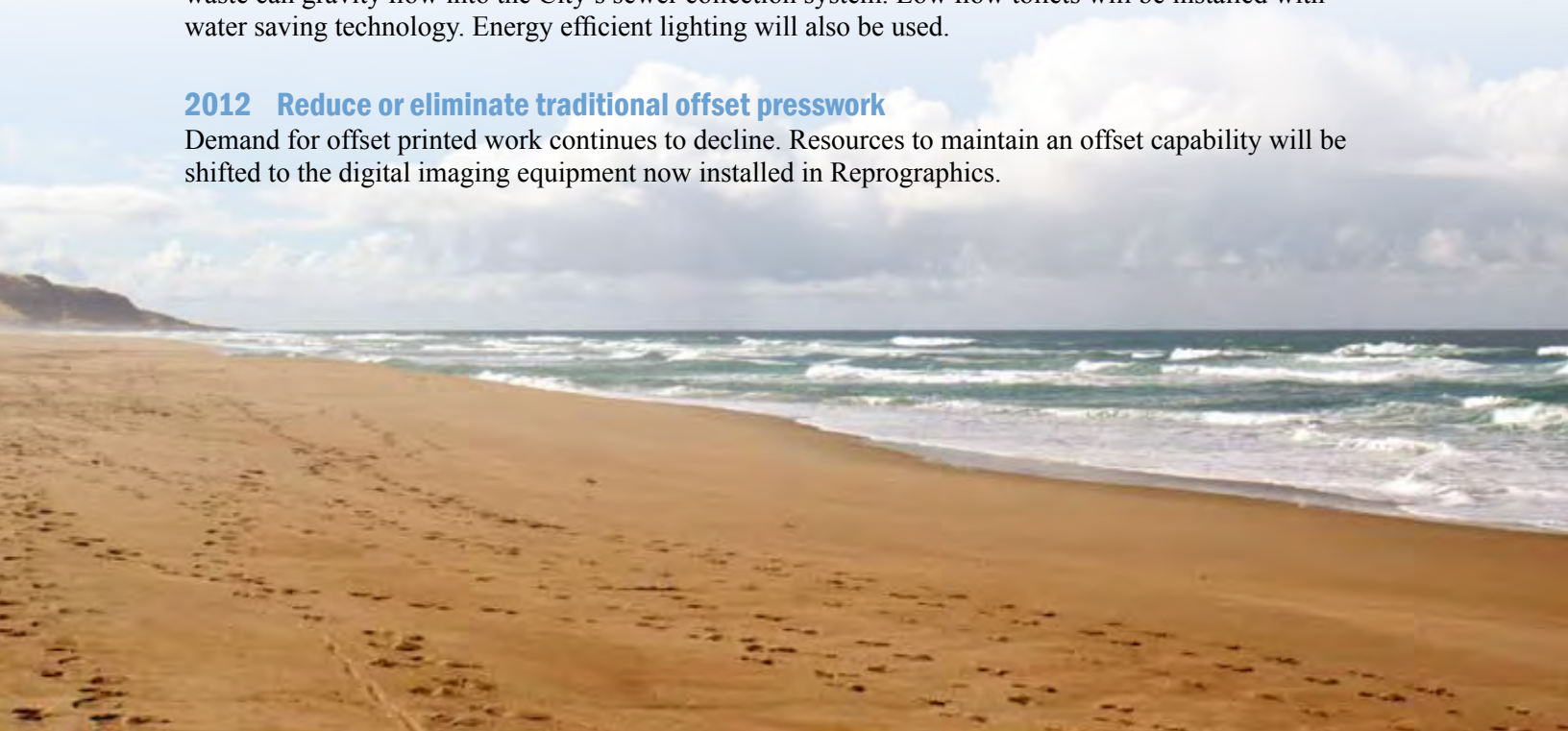
Engineering design for the Courthouse HVAC Replacement Project. This design will replace the main boiler / chiller plant, air handlers, and controls at the Court house. Initial design is for the use of a “Ground Loop” system as used on the Hall of Records.

### **2012 Arroyo Burro Beach Park Improvements**

Relocation of the men’s and women’s restrooms to an area in the vicinity of the maintenance yard where waste can gravity flow into the City’s sewer collection system. Low flow toilets will be installed with water saving technology. Energy efficient lighting will also be used.

### **2012 Reduce or eliminate traditional offset presswork**

Demand for offset printed work continues to decline. Resources to maintain an offset capability will be shifted to the digital imaging equipment now installed in Reprographics.



### **2012 Rincon Beach Park Upgrade**

Many day use improvements will be made, including a new drip type irrigation system that delivers water to the base of the plants, further enhancing conservation. New drought tolerant landscape will be planted as well. The conversion of a septic tank to sewer will also take place. This project is only partially funded.

### **2012 Mental Health Building**

Replacement of all HVAC units and building controls on the Mental Health building. Connect to 963 network controls.

### **2012 911 Dispatch Center**

Replacement of all HVAC units and building controls on the 911 Dispatch Center. Connect to 963 Network Controls.

### **2012 Social Services Building**

Replacement of roofing system on the Social Services Building to Title 24 requirements.

### **2013 Live Oak Camp Improvements**

Improvements consist of installation of a permanent restroom building, which will include energy efficiency lighting and low flow toilets. There will be electrical upgrades of the main stage, dining area, showers and camp host site. This project is partially funded.

### **2013 Social Service Building**

Replacement of all HVAC units and building controls on the Social Services Building. Connection to 963 Network controls.

### **2013 Betteravia Building # D**

Replacement of roofing system on Betteravia Building # D

### **2014 2010-2011 Park Restroom ADA Upgrade Program**

This project consists of the remodel of restrooms within County parks to meet deferred maintenance needs and to bring buildings into compliance with the Americans with Disabilities Act. All restrooms will be retrofitted with energy efficiency lighting, low flow toilets and water saving technology.

### **2014 Phase in new high-speed digital imaging equipment**

Color printing demand in the digital imaging area continues to grow. Equipment with a smaller power requirement utilizing non-petroleum-based toner should be available in the mainstream marketplace to replace obsolescent equipment.



### **2014 Park Infrastructure Repairs Program 2009-14**

This project will upgrade Park infrastructure, equipment and facilities countywide. Infrastructure facilities and equipment include; pumps, motors, plumbing systems, electrical systems, and conveyance systems. These improvements will be energy efficient and will have cost savings.

### **2014 Courthouse**

Replacement of Courthouse HVAC and Controls replacement.  
Construction Phase

### **2015 Solid Waste Conversion**

Waste conversion to energy of municipal solid waste disposed at the Tajiguas Landfill. Waste conversion technology has the ability to further process waste pulling out recyclables and converting remaining waste to energy. Public Works is working with Cities of Buellton, Goleta, Santa Barbara and Solvang to pursue a waste conversion technology facility. The project could generate 5 to 10 megawatts.

### **2015 Cachuma Lake Recreation Area Improvements**

This project includes infrastructure and revenue enhancement improvements to the recreation area. There will be sanitation plant and lift station upgrades, water plant relocation and upgrades, vault toilet buildings to replace portables; restroom renovations; erosion and drainage improvements; sewer main relining; automated irrigation system; new water main and fire protection system; new water storage reservoir and improvements to existing reservoir. This project is partially funded.

### **2015 Print on demand throughout all County buildings**

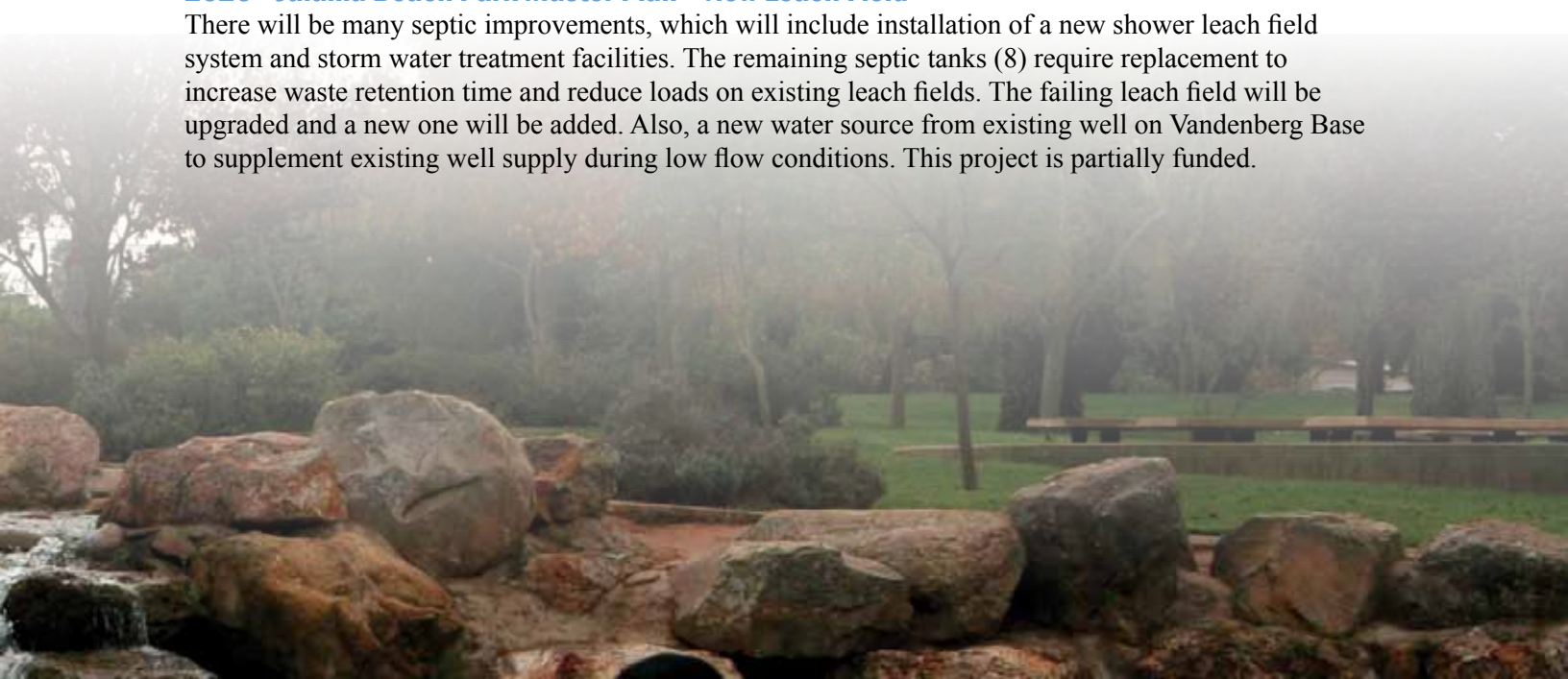
Personal imaging devices continue to evolve, and should be available to replace existing copy machines throughout the County. It is anticipated that new generation machines will be far more energy efficient and more environmentally friendly, as well as being far easier to use. This will enable the County to implement a true "Print on Demand" policy, greatly reducing the carbon footprint countywide.

### **2015 Betteravia Center**

Replacement of all HVAC units and building controls in the Probation building at the Betteravia Center. Connection to 963 Network controls.

### **2020 Jalama Beach Park Master Plan – New Leach Field**

There will be many septic improvements, which will include installation of a new shower leach field system and storm water treatment facilities. The remaining septic tanks (8) require replacement to increase waste retention time and reduce loads on existing leach fields. The failing leach field will be upgraded and a new one will be added. Also, a new water source from existing well on Vandenberg Base to supplement existing well supply during low flow conditions. This project is partially funded.







# *Conclusion*



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## *Conclusion*

AB32 is upon us; and budgets are constraining our local governments. However, these issues present opportunities to improve the local government operations. The County ensures that each of its policy decisions and programs adhere to the common goal of long-term sustainability as expressed in its guiding principles. In this Plan's GHG emissions inventory, the County has identified sources of emissions and established a baseline of emission levels against which future progress can be measured.

Santa Barbara County has applied many technologies and approaches that take advantage of emerging trends and resources in Building Energy, Mobile Workforce, Vehicle Fuels, Public Works Infrastructure, Resource Recovery, Grounds Management & Sequestration, and Printing & Reprographics to do its part to reduce the amount of greenhouse gas emissions emitted by the County operations.

Past examples of the County Operations included:

- County buildings were retrofitted with energy-efficient internal lighting saving thousands of dollars a year.
- Vehicle Operations replaced the virgin petroleum products used in servicing of County-owned vehicles with re-refined oil products.
- For the past 2.5 years, FORTISTAR Methane Group has operated a Landfill Gas-to-Energy facility at the Tajiguas Landfill in Santa Barbara. The landfill produced over 23,000 megawatt hours of electricity last year; enough to power approximately 2,079 homes.
- The Nature Center building at Lake Cachuma was equipped with on-demand water heaters in the bathrooms.
- In 1999, the County expanded its recycling program to offer commingled recycling to all County facilities where collection was possible.
- The Print shop switched to an environmentally-friendly low energy consumption system for polyester printing plates.

Current examples of the County Operations include:

- The County Jail is switching to an ozone system for its laundry which saves natural gas by using cold water with the same, or better, sanitizing effects of hot water.
- The County Executive Office has instituted several fleet cost-reduction policies, including individual fuel-reduction goals for each department.
- Unused computers generated by the County are donated to the Computers for Families program. Under the Computers for Families program, boys at the Los Prietos Boys Camp are taught how to repair and upgrade computers.
- Nojoqui Falls and Waller Parks electrical systems use Variable Frequency Drive motors to save energy.

Future examples of the County Operations will include:

- The County is pursuing 3rd party “Power Purchase Agreements” (PPA) to help bring solar and/or wind power to the County of Santa Barbara.
- A Green Fleet Committee will review current fleet practices, establish comprehensive Green Fleet policies, review future Green Fleet projects and make executive recommendations regarding fleet selections.
- The CEO’s Human Resources will implement a new policy for a “Mobile Workforce” that puts fewer cars on the road and reduces the fuel consumption of the County’s employees.

All County departments have made strides in energy-use reductions. In most cases, these actions have been driven by the need to reduce costs and increase efficiencies. Emissions reductions are already being seen as a result. The examples in this Sustainability Action Plan demonstrates how Santa Barbara County operates and strives to be smarter and more resourceful about the manner in which its buildings use energy, people, transportation, and waste management . The Energy and Environmental Inventory created here will be used to determine what, and where, energy is being used throughout the County and the amount of greenhouse gas emissions emitted, as a whole, by all County departments. These efforts by County departments will help curb the effects of climate change on our planet and help to ensure a more sustainable environment for our children.

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# *Appendices*



Appendix A

# Greenhouse Gas Emission Inventory

*Local Government Operations Report*

**2008 Baseline Year**



COUNTY OF SANTA BARBARA



This document is designed to provide accurate and authoritative information in regard to the subject matter covered. The information presented in this document is subject to change and represents data for the 2008 calendar year. Every effort will be made to notify those affected by such changes.

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General Services Department  
Public Works Department  
Sheriff Department

July 2010

Cover Graphics

Santa Ynez Valley  
SBC Facility Insets

*(Fire Station 11, Cachuma Park, Administration Bldg, SB Courthouse and SM Juvenile Hall)*



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GREENHOUSE GAS EMISSIONS INVENTORY  
LOCAL GOVERNMENT OPERATIONS REPORT

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SANTA BARBARA COUNTY  
2008 BASELINE YEAR

JULY 2010



Department of General Services  
Office of the County Architect

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# 1 ABSTRACT

This report identifies and catalogs estimates for greenhouse gas (GHG) emissions generated from the business functions and facility operations of the County of Santa Barbara. There are numerous facility locations, vehicle operations and business functions carried out by the County of Santa Barbara over an area of 2,774 square miles on behalf of its roughly 422,000 residents. Of the 2,774 square mile land area, one-third is comprised of the Los Padres National Forest and another portion, the Vandenberg Air Force Base. The GHG emissions inventory for Santa Barbara County indicates a total of 134,003 metric tonnes of CO<sup>2</sup>e. A summary table and chart are below with detailed tables offered in Chapter 2.5 of this report.

In 2005 the California Governor signed an *Executive Order* directing state agencies to begin the process of changing state regulations to include criteria in an effort to reduce the effects of GHG emissions in California. The California Legislature has also taken action to provide public law changes to implement stronger requirements on major sources of emissions, like utility companies, major manufacturing and similar major source generators. California State Agencies responsible for regulating these sources are now required to implement stronger emission rules beginning in 2008 and make them enforceable by 2010. These new requirements are not mandatory for consumers of energy, yet. It is felt by many who are watching this unfold, that the regulatory structure will extend to consumers of energy in the near future.

In general, the regulatory structure calls for the energy source generators located in California to return to emission levels of 1990. This is to be accomplished by the year 2020 with further reductions to 80% of the 1990 emission levels by 2050. These targets were identified in the State’s 2008 Scoping Plan, which is now being implemented by state agency regulations.

For non-generators, voluntary reporting of emission is still the case. However, it is anticipated that by 2010, the benefits of mandatory reporting and reductions will out weigh the cost to comply with these regulations. It is therefore in the best interest of the County of Santa Barbara to voluntarily comply now. This will enable the organization to implement strategies that not only help it to comply under mandatory requirements, but also help it to realize energy savings. Some organization-wide restructuring of data will be required to insure transparency of reporting going forward.

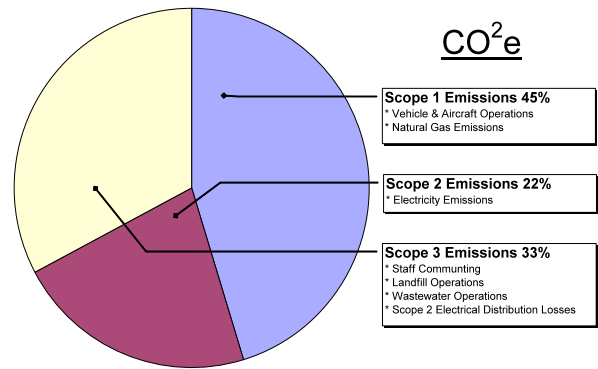


Figure 1: Emissions by Reporting Scope, County of Santa Barbara

This report has two main components, this document and its accompanying appendix. This report is structured to provide general information regarding the operations of the County of Santa Barbara and its GHG emissions. This report will also serve to comply with the California Air Resources Board—*Local Government Operations Protocol*. The appendix contains all the raw data used in the various tables, charts and strategies of the document you are reading.

Summary Total Emissions	%	CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	Unit
Scope 1	45	60,601.6	60,254,019.0	6,267.0	687.4	0.0	0.0	0.0	Metric Tons
Scope 2	22	29,454.1	29,428,882.6	144.7	74.1	0.0	0.0	0.0	Metric Tons
Scope 3	33	43,947.5	8,921,029.0	1,507,185.5	418.0	0.0	0.0	0.0	Metric Tons
<b>Total</b>	<b>100</b>	<b>134,003.3</b>	<b>98,603,930.6</b>	<b>1,513,597.1</b>	<b>1,179.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	Metric Tons

### 1.1 REGULATORY FRAMEWORK

There are myriad regulations across multiple state and local agencies that have oversight of organizations that generate emissions, buildings that use energy and vehicle emissions. Not all regulations are applicable to all emission sources; it depends upon the emission source. As an example, for office buildings, the California Energy Code (Title 24) applies. If the office building uses a gas-fired boiler to produce a heating source, the California Air Resources Board has regulatory oversight and places controls upon the operation of the boilers.

For vehicle operations, the California Air Resources Board will have regulations on the emissions of vehicles in addition to any Federal Standards applicable to the manufacture of the vehicle. The regional authority for air quality is the local *Santa Barbara County Air Pollution Control District (APCD)*. This agency has oversight of emissions made from the fueling of vehicles, other emitters like gas-fired boilers and diesel back-up generators.

An increasing area of emission regulation is the California Environmental Quality Act (CEQA). Beginning in 2009, environmental documents need to address green-house gas emissions in the analysis and mitigations of calculated emissions. The California Attorney General has been successful litigating a California Municipal Agencies when submitting an updated *General Plan* for certification if that general plan fails to address how the potential impacts of green-house gas emissions resulting from increased development were not incorporated into the environmental document associated with the implementation of the general plan. Environmental review that includes a discussion of green-house gas emissions and their mitigation will be required going forward for project meeting the threshold of environmental review.

In 2005 the California Governor signed *Executive Order S-20-04* which established California’s *Green Building Initiative*. This order committed the state to a series of actions that should result in a 20% reduction of energy use in state-owned facilities by the year 2015. The Order also calls for the same reductions of energy use in privately-held facilities. Further, in 2005, the Governor established targets to reduce California’s greenhouse gas emissions through a series of strategies including additional energy efficiency investments and the use of alternate energy sources.

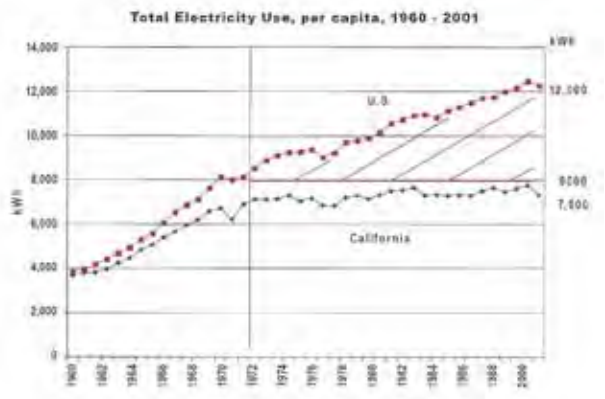


Figure 2: Electricity Use (per capita)

The California Legislature has been active in the passage of new laws that echo Executive Orders issued by the Governor or driven by individual Legislator’s belief that human events contribute to the accumulation of greenhouse gases and therefore have an effect on climate change. While some of these regulations will have an effect on how the County of Santa Barbara operates its business, constructs its

facilities and manages its resources, AB32 is not yet a requirement upon consumers of energy. When the Governor signed AB32 into law, it became known as the *California Global Warming Solutions Act of 2006*. The Act calls for greenhouse gas reduction targets that return the state to its 1990 levels by 2020 and 80% of that target by the year 2050. As already stated, it is mandatory for generators of greenhouse gas emissions. It is not yet mandatory for consumers of energy in California.

The California Energy Commission is charged with the oversight of the states energy resources. In 1974 the *Warren-Alquist Act* was signed into law, this Act created the Energy Commission and set into motion the creation of Building and Appliance Standards. These Standards have been strengthened over time as a result of the various energy crisis events since 1979. The current version of the Standards have set new targets for energy efficiency for both new and remodeled buildings as required by AB 549. Gaining greater efficiency in buildings like: sealing air ducts, higher window thermal transmission qualities, helps to reduce energy costs; and thus emissions.

State Legislation	Year Approved	Summary	Implementation Milestones	Oversight Agency
<b>AB 32</b> Sets target to reduce GHG emissions	<b>2006</b>	AB 32 requires the California Air Resources Board (CARB) to develop regulations and market mechanisms to reduce California greenhouse gas (GHG) emissions back to 1990 levels by 2020. Mandatory caps on GHG emissions will begin in 2012 to achieve reduction targets.  <b>County Impacts:</b> Specific requirements for local agencies as well as impacts associated with noncompliance are expected to be outlined by 2012.	<b>2008</b> - Baseline for mandatory GHG emissions and 2020 statewide cap adopted by CARB.  <b>2009</b> - CARB adopted Scoping Plan indication how emission reductions will be achieved from significant sources.  <b>2012</b> - GHG rules and market mechanisms adopted by CARB take effect and are legally enforceable.  <b>2020</b> - Deadline for emission reduction target.	<b>CARB</b> <b>OPR</b>
<b>SB 97</b> Ties GHG analysis to CEQA	<b>2007</b>	SB 97 requires the State Office of Planning and Research(OPR) to develop legal guidelines for analysis and mitigation of GHG emissions, pursuant to CEQA.  <b>County Impacts:</b> Specific requirements for local agencies as well as impacts associated with noncompliance are expected to be outlined by 2012.	<b>2009</b> - Preparation of guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emission, as required by CEQA.  <b>2010</b> - Certification and adoption of guidelines.	<b>OPR</b>
<b>SB 375</b> Implements one prtion of AB 32	<b>2008</b>	SB 375 addresses one of the eighteen implementation measures called for by AB 32 Through Alignment of the Regional Housing Needs Allocation (RHNA) and the Regional Transportation Plan. This includes development of a Sustainable Communities Strategy (SCS) that would be adopted by SBCAG. Certain types of infill projects that are consistent with the SCS would receive CEQA exemptions and/or streamling under SB 375.  <b>County Impacts:</b> SB 375 calls for a new regional planning process, new requirements for environmental analysis, and strengthens the Housing Element rezone mandate overseen by the State Housing and Community Development Department (SHCD).	<b>2010</b> - GHG reduction targets related to SB 375 are established by CARB and assigned to Metropolitan Planning Organizations (such as SBCAG).  <b>2013</b> - Local Regional Transportation Plan updates, including adoption of the SCS & RHNA.  <b>2015-2023</b> - Housing Element updates.	<b>CARB</b> <b>SHCD</b> <b>SBCAG</b>

## 2 COUNTY OF SANTA BARBARA PROFILE

### 2.1 GENERAL OVERVIEW

Santa Barbara County was established by an act of the State Legislature on February 18, 1850. The County is a general law county and political subdivision of the State of California. The constitution and laws of the State establish the County's rights, powers, privileges, authority, functions, and duties. The powers granted to California counties by State statute include the power to: sue and be sued; purchase, receive by gift or bequest and hold land within its limits, or elsewhere when permitted by law; make contracts, purchase and hold personal property necessary to the exercise of its powers; manage, sell, lease, or otherwise dispose of its property as the interest of its inhabitants require; levy and collect taxes authorized by law; and exercise such other and further powers as may be especially conferred by law, or as may be necessarily implied from those expressed. There are eight incorporated cities and many unincorporated communities with the county.



There are numerous facility locations, vehicle and aircraft operations and business functions carried out by the County of Santa Barbara over an area of 2,774 square miles on behalf of its roughly 422,000 residents. Of the 2,774 square mile land area, one-third is comprised of the Los Padres National Forest.

Budget at a Glance				
Dollars In Millions	2008-09	2009-10	2009-10	2010-11
	Actual	Adopted	Estimated	Recommend
Total Revenues	\$725.7	\$761.8	\$757.7	\$745.3
Other Financing Sources	\$101.5	\$95.6	\$103.3	\$119.0
Total Sources	\$827.2	\$857.4	\$861.0	\$864.3
Total Expenditures	\$733.2	\$795.3	\$777.5	\$831.5
Designated for Future Use	\$94.0	\$82.1	\$83.5	\$32.8
Total Uses	\$827.2	\$857.4	\$861.0	\$864.3
Staffing FTEs	4,172.2	4,045.6	4,099.5	3,875.1



Historically, the County of Santa Barbara constructs a number of new facilities approximately on a ten-year cycle. During any given ten-year cycle there are numerous major or minor facility remodels as operations change to the needs of the citizens. These projects range from office buildings, clinics, fire stations, storage facilities and other types of facilities that support the various departmental functions.

Facility inventory is tracked by both the Real Estate Services Group and the Facility Management Group of the General Services Department. On a five-year cycle, the County Architect evaluates department needs, staffing and facilities occupied to determine future facilities needs. A complete



facility listing can be found in the Appendix and more detailed assessments can be reviewed at the Office of the County Architect. The county’s lease holdings are maintained in a database application specifically prepared by the Real Estate Group. A current listing of leases can be found in the Appendix.

For approximately the last 15 years, the County of Santa Barbara has been implementing energy saving projects in an effort to reduce utility operating costs. These projects have primarily been the replacement of old lighting equipment, controllers and HVAC motors. Recently, the Vehicle Operations Group has replaced some of the motor-pool vehicles with hybrids. To date, there are no plans to use BioDiesel in any vehicles that currently use diesel.

In terms of implementing technologies of alternative energy, there are three projects: two that installed geothermal fields and one project that installed photovoltaic. There have been many attempts to install additional photovoltaic, geothermal and other renewable sources but because of the high initial capital cost and long pay back periods, no other projects have been funded.

With the recent global focus on climate change and the increased regulatory activity by the California Legislature to strengthen emissions regulations, it has become important to understand how county operations contribute to regional climate change. In addition to reducing emissions through replacement of old, out dated technologies, the fiscal impacts of energy costs can be minimized.

## 2.2 COUNTY SERVICES

### 2.2.1 Geographic Characteristics

The County of Santa Barbara is located within California Climate Zones 5 & 6, with the following population centers:

Santa Barbara Coast: Located in the southern portion of the County, this area is bordered on the south by the Pacific Ocean and on the north by the Santa Ynez Mountain range, one of the few mountain systems in North America that run east-west rather than north-south. This area includes the communities of Carpinteria, Montecito, Summerland, Santa Barbara and Goleta. Because of the unique north and south borders, and its year round mild ‘Mediterranean’ climate, Santa Barbara has been described by many as the American Riviera.

Santa Ynez Valley: Located in the central portion of the County, nestled between the Santa Ynez and San Rafael mountain ranges, this area includes the communities of Buellton, Solvang, and Santa Ynez, as well as the Chumash Reservation. Lake Cachuma is also nestled between the mountain ranges, offering recreational activities and a water supply to the County. The Valley’s climate has attracted many winemakers to the area, adding vast vineyards to the rolling hills that lead to the Los Padres National Forest.



Figure 4: Population Centers, County of Santa Barbara

Santa Maria Valley: Located in the northern portion of the County, this area is bordered by San Luis Obispo County to the north and includes the communities of Orcutt, Sisquoc, Casmalia, Garey ,Guadalupe and Santa Maria. Much of the new development within the County has taken place here and, as a result, the area has experienced considerable change.

Lompoc Valley: Located in the western portion of the County includes the Vandenberg Air Force Base, which is a major contributor to the local economy. Lompoc Valley is the least populated area within the County; yet, it is attracting many new residents desiring to relocate to a community that is still in its growth and development stage.



Figure 5: Santa Barbara, Climate Zones

Together these areas contribute to the unique profile of the County, blending the characteristics of each area into one world-class county.

### 2.2.2 Administration and Management

The Board of Supervisors (Board) is vested with legislative authority and the responsibility to set operational and land use policy. The Board is responsible for, among other things, passing ordinances, adopting the annual operating and capital budgets, appointing committee members, approving federal and state grants, and various land use matters. The County Executive Officer (CEO) reports to the Board with appointed department heads reporting to the CEO. Elected department heads are accountable directly to the Electorate with indirect oversight provided by the Auditor-Controller, Treasurer-Tax Collector, Board of Supervisors or the Chief Executive Office.

The County has 24 departments responsible for all County services (see organization chart) and is comprised of about 3,875 (FTE) employees. Five departments are lead by elected officials, they are: Auditor-Controller, Clerk-Recorder-Assessor-Registrar of Voters, District Attorney, Sheriff, and Treasurer-Tax Collector-Public Administrator. The Chief Probation Officer and the Court Executive Officer are appointed by the Presiding Judge of the Superior Court. All other department heads, except County Counsel (appointed by the Board) are appointed by the County Executive Officer.

The County Executive Officer works with departments, constituents, and community entities to analyze particular issues that arise within respective areas of responsibility, and submits recommendations for Board consideration or action. In addition, the County Executive Office is responsible for preparing and presenting the operating and capital budgets to the Board and making recommendations for the overall administration of the County. Numerous other boards, commissions, and committees assist the Board and departments in the execution of their services to the public. All department heads, elected or appointed, are ultimately responsible for their respective department’s daily operations and are legally responsible for controlling spending.

# County of Santa Barbara Organization Chart

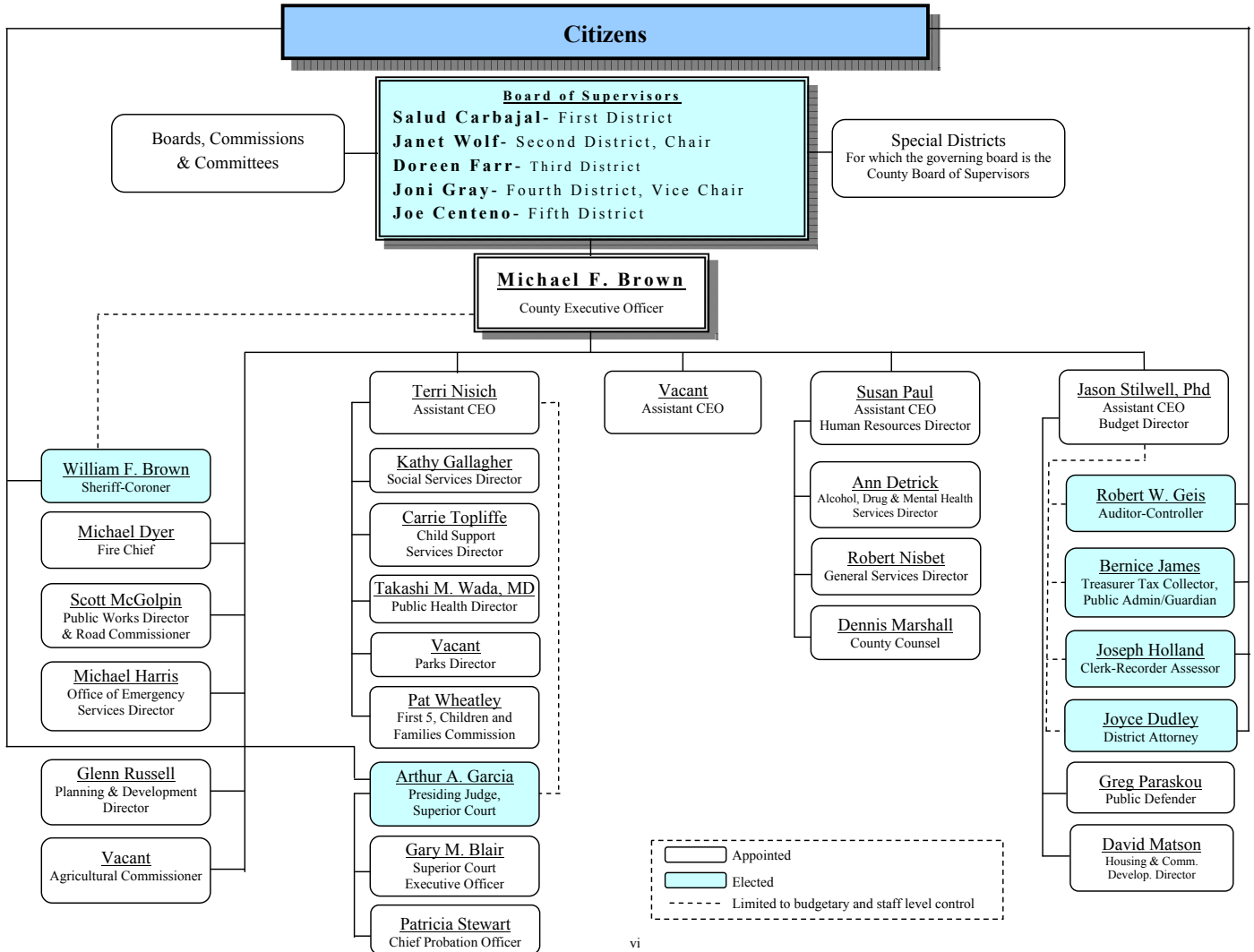


Figure 6: Santa Barbara County – 2010 Organizational Chart



Figure 7: Santa Barbara County – Supervisorial Boundaries

Cities are primarily charged with providing municipal services such as public safety, parks and recreation, planning and public works to their residents. In Santa Barbara County, the County provides these services to residents that do not live within cities (the unincorporated areas) or through contracts with individual cities. As the local arm of State government, the County is required by the State to make available health, safety and welfare services to every person in the county regardless of residency.

### 2.2.3 Services Provided Countywide

The County provides assessment, collection, and distribution of all property taxes gathered from all property owners in the county. The County then distributes designated taxes to all local governments, including: cities, school districts and special districts. The County provides the following services<sup>1</sup> to all residents of the County, regardless of residency:

- Agricultural Protection and consumer assurance (Agricultural Commissioner)
- Child support services (Child Support Services)

<sup>1</sup> For a complete description of department services, please review the County Operating Budget, D Section (by department). A copy of the Operating Budget can be obtained via the County Executive Officers website (<http://www.countyofsb.org/ceo/budgetresearch/budget0708.asp>).

- Criminal prosecution (District Attorney) and defense of underprivileged or indigent residents (Public Defender)
- Flood protection and control (Public Works)
- Foster care, “welfare to work”, support services (Social Services)
- Health services (Alcohol, Drug and Mental Health, Public Health)
- Juvenile detention/treatment, monitoring of Adult offenders (Probation)
- Library services (General County Programs)
- Jail Operations (Sheriff)
- Parks, beaches and open space maintenance (Parks Department)
- Veteran affairs (Treasurer-Tax Collector-Public Administrator)

2.2.4 Services to Unincorporated Areas

The County provides the following specific services to only those residents residing in the unincorporated County areas:

- Affordable Housing (Housing and Community Development)
- Building Permit Processing (Planning and Development)
- Fire Protection (Fire)
- Planning and Zoning (Planning and Development)
- Roads (Public Works)
- Sheriff Patrol (Sheriff)
- Street Lights (Public Works)
- Trash and Recycling Collection (Public Works)

2.2.5 Services to Incorporated Cities

The County provides services to some residents residing within cities, via service contracts with those cities, they area:

<u>Service</u>	<u>City</u>
Animal Control- Field and Shelter	All Cities (except Santa Barbara, Carpinteria)
Animal Control - Shelter	Santa Barbara, Carpinteria
Building Permit Processing	Buellton, Solvang
Fire	Solvang
Library	Santa Maria, Lompoc, Goleta, Santa Barbara
Sheriff Patrol	Buellton, Solvang, Goleta, Carpinteria

**2.3 REPORTING AND ORGANIZATIONAL BOUNDARIES**

2.3.1 Background

The *Local Government Operations Protocol* (Protocol) is designed to provide a standardized set of guidelines to assist local governments in quantifying and reporting Greenhouse Gas (GHG) emissions associated with their own operations. The Protocol was developed in partnership of the California Air Resources Board (ARB), California Climate Action Registry (CCAR), and Local Governments for Sustainability (International Council for Local Environmental Initiatives or ICLEI), in collaboration with The Climate Registry and dozens of agency stakeholders. Through this Protocol, the partners have sought to enable local governments to measure and report GHG emissions associated with government operations in a harmonized fashion. The Protocol facilitates the standardized and rigorous inventorying of GHG emissions, which can help track emissions reduction progress over time and in comparison to

GHG reduction targets. The Protocol provides the principles, approach, methodology, and procedures needed to develop a local government operations GHG emissions inventory. It is designed to support the complete, transparent, and accurate reporting of a local government's GHG emissions. The Protocol guides participants through emissions calculation methodologies and reporting guidance applicable to all U.S. local governments.

### 2.3.2 Purpose

The purpose of the *Local Government Operations Protocol* is to:

- Enable local governments to develop emissions inventories following internationally recognized GHG accounting and reporting principles defined below with attention to the unique context of local government operations;
- Advance the consistent, comparable and relevant quantification of emissions and appropriate, transparent, and policy-relevant reporting of emissions;
- Enable measurement towards climate goals;
- Promote understanding of the role of local government operations in combating climate change; and
- Help to create harmonization between GHG inventories developed and reported to multiple programs.

The Protocol is a tool for accounting and reporting GHG emissions across a local government's operations. Reductions in emissions are calculated by comparing changes in a local government's emissions over time. By tracking emissions over time, local governments should be able to measure the GHG reduction benefits from policies and programs put in place to reduce emissions within their operations. The following are key components to an agency inventory:

**Relevance:** The greenhouse gas inventory should appropriately reflect the greenhouse gas emissions of the local government and should be organized to reflect the areas over which local governments exert control and hold responsibility in order to serve the decision-making needs of users.

**Completeness:** All greenhouse gas emission sources and emission-causing activities within the chosen inventory boundary should be accounted for. Any specific exclusion should be justified and disclosed.

**Consistency:** Consistent methodologies should be used in the identification of boundaries, analysis of data and quantification of emissions to enable meaningful trend analysis over time, demonstration of reductions, and comparisons of emissions. Any changes to the data, inventory boundary, methods, or any relevant factors in subsequent inventories should be disclosed.

**Transparency:** All relevant issues should be addressed and documented in a factual and coherent manner to provide a trail for future review and replication. All relevant data sources and assumptions should be disclosed, along with specific descriptions of methodologies and data sources used.

**Accuracy:** The quantification of greenhouse gas emissions should not be systematically over or under the actual emissions. Accuracy should be sufficient to enable users to make decisions with reasonable assurance as to the integrity of the reported information.

2.3.3 Organizational Boundaries

Local governments vary in their legal and organizational structures, and may contain a diverse number of departments, boards, facilities, joint ventures, etc. The Protocol should account for and report all emissions according to one of two control approaches: operational control or financial control. Under both control approaches, a local government accounts for 100 percent of the GHG emissions from operations over which it has control. It does not account for GHG emissions from operations in which it owns an interest but has no control. However, there are situations where the control approach choice will determine whether a source falls within the reporting organizational boundary. Once a choice in control approach has been made it will be applied consistently across all operations and future reporting going forward.

2.3.3.1 Control Approach Recommendation

The Protocol strongly encourages local governments to utilize operational control when defining their organizational boundary. The stakeholders involved in the development of this Protocol believe that operational control most accurately represents the emission sources that local government’s can influence. Operational control is also the consolidation approach required under AB 32’s mandatory reporting program and is consistent with the requirements of many other types of environmental and air quality reporting.

2.3.3.2 Operational Control

A local government has operational control over an operation if the local government has the full authority to introduce and implement its operating policies on the facility or function. This approach is consistent with the current accounting and reporting practice of many organizations that report on emissions from facilities, which they operate (i.e., for which they hold the operating license). It is expected that except in very rare circumstances, if the local government is the operator of a facility, it will have the full authority to introduce and implement its operating policies and thus has operational control. One or more of the following conditions establishes operational control:

<b>Santa Barbara County Facility Inventory<sup>2</sup></b>	
<b>Region</b>	<b>Square Feet</b>
<b>North County</b>	<b>851,067</b>
<b>South County</b>	<b>1,475,345</b>
<b>Total</b>	<b>2,326,412</b>
Maintained Inventory by other departments (SF)	534,243
GS Maintained Inventory (SF)	1,792,169
Leased Facilities	160,403

- Wholly owning an operation, facility, or source; or
- Having the full authority to introduce and implement operational and health, safety and environmental policies (including both GHG- and non-GHG- related policies). In many instances, the authority to introduce and implement operational and health, safety, and environmental (HSE) policies is explicitly conveyed in the contractual or legal structure of the partnership or joint venture. In most cases, holding an operator’s license is an indication of your organization’s authority to implement operational and HSE policies. However, this may not always be so. If your organization holds an operating license and you believe you do not have

<sup>2</sup> See Appendix for a complete inventory of Santa Barbara County Facilities.

operational control, you will need to explicitly demonstrate that your authority to introduce operational and HSE policies is significantly limited or vested with a separate entity.

It is often the case that autonomous departments like municipal utilities, ports and airports are managed by their own board of commissioners or executives. If this board is appointed by local government officials (e.g. appointed by the Board of Supervisors or CEO and confirmed by the Board) and the local government officials have some level of oversight of the Board (e.g. the local government can help guide policy decisions of the department, the actions of the Board can be reviewed and overturned by the CEO or Board of Supervisors, etc.), then the local government is considered to have operational control over the department and should report the emissions associated with the municipal utility/port/airport as part of the local government's GHG inventory.

#### 2.3.4 LEASED FACILITIES/VEHICLES AND LANDLORD/TENANT ARRANGEMENTS

Annual emission reports shall account for and report emissions from leased facilities and vehicles according to the type of lease associated with the facility or source and the organizational boundary approach selected.

There are two types of leases:

- Finance or capital lease. If there are assets under a finance or capital lease, the Registry considers this asset to be wholly owned.
- Operating lease. If you have an asset under an operating lease, such as a building or vehicle, the Registry considers this asset to be under your operational control but you do not have any financial risk or reward from owning the asset.

The Registry considers any lease that is not a finance or capital lease to be an operating lease. In most cases, operating leases cover rented office space and leased vehicles, whereas finance or capital leases are for large industrial equipment, real estate acquisitions and similar transactions.

## 2.4 ESTABLISHING EMISSIONS BASELINE

A baseline is a datum or reference point against which to measure GHG emission increases or decreases going forward. Baselines are used in a regulatory context to establish a clear threshold for compliance or non-compliance. Submitting the emission baseline for certification to the Climate Registry is an important step in emission reduction accountability. As an example, the State of California has committed *“to use its best efforts to ensure that organizations that establish greenhouse gas emissions baselines and register emissions results that are certified in accordance with Registry Criterion receive appropriate consideration under any future international, federal, or state regulatory schemes relating to greenhouse gas emissions.”*

As of the date of this report, there is no commitment to join the Climate Registry or of having the County of Santa Barbara emission inventory certified.

Additionally, setting a baseline also allows the county to scale structural changes to its organization back to a benchmark emission profile. This aspect of a baseline is called “normalization”. To account for the impact on its emissions profile due to acquisition, the county would adjust its baseline to incorporate the additional emissions associated with the acquired asset, thereby showing that the change in emissions occurred because of structural changes. In the Registry's program, the county would select its baseline according to the year that best represents its standard emissions profile. The baseline year will serve as the benchmark to which the county will compare future reporting years.



The county may begin reporting emissions to the Registry for any year from 1990 forward; likewise it can establish as its baseline any reporting year from 1990 forward. After establishing a baseline, the county should report certified emissions results for each subsequent year from that baseline year. If the county’s participation in the Registry lapses temporarily, it must report emissions for all intervening years upon renewing its participation, or establish a new baseline. If its boundaries do not change significantly, the baseline will remain fixed over time.

2.4.1 RATIONALE FOR SETTING A BASELINE

There are several issues to consider when deciding a baseline year, including:

- Data certainty – does the county have sufficient data to certify its emissions against the requirements in the *Local Government Reporting Protocol* for the baseline year?
- Comparable organizational structure – is the county’s organization sufficiently comparable in its composition and structure to support a meaningful comparison with the baseline year? and,
- Relative emission levels – which year minimizes or maximizes the county emissions relative to most recent levels, and what are the benefits of doing so?

The county baseline should not be adjusted for the organic growth or decline of its organization. Organic growth or decline refers to the increase or decrease in production output, changes in product mix, facility closures or the opening of new facilities that are not the result of changes in the structure of the county’s organization or the result of shifting operations.

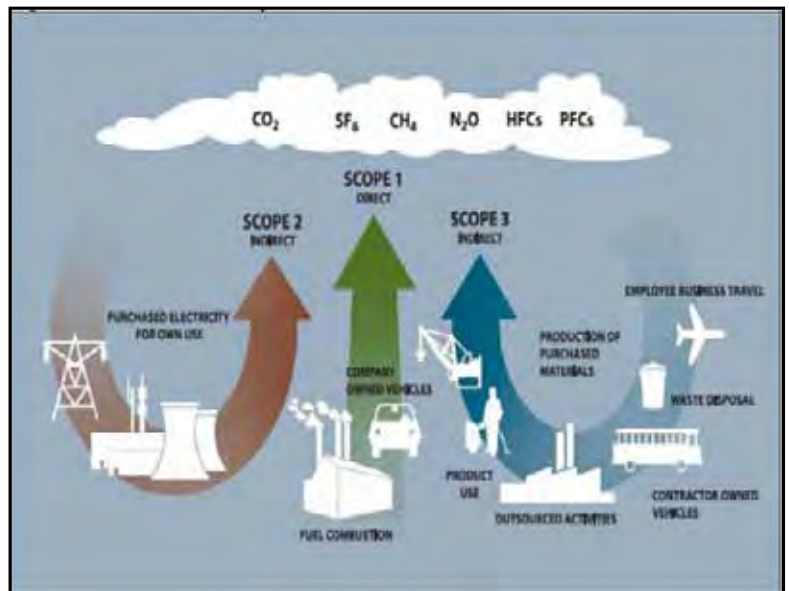
Many government organizations experience growth or reductions and thus their total absolute emissions will either increase or decrease from year to year, regardless of their organization’s operational efficiency. Such organizations, in addition to reporting their total emissions, may also elect to report an efficiency metric, that measures GHG emissions per unit of performance or output compared to the baseline ratio (e.g., CO2/ft2 of office space, CO2/customer, CO2/kWh, CO2/\$ of revenue, etc.).

2.4.2 GHG EMISSION SCOPES

To separately account for direct (Scope 1) and indirect emissions (Scopes 2 & 3), to improve transparency, and to provide utility for different types of climate policies and goals, the Local Government Protocol follows the WRI/WBCSD GHG Protocol Corporate Standard in categorizing direct and indirect emissions into “scopes” as follows:

**Scope 1:** All direct GHG emissions (with the exception of direct CO2 emissions from biogenic sources).

**Scope 2:** Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.



**Scope 3:** All other indirect emissions not covered in Scope 2, such as emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity (e.g., employee commuting and business travel), outsourced activities, waste disposal, etc.

The model used to calculate the County of Santa Barbara's emissions ( $\text{CO}_2$ ) was developed by the University of New Hampshire and Clean-Air Cool Planet on the Microsoft Excel platform. The original modeling tool was constructed for use by the nations Universities and modified by the County Architect to allow input under the Local Government Reporting Protocols (see circled elements in graphic below).

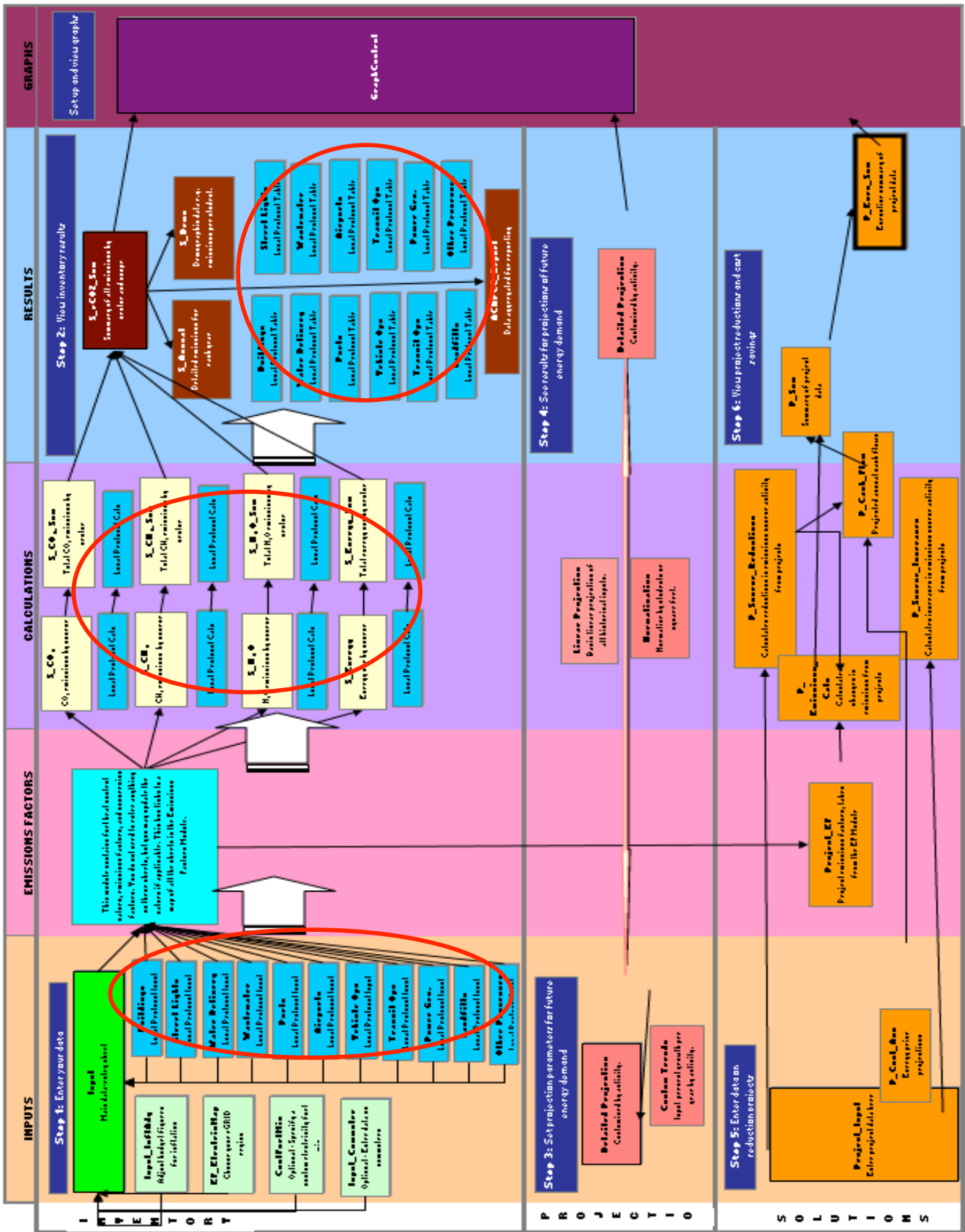


Figure 8: GHG Emissions Modeling Tool--Functional Mapping

### 2.5 COUNTY CO<sup>2</sup>E EMISSION ESTIMATES

The County of Santa Barbara, like many local governments has a diverse organization with numerous departments responsible for the various aspects of operations. The General Services Department is primarily responsible for buildings and their operations. The Public Works Department is primarily responsible for public transportation infrastructure, including street and traffic lights and the public road system. They are also responsible for wastewater and landfill operations. Other departments are responsible for their individual operations, of which contribute to the overall emissions footprint. To separately account for direct and indirect emissions, to improve transparency, and to provide utility for different types of climate policies and goals, the Protocol has developed a reporting structure based around major categories as follows:

Table 1: Total Emissions ..... 16	Table 8: Airport Facilities (No Reportable Emissions) ..... 20
Table 2: Informational Items ..... 16	Table 9: Vehicle Fleet Operations ..... 20
Table 3: Buildings & Other Facilities..... 17	Table 10: Transit Fleet Operations (No Reportable Emissions) ..... 20
Table 4: Street Lights & Traffic Signals ..... 18	Table 11: Power Generation Facilities (No Reportable Emissions) ..... 21
Table 5: Water Delivery Facilities (No Reportable Emissions) ..... 18	Table 12: Solid Waste Facilities..... 21
Table 6: Wastewater Facilities ..... 19	Table 13: Other Process & Fugitive Measures ..... 21
Table 7: Port Facilities (No Reportable Emissions) ..... 19	

The Local Government Reporting Protocol requires the reporting of Scope 1 and Scope 2 emissions. The calculated total CO<sup>2</sup>e of these two scopes is 90,055.8 MT. The Scope 3 emissions are voluntary and represent 33% of total emissions.

Table 1: Total Emissions	%	CO <sup>2</sup> e	CO <sup>2</sup>	CH <sup>4</sup>	N <sup>2</sup> O	HFCs	PFCs	SF <sup>6</sup>	Unit
Scope 1	45	60,601.6	60,254,019.0	6,267.0	687.4	0.0	0.0	0.0	Metric Tons
Scope 2	22	29,454.1	29,428,882.6	144.7	74.1	0.0	0.0	0.0	Metric Tons
Scope 3	33	43,947.5	8,921,029.0	1,507,185.5	418.0	0.0	0.0	0.0	Metric Tons
<b>Total</b>	<b>100</b>	<b>134,003.3</b>	<b>98,603,930.6</b>	<b>1,513,597.1</b>	<b>1,179.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	Metric Tons

Table 2: Informational Items	
CO <sup>2</sup> from BioMass Combustion	CO <sup>2</sup> e: _____
Carbon Offsets Retired	CO <sup>2</sup> e: _____
Carbon Offsets Generated & Sold	CO <sup>2</sup> e: _____
Renewable Energy Certificates (Green Power) Retired	MWH: _____
Percentage of Total electricity used offset by Green Power	%: _____ CO <sup>2</sup> e: _____
Renewable Energy Certificates (Green Power) Generated and Sold	MWH: _____ CO <sup>2</sup> e: _____
<b>Total Indirect</b>	

As stated in previous sections of this report, Scope 1 & 2 are the required reporting scopes. Scope 3 is informational only and therefore a voluntary reporting component. That said, of the Scope 3 emissions, those generating the largest number are Landfill and Wastewater operations. Staff commuting is generally thought to generate a significant emission level. Given the employee population of the County of Santa Barbara, this number is only 14% of Scope 3 total emissions and 5% of total GHG emissions. Under the de-minimis rules, emissions generated by employee commuting could be dropped from the report.

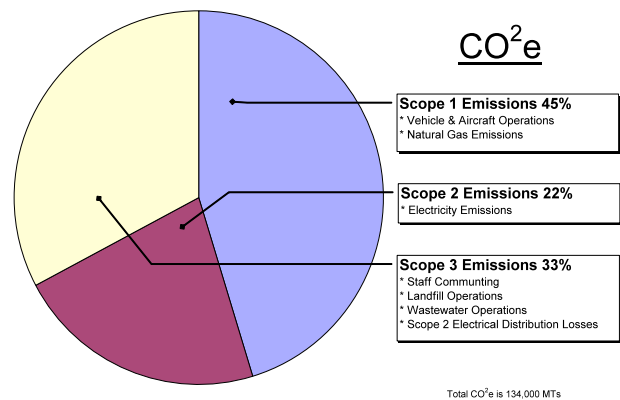
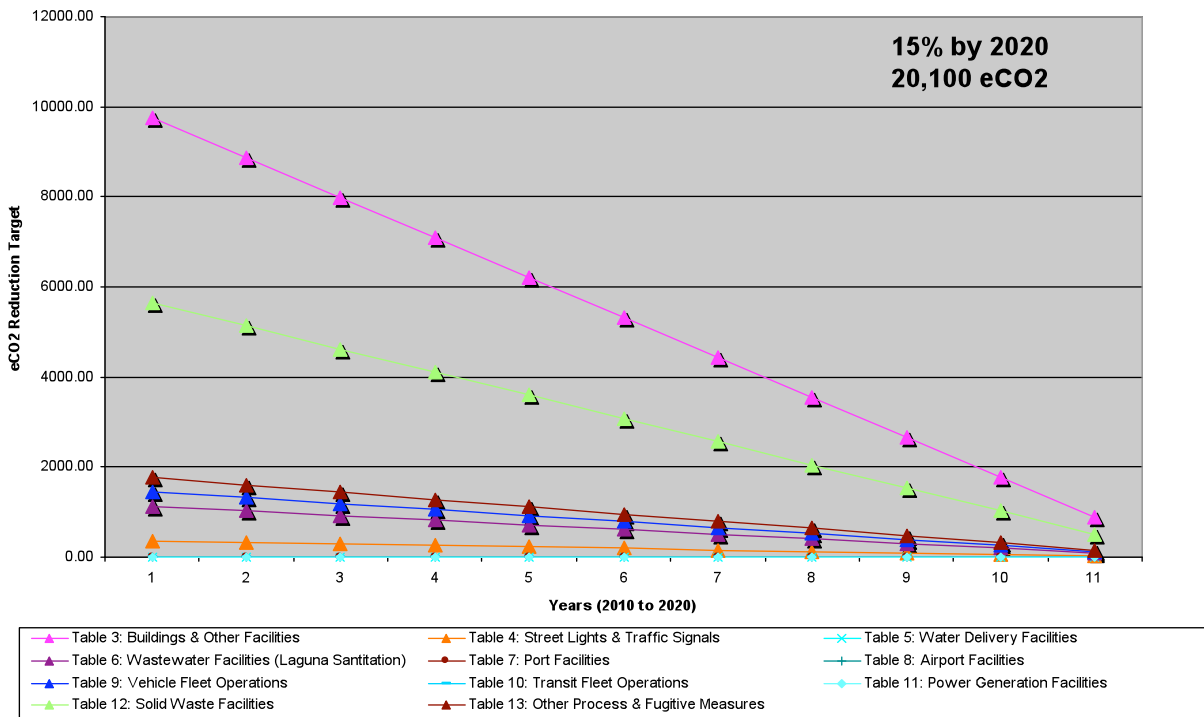


Figure 9: Emissions by Reporting Scope, County of Santa Barbara

Greenhouse Gas Emission Reduction Target over 10-Years



The chart above represents the following 11 tables. While general reporting protocols only require that emission inventories be reported by Scopes only, the Local Government Protocols require reporting by Scopes and Functional Categories. Santa Barbara County emissions data has been collected and calculated for functional groups under its control. The County does not operate an air or sea port, water distribution system, power distribution system or public transit system. While those tables are included in an effort to provide full disclosure, they are noted with “no reportable emissions”. The summary table can be found on page 15.

Table 3: Buildings & Other Facilities	CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>							
Stationary Combustion	43,106	42,981,949	4,298	86	-	-	-
Fugitive Emissions	-	-	-	-	-	-	-
Subtotal Scope 1	43,106	42,981,949	4,298	86	-	-	-
<b>Scope 2</b>							
Purchased Electricity	19,903	19,884,648	98	54	-	-	-
Purchased Steam	-	-	-	-	-	-	-
District Heating/Cooling	-	-	-	-	-	-	-
Subtotal Scope 2	19,903	19,884,648	98	54	-	-	-
<b>Scope 3</b>							
Scope 2: Transmission/Distribution Losses	1,968	1,966,614	10	5	-	-	-
Subtotal Scope 3	1,968	1,966,614	10	5	-	-	-
Total Buildings & Other Facilities	64,978	64,833,210	4,405	145	-	-	-
<b>Indicators</b>							

SANTA BARBARA COUNTY : GREENHOUSE GAS EMISSIONS INVENTORY

Table 4: Street Lights & Traffic Signals		CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>								
	<i>Stationary Combustion</i>	-	-	-	-	-	-	-
	<i>Fugitive Emissions</i>	-	-	-	-	-	-	-
	Subtotal Scope 1	-	-	-	-	-	-	-
<b>Scope 2</b>								
	<i>Purchased Electricity</i>	2,137	2,137,257	11	-	-	-	-
	<i>Purchased Steam</i>	-	-	-	-	-	-	-
	<i>District Heating/Cooling</i>	-	-	-	-	-	-	-
	Subtotal Scope 2	2,137	2,137,257	11	-	-	-	-
<b>Scope 3</b>								
	<i>Scope 2: Transmission/Distribution Losses</i>	211	211,377	-	-	-	-	-
	Subtotal Scope 3	211	211,377	-	-	-	-	-
Total Buildings & Other Facilities		2,349	2,348,635	11	-	-	-	-
<b>Indicators</b>								

Street and traffic light systems are under the management of the Santa Barbara County Public Works Department and are administered through *Community Service Areas* (CSA) or Special Districts organized for that purpose. There are six such CSA's or Special Districts.

Table 5: Water Delivery Facilities (No Reportable Emissions)		CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>								
	<i>Stationary Combustion</i>	-	-	-	-	-	-	-
	<i>Fugitive Emissions</i>	-	-	-	-	-	-	-
	Subtotal Scope 1	-	-	-	-	-	-	-
<b>Scope 2</b>								
	<i>Purchased Electricity</i>	-	-	-	-	-	-	-
	<i>Purchased Steam</i>	-	-	-	-	-	-	-
	<i>District Heating/Cooling</i>	-	-	-	-	-	-	-
	Subtotal Scope 2	-	-	-	-	-	-	-
<b>Scope 3</b>								
	Subtotal Scope 3	-	-	-	-	-	-	-
Total Buildings & Other Facilities		-	-	-	-	-	-	-
<b>Indicators</b>								

At the time of this report, the County of Santa Barbara does not operate a public or private water distribution system.

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Table 6: Wastewater Facilities		CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>								
	<i>Stationary Combustion</i>	4,411	4,398,141	440	9	-	-	-
	<i>Fugitive Emissions</i>	446	439,477	50	19	-	-	-
	Subtotal Scope 1	4,857	4,837,617	490	28	-	-	-
<b>Scope 2</b>								
	<i>Purchased Electricity</i>	2,531	2,528,715	12	7	-	-	-
	<i>Purchased Steam</i>	-	-	-	-	-	-	-
	<i>District Heating/Cooling</i>	-	-	-	-	-	-	-
	Subtotal Scope 2	2,531	2,528,715	12	7	-	-	-
<b>Scope 3</b>								
	<i>Scope 2: Transmission/Distribution Losses</i>	185	184,413	1	1	-	-	-
	Subtotal Scope 3	185	184,413	1	1	-	-	-
Total Buildings & Other Facilities		7,573	7,550,746	503	35	-	-	-
<b>Indicators</b>								

The County of Santa Barbara operates two wastewater treatment plants. The largest operates in the Orcutt Community (near Santa Maria) and serves residential and commercial customers. The other provides service to the Cachuma Lake Recreational area off State Highway 154 (roughly in the middle of the geographic area of the county).

Table 7: Port Facilities (No Reportable Emissions)		CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>								
	<i>Stationary Combustion</i>	-	-	-	-	-	-	-
	<i>Fugitive Emissions</i>	-	-	-	-	-	-	-
	Subtotal Scope 1	-	-	-	-	-	-	-
<b>Scope 2</b>								
	<i>Purchased Electricity</i>	-	-	-	-	-	-	-
	<i>Purchased Steam</i>	-	-	-	-	-	-	-
	<i>District Heating/Cooling</i>	-	-	-	-	-	-	-
	Subtotal Scope 2	-	-	-	-	-	-	-
<b>Scope 3</b>								
	Subtotal Scope 3	-	-	-	-	-	-	-
Total Buildings & Other Facilities		-	-	-	-	-	-	-
<b>Indicators</b>								

At the time of this report, the County of Santa Barbara does not operate a public or private port.

SANTA BARBARA COUNTY : GREENHOUSE GAS EMISSIONS INVENTORY

Table 8: Airport Facilities (No Reportable Emissions)		CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>								
	<i>Stationary Combustion</i>	-	-	-	-	-	-	-
	<i>Fugitive Emissions</i>	-	-	-	-	-	-	-
	Subtotal Scope 1	-	-	-	-	-	-	-
<b>Scope 2</b>								
	<i>Purchased Electricity</i>	-	-	-	-	-	-	-
	<i>Purchased Steam</i>	-	-	-	-	-	-	-
	<i>District Heating/Cooling</i>	-	-	-	-	-	-	-
	Subtotal Scope 2	-	-	-	-	-	-	-
<b>Scope 3</b>								
	Subtotal Scope 3	-	-	-	-	-	-	-
Total Buildings & Other Facilities		-	-	-	-	-	-	-
<b>Indicators</b>								

Table 9: Vehicle Fleet Operations		CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>								
	<i>Stationary Combustion</i>	-	-	-	-	-	-	-
	<i>Fugitive Emissions</i>	9,747	9,556,822	1,480	528	-	-	-
	Subtotal Scope 1	9,747	9,556,822	1,480	528	-	-	-
<b>Scope 2</b>								
	<i>Purchased Electricity</i>	-	-	-	-	-	-	-
	<i>Purchased Steam</i>	-	-	-	-	-	-	-
	<i>District Heating/Cooling</i>	-	-	-	-	-	-	-
	Subtotal Scope 2	-	-	-	-	-	-	-
<b>Scope 3</b>								
	Subtotal Scope 3	-	-	-	-	-	-	-
Total Buildings & Other Facilities		9,747	9,556,822	1,480	528	-	-	-
<b>Indicators</b>								

Table 10: Transit Fleet Operations (No Reportable Emissions)		CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>								
	<i>Stationary Combustion</i>	-	-	-	-	-	-	-
	<i>Fugitive Emissions</i>	-	-	-	-	-	-	-
	Subtotal Scope 1	-	-	-	-	-	-	-
<b>Scope 2</b>								
	<i>Purchased Electricity</i>	-	-	-	-	-	-	-
	<i>Purchased Steam</i>	-	-	-	-	-	-	-
	<i>District Heating/Cooling</i>	-	-	-	-	-	-	-
	Subtotal Scope 2	-	-	-	-	-	-	-
<b>Scope 3</b>								
	Subtotal Scope 3	-	-	-	-	-	-	-
Total Buildings & Other Facilities		-	-	-	-	-	-	-
<b>Indicators</b>								

At the time of this report, the County of Santa Barbara does not operate a public or private Transit Fleet system.



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Table 11: Power Generation Facilities (No Reportable Emissions)		CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>								
	<i>Stationary Combustion</i>	-	-	-	-	-	-	-
	<i>Fugitive Emissions</i>	-	-	-	-	-	-	-
	<b>Subtotal Scope 1</b>	-	-	-	-	-	-	-
<b>Scope 2</b>								
	<i>Purchased Electricity</i>	-	-	-	-	-	-	-
	<i>Purchased Steam</i>	-	-	-	-	-	-	-
	<i>District Heating/Cooling</i>	-	-	-	-	-	-	-
	<b>Subtotal Scope 2</b>	-	-	-	-	-	-	-
<b>Scope 3</b>								
	<b>Subtotal Scope 3</b>	-	-	-	-	-	-	-
<b>Total Buildings &amp; Other Facilities</b>		-	-	-	-	-	-	-
<b>Indicators</b>								

At the time of this report, the County of Santa Barbara does not operate a public or private power generation or distribution system.

Table 12: Solid Waste Facilities		CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>								
	<i>Stationary Combustion</i>	-	-	-	-	-	-	-
	<i>Fugitive Emissions</i>	1,624	1,611,493	-	43	-	-	-
	<b>Subtotal Scope 1</b>	1,624	1,611,493	-	43	-	-	-
<b>Scope 2</b>								
	<i>Purchased Electricity</i>	-	-	-	-	-	-	-
	<i>Purchased Steam</i>	-	-	-	-	-	-	-
	<i>District Heating/Cooling</i>	-	-	-	-	-	-	-
	<b>Subtotal Scope 2</b>	-	-	-	-	-	-	-
<b>Scope 3</b>								
	<i>Scope 2: Transmission/Distribution Losses</i>	-	-	-	-	-	-	-
	<i>Landfill Operations</i>	34,638	-	1,505,980	-	-	-	-
	<b>Subtotal Scope 3</b>	34,638	-	1,505,980	-	-	-	-
<b>Total Buildings &amp; Other Facilities</b>		36,262	1,611,493	1,505,980	43	-	-	-
<b>Indicators</b>								

Table 13: Other Process & Fugitive Measures		CO <sub>2</sub> e	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>
<b>Scope 1</b>								
	<i>Stationary Combustion</i>	-	-	-	-	-	-	-
	<i>Fugitive Emissions</i>	-	-	-	-	-	-	-
	<b>Subtotal Scope 1</b>	-	-	-	-	-	-	-
<b>Scope 2</b>								
	<i>Purchased Electricity</i>	4,797	4,792,141	24	13	-	-	-
	<i>Purchased Steam</i>	-	-	-	-	-	-	-
	<i>District Heating/Cooling</i>	-	-	-	-	-	-	-
	<b>Subtotal Scope 2</b>	4,797	4,792,141	24	13	-	-	-
<b>Scope 3</b>								
	<i>Scope 2: Transmission/Distribution Losses</i>	474	473,948	-	-	-	-	-
	<i>Staff Commuting</i>	6,226	6,076,160	1,194	412	-	-	-
	<b>Subtotal Scope 3</b>	6,937	6,550,108	1,194	412	-	-	-
<b>Total Buildings &amp; Other Facilities</b>		11,734	11,342,249	1,218	425	-	-	-
<b>Indicators</b>								

**3 GLOSSARY OF TERMS**

**AB 32** California Assembly Bill 32 (passed September 27, 2006)  
**Btu** British thermal unit(s)  
**CARB** California Air Resources Board  
**CARROT** Climate Action Registry Reporting Online Tool  
**CEC** California Energy Commission  
**CEMS** Continuous Emissions Monitoring Systems  
**CHP** combined heat and power  
**CH<sub>4</sub>** methane  
**COP** coefficient of performance  
**CO<sub>2</sub>** carbon dioxide  
**CO<sub>2e</sub>** carbon dioxide equivalent  
**EIA** U.S. Energy Information Administration  
**EIIP** Emissions Inventory Improvement Program  
**EPA** U.S. Environmental Protection Agency  
**g** gram(s)  
**GCV** gross caloric value  
**GHG** greenhouse gas  
**GRP** General Reporting Protocol  
**GWP** global warming potential  
**ha** hectare(s)  
**HDV** heavy duty vehicle  
**HFC** hydrofluorocarbon  
**HHV** higher heating value  
**IPCC** Intergovernmental Panel on Climate Change  
**IPP** independent power producer  
**kg** kilogram(s)  
**kWh** kilowatt-hour(s)  
**lb** pound  
**LDT** light duty truck  
**LHV** lower heating value  
**LPG** liquefied petroleum gas  
**Mcf** thousand cubic feet  
**mi** mile(s)  
**MMBtu** one million British thermal units  
**MWh** megawatt-hour(s)  
**NCV** net caloric value  
**NO<sub>x</sub>** oxides of nitrogen  
**N<sub>2</sub>O** nitrous oxide  
**PFC** perfluorocarbon  
**RFA** Request for Applications  
**SAR** IPCC Second Assessment Report (1996)  
**SB 1771** California Senate Bill 1771 (passed August 31, 2000)  
**SB 527** California Senate Bill 527 (passed September 14, 2001)  
**SF<sub>6</sub>** sulfur hexafluoride  
**TAR** IPCC Third Assessment Report (2001)  
**T&D** transmission and distribution  
**UNFCCC** United Nations Framework Convention on Climate Change  
**WBCSD** World Business Council for Sustainable Development  
**WRI** World Resources Institute

SANTA BARBARA COUNTY : GREENHOUSE GAS EMISSIONS INVENTORY

Key Terms	Definition
Baseline	Datum against which to measure GHG emissions performance over time.
Base Year	The first year in which GHG emissions are reported.
Batch Certification	Simultaneous certification process arranged by the Registry for multiple participants with simple GHG emissions (typically only indirect emissions from electricity consumption and direct emissions from stationary combustion at a single site and/or direct emissions from a small number of vehicles).
CO <sub>2</sub> -equivalent*	(CO <sub>2</sub> e) The quantity of a given GHG multiplied by its total global warming potential. This is the standard unit for comparing the degree of warming which can be caused by different GHGs.
Certification	The process used to ensure that a given participant's greenhouse gas emissions inventory (either the baseline or annual result) has met a minimum quality standard and complied with the Registry's procedures and protocols for calculating and reporting GHG emissions.
Certified Member Certifier	A Registry participant that has a current certified annual emissions report to the Registry. A firm or team of firms that has been State- and Registry-approved to conduct certification activities under the Registry program. A certifier may also refer to a single employee within a State- and Registry-approved firm who conducts certification activities
Datum	A reference or starting point.
De Minimis	A quantity of GHG emissions from one or more sources, for one or more gases, which, when summed equal less than 5% of an organization's total emissions.
Direct Emissions	Emissions from sources that are owned or controlled by the reporting organization.
Emission Factor*	A factor relating activity data and absolute GHG emissions.
Equity Share	Fractional percentage or share of an interest in an entity based either on ownership interest, or on some other contractual basis negotiated among the entity's stakeholders.
Fugitive Emissions*	Intentional and unintentional releases of GHGs from joints, seals, gaskets, etc.
Global Warming Potential*	(GWP) The ratio of radiative forcing (degree of warming to the atmosphere) that would result from the emission of one unit of a given GHG compared to one unit of CO <sub>2</sub> .
Greenhouse Gases	(GHG) For the purposes of the Registry, GHGs are the six gases identified in the Kyoto Protocol: Carbon Dioxide (CO <sub>2</sub> ), Nitrous Oxide (N <sub>2</sub> O), Methane (CH <sub>4</sub> ), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulphur Hexafluoride (SF <sub>6</sub> ).
Indirect Emissions	Emissions that are a consequence of the actions of a reporting entity, but are produced by sources owned or controlled by another entity.
Leakage	A situation where emissions shift from one location to another resulting in a direct increase in emissions.
Management Control	The ability of an entity to govern the operating policies of another entity or facility so as to obtain benefits from its activities.
Material	Means any emission of greenhouse gas that is not de minimis.
Material Discrepancy	With respect to verifying an entity's emission inventory, a material discrepancy occurs when a difference in reported emissions between an entity and a certifier exceeds 5% of the reported emissions. A difference is immaterial if it is less than 5% of reported emissions.

SANTA BARBARA COUNTY : GREENHOUSE GAS EMISSIONS INVENTORY

Mobile Combustion*	Burning of fuels by transportation devices such as cars, trucks, airplanes, vessels, etc.
Member	An entity that is preparing its annual GHG Emission Report, but does not have a current certified Emission Report with the Registry.
Outsourcing*	The contracting out of activities to other businesses.
Process Emissions*	Emissions generated from manufacturing or other activity processes, such as cement or ammonia production.
Project Baseline	Datum against which to measure GHG emissions performance of a specific emissions reduction project over time, usually annual emissions measured from a base year.
Significance Threshold	Significance, in the context of the Registry, is defined as including all sources that are not de minimis. For the purposes of the Registry, the significance threshold is set at 95%.
Stationary Combustion*	Burning of fuels to generate electricity, steam, or heat.



Appendix B

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# Appendix B

## GLOSSARY

### **Alternative fuel vehicles**

Vehicles that operate on fuels other than gasoline or diesel. Alternative fuel vehicles include those that operate using compressed natural gas (CNG), liquid natural gas (LNG), propane, electricity, a hybrid of gasoline and electricity, and hydrogen.

### **Alternative (and/or sustainable) modes of transportation**

For the purpose of this document, alternative (and/or sustainable) modes of transportation include transportation by public transit (bus or rail), bicycle, walking, or alternative fuel vehicles.

### **Assembly Bill (AB) 32**

Authored by Fabian Nunez (D-Los Angeles). Supports the California Global Warming Solutions Act of 2006.

### **Building square footage**

The outside dimensions of length multiplied by width produces the total square feet of a building.

### **California Environmental Quality Act (CEQA)**

A statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.

### **CAS**

Climate Action Strategy

### **California Air Resources Board (CARB)**

Established in 1967, CARB is the “clean air agency” in the government of California. The Mulford-Carrell Act combined the Bureau of Air Sanitation and the Motor Vehicle Pollution Control Board to create CARB. CARB is a department within the cabinet-level California Environmental Protection Agency.

### **Clean distributed generation**

Distributed generation refers to generation of electricity at or near the location where that electricity will be used. This differs from traditional electricity generation, which occurs at centralized power plants and is distributed over hundreds of miles to millions of customers through the electricity “grid”. For the purpose of this document, clean distributed generation (in order of preferred technology type) refers to 1) renewable distributed generation, including electricity generated by solar photovoltaic systems, fuel cells (powered by hydrogen generated from solar, wind, or other non-fossil fuel, renewable energy technologies), and small wind generators; 2) electricity generated by high efficiency (i.e., meeting or exceeding efficiency of large natural gas power plants) natural gas generators and fuel cells using hydrogen generated through a natural gas catalyst; and 3) medium scale, high-efficiency co-generation systems (powered by natural gas) serving many properties located within close proximity of each other. Clean distributed generation does not include electricity generated by gasoline or diesel powered generators.



## **CH4**

Methane (CH4) is expelled pursuant to the transportation and production of natural gas, coal, and oil. Methane emissions are created in municipal solid waste landfills as a result of the decay of organic waste, additionally from agricultural practices and livestock.

## **CO2**

Carbon dioxide (CO2) builds up in the atmosphere while burning fossil fuels (natural gas, oil, and coal), trees, solid waste, and plant products, and also as from chemical reactions (manufacture of cement, and others).

### **Diversion**

In reference to solid waste, diversion refers to waste that is kept out of a landfill through recycling, beneficial reuse, composting, or other means.

### **Ecological footprint**

The ecological footprint is a tool to help measure human impacts on local and global ecosystems. The ecological footprint of a given population (household, community, country) is the total area of ecologically productive land and water used exclusively to produce all the resources (including food, fuel, and fiber) consumed and to assimilate all the wastes generated by that population. Since resources are used from all over the world and since far-away places are affected by the waste from those resources, the footprint is a sum of all of the ecological areas. Thus the ecological footprint of Santa Barbara is that area of productive land inside and outside its borders that is appropriated for its resource consumption or waste assimilation.

### **Environmentally preferable**

A product, service, activity or process that has a lesser or reduced effect on human health and the environment when compared to other products, services, activities or processes that serve the same purpose.

### **Environmental Protection Agency (EPA)**

The EPA, or sometimes USEPA, is an agency of the federal government of the United States charged to protect human health and the environment by writing and enforcing regulations based on laws passed by Congress.

### **Fluorinated gases**

Perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride are synthetic, strong greenhouse gases that are generated during several industrial processes. Sometimes fluorinated gases are used as substitutes to ozone-depleting chemicals like HCFCs, CFCs, and halons. These gases are considered to have a high global warming potential.

### **Greenhouse gas (GHG)**

Greenhouse gases are natural and manmade gases in the earth's atmosphere that allow incoming solar radiation to pass through the atmosphere and warm the earth but trap radiant heat given off by the earth. The radiant heat absorbed by these gases heats the atmosphere. This is a natural process known as the "greenhouse effect" that keeps the earth habitable. The four primary greenhouse gases are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O) and chlorofluorocarbons (CFCs). Since the onset of the industrial period, human activities have lead to sharp increases in the levels of GHGs in the atmosphere, enhancing the greenhouse effect and contributing to rising global temperatures.

### **Hazardous material**

A material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant, or potentially significant, hazard to human health and safety or to the environment if released into the environment.

**Hazardous waste**

A waste (or combination of wastes) that, because of its quantity, concentration, or physical, chemical or infectious characteristics, may cause, or significantly contribute to, an increase in serious, irreversible, or incapacitating illness. A defined hazardous waste product may pose a substantial present hazard, or potential hazard, to human health and safety (or to the welfare of the environment) when improperly treated, stored, transported, used or disposed of, or otherwise managed.

**HVAC**

HVAC is an acronym for the closely related functions of “Heating, Ventilating, and Air Conditioning”. HVAC involves the technology of indoor, or other enclosed area, environmental comfort.

**International Council for Local Environmental Initiatives (ICLEI)**

Local Governments for Sustainability is an international association of local governments and national and regional local government organizations that have made a commitment to sustainable development of resources.

**Kilowatt (KW)**

The kilowatt is equal to one thousand watts.

**Kyoto Protocol**

A protocol to the United Nations Framework Convention on Climate Change (UNFCCC or FCCC), aimed at combating global warming.

**LFG**

Landfill Gas

**LED**

A Light-Emitting Diode is a semiconductor light source.

**Leadership in Energy & Environmental Design (LEEDTM) certification**

A rating system developed by the United States Green Building Council (USGBC) that sets definitive standards for what constitutes a green or environmentally preferable building. The certification system is self-assessing and is designed for rating new and existing commercial, institutional, and high-rise residential buildings. It evaluates environmental performance of the entire building over the building’s life cycle. LEED certifications are awarded at various levels (certified, silver, gold, and platinum) according to a point-based scoring system.

**Mixed-use projects**

Developments which incorporate both residential and commercial uses.

**Megawatt (MW)**

The megawatt is equal to one million watts.

**N2O**

Nitrous oxide (N<sub>2</sub>O) is generated in both industrial and agricultural operations through the combustion of solid waste and fossil fuels.

**NASA**

The National Aeronautics and Space Administration is an Executive Branch agency of the United States government; responsible for the nation’s civilian space program and aeronautics and aerospace research.

**Native species**

Plant or animal species native to the southern California bioregion.

**Natural function/wildlife habitat**

Geographic areas that provide life supportive functions associated with atmospheric, biological, biochemical and hydrological processes that keep our air and water clean, process waste and support survival and reproduction of plant and animal life.

**NOAA**

The National Oceanic and Atmospheric Administration is a scientific agency within the United States Department of Commerce focused on the conditions of the oceans and the atmosphere.

**Non-renewable resources**

Natural resources that have a finite availability worldwide. Examples include coal, oil and other petroleum products.

**Open space**

For the purpose of this document, open space refers to all land uses defined as open space in the City of Santa Barbara's General Plan. These include beaches, parks, public gathering places, usable green open space in street medians, scenic highway corridors, gardens, and other publicly accessible land.

**Passive recreation**

Recreational opportunities that occur in a natural setting which require minimal development or facilities, and the importance of the environment or setting for the activities is greater than in developed or active recreation settings.

**PG&E**

Pacific Gas and Electric

**PPA**

A Power Purchase Agreement (PPA) is a legal contract between an electricity generator (provider) and a power purchaser (host).

**Qualified low emission / alternative fuel vehicles**

Vehicles recognized by the State of California as being low emission and/or alternative fuel vehicles. These vehicles exceed the basic standards all new vehicles must meet to be sold in California and include low emission vehicles (LEVs), ultra low emission vehicles (ULEVs), super ultra low emission vehicles (SULEVs) and zero emission vehicles (ZEVs).

**RHNA**

Regional Housing Needs Allocation

**RTP**

Regional Transportation Plan

**Renewable limits**

Harvesting resources within renewable limits refers to a rate of harvest that is lower than the rate the resource can replace itself; e.g. catching fish at a rate that will allow the fish population to be maintained over time. If too many fish are caught, exceeding renewable limits, the fish population will decline. The terms renewable limits and sustainable limits are synonymous.

**Renewable resources**

Natural resources that have an unlimited supply (such as solar radiation) or that can be renewed indefinitely if ecosystem health is maintained (e.g. fisheries or forests).

**RRWMD**

Resource Recovery and Waste Management Division of Public Works

**RPG**

Renewable Power Generating

**Routine**

When describing generation of hazardous waste by government operations for the purpose of this document, routine refers to regular and consistent operational practices, such as: vehicle maintenance, regular cleaning procedures, etc. Non-routine refers to hazardous waste generated during unanticipated events such as chemical spills or leaks.

**SBCAG**

Santa Barbara County Association of Governments

**SAP**

Sustainability Action Plan

**SCE**

Southern California Edison; a utility company

**Scope 1 GHG Emissions**

Direct GHG emissions from sources that are owned or controlled by the reporting entity. This can include emissions from fossil fuels burned on site, emissions from agency-owned or agency-leased vehicles, and other direct sources.

**Scope 2 GHG Emissions**

Indirect GHG emissions resulting from the generation of electricity, heat, or steam generated off site but purchased by the reporting agency.

**Scope 3 GHG Emissions**

Indirect GHG emissions from sources not owned or directly controlled by the reporting agency but related to the agency's activities such as vendor supply chains, delivery services, outsourced activities, and employee travel and commuting.

**Senate Bill (SB) 97**

Chapter 185, 2007. SB 97 required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the State CEQA Guidelines for addressing greenhouse gas emissions.

**Senate Bill 375**

Provides emission-reducing goals for which regions can plan; integrates disjointed planning activities, and provides incentives for local governments and developers to follow new conscientiously-planned growth patterns. SB 375 enhances the Air Resources Board's (ARB) ability to reach AB 32 goals.

**Significant emissions source**

Sources of toxic air contaminants and other air emissions that pose a threat to human health and the environment. A specific list of significant emission sources within Santa Barbara will be developed in the course of tracking this indicator.

## **Sustainable**

Has slightly different definitions depending on the context in which it is used. For the purpose of this document, the following definitions are used:

### **Sustainable (in reference to resource use)**

A method of harvesting or using a resource so that it is not depleted or permanently damaged.

### **Sustainable landscapes**

An approach to ornamental landscaping that emphasizes plantings that closely approach a “natural system” and do not rely on unnecessary input of natural resources (fuel, water, chemical fertilizers, toxic substances) or excessive output of green waste, toxic run-off, and groundwater pollutants. Sustainable landscapes also embrace the ethos of using locally-derived and/or recycled materials for constructed elements.

### **Sustainable procurement**

Procurement of environmentally preferable goods and services in a way that also takes into consideration social responsibility and sustainable economic development issues in the manufacture, transportation, sale and use of those goods and services.

### **T8**

One inch diameter tube fluorescent lamp tube that is gas-discharge lamp and uses electricity to excite mercury vapor.

### **T12**

One and one-half inch diameter tube fluorescent lamp tube that is gas-discharge lamp and uses electricity to excite mercury vapor.

### **The Global Warming Solutions Act of 2006**

An environmental law in California, signed into law by Governor of California Arnold Schwarzenegger on September 27, 2006.

### **Toxic material**

A chemical or poisonous substance that causes illness, injury or death when ingested or contacted.

### **Toxic air contaminants (TACs)**

Air pollutants which may cause or contribute to an increase in mortality or serious illness; or which may pose a present or potential hazard to human health.

### **Variable-Frequency Drive (VFD)**

A variable-frequency drive (VFD) is a system for controlling the rotational speed of an alternating current (AC) electric motor by controlling the frequency of the electrical power supplied to the motor.

### **Zero waste**

Recycling or reusing all natural and man made materials back into nature or the marketplace rather than sending those materials to landfills or similar disposal options.

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Appendix C

# Appendix C

## SOURCES

### Cool Counties

“U.S. counties join global warming fight with ‘Cool Counties’ declaration”

Posted 23 July 2007 in EDITOR’S CHOICE | United States | Climate Change | Governance | News

Published 16 July 2007 by Sierra Club (original article)

On July 16th, twelve large U.S. counties and the Sierra Club launched the “Cool Counties Climate Stabilization Declaration”, a major new initiative

### Other Sources

AB 32 Scoping Plan, California Air Resources Board, October 2008

Energy Aware Planning Guide, California Energy Commission, December 2009

U.S. Mayors Handbook; Climate Protection Agreement and Climate Action Handbook, ICLEI and the City of Seattle and the U.S. Conference of Mayors.

Cities for Climate Protections Milestone Guide, ICLEI, EPA, State of California



Appendix A

## Appendix D

### RESOLUTION OF THE BOARD OF SUPERVISORS COUNTY OF SANTA BARBARA, STATE OF CALIFORNIA

IN THE MATTER OF ADOPTING SANTA BARBARA )  
COUNTY'S CLIMATE CHANGE GUIDING PRINCIPLES )  
AND SUPPORTING COUNTY EFFORTS TO REDUCE ) RESOLUTION NO. 09- 059  
GREENHOUSE GAS EMISSIONS )

#### WITH REFERENCE TO THE FOLLOWING:

WHEREAS, as a result of scientific research and growing public awareness and concern regarding climate change, in 2005, Governor Arnold Schwarzenegger unveiled his plan to reduce California's greenhouse gas emissions. This led to a series of recent climate laws, which present a new policy framework in which all segments of the economy will be required to undertake efforts to reduce Statewide greenhouse gas emissions; and,

WHEREAS, the most comprehensive of these State policies, Assembly Bill (AB) 32, states that climate change "poses a serious threat to the economic well-being, public health, natural resources, and the environment of California" and "will have detrimental effects on some of the State's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry." AB 32 established a benchmark for greenhouse gas emission reductions to 1990 levels by 2020 (15% or 169 million metric tons) and to 80 percent below 1990 levels by 2050, and outlined a process of regulatory and market mechanisms to achieve these benchmarks, including implementation of an eighteen-point emission reduction plan; and,

WHEREAS, Subsequent to AB 32, more than a dozen implementing laws have been adopted and many more are expected to be enacted in the near term. Notable bills include Senate Bill 375, which aligns housing, transportation and greenhouse gas planning to reduce vehicle miles traveled, and Senate Bill 97, which requires local jurisdictions to address and mitigate greenhouse gas emissions during CEQA review. Many of these laws contain requirements, implications and opportunities for local jurisdictions; and,

WHEREAS, emerging State and Federal legislation, including H.R.1, the American Recovery and Reinvestment Act of 2009 ("Federal Economic Stimulus") enacted on February 17, 2009, is poised to reward communities that incentivize investment in energy efficiency and "green" infrastructure improvements, while simultaneously providing opportunity to protect and preserve components vital and unique to regional economic stability; and,

WHEREAS, local governments play an important role in reducing greenhouse gas emissions through operating practices in public facilities and assets, effective land use and transportation planning, integrated waste management services, protection of natural habitat and rural agricultural resources, promotion of renewable energy, efficient use of energy, and other means to achieve a larger cumulative change; and,

WHEREAS, the 2009 California Planners' Book of Lists, published by the Governor's Office of Planning and Research, indicates that over 135 jurisdictions, including a third of Counties in California have already adopted policies and/or programs to address climate change and the effects of greenhouse gases; and,

WHEREAS, Santa Barbara County has a long tradition of environmental stewardship, specifically in promoting the preservation of agricultural land and open space, an important component of greenhouse gas mitigation. Additionally, the County has already begun to engage in activities to reduce greenhouse gas emissions such as regional housing and transportation planning, the County Carbon Footprint Project, the Innovative Building Review Program, the Sustainable Public Architecture Directive, Tajiguas Landfill Gas Collection System and the recently approved Lompoc Wind Energy development; and,

WHEREAS, in November 2008, the Board of Supervisors reconstituted the County Sustainability and Conservation Team, charged with increasing energy efficiency and reducing greenhouse gas emissions from municipal operations; and,

NOW, THEREFORE, IT IS HEREBY RESOLVED that:

1. The above recitation is true and correct.
2. In acknowledgement of the growing and urgent concerns regarding global climate change and the expanding regulatory environment, the Santa Barbara County Board of Supervisors will:
  - a. Adopt Exhibit 1, The Santa Barbara County Climate Change Guiding Principles.
  - b. Take immediate, cost effective and coordinated steps to reduce the County's collective greenhouse gas emissions.
  - c. Direct County staff to seek funding, including grants and rebates, to offset general fund costs of preparing the County's greenhouse gas emission reduction strategy and implementing programmatic actions that support climate protection.

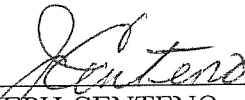
PASSED, APPROVED, AND ADOPTED by the Board of Supervisors of the County of Santa Barbara, State of California, this 17th day of March, 2009, by the following vote:

AYES: Supervisors Carbajal, Wolf, Farr, Gray and Centeno

NOES: None

ABSTAIN: None

ABSENT: None

  
\_\_\_\_\_  
JOSEPH CENTENO  
Chair, Board of Supervisors  
County of Santa Barbara

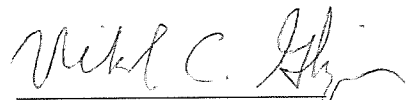
ATTEST:

MICHAEL F. BROWN  
Clerk of the Board of Supervisors

By:   
Deputy Clerk

APPROVED AS TO FORM:

DENNIS A. MARSHALL  
County Counsel

By:   
Deputy County Counsel

## **EXHIBIT 1: SANTA BARBARA COUNTY CLIMATE CHANGE GUIDING PRINCIPLES**

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1. Protecting the community from the effects of climate change is a high priority for Santa Barbara County (County).
2. The County recognizes the State of California's climate change goals, regulations, and requirements set forth by AB 32 to reduce Statewide greenhouse gas (GHG) emissions and will implement programs to comply with these requirements.
3. As outlined in the State's AB 32 Scoping Plan, the benefits of investing in actions to reduce GHG emissions can outweigh the costs in numerous ways, including: economic vitality; public health and safety; natural resource protection; and infrastructure stability.
4. In order to maintain long-term regional well-being, health and prosperity of current residents, as well as future generations of residents, the County will preserve and balance our shared social wellbeing, economic prosperity, environmental resources, and biodiversity.
5. The County recognizes that challenges associated with climate change are regional in nature and can best be addressed in partnership with both public and private sectors.
6. The County has three strategic roles to play in reducing GHG emissions: 1) a producer of GHG emissions, 2) a regulator of GHG emitting activities, and 3) an incentivizer of communitywide enhancements to reduce GHG emissions.
7. The County will preserve its fiscal health by conserving resources and promoting renewable resources, thereby reducing costs.
8. The County will enhance our local economy through the incubation of clean technology, by attracting innovative firms and talent through private sector incentives, and by creating opportunities for local residents to attain jobs and training in the growing regional green economy.
9. A key component in a successful climate strategy is the development of an effective and inclusive decision making process that promotes the sharing of information and encourages diverse public input.
10. Through coordinated planning, measurement, evaluation, and reporting, the County will continue to address state requirements, capitalize on economic opportunities, and protect the regional quality of life while strategically progressing towards regional sustainability.

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Appendix E

# Appendix E

## Assembly Bill No. 32

### CHAPTER 488

An act to add Division 25.5 (commencing with Section 38500) to the Health and Safety Code, relating to air pollution.

[Approved by Governor September 27, 2006. Filed with  
Secretary of State September 27, 2006.]

#### LEGISLATIVE COUNSEL'S DIGEST

AB 32, Nunez. Air pollution: greenhouse gases: California Global Warming Solutions Act of 2006.

Under existing law, the State Air Resources Board (state board), the State Energy Resources Conservation and Development Commission (Energy Commission), and the California Climate Action Registry all have responsibilities with respect to the control of emissions of greenhouse gases, as defined, and the Secretary for Environmental Protection is required to coordinate emission reductions of greenhouse gases and climate change activity in state government.

This bill would require the state board to adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program, as specified. The bill would require the state board to adopt a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020, as specified. The bill would require the state board to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions, as specified. The bill would authorize the state board to adopt market-based compliance mechanisms, as defined, meeting specified requirements. The bill would require the state board to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism adopted by the state board, pursuant to specified provisions of existing law. The bill would authorize the state board to adopt a schedule of fees to be paid by regulated sources of greenhouse gas emissions, as specified.

Because the bill would require the state board to establish emissions limits and other requirements, the violation of which would be a crime, this bill would create a state-mandated local program.

The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.



*The people of the State of California do enact as follows:*

SECTION 1. Division 25.5 (commencing with Section 38500) is added to the Health and Safety Code, to read:

DIVISION 25.5. CALIFORNIA GLOBAL WARMING SOLUTIONS  
ACT OF 2006

PART 1. GENERAL PROVISIONS

CHAPTER 1. TITLE OF DIVISION

38500. This division shall be known, and may be cited, as the California Global Warming Solutions Act of 2006.

CHAPTER 2. FINDINGS AND DECLARATIONS

38501. The Legislature finds and declares all of the following:

(a) Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

(b) Global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the state.

(c) California has long been a national and international leader on energy conservation and environmental stewardship efforts, including the areas of air quality protections, energy efficiency requirements, renewable energy standards, natural resource conservation, and greenhouse gas emission standards for passenger vehicles. The program established by this division will continue this tradition of environmental leadership by placing California at the forefront of national and international efforts to reduce emissions of greenhouse gases.

(d) National and international actions are necessary to fully address the issue of global warming. However, action taken by California to reduce emissions of greenhouse gases will have far-reaching effects by encouraging other states, the federal government, and other countries to act.

(e) By exercising a global leadership role, California will also position its economy, technology centers, financial institutions, and businesses to benefit from national and international efforts to reduce emissions of greenhouse gases. More importantly, investing in the development of innovative and pioneering technologies will assist California in achieving the 2020 statewide limit on emissions of greenhouse gases established by this division and will provide an opportunity for the state to take a global economic and technological leadership role in reducing emissions of greenhouse gases.

(f) It is the intent of the Legislature that the State Air Resources Board coordinate with state agencies, as well as consult with the environmental justice community, industry sectors, business groups, academic institutions, environmental organizations, and other stakeholders in implementing this division.

(g) It is the intent of the Legislature that the State Air Resources Board consult with the Public Utilities Commission in the development of emissions reduction measures, including limits on emissions of greenhouse gases applied to electricity and natural gas providers regulated by the Public Utilities Commission in order to ensure that electricity and natural gas providers are not required to meet duplicative or inconsistent regulatory requirements.

(h) It is the intent of the Legislature that the State Air Resources Board design emissions reduction measures to meet the statewide emissions limits for greenhouse gases established pursuant to this division in a manner that minimizes costs and maximizes benefits for California's economy, improves and modernizes California's energy infrastructure and maintains electric system reliability, maximizes additional environmental and economic co-benefits for California, and complements the state's efforts to improve air quality.

(i) It is the intent of the Legislature that the Climate Action Team established by the Governor to coordinate the efforts set forth under Executive Order S-3-05 continue its role in coordinating overall climate policy.

### CHAPTER 3. DEFINITIONS

38505. For the purposes of this division, the following terms have the following meanings:

(a) "Allowance" means an authorization to emit, during a specified year, up to one ton of carbon dioxide equivalent.

(b) "Alternative compliance mechanism" means an action undertaken by a greenhouse gas emission source that achieves the equivalent reduction of greenhouse gas emissions over the same time period as a direct emission reduction, and that is approved by the state board. "Alternative compliance mechanism" includes, but is not limited to, a

flexible compliance schedule, alternative control technology, a process change, or a product substitution.

(c) “Carbon dioxide equivalent” means the amount of carbon dioxide by weight that would produce the same global warming impact as a given weight of another greenhouse gas, based on the best available science, including from the Intergovernmental Panel on Climate Change.

(d) “Cost-effective” or “cost-effectiveness” means the cost per unit of reduced emissions of greenhouse gases adjusted for its global warming potential.

(e) “Direct emission reduction” means a greenhouse gas emission reduction action made by a greenhouse gas emission source at that source.

(f) “Emissions reduction measure” means programs, measures, standards, and alternative compliance mechanisms authorized pursuant to this division, applicable to sources or categories of sources, that are designed to reduce emissions of greenhouse gases.

(g) “Greenhouse gas” or “greenhouse gases” includes all of the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

(h) “Greenhouse gas emissions limit” means an authorization, during a specified year, to emit up to a level of greenhouse gases specified by the state board, expressed in tons of carbon dioxide equivalents.

(i) “Greenhouse gas emission source” or “source” means any source, or category of sources, of greenhouse gas emissions whose emissions are at a level of significance, as determined by the state board, that its participation in the program established under this division will enable the state board to effectively reduce greenhouse gas emissions and monitor compliance with the statewide greenhouse gas emissions limit.

(j) “Leakage” means a reduction in emissions of greenhouse gases within the state that is offset by an increase in emissions of greenhouse gases outside the state.

(k) “Market-based compliance mechanism” means either of the following:

(1) A system of market-based declining annual aggregate emissions limitations for sources or categories of sources that emit greenhouse gases.

(2) Greenhouse gas emissions exchanges, banking, credits, and other transactions, governed by rules and protocols established by the state board, that result in the same greenhouse gas emission reduction, over the same time period, as direct compliance with a greenhouse gas emission limit or emission reduction measure adopted by the state board pursuant to this division.

(l) “State board” means the State Air Resources Board.

(m) “Statewide greenhouse gas emissions” means the total annual emissions of greenhouse gases in the state, including all emissions of greenhouse gases from the generation of electricity delivered to and consumed in California, accounting for transmission and distribution line losses, whether the electricity is generated in state or imported. Statewide emissions shall be expressed in tons of carbon dioxide equivalents.

(n) “Statewide greenhouse gas emissions limit” or “statewide emissions limit” means the maximum allowable level of statewide greenhouse gas emissions in 2020, as determined by the state board pursuant to Part 3 (commencing with Section 38850).

#### CHAPTER 4. ROLE OF STATE BOARD

38510. The State Air Resources Board is the state agency charged with monitoring and regulating sources of emissions of greenhouse gases that cause global warming in order to reduce emissions of greenhouse gases.

#### PART 2. MANDATORY GREENHOUSE GAS EMISSIONS REPORTING

38530. (a) On or before January 1, 2008, the state board shall adopt regulations to require the reporting and verification of statewide greenhouse gas emissions and to monitor and enforce compliance with this program.

(b) The regulations shall do all of the following:

(1) Require the monitoring and annual reporting of greenhouse gas emissions from greenhouse gas emission sources beginning with the sources or categories of sources that contribute the most to statewide emissions.

(2) Account for greenhouse gas emissions from all electricity consumed in the state, including transmission and distribution line losses from electricity generated within the state or imported from outside the state. This requirement applies to all retail sellers of electricity, including load-serving entities as defined in subdivision (j) of Section 380 of the Public Utilities Code and local publicly owned electric utilities as defined in Section 9604 of the Public Utilities Code.

(3) Where appropriate and to the maximum extent feasible, incorporate the standards and protocols developed by the California Climate Action Registry, established pursuant to Chapter 6 (commencing with Section 42800) of Part 4 of Division 26. Entities that voluntarily participated in the California Climate Action Registry prior to December 31, 2006, and have developed a greenhouse gas emission reporting program, shall not be required to significantly alter their reporting or verification program except as necessary to ensure that reporting is complete and verifiable for the purposes of compliance with this division as determined by the state board.

(4) Ensure rigorous and consistent accounting of emissions, and provide reporting tools and formats to ensure collection of necessary data.

(5) Ensure that greenhouse gas emission sources maintain comprehensive records of all reported greenhouse gas emissions.

(c) The state board shall do both of the following:

(1) Periodically review and update its emission reporting requirements, as necessary.

(2) Review existing and proposed international, federal, and state greenhouse gas emission reporting programs and make reasonable efforts to promote consistency among the programs established pursuant to this part and other programs, and to streamline reporting requirements on greenhouse gas emission sources.

### PART 3. STATEWIDE GREENHOUSE GAS EMISSIONS LIMIT

38550. By January 1, 2008, the state board shall, after one or more public workshops, with public notice, and an opportunity for all interested parties to comment, determine what the statewide greenhouse gas emissions level was in 1990, and approve in a public hearing, a statewide greenhouse gas emissions limit that is equivalent to that level, to be achieved by 2020. In order to ensure the most accurate determination feasible, the state board shall evaluate the best available scientific, technological, and economic information on greenhouse gas emissions to determine the 1990 level of greenhouse gas emissions.

38551. (a) The statewide greenhouse gas emissions limit shall remain in effect unless otherwise amended or repealed.

(b) It is the intent of the Legislature that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020.

(c) The state board shall make recommendations to the Governor and the Legislature on how to continue reductions of greenhouse gas emissions beyond 2020.

### PART 4. GREENHOUSE GAS EMISSIONS REDUCTIONS

38560. The state board shall adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions from sources or categories of sources, subject to the criteria and schedules set forth in this part.

38560.5. (a) On or before June 30, 2007, the state board shall publish and make available to the public a list of discrete early action greenhouse gas emission reduction measures that can be implemented prior to the measures and limits adopted pursuant to Section 38562.

(b) On or before January 1, 2010, the state board shall adopt regulations to implement the measures identified on the list published pursuant to subdivision (a).

(c) The regulations adopted by the state board pursuant to this section shall achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions from those sources or categories of

sources, in furtherance of achieving the statewide greenhouse gas emissions limit.

(d) The regulations adopted pursuant to this section shall be enforceable no later than January 1, 2010.

38561. (a) On or before January 1, 2009, the state board shall prepare and approve a scoping plan, as that term is understood by the state board, for achieving the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions from sources or categories of sources of greenhouse gases by 2020 under this division. The state board shall consult with all state agencies with jurisdiction over sources of greenhouse gases, including the Public Utilities Commission and the State Energy Resources Conservation and Development Commission, on all elements of its plan that pertain to energy related matters including, but not limited to, electrical generation, load based-standards or requirements, the provision of reliable and affordable electrical service, petroleum refining, and statewide fuel supplies to ensure the greenhouse gas emissions reduction activities to be adopted and implemented by the state board are complementary, nonduplicative, and can be implemented in an efficient and cost-effective manner.

(b) The plan shall identify and make recommendations on direct emission reduction measures, alternative compliance mechanisms, market-based compliance mechanisms, and potential monetary and nonmonetary incentives for sources and categories of sources that the state board finds are necessary or desirable to facilitate the achievement of the maximum feasible and cost-effective reductions of greenhouse gas emissions by 2020.

(c) In making the determinations required by subdivision (b), the state board shall consider all relevant information pertaining to greenhouse gas emissions reduction programs in other states, localities, and nations, including the northeastern states of the United States, Canada, and the European Union.

(d) The state board shall evaluate the total potential costs and total potential economic and noneconomic benefits of the plan for reducing greenhouse gases to California's economy, environment, and public health, using the best available economic models, emission estimation techniques, and other scientific methods.

(e) In developing its plan, the state board shall take into account the relative contribution of each source or source category to statewide greenhouse gas emissions, and the potential for adverse effects on small businesses, and shall recommend a de minimis threshold of greenhouse gas emissions below which emission reduction requirements will not apply.

(f) In developing its plan, the state board shall identify opportunities for emission reductions measures from all verifiable and enforceable voluntary actions, including, but not limited to, carbon sequestration projects and best management practices.

(g) The state board shall conduct a series of public workshops to give interested parties an opportunity to comment on the plan. The state board shall conduct a portion of these workshops in regions of the state that have the most significant exposure to air pollutants, including, but not limited to, communities with minority populations, communities with low-income populations, or both.

(h) The state board shall update its plan for achieving the maximum technologically feasible and cost-effective reductions of greenhouse gas emissions at least once every five years.

38562. (a) On or before January 1, 2011, the state board shall adopt greenhouse gas emission limits and emission reduction measures by regulation to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions in furtherance of achieving the statewide greenhouse gas emissions limit, to become operative beginning on January 1, 2012.

(b) In adopting regulations pursuant to this section and Part 5 (commencing with Section 38570), to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit, the state board shall do all of the following:

(1) Design the regulations, including distribution of emissions allowances where appropriate, in a manner that is equitable, seeks to minimize costs and maximize the total benefits to California, and encourages early action to reduce greenhouse gas emissions.

(2) Ensure that activities undertaken to comply with the regulations do not disproportionately impact low-income communities.

(3) Ensure that entities that have voluntarily reduced their greenhouse gas emissions prior to the implementation of this section receive appropriate credit for early voluntary reductions.

(4) Ensure that activities undertaken pursuant to the regulations complement, and do not interfere with, efforts to achieve and maintain federal and state ambient air quality standards and to reduce toxic air contaminant emissions.

(5) Consider cost-effectiveness of these regulations.

(6) Consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources, and other benefits to the economy, environment, and public health.

(7) Minimize the administrative burden of implementing and complying with these regulations.

(8) Minimize leakage.

(9) Consider the significance of the contribution of each source or category of sources to statewide emissions of greenhouse gases.

(c) In furtherance of achieving the statewide greenhouse gas emissions limit, by January 1, 2011, the state board may adopt a regulation that establishes a system of market-based declining annual aggregate emission limits for sources or categories of sources that emit greenhouse gas emissions, applicable from January 1, 2012, to December 31, 2020, inclusive, that the state board determines will achieve the maximum

technologically feasible and cost-effective reductions in greenhouse gas emissions, in the aggregate, from those sources or categories of sources.

(d) Any regulation adopted by the state board pursuant to this part or Part 5 (commencing with Section 38570) shall ensure all of the following:

(1) The greenhouse gas emission reductions achieved are real, permanent, quantifiable, verifiable, and enforceable by the state board.

(2) For regulations pursuant to Part 5 (commencing with Section 38570), the reduction is in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur.

(3) If applicable, the greenhouse gas emission reduction occurs over the same time period and is equivalent in amount to any direct emission reduction required pursuant to this division.

(e) The state board shall rely upon the best available economic and scientific information and its assessment of existing and projected technological capabilities when adopting the regulations required by this section.

(f) The state board shall consult with the Public Utilities Commission in the development of the regulations as they affect electricity and natural gas providers in order to minimize duplicative or inconsistent regulatory requirements.

(g) After January 1, 2011, the state board may revise regulations adopted pursuant to this section and adopt additional regulations to further the provisions of this division.

38563. Nothing in this division restricts the state board from adopting greenhouse gas emission limits or emission reduction measures prior to January 1, 2011, imposing those limits or measures prior to January 1, 2012, or providing early reduction credit where appropriate.

38564. The state board shall consult with other states, and the federal government, and other nations to identify the most effective strategies and methods to reduce greenhouse gases, manage greenhouse gas control programs, and to facilitate the development of integrated and cost-effective regional, national, and international greenhouse gas reduction programs.

38565. The state board shall ensure that the greenhouse gas emission reduction rules, regulations, programs, mechanisms, and incentives under its jurisdiction, where applicable and to the extent feasible, direct public and private investment toward the most disadvantaged communities in California and provide an opportunity for small businesses, schools, affordable housing associations, and other community institutions to participate in and benefit from statewide efforts to reduce greenhouse gas emissions.



## PART 5. MARKET-BASED COMPLIANCE MECHANISMS

38570. (a) The state board may include in the regulations adopted pursuant to Section 38562 the use of market-based compliance mechanisms to comply with the regulations.

(b) Prior to the inclusion of any market-based compliance mechanism in the regulations, to the extent feasible and in furtherance of achieving the statewide greenhouse gas emissions limit, the state board shall do all of the following:

(1) Consider the potential for direct, indirect, and cumulative emission impacts from these mechanisms, including localized impacts in communities that are already adversely impacted by air pollution.

(2) Design any market-based compliance mechanism to prevent any increase in the emissions of toxic air contaminants or criteria air pollutants.

(3) Maximize additional environmental and economic benefits for California, as appropriate.

(c) The state board shall adopt regulations governing how market-based compliance mechanisms may be used by regulated entities subject to greenhouse gas emission limits and mandatory emission reporting requirements to achieve compliance with their greenhouse gas emissions limits.

38571. The state board shall adopt methodologies for the quantification of voluntary greenhouse gas emission reductions. The state board shall adopt regulations to verify and enforce any voluntary greenhouse gas emission reductions that are authorized by the state board for use to comply with greenhouse gas emission limits established by the state board. The adoption of methodologies is exempt from the rulemaking provisions of the Administrative Procedure Act (Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code).

38574. Nothing in this part or Part 4 (commencing with Section 38560) confers any authority on the state board to alter any programs administered by other state agencies for the reduction of greenhouse gas emissions.

## PART 6. ENFORCEMENT

38580. (a) The state board shall monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism adopted by the state board pursuant to this division.

(b) (1) Any violation of any rule, regulation, order, emission limitation, emissions reduction measure, or other measure adopted by the state board pursuant to this division may be enjoined pursuant to Section 41513, and the violation is subject to those penalties set forth in Article 3 (commencing with Section 42400) of Chapter 4 of Part 4 of, and Chapter 1.5 (commencing with Section 43025) of Part 5 of, Division 26.

(2) Any violation of any rule, regulation, order, emission limitation, emissions reduction measure, or other measure adopted by the state board pursuant to this division shall be deemed to result in an emission of an air contaminant for the purposes of the penalty provisions of Article 3 (commencing with Section 42400) of Chapter 4 of Part 4 of, and Chapter 1.5 (commencing with Section 43025) of Part 5 of, Division 26.

(3) The state board may develop a method to convert a violation of any rule, regulation, order, emission limitation, or other emissions reduction measure adopted by the state board pursuant to this division into the number of days in violation, where appropriate, for the purposes of the penalty provisions of Article 3 (commencing with Section 42400) of Chapter 4 of Part 4 of, and Chapter 1.5 (commencing with Section 43025) of Part 5 of, Division 26.

(c) Section 42407 and subdivision (i) of Section 42410 shall not apply to this part.

#### PART 7. MISCELLANEOUS PROVISIONS

38590. If the regulations adopted pursuant to Section 43018.5 do not remain in effect, the state board shall implement alternative regulations to control mobile sources of greenhouse gas emissions to achieve equivalent or greater reductions.

38591. (a) The state board, by July 1, 2007, shall convene an environmental justice advisory committee, of at least three members, to advise it in developing the scoping plan pursuant to Section 38561 and any other pertinent matter in implementing this division. The advisory committee shall be comprised of representatives from communities in the state with the most significant exposure to air pollution, including, but not limited to, communities with minority populations or low-income populations, or both.

(b) The state board shall appoint the advisory committee members from nominations received from environmental justice organizations and community groups.

(c) The state board shall provide reasonable per diem for attendance at advisory committee meetings by advisory committee members from nonprofit organizations.

(d) The state board shall appoint an Economic and Technology Advancement Advisory Committee to advise the state board on activities that will facilitate investment in and implementation of technological research and development opportunities, including, but not limited to, identifying new technologies, research, demonstration projects, funding opportunities, developing state, national, and international partnerships and technology transfer opportunities, and identifying and assessing research and advanced technology investment and incentive opportunities that will assist in the reduction of greenhouse gas emissions. The committee may also advise the state board on state, regional, national, and

international economic and technological developments related to greenhouse gas emission reductions.

38592. (a) All state agencies shall consider and implement strategies to reduce their greenhouse gas emissions.

(b) Nothing in this division shall relieve any person, entity, or public agency of compliance with other applicable federal, state, or local laws or regulations, including state air and water quality requirements, and other requirements for protecting public health or the environment.

38593. (a) Nothing in this division affects the authority of the Public Utilities Commission.

(b) Nothing in this division affects the obligation of an electrical corporation to provide customers with safe and reliable electric service.

38594. Nothing in this division shall limit or expand the existing authority of any district, as defined in Section 39025.

38595. Nothing in this division shall preclude, prohibit, or restrict the construction of any new facility or the expansion of an existing facility subject to regulation under this division, if all applicable requirements are met and the facility is in compliance with regulations adopted pursuant to this division.

38596. The provisions of this division are severable. If any provision of this division or its application is held invalid, that invalidity shall not affect other provisions or applications that can be given effect without the invalid provision or application.

38597. The state board may adopt by regulation, after a public workshop, a schedule of fees to be paid by the sources of greenhouse gas emissions regulated pursuant to this division, consistent with Section 57001. The revenues collected pursuant to this section, shall be deposited into the Air Pollution Control Fund and are available upon appropriation, by the Legislature, for purposes of carrying out this division.

38598. (a) Nothing in this division shall limit the existing authority of a state entity to adopt and implement greenhouse gas emissions reduction measures.

(b) Nothing in this division shall relieve any state entity of its legal obligations to comply with existing law or regulation.

38599. (a) In the event of extraordinary circumstances, catastrophic events, or threat of significant economic harm, the Governor may adjust the applicable deadlines for individual regulations, or for the state in the aggregate, to the earliest feasible date after that deadline.

(b) The adjustment period may not exceed one year unless the Governor makes an additional adjustment pursuant to subdivision (a).

(c) Nothing in this section affects the powers and duties established in the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code).

(d) The Governor shall, within 10 days of invoking subdivision (a), provide written notification to the Legislature of the action undertaken.

SEC. 2 No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that

may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.

**Appendix B – Baseline and Forecasted GHG Emissions  
Inventory for the Unincorporated County**

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# Baseline and Forecasted GHG Emissions Inventory for the Unincorporated County

*Prepared For:*

**County of Santa Barbara  
Office of Long Range Planning**

January 2011

*Prepared By:*

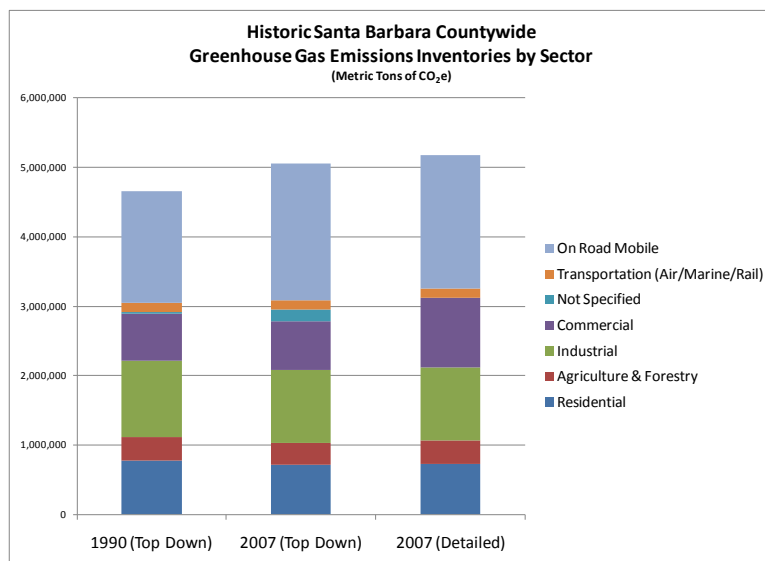


## Executive Summary

Historic and projected emission inventories for the unincorporated jurisdiction of Santa Barbara County are presented for 1990, 2007, 2020 and 2035. The 1990 and 2020 inventories are relevant to Assembly Bill 32 (Health and Safety Code Section 35000 et seq.) mileposts. The 2007 inventory complies with both CARB’s directive on local government planning and with a companion state law in Senate Bill 375 (Chapter 728 of the Statutes of 2008) that requires local governments take actions to reduce on-road GHG emissions. The Santa Barbara County Air Pollution Control District (SBAPCD) and the Santa Barbara County Association of Governments (SBCAG) use 2007 as the basis for their analysis on this issue. The 2035 forecast is consistent with CARB’s choice of planning horizon for implementing SB 375.

The emissions inventory includes all areas within the unincorporated County under the land-use jurisdiction of the County. It excludes incorporated cities, the University of California (UCSB), tribal, State and federal lands.<sup>1</sup> Incorporated area exclusions include the incorporated communities of Buellton, Carpinteria, Goleta, Guadalupe, Lompoc, Santa Barbara, Santa Maria and Solvang. Federal jurisdictional exclusions include Los Padres National Forest and the Vandenberg Air Force Base, as well as the

Figure ES 1



offshore oil production facilities on the Outer Continental Shelf (OCS)

and State waters up to the mean high tide water line. Tribal lands excluded are within the Chumash reservation.

Because much of the detailed energy and emissions data is only available for recent years, a different method was used to prepare the 1990 inventory versus the 2007 inventory. To address this disparity, a second 2007 inventory was prepared using the same “top down” method as the 1990 inventory. **Figures ES-1 and ES-2** compare the inventories for 1990 and 2007 using a “top-down”

method to the 2007 inventory using the “detailed” approach. Figure ES-1 is for the County as a whole; Figure ES-2 is for the unincorporated County. In general, the two methodologies arrive at similar estimates, with the only significant difference arising among Scope 2 emissions from an inability to collect industry-specific electricity usage for the County in 1990.

<sup>1</sup> While a separate inventory of County government municipal facilities and activities has been prepared, those emissions are also included here because the data sources that we relied on do not have sufficient resolution to separate out those activities.



Over that time period, population for the entire county rose 9.4 percent from 369,608 to 404,197, households increased 11.4 percent from 138,149 to 153,933, and employment climbed from 159,700 to 189,700 jobs.

Countywide emissions appear to have increased somewhat by 8 percent, but a reduction in industrial activity and a shift in stationary fuel types towards natural gas in the residential and commercial sectors lead to a 10 percent reduction from stationary sources. On the other hand, mobile sources increased by 50 percent.

In the Unincorporated County, population rose more slowly at 8.3 percent from 130,167 to 140,929 after excluding Buellton and Goleta. Meanwhile, industrial employment fell 10 percent from 22,372 to 20,098

Figure ES 2

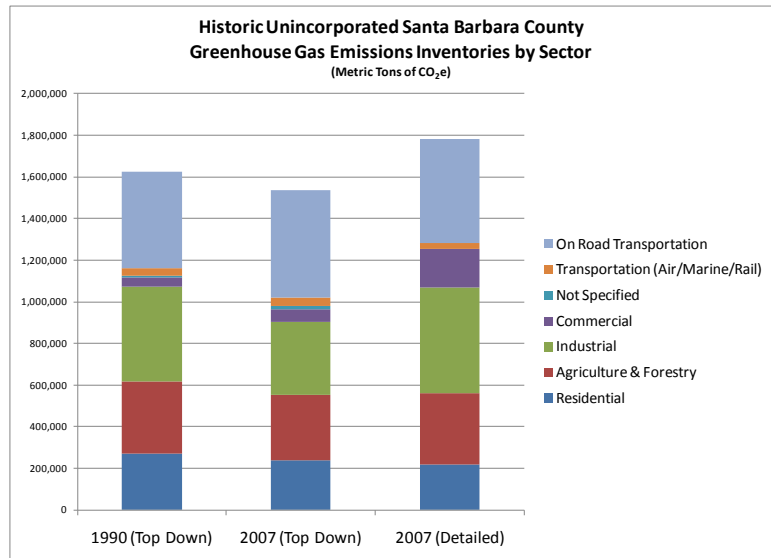
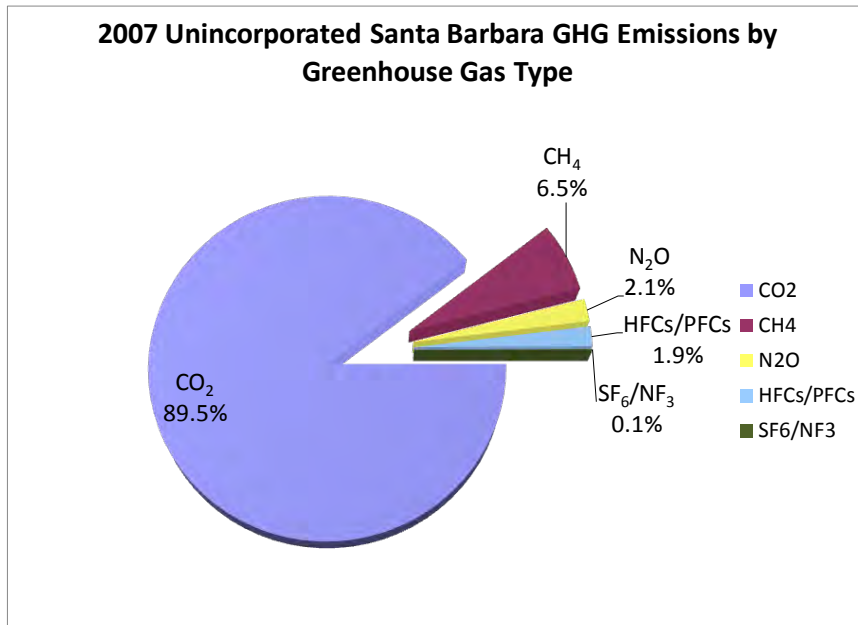


Figure ES 3



jobs. The commensurate GHG emissions fell by 5 percent, lead by a 13 percent decrease in stationary sources. A drop in industrial emissions, driven by an apparent loss of jobs in that sector, explains the largest share. Mobile source emissions increased by 11 percent.

**Figure ES-3** shows the components of the greenhouse gases in the Unincorporated County's emission inventory. As with the Statewide inventory, carbon dioxide (CO<sub>2</sub>) is the dominant constituent.

Figure ES 4

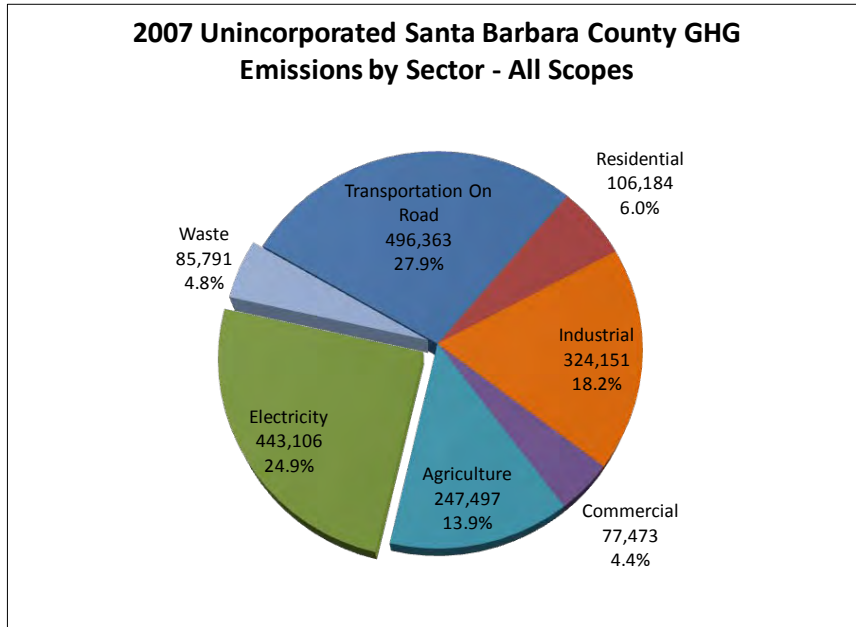


Figure ES-4 shows the 2007 inventory segmented by activity sector. On-road transportation is the largest source with electricity next. Both of these represent amalgamations of various economic activities. Industrial is the largest direct emitter from stationary sources.

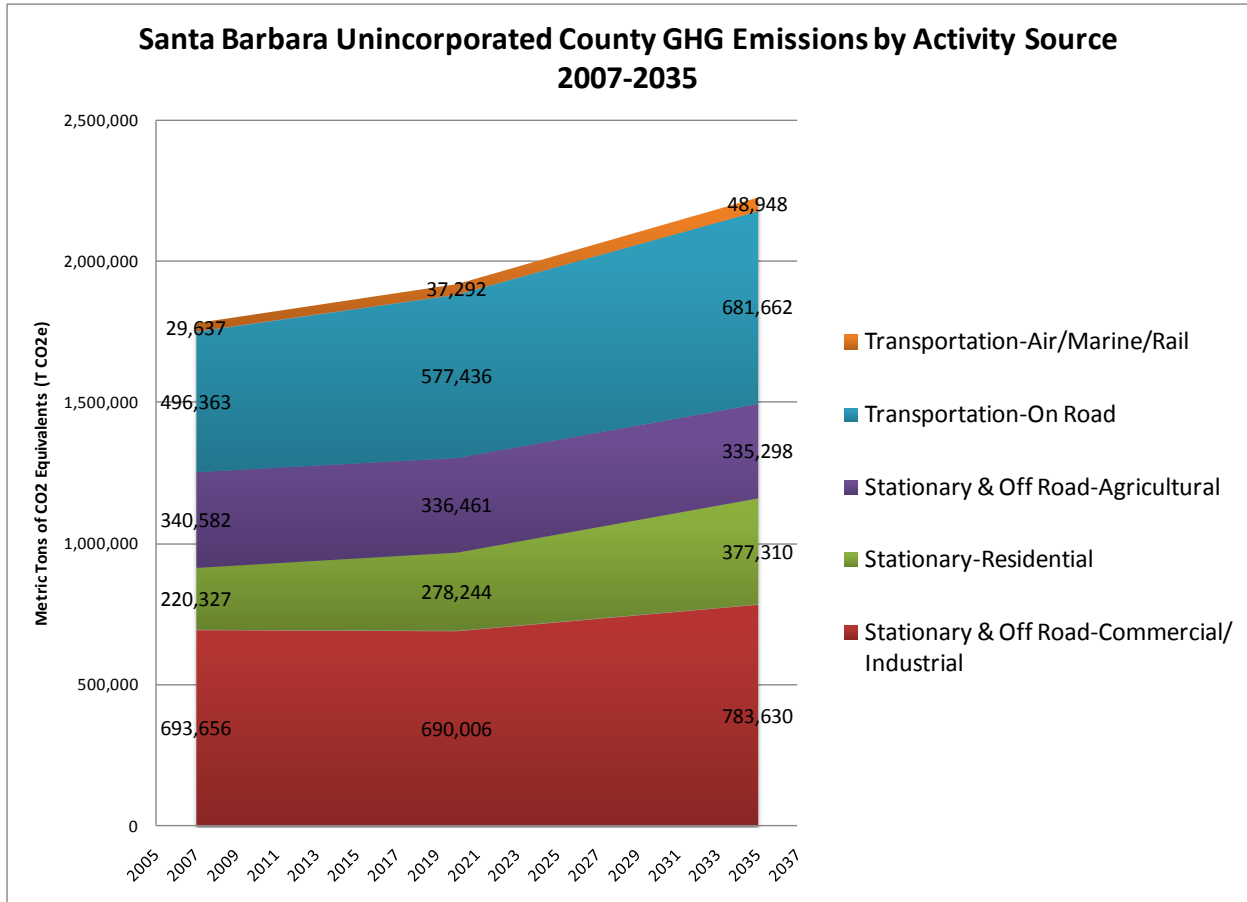
Table ES-1 and Figure ES-5 shows a forecast of emissions growth from 2007 to 2035 based on emission factors derived from CARB’s GHG Inventory and other sources, and the SBCAG’s Regional Growth Forecast. Total emissions are projected in the

“business as usual” case to grow from 1.78 million metric tons of CO<sub>2</sub> equivalent gases by 0.8 percent per year over the period to 2.23 million tons, increasing 25 percent. In comparison, total Countywide emissions are forecasted to rise by 1.5 percent per year or by 54 percent over the 28-year period. The projected 2020 BAU emissions using the 2007 inventory are 1.92 million tons of CO<sub>2</sub>e.

Table ES-1

Unincorporated County GHG Emissions	2007	2020	2035
Scope 1 Direct	1,336,290	1,561,588	1,839,428
<i>Growth</i>		16.9%	37.7%
Scope 2 Indirect	444,275	357,851	387,419
<i>Growth</i>		-19.5%	-12.8%
<b>Total</b>	<b>1,780,565</b>	<b>1,919,439</b>	<b>2,226,848</b>
<i>Growth</i>		7.8%	25.1%
Population (SBCAG)	138,176	145,934	153,993
<i>Growth</i>		5.6%	11.4%
Employment (SBCAG)	19,663	22,188	24,005
<i>Growth</i>		12.8%	22.1%

Figure ES 5



This report details the methodology used to collect the data on energy use and other emission sources, the relationship of emissions to various activities, and projections of socio-economic activity through 2035. The resulting inventory and forecast are described in several different dimensions. Underlying this analysis is a detailed spreadsheet-based model that accommodates changes in assumptions and be updated in the future.

As with most forecasts, the ones presented in this report are intended to be indicative and not predictive. The underlying algorithms are tied to parameters and assumptions that can be varied to see how differences in population and job growth or changes in emission rate coefficients affect the project inventories. Substantial uncertainty exists around both the underlying socio-economic forecasts from SBCAG, and the actual emission rates for different activities.

In addition, the emission sources and amounts are included in a geographic information systems (GIS) database. This GIS database was integral to segmenting emissions between jurisdictions. Maps depicting the GIS data are included in this report.

## Introduction

Greenhouse gas emission inventories are presented for all of Santa Barbara County for 2007, and for the unincorporated jurisdiction of Santa Barbara County for 1990, 2007, 2020 and 2035. The 1990 and 2020 inventories are relevant to Assembly Bill 32 (Health and Safety Code Section 35000 et seq.) mileposts. The 2007 inventory complies with both CARB's directive on local government planning and with a companion state law in Senate Bill 375 (Chapter 728 of the Statutes of 2008) that requires local governments take actions to reduce on-road GHG emissions. The Santa Barbara County Air Pollution Control District (SBAPCD) and the Santa Barbara County Association of Governments (SBCAG) use 2007 as the basis for their analysis on this issue. The 2035 forecast is consistent with CARB's choice of planning horizon for implementing SB 375.

This report details the methodology used to collect the data on energy use and other emission sources, the relationship of emissions to various activities, and projections of socio-economic activity through 2035. The resulting inventory and forecast are described in several different dimensions. Underlying this analysis is a detailed spreadsheet-based model that accommodates changes in assumptions and can be updated in the future.

In addition, the emission sources and amounts are included in a geographic information systems (GIS) database. This GIS database was integral to segmenting emissions between jurisdictions. Maps depicting the GIS data are included in this report.

## Inventory Methodology

The inventory analysis presented in this report builds off of existing Statewide data sets and various Santa Barbara County agencies' sources that compile GHG emission sources and related analyses that are relevant to the County. These studies include fuel use, GHG-related production activities, and economic and demographic forecasts. The emission inventory has been compiled to match the International Council for Local Environmental Initiatives (ICLEI) Clean Air and Climate Protection (CACP 2009) Software data collection protocol.

The emission inventory includes two sets of the emissions spelled out in the ICLEI Protocol:

- **Scope 1:** All direct GHG emissions (with the exception of direct CO<sub>2</sub> emissions from biogenic sources), including stationary, area, and mobile sources. Agricultural activities such as dairies and vineyards are included here.
- **Scope 2:** Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling, water and wastewater pumping, and solid waste transport and disposal at out-of-county facilities.

The baseline does not include the Scope 3 emissions defined by ICLEI as:

- **Scope 3:** All other indirect emissions not covered in Scope 2, such as emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not

owned or controlled by the reporting entity (e.g., employee commuting and business travel), outsourced activities, waste disposal, etc.<sup>2</sup>

A discussion of the ICLEI inputs and outputs is included in Appendix C to this report.

## Inventory Study Area

The emissions inventory includes all areas within the unincorporated County under the land-use jurisdiction of the County. It excludes incorporated cities, the University of California (UCSB), tribal, State and federal lands.<sup>3</sup> Incorporated area exclusions include the incorporated communities of Buellton, Carpinteria, Goleta, Guadalupe, Lompoc, Santa Barbara, Santa Maria and Solvang. Federal jurisdictional exclusions include Los Padres National Forest and the Vandenberg Air Force Base, as well as the offshore oil production facilities on the Outer Continental Shelf (OCS) and State waters up to the mean high tide water line. Tribal lands excluded are within the Chumash reservation.

The GHG Emissions Inventory covers all emissions produced by County municipal operations located in the unincorporated County. These are a portion of the emissions captured in the County's General Services inventory of County-owned/operated facilities being addressed separately. The County is relying on the inventory conducted by General Services to account for its own municipal services (government sector) emissions that would be attributable to each of these Scopes.

A polygon region map layer for the geographic information system (GIS) has been created delineating the boundaries of the 'Unincorporated County' as defined for the Inventory and polygon and point layers showing the locations of the regions and point sources to be excluded from the Inventory. These map layers served as a source for map graphics for the final report as well as functional tools facilitating the socioeconomic forecasts and the inventory. A full list of the 38 layers in the GIS database is included in Appendix A on data sources.

## Greenhouse Gases in the Inventory

Emissions from seven greenhouse gases (GHGs) have been targeted for reduction by the County, including the six primary GHGs under Assembly Bill 32 plus nitrogen trifluoride (see Health and Safety Code 38500 *et seq.*). Table 1 below lists the GHGs and their uses and sources as well as the economic activities associated with each GHG source.

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<sup>2</sup> To estimate Scope 3 emissions would require a complete life-cycle analysis of all products produced worldwide. No such methodology yet exists that can provide an adequate and realistic estimate of these life-cycle emissions. For the example, the California Air Resources Board is still, after four years, trying to define an approach for calculating the life-cycle emissions from fuel production to be able to fully implement its LCFS proposal. In addition, ICLEI has not developed a protocol for calculating these emissions. The few jurisdictions that have purportedly calculated Scope 3 emissions in fact incorrectly included waste disposal emissions that should have been accounted for under Scope 2 as is done in this study. For this reason, we recommend that the County defer calculating Scope 3 emissions for the time being.

<sup>3</sup> While a separate inventory of County government municipal facilities and activities has been prepared, those emissions within the County's jurisdiction are also included here because the data sources that we relied on do not have sufficient resolution to separate out those activities.

Table 1. AB 32 Greenhouse Gases

Gas	GWP	Main Sources	CO <sub>2</sub> Equivalent GWP	Uses / Sources	Industry/Activity
Carbon Dioxide	(CO <sub>2</sub> )	1		Combustion of fossil fuels (solid, liquid and gaseous fuels) for energy purposes.	Transportation, heating, electricity generation, and motive power
				Incineration of solid wastes	Landfills
				Incineration of lime stone in industrial process (e.g., cement production)	Cement production, construction
Methane	(CH <sub>4</sub> )	21		Anaerobic fermentation at landfills	Landfills
				Combustion of fossil fuels for energy purposes.	See above
				Anaerobic treatment of waste water	Wastewater/sewage; livestock/dairy
				Animal manure	Livestock/dairy
				Rice production	Agriculture
Nitrous Oxide	(N <sub>2</sub> O)	310		Raw material production process of chemical industry	Chemical industry
				Combustion of fossil fuels for energy purposes.	See above
				Digestion process of animal manure	Livestock/dairy
Hydrofluorocarbon	(HFCs)	140 - 11,700		Leakage of cooling medium used in refrigerators air-conditioning device, etc.	Commercial / residential
				Leakage from heat insulating materials used in buildings and houses (foaming agent)	Commercial / residential
Perfluorocarbon	(PFCs)	6,500 - 9,200		Fluxing materials in metal cleaning process	Metal manufacturing
				Etching agent in production process of semiconductors	Electronics manufacturing
Sulphur hexafluoride	(SF <sub>6</sub> )	23,900		Production process of semiconductor material	Electronics manufacturing
				Electricity equipment insulating gas	Electricity production
				Cover gas for magnesium melting process	Metal manufacturing
Nitrogen trifluoride	(NF <sub>3</sub> )	17,000		Manufacturing of liquid crystal display (LCD) televisions, computer circuits and thin-film solar cells	Electronics manufacturing

Source: Aspen Environmental Group, June 2010

## Developing the Baseline Use for 2007

GHG-generating activity estimates are derived from past County-differentiated fuel use and emission inventories consistent with the ICLEI protocol and CARB's Assembly Bill 32 (AB 32) Statewide inventories for 1990 and a current baseline for 2007. The "current" year is chosen to meet the needs of the County's CAS, and to be consistent with other regulatory and planning agencies. It also is

constrained by the availability of recorded data from various sources. The year 2007 is the most recent year for which such data is consistently available.

The inventory presented here is the first such estimate for this source for the entire County as well as the unincorporated area. The basic emission data came from a variety of sources. CARB released a Statewide inventory update for 2000-2008 in May 2010. SBAPCD prepared draft CO<sub>2</sub> emission inventory based on 2007 data, with a draft completed in April 2010. The on-road mobile source usage inventory was provided by SBCAG and the emissions developed using CARB's EMFAC model. These data sets are the core for the 2007 baseline data set, but they were extensively supplemented. Since SBAPCD has already identified the CO<sub>2</sub> emissions from these sources (except where noted either from SBCAG or by the Aspen Team), these categories are used to segment the other GHG emissions. The non-CO<sub>2</sub> GHG emissions are estimated using the emission rates per activity unit from CARB's GHG inventory database, multiplied by the relevant activity units either comparable to the CO<sub>2</sub> inventory or linked to County-specific data. The emission rates per activity are compiled or calculated from:

- SBAPCD emission rate factor per source;
- CARB's GHG inventory emission rate per activity unit; or
- Directly referenced sources (e.g., CARB standard carbon content per fuel unit, California Energy Commission (CEC) electricity generation source reports, California Board of Equalization (BOE) transportation fuel sales divided by Caltrans vehicle mileage data, University of California Cooperative Extension crop budgets fuel use and fertilizer application).

Estimation of emissions for individual sectors is described in greater detail with supporting tables in **Appendix A** of this report.

### **Identifying Socio-economic Categories and Related Activity Measures**

Emissions are calculated by economic activity, broken out by GHG type or speciation. Economic sectors are segmented per CARB / SBAPCD categories,<sup>4</sup> with the following codes added where available or applicable:

- Santa Barbara County land use Assessor codes,
- SBCAG land use codes,
- U.S. Bureau of Economic Activity North American Industrial Classification System (NAICS),
- U.S. Bureau of Economic Activity Standard Industrial Classification (SIC),
- CARB Category and Emission Inventory Codes (EIC),
- Intergovernmental Panel on Climate Change (IPCC) activity categories.
- The economic activity codes are associated with each of the emission source codes to correlate activity and emissions.

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<sup>4</sup> The list of codes are included in the Appendix A.

## Representing the Geographic Distribution of Emissions

An important additional step in preparing this inventory is being able to geographically segment emissions to correspond with characteristics in specific locations. Only by making this differentiation can a more accurate assignment be made among jurisdictions. Much of the State's energy and economic data is segmented only to the county level. Preparing this inventory required carving out cities, federal and state lands, and tribal nations. The Aspen Team used GIS data and other sources to make this refinement. A more detailed discussion of the methodology is included in the Appendix A.

The inventory data is linked to the GIS data on land uses and activities through the corresponding County land use (i.e., 10 sectors) to show the geographic distribution of emissions across the County. This data also is tied to other relevant activity sector codes, e.g., SIC, IPCC, where possible.

## Using and Developing Local Emission Data Sets

The SBAPCD CO<sub>2</sub> inventory is dominated by four main categories of sources:

- large point sources that can be individually identified (and regulated);
- diffuse small commercial area sources,
- residential fuel combustion, and
- off-road mobile sources including air travel, railroads, marine, construction and agriculture.

SBAPCD's inventory excludes electricity use (except where self-generated, such as at several of the oil and gas production facilities. This usage is appropriately included in the Scope 2 emissions group and is discussed below. Electricity used to pump water deliveries through the State Water Project (SWP) also is included in the Scope 2 category. SBAPCD had not incorporated on-road transportation emissions yet as that the District was awaiting the vehicle miles traveled (VMT) projections from SBCAG. Those VMT projections are incorporated separately here as discussed below.

We used CEC natural gas sales data by County and by economic sector to geographically disaggregate the commercial and residential area sources. For the latter, we used Southern California Gas Company's climate zone baseline allowances to determine average usage within those zones in the County. Emissions are then allocated across households. SBAPCD's inventory identifies the emissions and fuel source for the large point sources. The air travel, railroad and marine emissions were taken from SBAPCD as well. In the case of marine emissions, much are in federal and state waters and thus outside the County's jurisdiction that ends at the mean high tide line; in other words, there are no marine emissions in the unincorporated County inventory. SBAPCD used Federal Aviation Administration (FAA) data on airport operations and flight schedules to determine airport emissions through an FAA model. Emissions among airports indifferent jurisdictions were allocated based on relative operational shares and by type of aviation operation. Rail emissions are allocated on a per mile basis.

## Off-Road and Agricultural Emissions

The largest difference with the draft SBAPCD inventory is in the off-road construction, industrial and agricultural emissions. The CARB has used its OFFROAD criteria pollutant simulation model in the past



to estimate GHG emissions in earlier inventories, but recent review has found that this method overestimates emissions by as much as 340 percent. The inventory for these sources was recalculated relying on U.S. Energy Information Administration (EIA) and the State Board of Equalization (BOE) fuel sales data for the state.

Construction fleets are the largest source, constituting 75 percent of the non-agricultural emissions. Emissions for this sector are allocated from the Statewide level to the entire County based on building permits issued as a share of the Statewide amount. Emissions within the County are then allocated based on employment shares derived from the SBCAG RGF as previous work by the Aspen Team has shown that this is a reasonable proxy for fleet size and activity. Other industrial emissions were allocated based on Statewide employment by sector from California Employment Development Department (EDD) data by county, and then allocated within the County from the SBCAG RGF. Oil drilling and workover equipment emissions were allocated Statewide based on drilling activity from the Division of Oil, Gas, and Geothermal Resources (DOGGR) annual reports for 2007.

For rail operations, we used 2007 rail emissions estimates for the County from SBAPCD and 2006 rail emissions estimates for California from CARB Greenhouse Gas Inventory. We estimated the ratio of rail emissions for the County and State and allocated them on a per mile of rail basis.

Agricultural emissions were allocated Statewide based on the farm production expenses for utilities, farm equipment fuel, fertilizer and soil amendment, and animal feed purchases reported to the U.S. Department of Agriculture's (USDA) 2007 Census of Agriculture for California and Santa Barbara County. Utilities are used to allocate electricity use; fuel for diesel and gasoline consumption; fertilizer and soil amendments for cultivation-related emissions and animal feed for livestock emissions. Emissions were calculated for cultivation for individual crops within the County from Cost and Return Studies prepared by the University of California's Cooperative Extension. The per acre rates were applied to the amount of harvested acreage and found to closely approximate SBAPCD's inventory (these include non-carbon emissions discussed below). These rates were then applied to the individual parcels to allocate emissions across the County, and are represented in the GIS database. Over 98 percent of agricultural emissions are in the unincorporated County.

## On-Road Emissions

SBAPCD is relying on SBCAG to generate the baseline emission inventory for on-road light-duty and heavy-duty vehicles based on SBCAG's forecast for vehicle miles traveled (VMT). SBCAG is producing this analysis to comply with Senate Bill 375 requirements. The VMT forecast is tied to SBCAG forecasts for 2020 and 2035 that are the basis for the overall emission inventory forecasts in this report.

On-road travel was estimated using the SBCAG Travel Demand Model (TDM). VMT are reported by body type, ranging from automobiles to trucks to buses, and by engine type. The CARB's EMFAC model was used to calculate CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O (calculated from NO<sub>x</sub>) emissions. Note however that the diesel fleet on-road emissions have not been adjusted for the overestimate of about 20 percent that CARB revealed in September 2010, referenced previously. Based on the SB 375 RTAC recommendations, the tentative allocation of trips among County jurisdictions using the follow algorithm:

- 100 percent of emissions for trips starting and ending within the County jurisdiction (i.e., Unincorporated County),
- 0 percent of emissions for trips passing through but without a terminus in the Unincorporated County, and
- 50 percent of emissions for trips either originating or ending within the Unincorporated County.

Emissions are then allocated geographically within the County on the basis of the Daytime Population, which is akin to the “service” population. Daytime Population is a simple sum of Total Population + Total Employment,<sup>5</sup> used to serve as means of allocating VMT measures by TAZ from the Countywide Travel Demand Model.

### Non-Carbon Emissions

CH<sub>4</sub> and N<sub>2</sub>O come from several key sources—fuel combustion, waste management and agriculture. Emission factors for each of these were taken from CARB’s GHG Inventory and applied to the appropriate population within the County to scale down emissions from the Statewide inventory. For fuel combustion, these were per unit of fuel. Agricultural GHG emissions were allocated to the County based on the relative Statewide farm production expenses for fertilizer and soil amendment, and animal feed purchases. Cultivated acreage and livestock head were used as appropriate within the County. Waste management emissions were allocated on a per capita or commercial product basis.

Another large source of emission is high global warming potential (HGWP) substances. These include HFC and PFC classes used for refrigeration, cooling and electronics manufacturing. These emissions were allocated per CARB assumptions about relationships to activities on either per employee for commercial or per household for residential bases. The other category includes SF<sub>6</sub> and NF<sub>3</sub> fluorides, which are used in electronics manufacturing. Other SF<sub>6</sub> related to electricity system operations are aggregated into the overall Scope 2 electricity emissions. Santa Barbara was allocated a share on a per employee basis within the relevant industrial sector.

### Methodology of Estimating 1990 GHG Emissions

While extensive data is now available on local energy use and other GHG emission sources, similar data is not as readily available for activities in 1990. The 2007 inventory relies on the Countywide inventory compiled by the SBAPCD, and County-level energy use, water, landfill and agricultural data from various sources. County-level data on natural gas, electricity and other stationary fuel uses are not readily available in the same level of detail from the CEC or the serving energy utilities. For example, the 2007 inventory uses climate-zone and business-type data either not available or in a different form from the 1990 data.

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<sup>5</sup> Daytime Population is often estimated as (Total Population – Employed Residents) + Total Employment to avoid double-counting workers at their TAZs of residence as well as their TAZs of work. Employed resident data projections at the TAZ level are not currently available from SBCAG’s draft RGF2007 TAZ allocations. Future modelers may wish to revise the Daytime Population calculations and related allocation factors and VMT allocations described herein, should TAZ projections of employed residents become available at a later time.

The alternative is to compile an approximation of the County inventory by scaling down from CARB's 1990 Statewide Inventory. Statewide data is available because the CEC has been compiling energy-use data for more than three decades and CO<sub>2</sub> represents about 90 percent of the total GHG inventory. Santa Barbara's shares of GHG emissions in 1990 are estimated by applying relative shares of key drivers by various sectors. For residential heating, cooking and electricity use, population as reported by the California Department of Finance is used. However, this methodology does not reflect the differences that accrue for climate and demographic factors. For commercial uses, emission shares are based on number of employees as reported by the EDD as a proxy. Compared with the methodology used to develop the 2007 inventory and forecast future emissions, this methodology cannot fully reflect the wide ranges of emission rates for different businesses. Scope 1 Industrial emissions shares are based on either criteria pollutant inventories from CARB (NO<sub>x</sub> for manufacturing and petroleum refining and marketing, total organic gases plus NO<sub>x</sub> for waste disposal) or enhanced oil recovery water flooding for petroleum production from the Division of Oil, Gas and Geothermal Resources. Scope 2 industrial emissions are allocated using employment shares. Air, marine and railroad emissions also are allocated based on the County's share of Statewide criteria pollutant emissions for each of these activities. On-road emissions are derived from the County's share of VMT reported in the California Department of Transportation (Caltrans) MVSTAFF Report. For agriculture, the same methodology was used for both approaches, but in the 1990 case, the primary source was the 1992 USDA Census of Agriculture. Electricity use was adjusted to reflect 1990 Statewide usage. A parallel 2007 inventory for all sectors was developed using the same approach to allow comparison to the 2007 inventory developed with more specific local data.

The 1990 inventory for the unincorporated County was developed in a similar manner as for the 2007 inventory, but instead of using population and employment data within the 268 Traffic Analysis Zones (discussed further below), data from Department of Finance and U.S. Census Transportation Planning Package (CTPP) is used. Since almost all agricultural acreage is in the unincorporated County, this was allocated on a per acre basis. On-road VMT was allocated using a measure of "daytime" or service population discussed further below.

Over the 1990 to 2007 period, population for the entire County rose 9.4 percent from 369,608 to 404,197, households increased 11.4 percent from 138,149 to 153,933, and employment climbed from 159,700 to 189,700 jobs. In the unincorporated County, population rose more slowly at 8.3 percent from 130,167 to 140,929 after excluding Buellton and Goleta. Meanwhile, employment fell 10 percent from 22,372 to 20,098 jobs.

Two issues of particular note arose. The first is that the unincorporated County inventory is adjusted for the incorporation of Buellton and Goleta. Because Buellton was incorporated in 1993 and it was a Community Designated Place (CDP) in 1990, the associated population and jobs are easily excised. Goleta is more difficult because it was incorporated in 2003 and its CDP was about twice the size of the actual city. Using the GIS dataset, the number of parcels is counted in each Census Block within and outside the city boundary, and that proportion applied to the total of those Census Blocks for 1990. For employment, the proportion of jobs within Goleta in 2007 compared to Goleta plus the unincorporated area for each sector was applied to the 1990 data.

This analysis leads to a second issue that the number of "goods producing" or industrial jobs within the unincorporated County appears to have dropped precipitously from 1990 to 2007. California

manufacturing jobs fell from 1.964 million to 1.464 million from 1990 to 2007 according to EDD. Similarly, Santa Barbara County's industrial jobs fell from 29,100 to 24,900 for the County as a whole. Yet, based on this method, industrial jobs in the unincorporated area fell from 10,000 to 3,800 or more than the loss for the entire County. This reduction may not be inconsistent with actual experience as California's defense industry shrunk substantially beginning in 1990 with the end of the Cold War and Vandenberg Air Force is a key economic driver in the County. However, exploring the underlying reasons for this decline is beyond the scope of this report.

Another reason for expecting a significant decline in industrial emissions over the period relates to oil and gas production as the largest single source in that sector. According to Division of Oil, Gas and Geothermal Resources (DOGGR) data, oil production in Santa Barbara County declined 56 percent from 7,266,600 barrels in 1990 to 3,026,300 barrels in 2007. While natural gas production increased, most was reinjected to improve oil recovery, and net gas production fell as well. The data is not available to directly link changes in energy and electricity use in this sector, but one would expect some commensurate GHG reduction. However, steam injection increased over the period to aid resource recovery which became more difficult.

Since 1990, the characteristics of residential fuel use for heating and cooking changed. Natural gas has almost completely replaced heating fuel oil and liquid propane gas (LPG) in the County. LPG and oil were even more common in the unincorporated area until gas service was extended beyond the cities. Natural gas has a lower carbon content and emits less GHGs.

Similarly, emissions from electricity use have decreased. The CARB's inventory reports that Statewide average emissions in 1990 were 522 grams per kilowatt-hour (kWh) and fell 25 percent to 390 grams per kWh in 2007.

## Forecasting Future Emission Quantities

With the reference to the economic sector identifiers, such as the County land use codes and federal NAICS codes, the activity forecast for the selected future years of 2020 and 2035 are linked to the corresponding emission rates. The emission rates are adjusted for projected future years based on changes to the baseline assumptions identified by CARB and/or the CEC. These include implementation of existing regulations such as improvements in vehicle fuel economy and the renewables portfolio standard.

## Summary of Data and Methodological Approach

The methodology outlined in this section required multiple tasks performed in parallel as well as the resolution of a number of critical path issues before subsequent analysis could proceed:

- **Selection of Primary Forecast Data Sources:** The key forecast assumptions are currently based on the Santa Barbara Association of Governments (SBCAG) Regional Growth Forecasts 2005-2040 (RGF2007). This information is supplemented with a variety of other data sources and analysis, as described further in the subsequent section.

- **Determination of Forecast Period:** The Base Year for the GHG Emissions Inventory has been set as 2007. The Horizon Year for the RGF2007 regional land use, demographic and economic forecasts developed by SBCAG is 2040. The target years for the Inventory Forecast are 2020 and 2035, to correspond with CARB's AB 32 (2020) and SB 375 (2035) greenhouse gas reduction target setting.
- **Identification of Output Variables:** The key energy use, emission rate, land use, demographic and economic forecast variables required for this GHG emissions analysis and inventory are specifically and comprehensively defined for the activity-based emission relationships. The demographic and economic forecast measures have been prepared in units of population, households, and employment (jobs by North American Industry Classification System (NAICS) 2-digit sectors and place of work), and 'daytime population', i.e., Total Population + Total Jobs.
- **Prepare Output Variables for GHG Inventory:** As a final step, the energy use, emission rate, identified land use, demographic, and economic variables are calculated and recorded in an Excel workbook format suitable for subsequent use in the GHG emissions inventory, and capable of follow-on revision and updates by the Aspen Team or County staff.

The forecasting process requires two processes, which are summarized in turn below. The first is to create the demographic and economic forecast for Santa Barbara County. This forecast breaks out the jurisdictional and economic sector components that are tied to the inventory. The on-road VMT forecast, which is a key component driving the inventory forecast, also is driven by this forecast. The SBCAG RGF2007 forecast is the core of this forecasting effort.

The second component is the energy use and emission source forecasts that are adapted and melded to Santa Barbara County. The base forecasts are generally Statewide or for serving energy utilities, e.g., Pacific Gas and Electric, Southern California Edison or Southern California Gas. The prime Statewide forecasts are CARB's GHG Inventory for 2020 as well as CARB EMFAC on-road emission model for projected emission rates.

## Available Data Sources and Forecasts for the Socio-economic Forecast

The methodology used to allocate emissions among jurisdictions and to forecast "business as usual" activity through 2035 is based primarily on SBCAG's RGF 2007 but also incorporates information and relationships derived from selected other sources from federal and state agencies, listed in Appendix B. These sources provide a variety of demographic and economic data for years ranging from 2000 to 2050. The following sections present the step-by-step methodology used to prepare the socioeconomic forecasts.

## Forecast Methodology

### Selection of Preferred Existing Growth Forecast and Consistency Target

SBCAG's RGF for 2005-2040 (RGF2007) is a primary source of control totals and consistency checks for the needed economic and demographic forecasts for the unincorporated County. RGF2007 offers the single most comprehensive set of long-range forecasts incorporating both local planning agency inputs and growth projection models specifically designed for the County. Its Final Report document also provided jurisdictional or subregional breakouts for most of the forecast variables at the beginning of this inventory process. SBCAG draft allocations of RGF2007 to SBC Transportation Analysis Zones (TAZs) became available in May 2010 and, following review and discussion of SBCAG parallel efforts involving SB375, the County approved use of RGF2007 TAZ allocations as the preferred Countywide growth forecast.

The prior SBCAG Regional Growth Forecast for 2000-2030 (RGF2000) is the current dataset for the County's Travel Demand Model (TDM), as documented in the 2030 Travel Forecast for Santa Barbara County final report. However, RGF2000 has been superseded by RGF2007 and SBCAG modelers are in the process of replacing RGF2000 with RGF2007 in the TDM. RGF2000 employment forecasts were developed using Standard Industrial Classification (SIC) economic activity groups. As is explained in more detail below, the SIC classifications require substantial translation (which can be incomplete) with the NAICS economic activity groups used in all of the other data sources shown in the Appendix B, including RGF2007.

Other long-range forecast alternatives to RGF2007 exist and may be helpful for comparison purposes, but have limitations. The California Department of Finance (DOF) Demographic Research Unit has produced long-range forecasts (2050), though they are limited to the county level and for Total Population only—by Age, Gender and Race. The Caltrans Office of Transportation Economics has produced long-range forecasts (2035), also limited to the county level, but projecting population, households and

employment sectors similar to those defined for RGF2007. There are also long-range (2007-2040) forecasts available from commercial demographic forecasting services such as Woods & Poole, but these are essentially limited to the county level with little or no local planning agency input and much less detailed land use and policy information than informed SBCAG's RGF2007. For this reason, we have relied on the RGF2007 forecast.

### **Itemization of Inclusions to and Exclusions from Unincorporated County Forecasts**

To account for all defined exclusion/inclusion area and point sources in both the Base and Future Years estimates and forecasts of socioeconomic conditions, Aspen GIS staff created an itemized dataset identifying and recording essential attributes. Areas to be excluded, such as federal jurisdictions and the UCSB campuses, located outside of incorporated communities, needed to be 'netted out' of the available demographic and economic measures for the unincorporated County. To facilitate the required spatial identification and separation processes, Aspen GIS specialists created an authoritative Study Area digital map for the project. This map coverage, shown in **Figure 1**, distinguishes the unincorporated Study Area from incorporated SBC communities and from other unincorporated but excluded lands. The Study Area is depicted in **Figure 1** with bright red coloring, and comprises the large unincorporated area in the Central County; the extended 'wings' along the northeast and southeast County borders, north and south of the Los Padres National Forest; and the smaller bright red 'islands' distributed throughout the County. Excluded lands are shown in contrasting colors and identified by jurisdiction in the thematic legend at the top right corner of **Figure 2**.

Figure 1

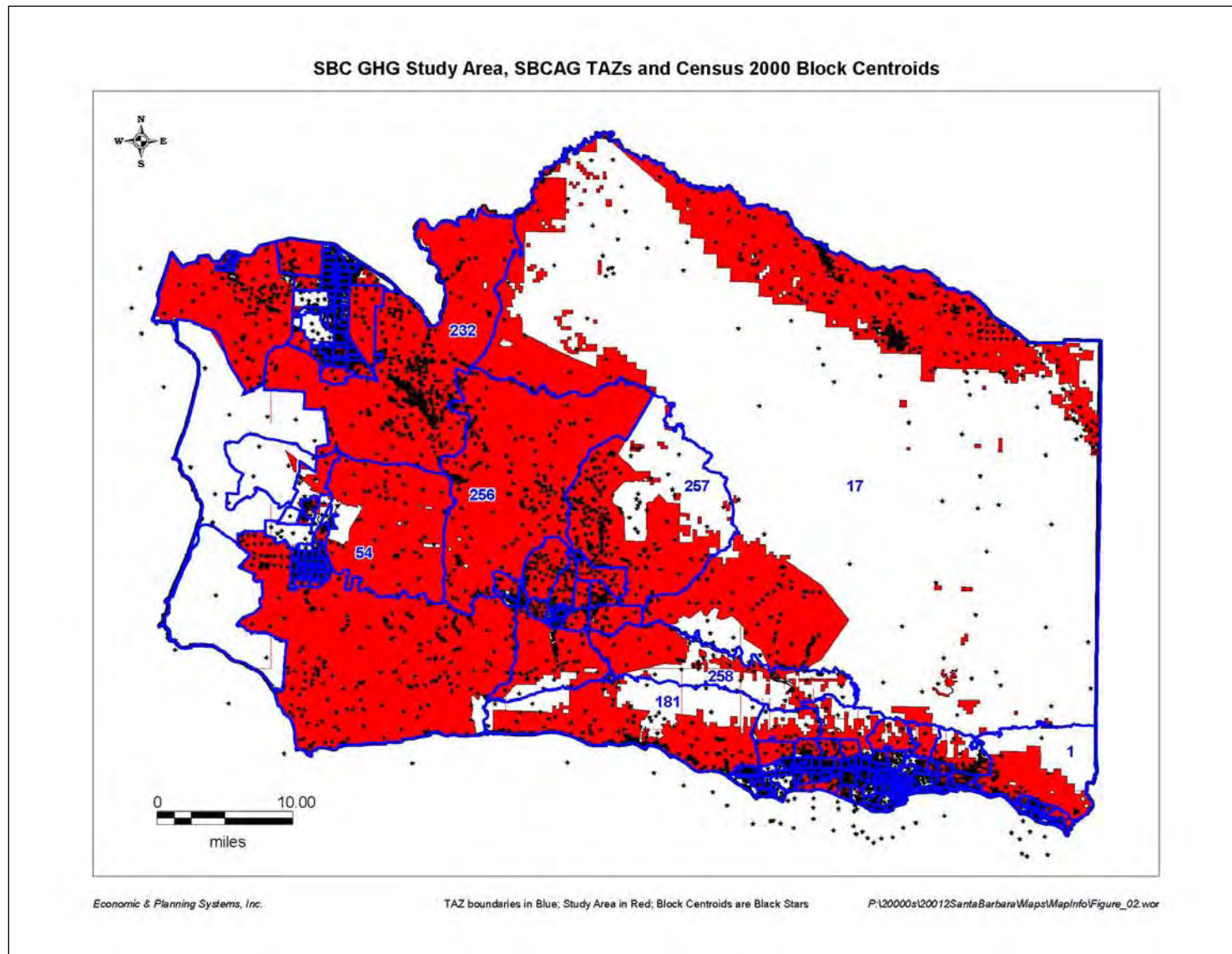
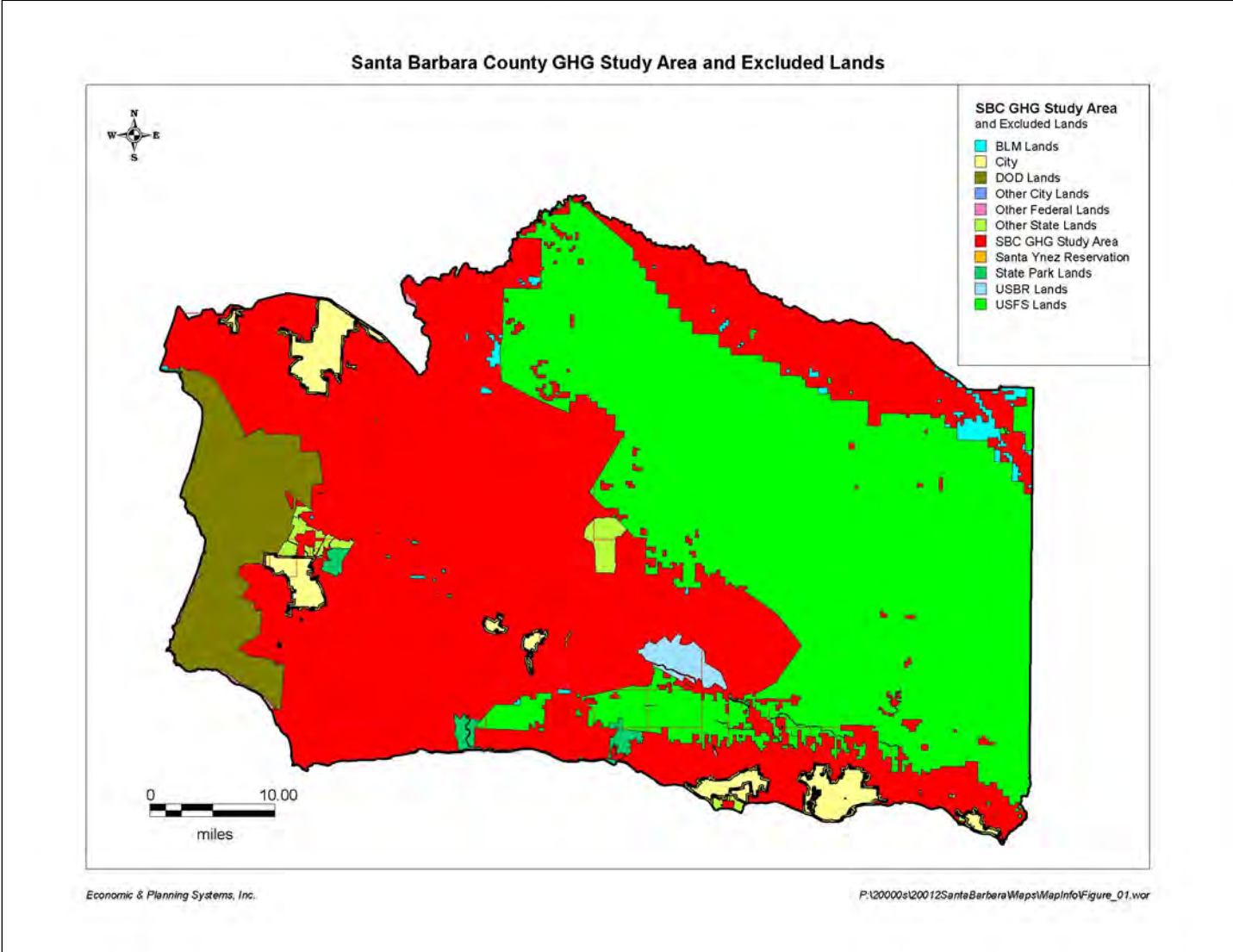




Figure 2



It may be possible in the future to distinguish within the Regional Growth Forecast, comprehensively and in complete detail, the exact socioeconomic components of the Study Area from all excluded lands. This distinction has not proven feasible from currently available parcel data, the RGF2007 technical documentation or through discussions with SBCAG modelers. The Aspen Team for the Aspen Team have therefore used readily available alternative estimates and projections, making approximations where necessary using data from, but not limited to, the sources listed in Appendix B.

In some cases, demographic and economic estimates and forecasts for excluded and included lands were necessary and not available from RGF2007 documentation, Aspen Team data archives, work by other consultants, or published planning agency documents. These are estimated using historical and forecast data available from sources, such as the 2000 Census population and housing counts, the California EDD Industry Employment & Labor Force reports, and Longitudinal Employer-Household Dynamics (LEHD) datasets. Unless otherwise indicated, the resulting proportional decrements and increments to the 'default' unincorporated County forecast have been carried forward unaltered from the Base Year to the Horizon Year (i.e., 2020 or 2035). This convention is similar to that adhered to in the SBCAG RGF, which did not include proposed but unapproved projects or development policy changes in the 2005-2040 forecasts. However, the modeling tool can be altered to accommodate alternative growth pattern scenarios.

As indicated in Table B-1 in Appendix B, the published RGF2007 forecasts do not include separate 'breakouts' for all socioeconomic data segments which are needed for linkage to GHG emission rates. The published RGF2007 housing projections are tabulated only as Total Households, and the employment forecasts are by major NAICS sectors, grouped (for the aggregate Countywide totals and five subregion subtotals) in ten employment types. These employment types are then further segmented into two-digit NAICS code categories for these economic sectors:

- Agriculture
- Mining
- Construction
- Manufacturing
- Wholesale Trade
- Retail Trade
- Transportation
- Fire, Insurance and Real Estate
- Services
- Government

Recent SBCAG allocations of the RGF2007 projections, a part of the Countywide Travel Demand Model Improvement Plan, offer finer geographic detail, with 268 Transportation Analysis Zones (TAZs) defined within the County boundary. However, the TAZ allocations only provide five employment types, half as many as for the SBCAG Countywide and the subregional projections, and the TAZ employment types are

more like major Standard Industrial Classification (SIC) groups, based on an older classification system than NAICS sectors, which is the most current system:

- Agriculture
- Industrial
- Commercial
- Office
- Services

It was necessary to identify the key land use and socioeconomic measures essential for intended GHG emission rate linkage and to segment the RGF2007 source projections to supply these measures. Aspen staff directed the Aspen Team to focus on Total Population, Total Households, and Employment by NAICS Sector (2-Digit level) as the key land use and socioeconomic measures to be derived for the Study Area from the preferred RGF 2007 source forecast.

The methodology used to reconcile the RGF and TDM allocations and forecasts is discussed in detail in the Appendix B.

### **Santa Barbara County Demographic and Socioeconomic Trends and Forecasts**

SBCAG staff have researched and reported the history of the County's demographic and socioeconomic trends and made detailed comparisons of alternative SBC regional growth projections as part of their *Regional Growth Forecast 2005-2040* Final Report (RGF2007), published in August 2007.

Rather than duplicate that extensive work, we will in this section focus on pertinent revisions made possible by the release of subsequent housing unit counts by the California Department of Finance; annual employment by industry estimates by the EDD; updated population and demographic profile estimates from the U.S Bureau of the Census (American Community Survey); and updated long-range Countywide growth forecasts from the Department of Finance, Caltrans and the Tri-Counties' Councils of Government.

### **Historical Demographic and Socioeconomic Changes: 1990-2007**

**Table 2** shows the changes in the size and composition of the County's population, household and housing stock from 1990 to 2007, as indicated by comparable counts and estimates from the 1990 Census, the ongoing American Community Survey (ACS),<sup>6</sup> and DOF estimates. The overall patterns observable reinforce trends noted in SBCAG's RGF2007 Final Report. The County's Hispanic population has grown significantly since 1990, and the associated number of young and (relatively) large families have to some

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<sup>6</sup> Recent American Community Survey (ACS) estimates for many California jurisdictions have been lower than DOF estimates for the same geographic regions and time intervals. We have used the ACS 2007 estimates of population and households in this instance to facilitate comparison of 1990 and 2007 composition by age and by Hispanic Origin (Census Bureau-to-Census Bureau data comparisons); DOF 2007 estimates were used to govern/control all interpolation calculations applied to estimate Base Year Population and Housing from SBCAG RGF2007 for the GHG Emissions Inventory analysis.

extent offset the “graying” of the Baby Boomers; while the County has experienced loss in both absolute and proportional residents in the 25-44 year-old age-group, and the proportion of the population aged 45 and-older has increased from 29.4 percent in 1990 to 35.9 percent by 2007, the proportion of the population aged 0-25 years grew approximately 15,100 persons and represented a larger proportion of total population (38.4 percent) in 2007 that in 1990 (37.9 percent). Average Household Size, measured as Total Population/Households, remained at about 2.85; recent ACS estimates indicate there have been proportional increases in Non-Family households and in Renter-Occupied households over the seventeen years.<sup>7</sup>

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<sup>7</sup> As with all ACS estimates since 2000, these numbers will be revisited and possibly revised as part of the 2010 Decennial Census process.

Table 2: 1990 to 2007 Change in Countywide Demographics

Indicator	1990	Percent of 1990 Total	2007	Percent of 2007 Total	Notes	Change 1990-2007	Percent Change 1990-2007
Population	369,608	100.0%	404,197		[1]	34,589	9.4%
Under 25	139,949	37.9%	155,048	38.4%		15,099	10.8%
25 to 44	120,996	32.7%	104,183	25.8%		(16,813)	-13.9%
45 to 54	34,270	9.3%	54,089	13.4%		19,819	57.8%
55 to 59	14,438	3.9%	20,870	5.2%		6,432	44.5%
60 to 64	14,340	3.9%	18,074	4.5%		3,734	26.0%
65 and Over	45,615	12.3%	51,933	12.8%		6,318	13.9%
Hispanic origin	98,199	26.6%	156,500	38.7%		58,301	59.4%
Households	129,802	100.0%	142,465	100.0%	[1]	12,663	9.8%
Family Households	86,077	66.3%	89,390	62.7%		3,313	3.8%
Non Family Households	43,725	33.7%	53,075	37.3%		9,350	21.4%
Renter Occupied	58,749	45.3%	66,045	46.4%		7,296	12.4%
Owner Occupied	71,053	54.7%	76,420	53.6%		5,367	7.6%
Avg. HH size	2.85		2.84			(0)	-0.4%
Housing Units	138,149	100.0%	153,933	100.0%	[2]	15,784	11.4%
Single-Family	95,984	69.5%	110,108	71.5%	[3]	14,124	14.7%
Multi-Family	42,165	30.5%	43,825	28.5%		1,660	3.9%

Notes: [1]

ACS 2007 Population and Household estimates shown for comparability to Census '90 demographics; ACS estimates are lower than equivalent DOF estimates for many California areas, including SBC; DOF currently estimates 405,256 HH residents and 422,835 Total Population for SBC at 1/1/07.

[2] Housing Unit estimates from DOF Historical reports and data; DOF and Census housing counts for 1990 are identical for SBC.

[3] "Single-Family" = 1-Unit attached and detached types + Mobile Homes; "Multi-Family" = 2- or more units.

Sources; 1990 Census; American Community Survey, 2007 Single Year Estimates; California DOF, Historical Population and Housing Estimates, 1990-2000 (August 2007), Population Estimates 2000-1010 (May 2010).

DOF estimates for the composition of Housing Stock in Santa Barbara County indicate a proportional increase in Single-Family (single-unit attached and detached structures and mobile homes) to Multi-

Family (2-and more unit attached structures), with Single-Family types of structure representing over 89 percent of the net increase in Housing Units from 1990 to 2007.

On the employment side, **Table 3** displays trends that are frequent topics for discussion of the California and Santa Barbara County economies.<sup>8</sup> Agricultural activities are strong in the County, and unlike many California areas, employment in this sector increased significantly from 1990 to 2007. Manufacturing jobs declined sharply, as they have in most areas across the United States, while employment in the personal and business service sectors rose and generally increased their share of overall employment. It should be noted that by 2007 the Finance and Insurance, Information, and Real Estate and Rental and Leasing Sectors were all 'down' from higher employment peaks earlier in the decade, likely as leading indicators of the end of the California Housing Bubble and the onset of the worldwide Great Recession. Annual Average Employment was at a peak for Santa Barbara County in 2007, subsequently declining year-over-year in 2008 and 2009 (to 189,400 and 182,300 respectively).

Table 3: 1990 to 2007 Change in Countywide Employment

Industry Sector	1990	Percent of 1990 Total	Notes	2007	Percent of 2007 Total	Notes	Change 1990-2007	Percent Change 1990-2007
Total All Industries	159,700	100.0%		189,700	100.0%	[1]	30,000	18.8%
NAICS 11 (Agriculture, Forestry, Fishing and Hunting)	11,300	7.1%	[2]	16,100	8.5%		4,800	42.5%
NAICS 21 (Mining, Quarrying, and Oil and Gas Extraction)	1,600	1.0%		1,200	0.6%		(400)	-25.0%
NAICS 23 (Construction)	7,500	4.7%		10,500	5.5%		3,000	40.0%
NAICS 31-33 (Manufacturing)	20,000	12.5%		13,200	7.0%		(6,800)	-34.0%
NAICS 42 (Wholesale Trade)	4,300	2.7%		4,800	2.5%		500	11.6%
NAICS 44-45 (Retail Trade)	17,400	10.9%		20,300	10.7%		2,900	16.7%
NAICS 48-49 (Transport. and Warehsng) & 22 (Utilities)	3,400	2.1%		3,000	1.6%		(400)	-11.8%
NAICS 51 (Information)	4,400	2.8%		3,900	2.1%		(500)	-11.4%
NAICS 52 (Finance and Insurance)	5,200	3.3%		5,300	2.8%		100	1.9%
NAICS 53 (Real Estate and Rental and Leasing)	3,100	1.9%		3,000	1.6%		(100)	-3.2%
NAICS 54 (Professional, Scientific, and Technical Services)	7,800	4.9%		11,100	5.9%		3,300	42.3%
NAICS 55 (Management of Companies and Enterprises)	400	0.3%		1,700	0.9%		1,300	325.0%
NAICS 56 (Admin. and Support and Waste Mng. And Remed. Svcs)	7,700	4.8%		9,500	5.0%		1,800	23.4%
NAICS 61 (Educational Services)	2,200	1.4%		2,800	1.5%		600	27.3%
NAICS 62 (Health Care and Social Assistance)	12,400	7.8%		17,500	9.2%		5,100	41.1%
NAICS 71 (Arts, Entertainment, and Recreation)	2,100	1.3%		2,900	1.5%		800	38.1%
NAICS 72 (Accommodation and Food Services)	14,300	9.0%		19,900	10.5%		5,600	39.2%
NAICS 81 (Other Services [except Public Administration])	5,300	3.3%		6,000	3.2%		700	13.2%
NAICS 92 (Public Administration)	29,300	18.3%		37,000	19.5%		7,700	26.3%

Notes: [1] Totals and Subtotals may differ slightly from EDD Annual Reports, due to round-off.

[2] 1990 NAICS counts are 'backcasts' by EDD, as the NAICS typology was not adopted nationally until 1997.

Sources: California Employment Development Department, 1990-2000 (August 2007), Population Estimates 2000-1010 (May 2010).

<sup>8</sup> Detailed comparisons of EDD 1990 and 2007 employment estimates by sector must be accompanied by the caveat that the transition from Standard Industrial Classification (SIC) to North American Industry Classification System (NAICS) occurred in 1997 (between the 1990 and 2007 milestones), and so the 1990 numbers were converted from older report tables by EDD staff.

Apart from Agriculture, the largest growth sectors in terms of absolute employment gains were Public Administration, Accommodation and Food Services, and Health Care and Social Assistance, all of which increased by more than 5,000 from 1990 to 2007. Accommodation and Food Services includes both lodging establishments and eating and drinking places. The latter (restaurants and fast-food outlets, bars, taverns, etc.) were until 1997 grouped with Retail Trade under the Standard Industrial Classification (SIC) system; thereafter they have been treated as services under the North American Industry Classification System (NAICS).

### Comparison of Long-Range Regional Growth Forecasts: 2010-2035

The SBCAG *Regional Growth Forecast 2005-2040* Final Report provides extensive comparisons of the RGF2007 forecasts of growth with prior SBCAG projections, with parallel forecasts for Ventura and San Luis Obispo Counties, and with alternate forecasts from the Department of Finance, and Caltrans. The report explores in detail the origins and methodologies of the alternative forecasts; there will be no attempt to duplicate that extensive effort here.

However, since the RGF2007 Final Report was published in August 2007, there have been updates and revisions among the comparable long-range forecasts. These include recent forecasts by the State Department of Finance (DOF), Caltrans, SCAG and SLOCOG. The DOF released 2000-2050 population forecasts at the county level in July 2007, too late to be included in the RGF2007 Final Report. SCAG projections for Ventura and its other modeling region counties' population, housing and employment were produced and adopted for the SCAG 2008 RTP. SLOCOG selected and approved a 'Medium Scenario' forecast for San Luis Obispo County in June 2009. Caltrans has updated its Long-Term Socio-Economic Forecasts by county for 2010.

As indicated in **Table 4** and shown by **Figure 3**, RGF2007 projections of Countywide population growth from 2010-2035 are more conservative than the DOF and Caltrans equivalent long-range forecasts; the RGF2007 projection of 487,000 persons by 2035 is lower by about 14,750 persons than the Caltrans forecast and about 10,650 persons lower than the DOF forecast. The same general relationships pertain to the extended Tri-County region including Santa Barbara, Ventura and San Luis Obispo Counties; the Caltrans aggregate population forecast is 1,942,178 persons by 2035, as compared to 1,917,718 for the DOF aggregate forecast and 1,831,560 for the SCAG (Ventura) + SLOCOG (San Luis Obispo) + SBCAG (Santa Barbara) combined COGs forecasts. Caltrans most recent growth forecasts are relatively more 'aggressive' than the DOF equivalents, which in turn are more 'aggressive' than the local COGs.

**Baseline and Forecasted GHG Emissions Inventory for the Unincorporated County**

PREPARED FOR THE COUNTY OF SANTA BARBARA OFFICE OF LONG RANGE PLANNING

Table 4: Department of Finance, Caltrans and Tri-Counties COG Population Growth Forecast Comparisons

County	Current DOF Estimate		Projected by DOF July 2007							
	Year	2010	2010	2020	2030	2035	2040	2050	Change 2010-2035	Percent Change
Ventura (DOF)		844,713	855,876	956,392	1,049,758	1,092,557	1,135,684	1,229,737	236,681	28%
San Luis Obispo (DOF)		273,231	269,734	293,540	316,613	327,514	338,760	364,748	57,780	21%
Santa Barbara (DOF)		434,481	434,497	459,498	484,570	497,647	509,920	534,447	63,150	15%

County	Current DOF Estimate		Projected by Caltrans 2009							
	Year	2010	2010	2020	2030	2035	2040	2050	Change 2010-2035	Percent Change
Ventura (CALTRANS)		844,713	848,744	949,081	1,055,988	1,105,348	N/A	N/A	256,604	30%
San Luis Obispo (CALTRANS)		273,231	273,176	300,046	325,363	335,082	N/A	N/A	61,906	23%
Santa Barbara (CALTRANS)		434,481	436,912	475,848	496,392	501,748	N/A	N/A	64,836	15%

County	Current DOF Estimate		Projected by COGs 2008-2009							
	Year	2010	2010	2020	2030	2035	2040	2050	Change 2010-2035	Percent Change
Ventura (SCAG)		844,713	860,610	937,367	996,100	1,013,760	N/A	N/A	153,150	18%
San Luis Obispo (SLOCOG) - Medium Scenario		273,231	273,500	295,400	318,100	330,800	N/A	N/A	57,300	21%
Santa Barbara (SBCAG) RGF2007 - Countywide		434,481	430,200	459,600	481,400	487,000	492,800	N/A	56,800	13%

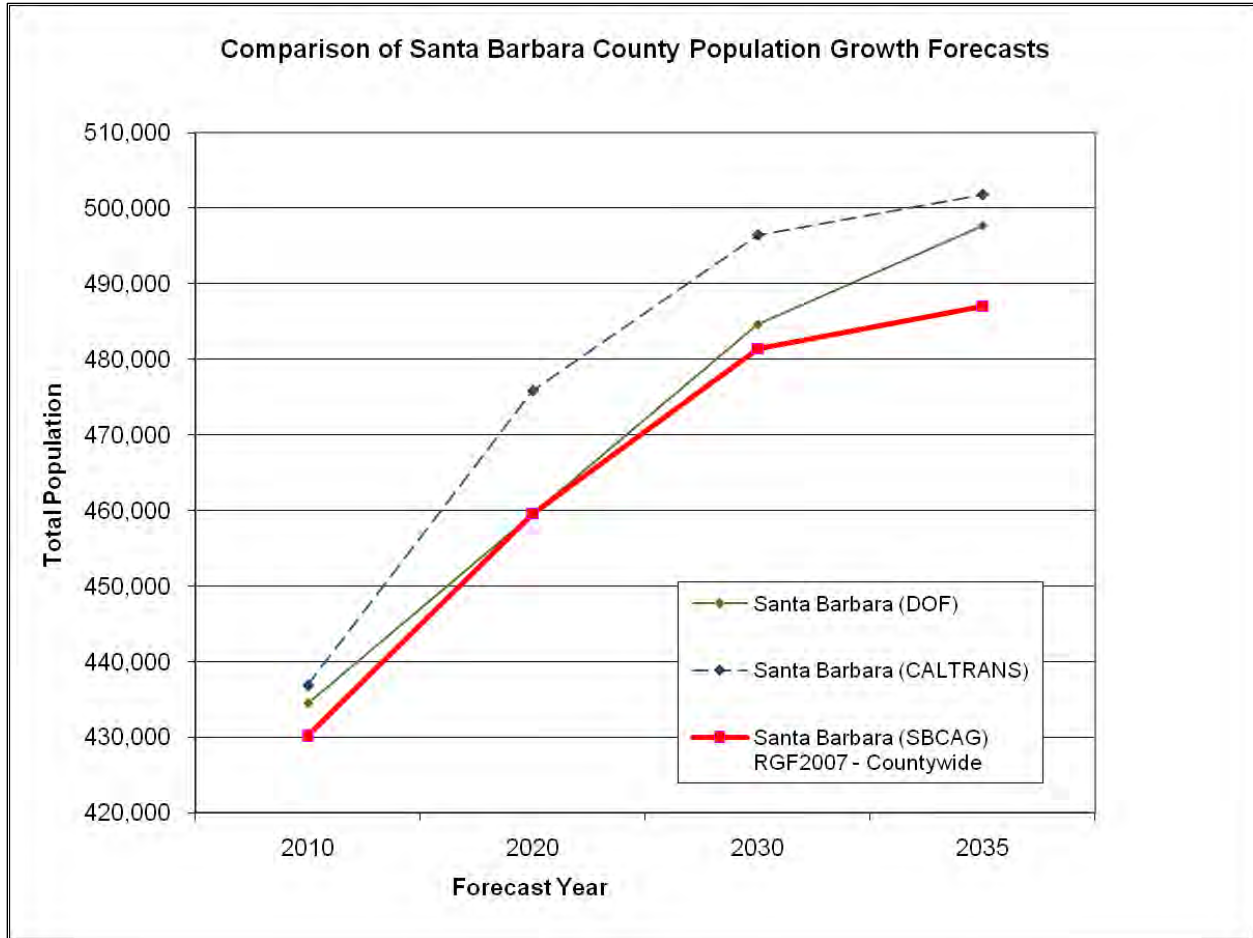
  

County	DOF Estimate		Allocated by EPS 2010							
	Year	2007	2007	2020	2030	2035	2040	2050	Change 2007-2035	Percent Change
Santa Barbara (SBCAG) RGF2007 by TAZ (Draft) - 'Unincorporated'			138,176	145,934	N/A	153,993	N/A	N/A	15,817	11%
Santa Barbara (SBCAG) RGF2007 by TAZ (Draft) - Countywide		422,731	422,739	459,797	N/A	486,898	N/A	N/A	64,159	15%

Sources: California DOF, 1/1/10 Population Estimates (May 2010), 2000-2050 Population Forecasts (July, 2007); SBCAG RGF2007; SCAG Adopted 2008 RTP; SLOCOG Approved Medium Scenario (June 2009); EPS Draft Allocations (July 18, 2010)



Figure 3



There are smaller differences in the estimated Countywide population for the common base year 2010, but **Figure 3** shows that while the DOF and Caltrans projections are convergent as they near 2035, both the Caltrans and RGF2007 projections anticipate a significant slowing in the rate of population growth after 2030. This causes the RGF2007 forecast population curve to pull-away from the DOF forecast curve after 2030; from 2010 through 2030 RGF2007 and the DOF (July 2007) projections are nearly coincident.

The DOF and SLOCOG did not publish housing unit/household projections to match their long-range population forecasts, and so **Table 5** and **Figure 4** focus on comparisons between RGF2007 and Caltrans projections. Again RGF2007 is more conservative than Caltrans in projecting households (HH) growth to 2035; the 165,970 HH projected by SBCAG is just over 6,000 HH lower than the Caltrans forecast of 172,000. As with population, both household growth forecasts anticipate a marked slowing in the rate of growth between 2030 and 2035, compared to the rate projected between 2010 and 2030.

**Baseline and Forecasted GHG Emissions Inventory for the Unincorporated County**

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Table 5: Caltrans and Tri-Counties COG Household Growth Forecast Comparisons

County	Current DOF Estimate	Projected by Caltrans 2009							
	Year 2010	2010	2020	2030	2035	2040	2050	Change 2010-	Percent Change
Ventura (CALTRANS)	269,011	269,000	298,000	331,000	347,000	N/A	N/A	78,000	29%
San Luis Obispo (CALTRANS)	108,034	106,900	117,400	129,300	134,800	N/A	N/A	27,900	26%
Santa Barbara (CALTRANS)	149,574	149,000	159,000	168,000	172,000	N/A	N/A	23,000	15%

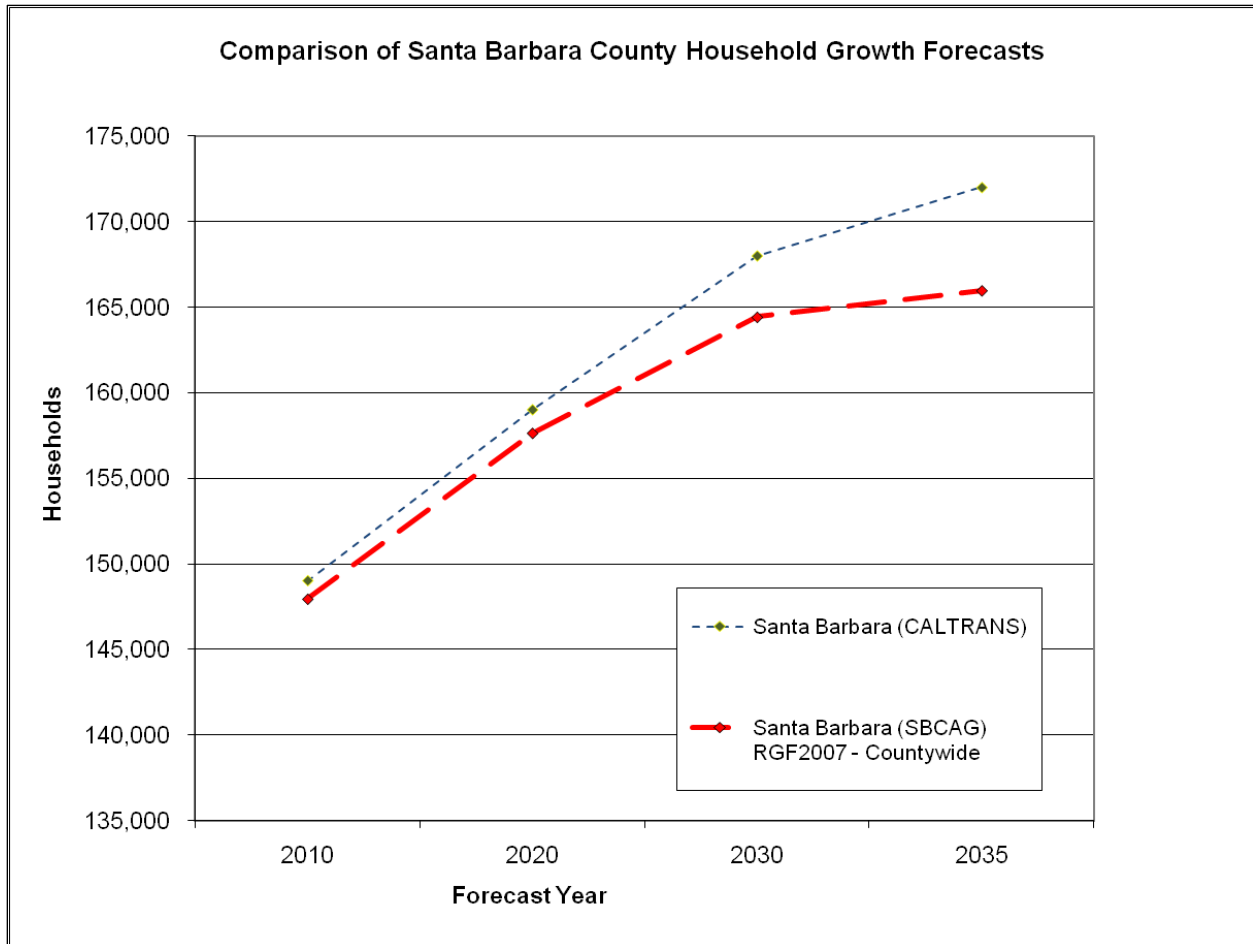
County	Current DOF Estimate	Projected by COGs 2008-2009							
	Year 2010	2010	2020	2030	2035	2040	2050	Change 2010-	Percent Change
Ventura (SCAG)	269,011	275,117	302,943	321,787	330,192	N/A	N/A	55,075	20%
San Luis Obispo (SLOCOG) - Medium Scenario	108,034	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Santa Barbara (SBCAG) RGF2007 - Countywide	149,574	147,961	157,648	164,422	165,970	167,542	N/A	18,009	12%

County	DOF Estimate	Allocated by EPS 2010							
	Year 2007	2007	2020	2030	2035	2040	2050	Change 2007-	Percent Change
Santa Barbara (SBCAG) RGF2007 by TAZ (Draft) - 'Unincorporated'	N/A	48,212	50,270	N/A	52,988	N/A	N/A	4,776	10%
Santa Barbara (SBCAG) RGF2007 by TAZ (Draft) - Countywide	146,979	146,980	157,650	N/A	165,968	N/A	N/A	18,988	13%

Sources: California DOF, 1/1/10 Population Estimates (May 2010); Caltrans 2010 Long-Term Socio-Economic Forecasts by County (2009); SBCAG RGF2007; SCAG Adopted 2008 RTP; SLOCOG Approved Medium Scenario (June 2009); EPS Draft Allocations (July 18, 2010)

Figure 4



The RGF2007 employment projection through 2035 is more ‘aggressive’ than the comparable Caltrans long-range forecast, with SBCAG’s 241,000 Total Jobs projection about 3,600 more than Caltrans 237,400 Total Employment forecast (**Table 6** and **Figure 5**). Note that the growth curves of both forecasts are similar and are convergent as the projections approach 2035.

**Baseline and Forecasted GHG Emissions Inventory for the Unincorporated County**

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**Table 6: Caltrans and Tri-Counties COG Employment Growth Forecast Comparisons**

County	Current EDD Estimate	Projected by Caltrans 2009							
	Year	2010	2010	2020	2030	2035	2040	2050	Change 2010-
Ventura (CALTRANS)	297,800	301,100	350,400	393,300	409,800	N/A	N/A	108,700	36%
San Luis Obispo (CALTRANS)	100,900	105,400	122,100	138,300	145,900	N/A	N/A	40,500	38%
Santa Barbara (CALTRANS)	184,700	185,900	208,900	229,300	237,400	N/A	N/A	51,500	28%

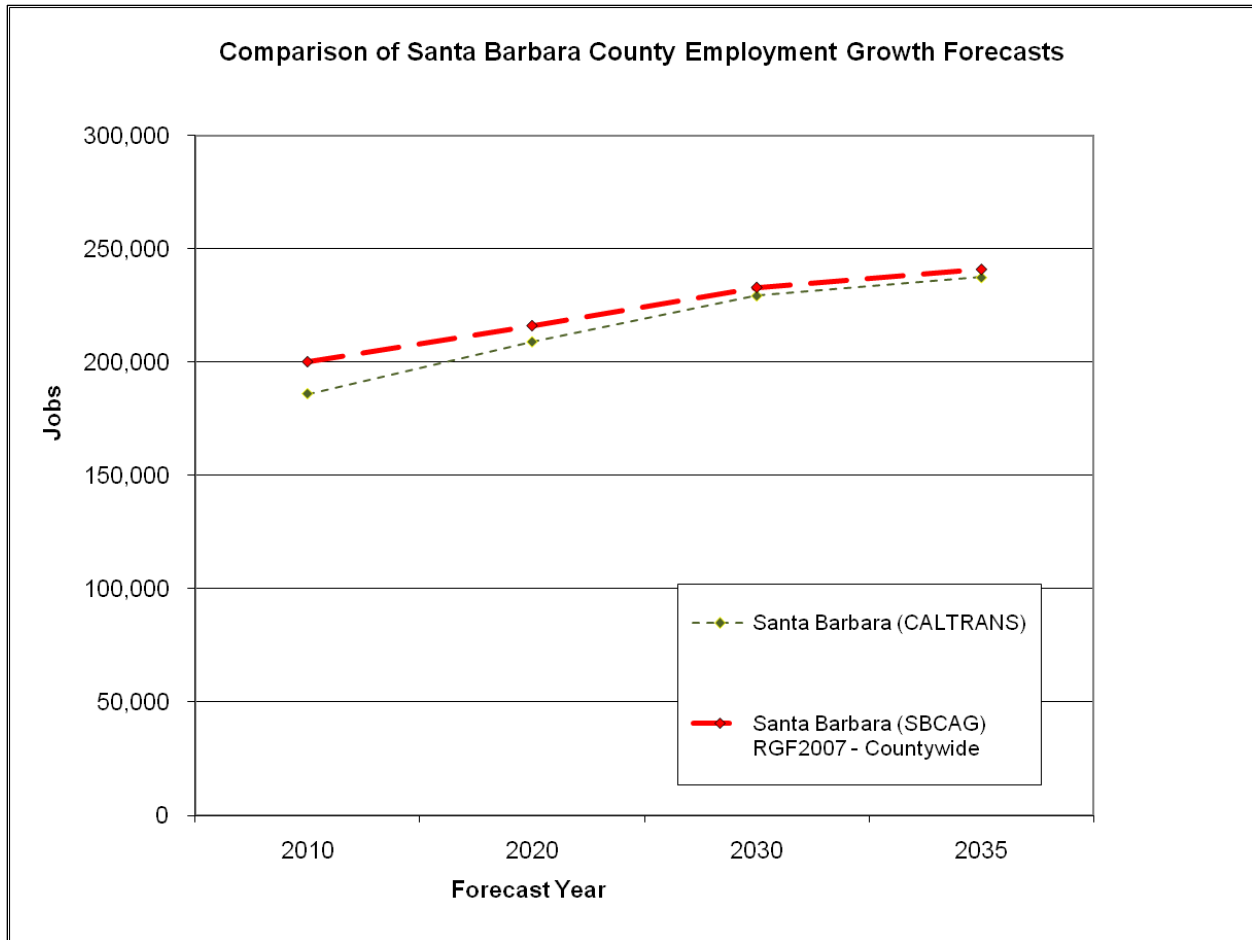
County	Current EDD Estimate	Projected by COGs 2008-2009							
	Year	2010	2010	2020	2030	2035	2040	2050	Change 2010-
Ventura (SCAG)	297,800	373,447	416,937	449,941	463,227	N/A	N/A	89,780	24%
San Luis Obispo (SLOCOG) - Medium Scenario	100,900	100,600	113,400	129,100	138,100	N/A	N/A	37,500	37%
Santa Barbara (SBCAG) RGF2007 - Countywide	184,700	200,001	216,001	233,001	241,001	249,001	N/A	41,000	20%

County	EDD Estimate	Allocated by EPS 2010							
	Year	2007	2007	2020	2030	2035	2040	2050	Change 2007-
Santa Barbara (SBCAG) RGF2007 by TAZ (Draft) - 'Unincorporated'	N/A	19,663	22,365	N/A	24,348	N/A	N/A	4,685	24%
Santa Barbara (SBCAG) RGF2007 by TAZ (Draft) - Countywide	189,600	189,600	215,995	N/A	240,998	N/A	N/A	51,398	27%

Sources: California EDD June 2010 Employment Estimates (Preliminary); Caltrans 2010 Long-Term Socio-Economic Forecasts by County (2009); SBCAG RGF2007; SCAG Adopted 2008 RTP; SLOCOG Approved Medium Scenario (June 2009); EPS Draft Allocations (July 18, 2010)

Figure 5



Caltrans’ recent long-range employment forecasts have been progressively more conservative as the scale and depth of job losses during the Recession have become evident. The Caltrans 2010 Series projections forecast 20,381,000 Total Wage & Salary Jobs Statewide by 2035, which is 1.464 million jobs less than was forecast by 2030 in the Caltrans 2006 Series projections. For Santa Barbara County, Caltrans 2010 Series forecast of 237,400 Total Wage & Salary Jobs nearly matches the 237,500 Total Wage & Salary Jobs forecast Countywide by 2030 in the Caltrans 2006 Series projections.

For the extended Tri-County region, Caltrans forecast of 793,100 Total Wage & Salary Jobs by 2035 is about 49,230 jobs lower than the aggregate COGs adopted projections of 842,328 jobs (**Table 6**). As the SLOCOG employment projection for 2035 is 7,800 jobs lower than the Caltrans equivalent, more than offsetting the SBCAG differential from Caltrans, the major component of the Tri-County difference is the SCAG 2008 RTP forecast for Ventura County, which is about 53,425 jobs higher than the Caltrans equivalent for 2035. SCAG’s current Local Input/General Plan Growth Forecast for the 2012 RTP<sup>9</sup> indicates a working estimate of 429,584 jobs for Ventura County by 2035. This is lower by about 33,465

<sup>9</sup> <http://www.scag.ca.gov/forecast/downloads/excel/RTP2012-GROWTH-FORECAST.xls>

jobs than the approved SCAG 2008 RTP forecast, and would reduce the net COGs/Caltrans employment forecast difference by more than two-thirds.

In applying the RGF2007 forecasts to the Base Year 2007 chosen for GHG Emission Modeling, the Aspen Team used the DOF estimates of 2007 Population and Housing and the EDD estimates of 2007 Jobs to interpolate Base Year inputs from the Draft TAZ allocations of RGF2007 for Years 2005 and 2020 provided by SBCAG. These interpolation control totals and the equivalent aggregate projections for the Defined Unincorporated County Study Area and Whole County are provided at the bottom of each of the **Tables 2 to 4**. It can be seen that the Countywide aggregate population, households, and employment estimates and forecasts differ from the EDD and DOF controls for 2007 and the RGF2007 adopted projections for 2020 and 2035 by only a few persons, HH or jobs – the very small differences resulting from unavoidable ‘round-off’ as the Countywide and subregional forecasts are allocated among hundreds of transportation analysis zones.

## Emission and Energy Use Forecasts

The emission inventory forecasts are driven by relationships of certain activities to the demographic and economic forecasts developed by SBCAG. The relationships are generally per capita or per employee emission rates. Each relationship starts from the 2007 baseline inventory and is projected to change to the 2020 and 2035 levels assuming a business as usual (BAU) scenario. In most cases, specific relationship parameters are available for 2020, for example, GHG emissions per kilowatt-hour of electricity generated or natural gas use per household. However, similar forecasts have not yet been developed for 2035 for most parameters. In that situation, we made linear projections of continued trends for the subsequent 15 years.

The emission relationships can be broken into several broad categories:

**Energy use per residential household or per employee by two-digit NAICS code, which leads to mostly CO<sub>2</sub> emissions.** These are mostly electricity and natural gas consumption, but include small amounts of other fuels such as propane and diesel. The household, business and agricultural electricity and natural gas usage values are derived from California Energy Commission historic data on its website and forecasts in the 2010 *Integrated Energy Policy Report Update*. Stationary liquid fuel use in 2007 is estimated from SBAPCD CO<sub>2</sub> inventory data using throughput rates provided by SBAPCD staff. Fuel use is forecasted to increase based on Statewide relationships to employment changes for each economic sector. The emission rate per kilowatt-hour consumed is based on CARB estimate of the averages for each economic sector or category in its 2020 projection for the Statewide GHG inventory.

**On-road VMT which are derived from CARB’s EMFAC model.** The EMFAC model accounts for the range of on-road vehicles from cars to trucks to buses, and projects how fleet composition may change over time. It estimates both fuel use and criteria pollutant emissions and was recently calibrated to actual fuel sales data. EMFAC can derive local travel estimates and associated emissions based on SBCAG’s travel forecast model. An important assumption here is that the State’s Pavley fuel economy standards are considered to be part of the AB 32 Scoping Plan and not in the business as usual baseline, consistent with CARB’s assumptions in applying AB 32 standards. *In developing its Climate Action Strategy, the*

*County will want to account for this and other Statewide AB 32 measures in reducing County emissions before developing a plan with additional local measures.*

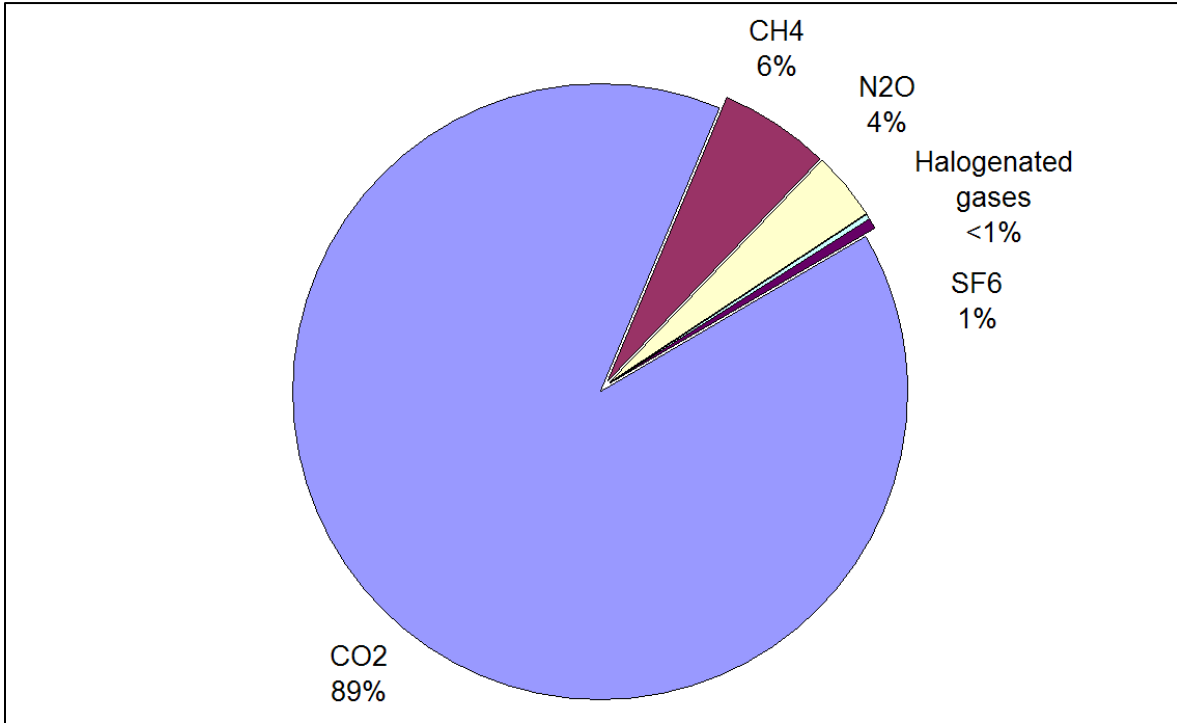
Refrigerants and coolants become an increasing share of emissions as ozone-depleting substances (ODS) emissions are reduced through turnover. Note that this GHG emission increase is somewhat deceptive though because ODS gases generally have higher, not lower, global warming potential, so the increase in HFCs and PFCs actually reduce the true GHG emission inventory. ODS GHGs are not regulated under AB 32. Unfortunately, CARB has not developed an inventory of ODS GHGs and ODS are considered to be outside of the gases accounted for in the international standards. The parameters relating emissions to households and employees, and changes in the emission rates for HFC, PFC, SF<sub>6</sub> and NF<sub>3</sub> emissions are derived from CARB's 2007 and 2020 GHG inventories.

Agricultural non-combustion activities, mostly related to cultivation and livestock rearing, are derived from CARB emission inventories. These are based on either per acre or per head of livestock rates. The acreage and livestock data comes from the Santa Barbara Agricultural Commissioner Report and the USDA 2007 Census of Agriculture.

## Emission Inventory Results

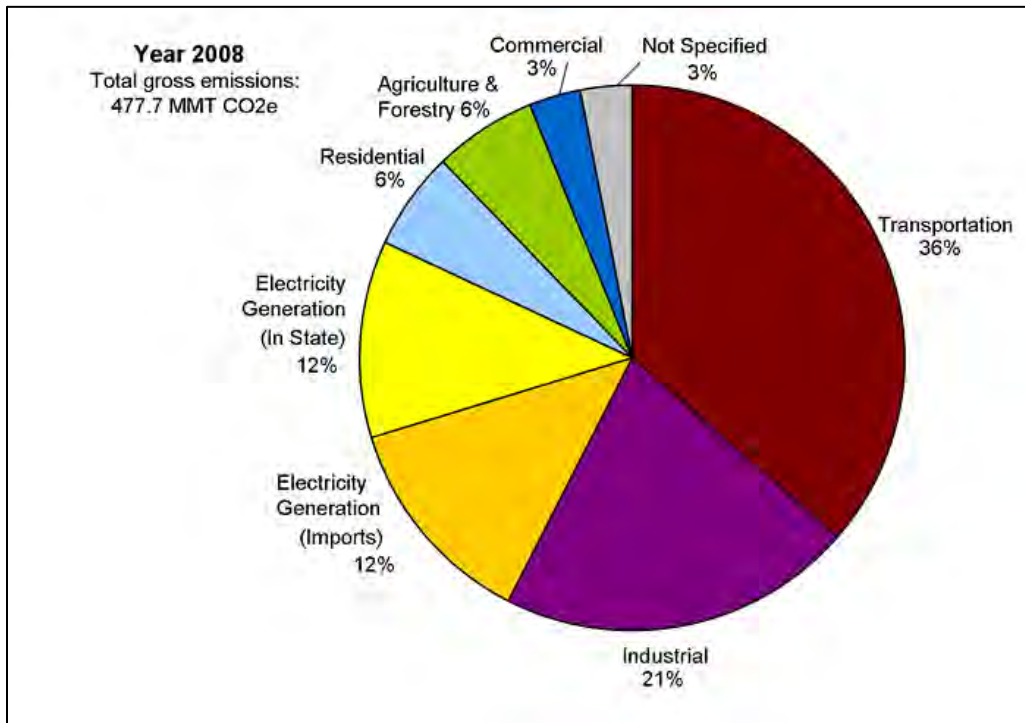
CARB has prepared a Statewide inventory for the years 2000 to 2008. **Figure 6** shows the breakdown by GHG type Statewide for 1990. **Figure 7** shows the breakdown by sector Statewide for 2008. Carbon dioxide (CO<sub>2</sub>) is the primary constituent to greenhouse gases, and it is used as the primary metric for comparing climate change potential among the different gases. The inventory is usually reported in "CO<sub>2</sub> equivalents." According to CARB as shown in Figure 6, CO<sub>2</sub> is about 89 percent of the 1990 GHG inventory.

Figure 6 California 1990 Greenhouse Gas Emissions Inventory Gas Type



Source: California Air Resources Board

Figure 7 California 2008 Greenhouse Gas Inventory by Sector



Source: California Air Resources Board



The inventory for Santa Barbara County can deviate significantly from the Statewide shares as the County has a different set of key economic activities. Underlying activity parameters have been derived for various sectors based on CARB's GHG inventory methodology. These activity parameters are the primary drivers of the emission levels, and by forecasting the activity levels, the associated emissions can also be forecasted.

## Baseline 1990 and 2007 Emissions for Santa Barbara County

The baseline emission inventory was estimated for both 1990 and 2007, and both for Countywide and unincorporated areas. The Countywide inventory includes emissions from cities, universities, State-owned, federal<sup>10</sup> and Native American lands. The Countywide inventory is presented for relative perspective, and in less detail than that for the unincorporated areas. Those under Scope 1 include direct emissions from fuel combustion and emitting activities; Scope 2 includes indirect emissions caused at linked infrastructure caused by activity within the jurisdiction. In the latter case, these are related to electricity generation through PG&E, SCE and the City of Lompoc, water deliveries from the State Water Project, and waste disposal at County landfills.<sup>11</sup> The landfill sources represent fugitive emissions, mostly related to methane.

### 1990 Emissions Inventory

**Figure 8** compares the Countywide emissions inventory for 1990 using the top-down scaling method to the 2007 inventory calculated using the same methodology and using the bottom-up detailed method that is the basis for the inventory forecasts for 2020 and 2035. **Table 7** summarizes these results by sector and year. Moving from 1990 to 2007 shows an increase of 8 percent in emissions. A reduction in industrial activity and a shift in stationary fuel types towards lower-GHG natural gas in the residential and commercial sectors lead to a 10 percent reduction from stationary sources. On the other hand, mobile sources increased by 20 percent. This increase is driven almost entirely by increased on-road mobile activity, with a minor contribution from replacing ODS refrigerants, coolants and foam products with HFCs and PFCs. While emissions increased 8 percent, population increased 14 percent, so per capita emissions decreased over the period by 5 percent.

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<sup>10</sup> Excluding Outer Continental Shelf (OCS) off shore petroleum production facilities and ocean-going vessels in federal waters.

<sup>11</sup> The County exports very little solid waste, most of which is used for ground cover, so any waste export emissions have been ignored here. All waste emissions are from facilities within the County.

Figure 8

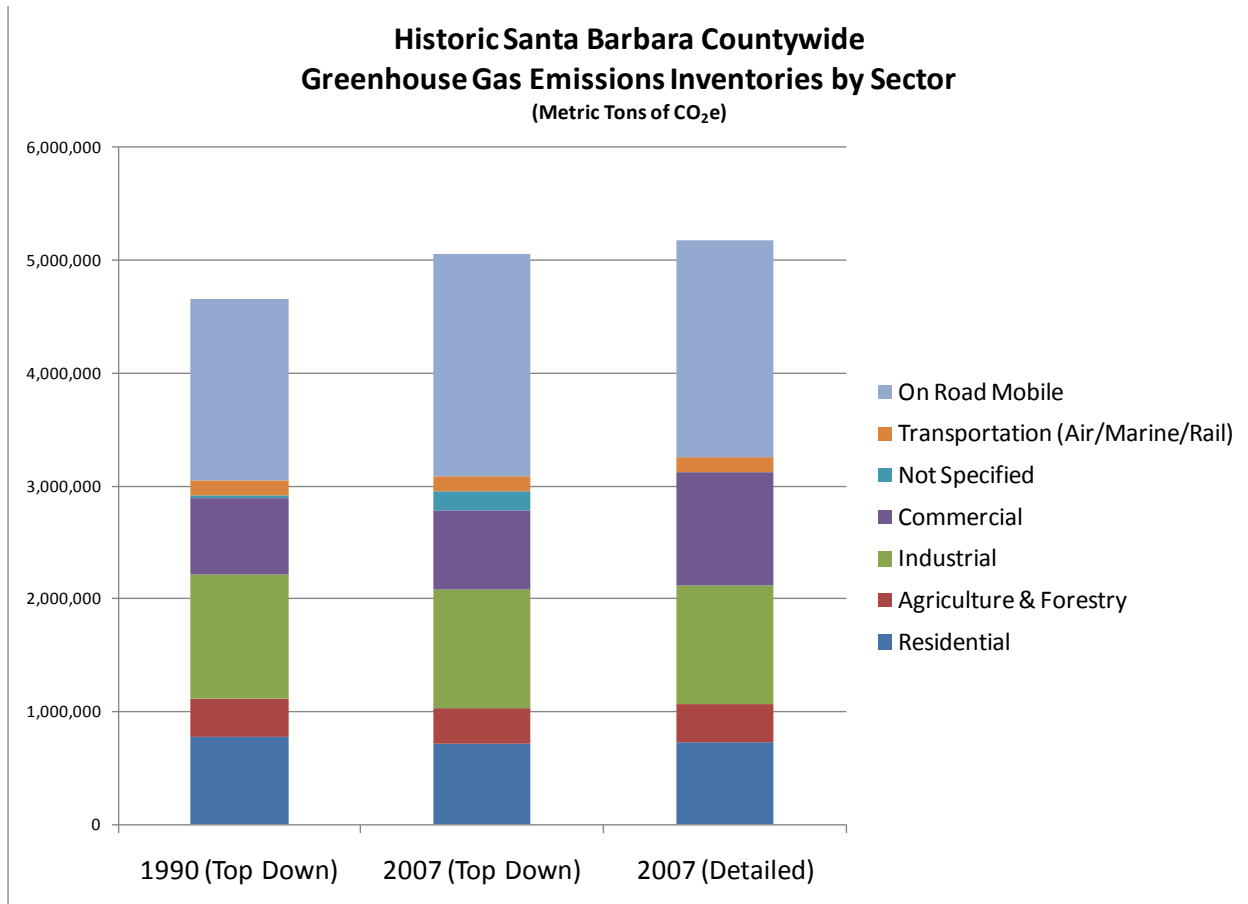


Table 7

Countywide GHG Inventory	Method / Source	1990	2007	2007
		Top Down	Top Down.	Detailed
Residential		772,828	718,459	725,316
Agriculture & Forestry		345,145	314,380	344,323
Industrial		1,099,708	1,047,082	1,043,800
Commercial		670,397	697,802	1,104,741
Not Specified		25,892	178,578	NA
Transportation (Air/Marine/Rail)		136,206	118,324	130,899
On Road Mobile		1,608,030	1,964,047	1,925,639
<b>Total</b>		<b>4,658,207</b>	<b>5,038,672</b>	<b>5,274,717</b>

The two 2007 inventories differ by 4 percent between the top-down and detailed methods. This difference arises in the industrial and commercial sectors, where the industrial emissions for Scope 1 and Scope 2 differ by offsetting amounts, and commercial emissions for both scopes are lower in the top-down method than using the detailed bottom-up approach. Some of this difference probably arises from differences in classifying businesses by commercial versus industrial as that the classification system

changes in 1997. This divergence also may reflect the improved ability to capture local characteristics with the detailed approach that cannot be captured by using Statewide or generalized emission factors allocated solely on the basis of surrogate factors such as employment, criteria pollutant emission inventories or oil and gas operation parameters. The detailed inventory is able to rely on direct activity measures which are more accurate but not readily available for 1990 at the necessary geographic and industrial-sector disaggregation. Nevertheless, the top down methodology calibrated in this manner provides a useful measure of trends from 1990 to 2007.

**Figure 9** compares the inventories for the unincorporated County. **Table 8** shows the emissions by sector. Emissions dropped 5 percent from 1990 to 2007 according to this analysis, despite population increasing by 8 percent. The decrease was lead by a 13 percent reduction from stationary sources. A drop in industrial emissions, driven by an apparent loss of jobs in that sector, explains the largest share. Mobile source emissions increased by 11 percent. Residential and industrial emissions dropped significantly; more than 60 percent in the latter case. Agricultural emissions fell slightly, while commercial ones increased somewhat.

Figure 9

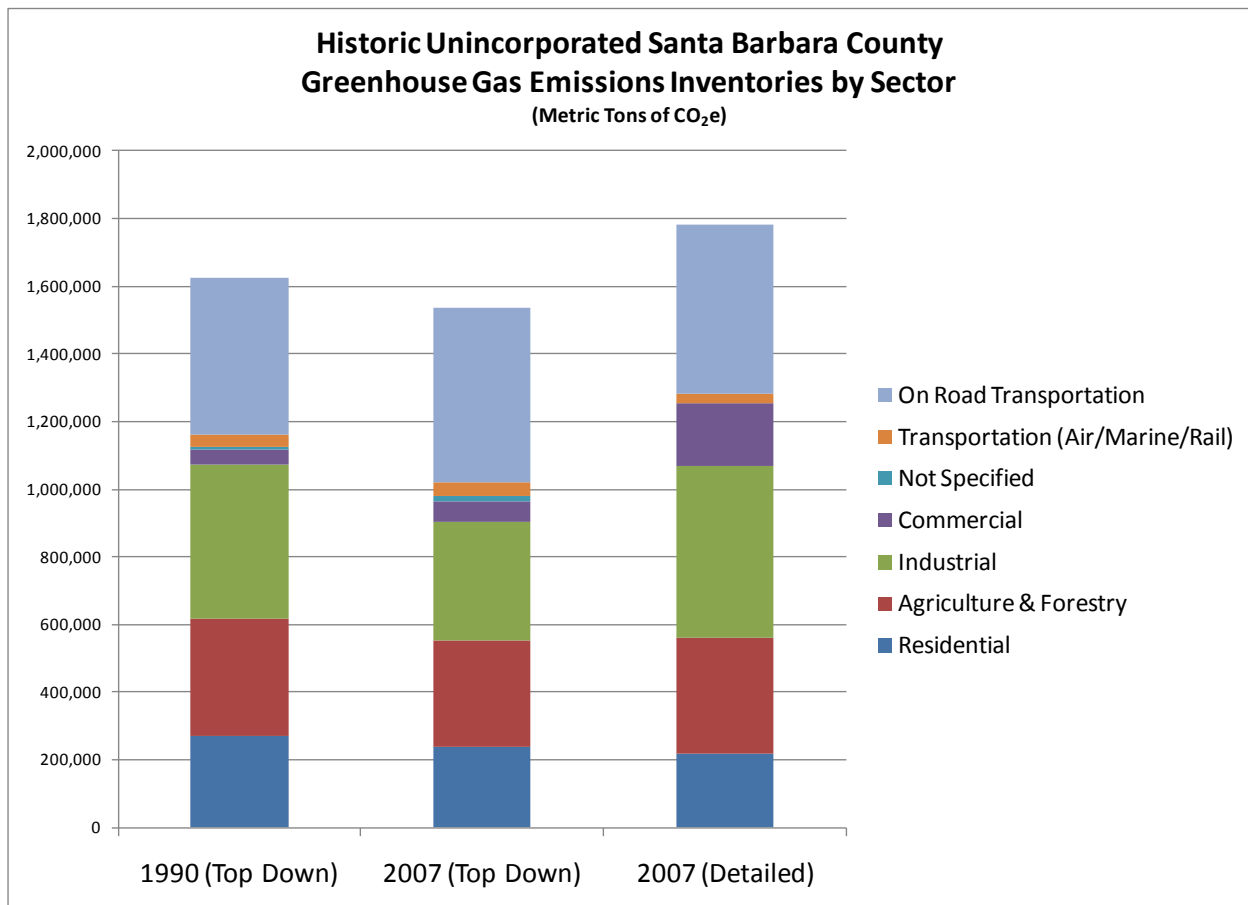


Table 8

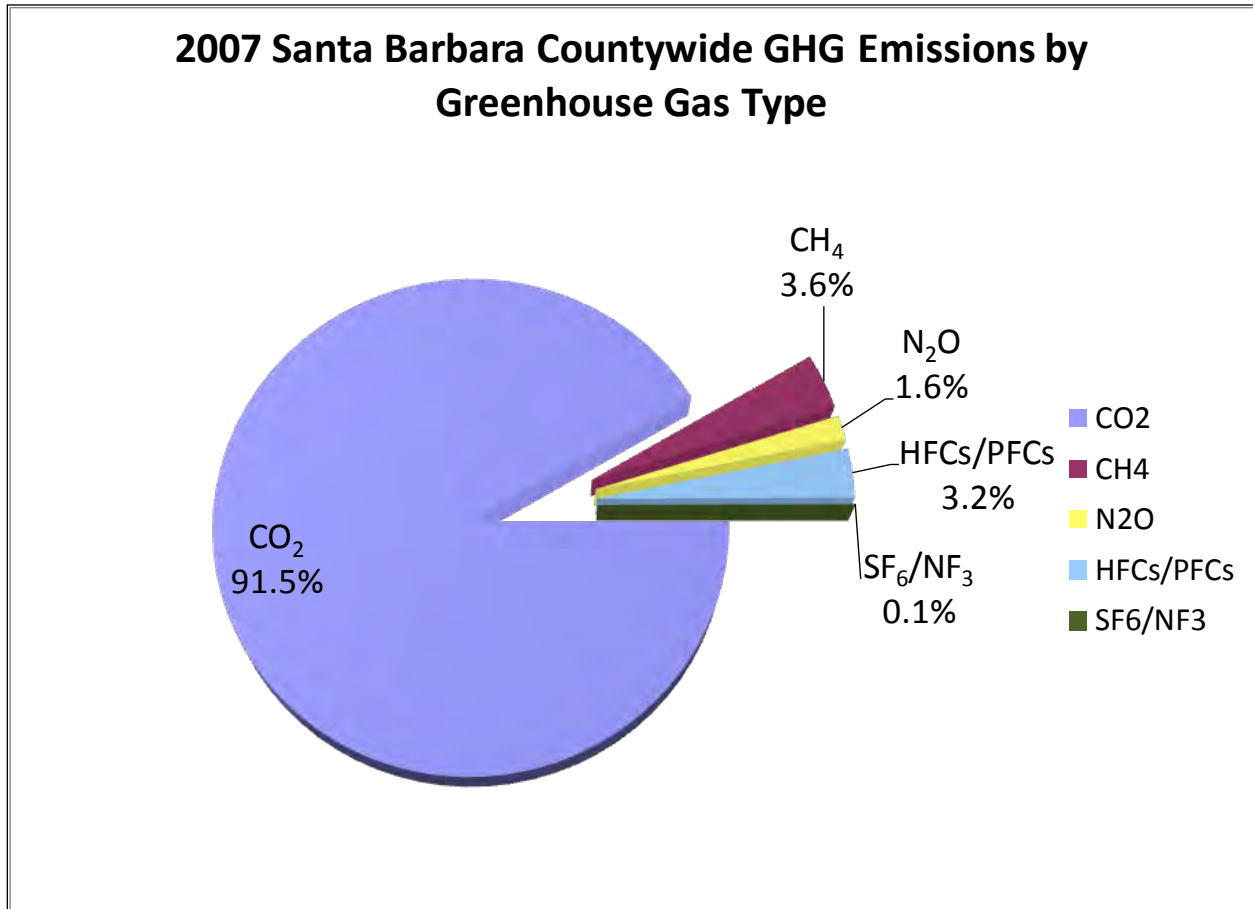
Unincorporated County GHG Inventory <i>Method / Source</i>	1990	2007	2007
	<i>Top Down.</i>	<i>Top Down.</i>	Detailed
Residential	272,171	239,518	220,327
Agriculture & Forestry	345,145	314,380	340,582
Industrial	457,383	349,425	507,009
Commercial	42,270	59,795	186,647
Not Specified	6,441	18,919	NA
Transportation (Air/Marine/Rail)	36,143	39,374	29,637
On Road Mobile	463,498	516,407	496,363
<b>Total</b>	<b>1,623,051</b>	<b>1,537,819</b>	<b>1,780,565</b>

For the unincorporated County, the divergence between the top down and detailed methods is about 14 percent for the two 2007 inventory methods. The difference is almost entirely attributable to Scope 1 emissions from the commercial sector and Scope 2 industrial emissions from electricity. The Scope 2 difference is probably occurring because the electricity use of industries dominant in the unincorporated County has a different electricity intensity than the County as a whole. For commercial emissions, as with the Countywide inventory, specific fuel use by type of commercial entity is not available for 1990, and scaling down on a per employee basis distorts the allocation at the local level. The use of the detailed NAICS data from the CEC, which is only available after 2005, adds precision to the local allocation to the bottom up analysis used through the rest of this report.

### 2007 Emissions Inventory

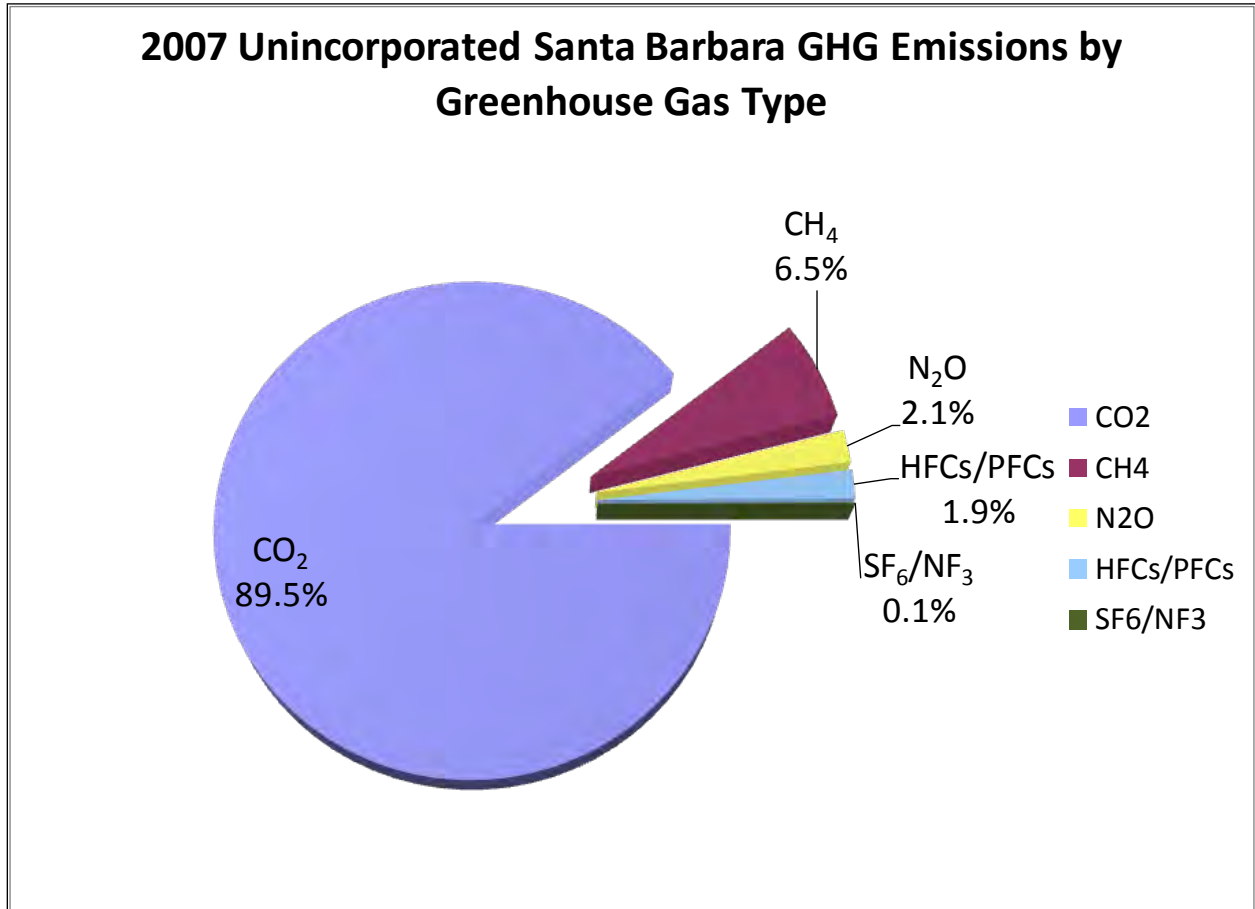
**Figure 10** shows Santa Barbara’s Countywide emissions by type of GHG for 2007. CO<sub>2</sub> is the predominant emission, as it is for the State, accounting for over 90 percent, similar to the State’s emission profile. HFCs and PFCs have become a more predominate source over the last 17 years. This is a result of the Montreal Protocol signed in 1987 that phases out ozone-depleting substances that are used in coolants and insulation products. However, this change is somewhat deceptive as ODS in fact have even greater global warming potential (GWP) than the HFCs and PFCs used to substitute for the ODS, but the ODS are excluded from any inventory accounting.

Figure 10



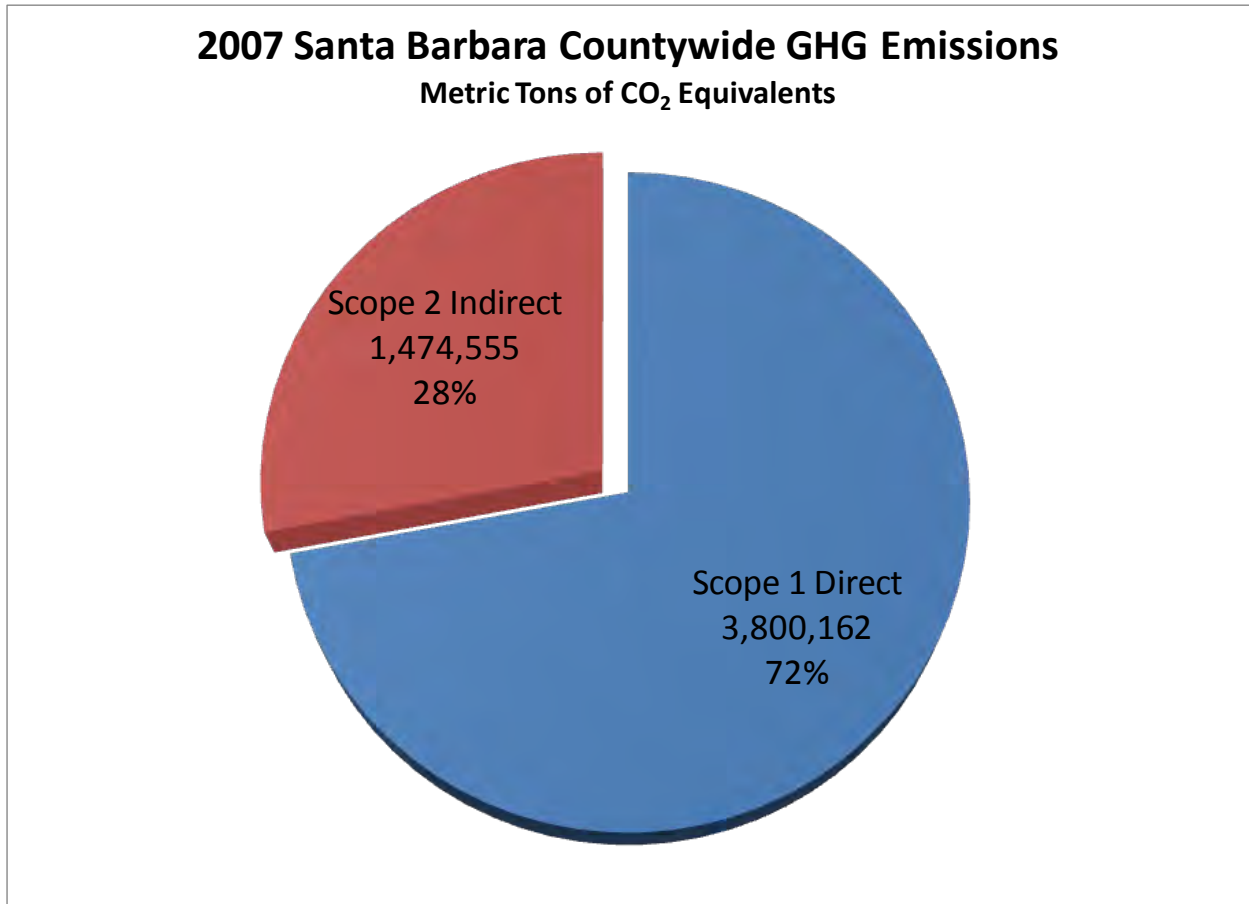
**Figure 11** shows the GHGs in 2007 for the unincorporated County. Methane and nitrogen dioxide emissions are substantially higher than for the full County due to the predominance of agricultural activities in the unincorporated areas. HFCs and PFCs are associated with commercial and residential cooling and refrigeration that are concentrated in the cities so that share falls.

Figure 11



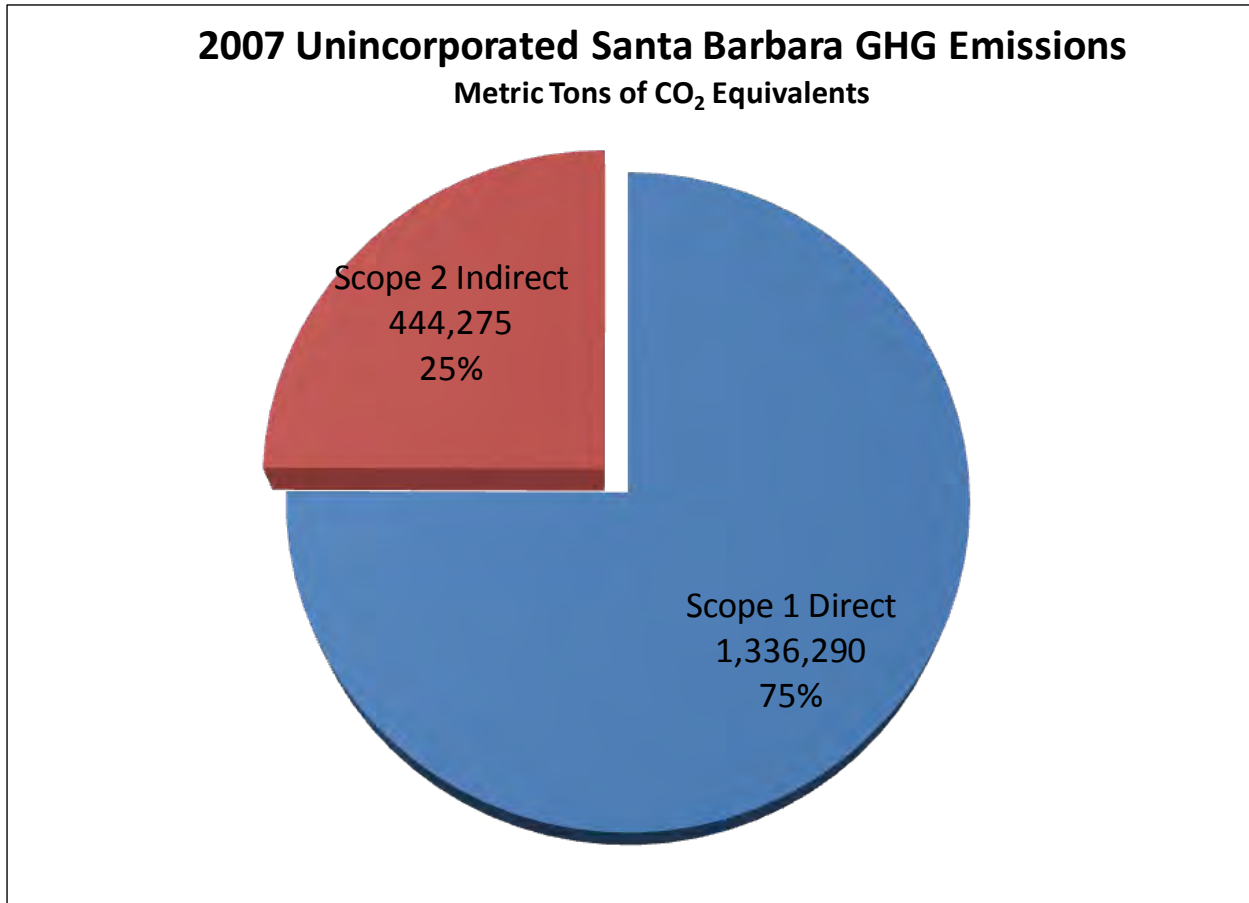
**Figure 12** shows the direct Scope 1 and indirect Scope 2 Countywide emissions for Santa Barbara in 2007. The 2007 Countywide inventory was 5.27 million metric tons in carbon dioxide equivalents. This compares to the Statewide total reported by CARB of 476.77 million tons. The County's emissions represent about 1.1 percent of the Statewide totals, roughly on par with the County's share of the State population. Direct Scope 1 emissions are 72 percent of the inventory, while indirect emissions mostly from electricity generation represent the other 28 percent.

Figure 12



**Figure 13** shows emissions by Scope within the unincorporated County jurisdiction for 2007. The unincorporated County emissions were 1.78 million tons or about one-third of the Countywide total. Direct Scope 1 emissions for the unincorporated area were 35 percent of the Countywide emissions, while indirect Scope 2 emissions were 30 percent of the Countywide amount. Scope 1 emissions represent a larger share of the total at 73 percent as agriculture and the oil and gas industries are relatively more important economic activities outside of the cities and various State, federal and Native American jurisdictions.

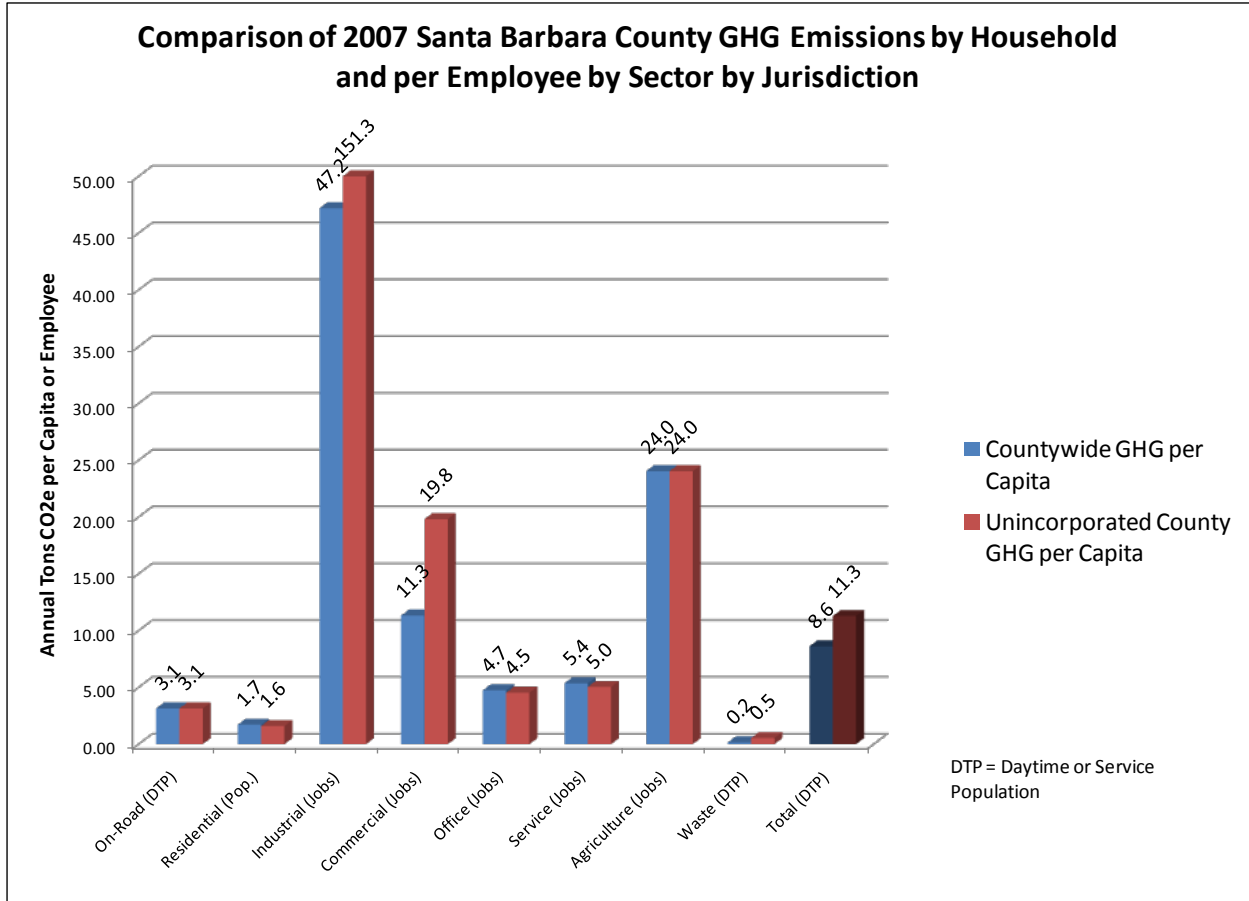
Figure 13





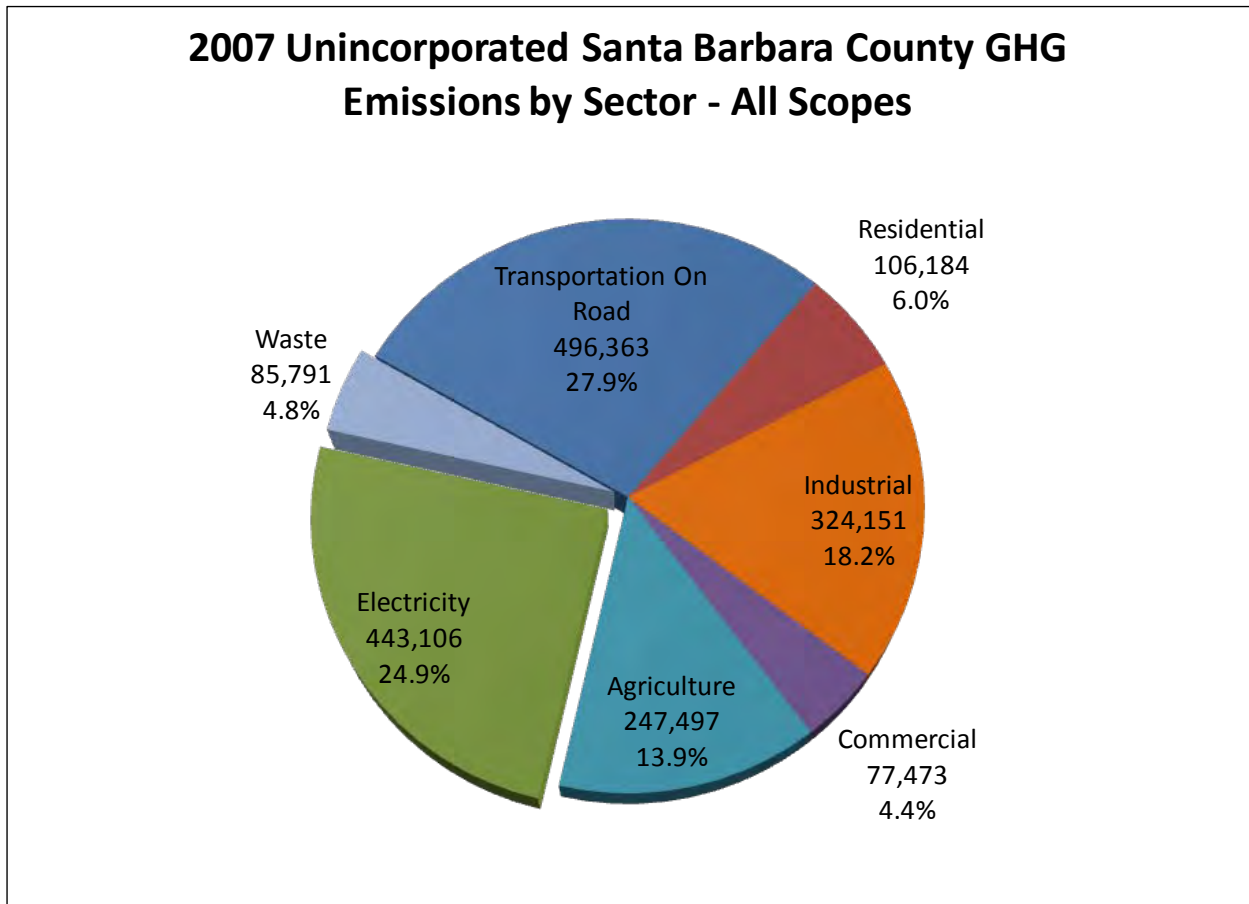
**Figure 14** compares the Countywide and unincorporated County emission rate per capita, either against population for residential or jobs for commercial, industrial and agricultural. On-road and total emissions are computed based on the daytime or service population as discussed previously. Industrial emissions in the unincorporated area are three-fold those of the County average as the oil and gas industry is largely situated outside of the cities. Agricultural emissions also are higher than for other industries, and 98 percent of agriculture is in the unincorporated area. The result is that the per capita emissions, based on daytime population, in the unincorporated County are 31 percent higher than for the Countywide average.

Figure 14



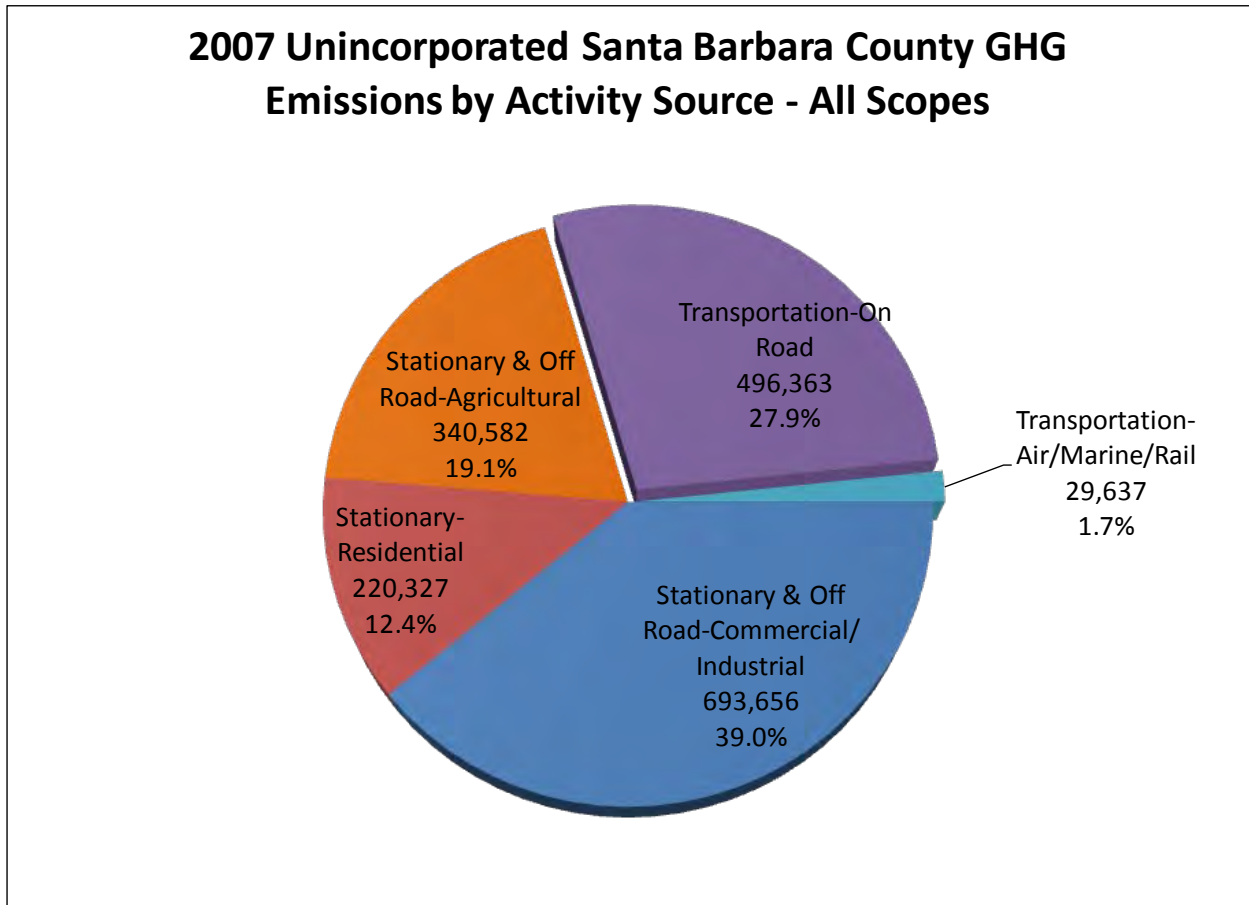
**Figure 15** shows emissions by socio-economic sector, in a similar fashion to the Statewide inventory shown in **Figure 7** above. Waste and on-road emissions are shown separately as those could not be assigned to specific sectors with the data available. Electricity emissions can be assigned to sector but are shown separately by CARB, so this chart is constructed to be comparable. On road mobile sources (e.g., automobiles and trucks) account for about 28 percent of all emissions for the unincorporated county as the single largest source. Industrial and agricultural emissions are the next largest direct sources as the oil industry and farming are the two dominant economic activities in the unincorporated County. Electricity use, which is the entirety of the Scope 2 emissions, represents one-quarter of the inventory. Residential emissions from heating, cooking, and cooling and refrigerant gases amount to about 6 percent.

Figure 15



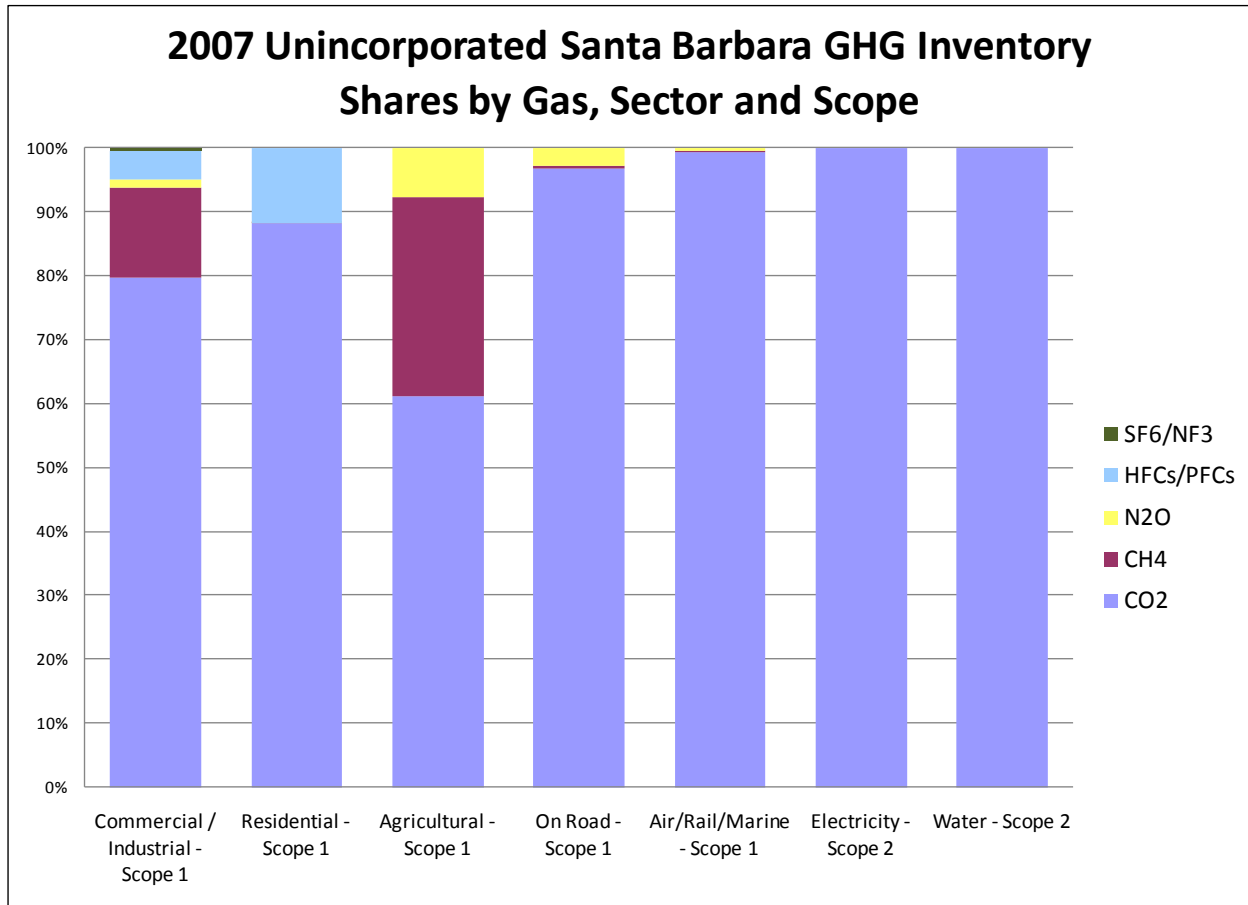
**Figure 16** shows emissions for the unincorporated County by activity source, whether stationary or mobile. In this case, indirect Scope 2 emissions such as electricity use have been allocated to final end uses. Thus stationary emissions represent both direct HFC emissions and emissions from electricity generation associated with cooling and refrigeration in the residential, commercial and industrial sectors. Off road mobile sources, such as for construction and agriculture, are allocated to the industrial and agricultural activities. Transportation sources are 31 percent of the inventory and stationary 69 percent. Commercial and industrial sources are the largest with 37 percent and agriculture represents 20 percent. Residential sources are 13 percent of the total.

Figure 16



**Figure 17** shows emissions by sector, by GHG, and by Scope. Carbon dioxide is the dominant gas in most sectors, but methane (CH<sub>4</sub>) and nitrogen dioxide (N<sub>2</sub>O) are significant for both agriculture and waste disposal embedded in the commercial and industrial sector. HFCs are important for residential, commercial and industrial sources, and as shown later, a growing share into the future.

Figure 17



**Figure 18** breaks out the emissions for the agricultural, commercial and industrial sectors in total by two-digit NAICS Code sectors, and **Figure 19** details direct Scope 1 and indirect Scope 2 activities. The comparison allows a more refined assessment of which sectors have the greatest emissions. The oil and gas sector is the single largest source with 31 percent, and agriculture next with 13 percent. Other sectors that represent more than 5 percent of the business sector emissions are accommodation and food service, transportation and warehousing, education, retail, and consumer goods manufacturing. As Figure 19 shows, outside of the oil and gas, and agricultural sectors, most emissions are indirect, related to electricity use.

Figure 18

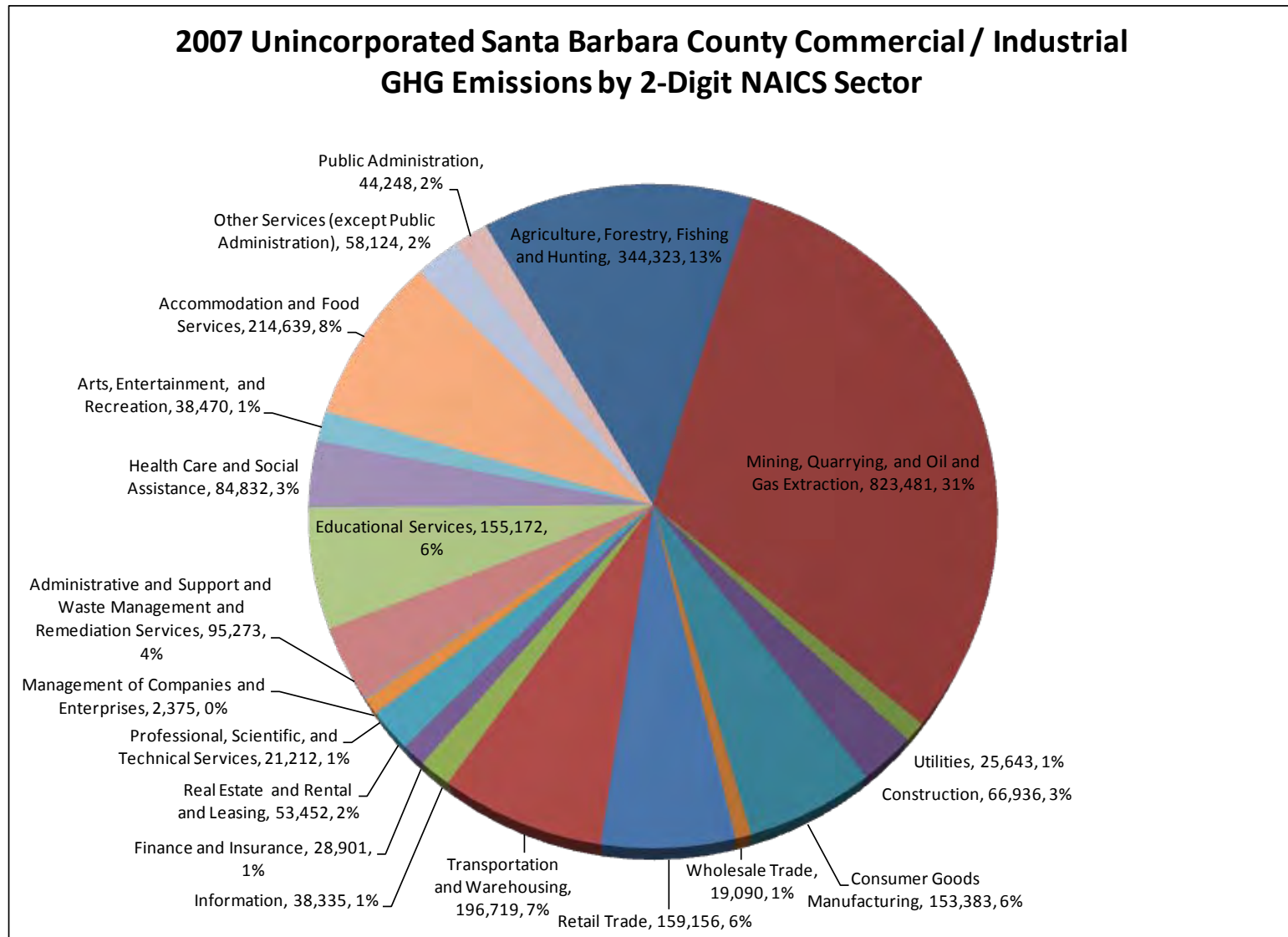
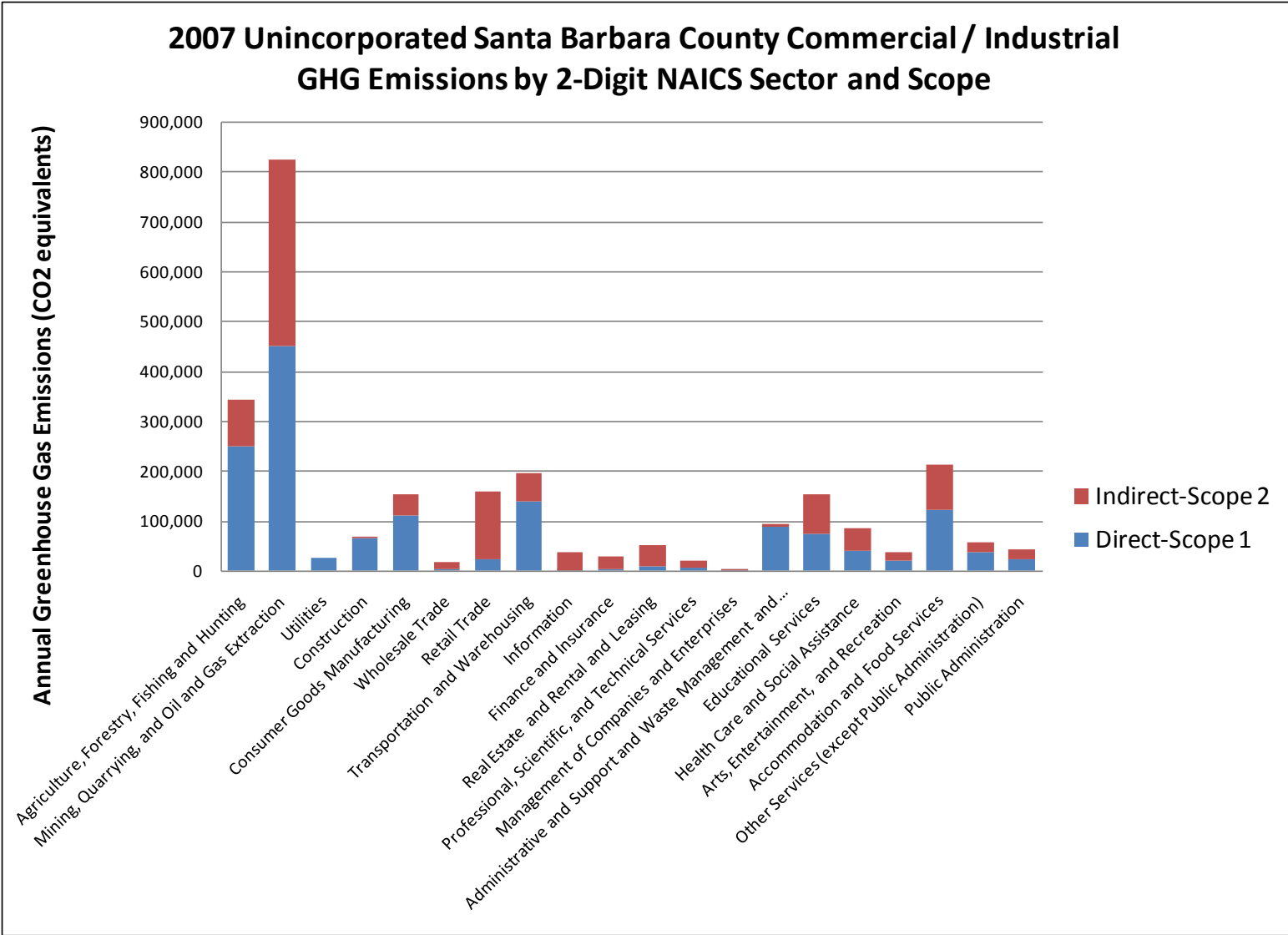


Figure 19



**Table 9** categorizes the 2007 emissions inventory for the unincorporated County by several segments. Sources are separated by point (large, individually monitored locations), area-wide (smaller businesses and residences), and mobile (on-road and non-road transport). Sectors are segmented into residential, transportation, and economic sectors consistent with the SBCAG categories of industrial, commercial, office, service, waste and agriculture. Much of this information is presented in the previous charts.

Table 9 – 2007 GHG Emission Inventory by Sector, Activity and Scope

Sources	Total	Residential	Transport	Industrial	Commercial	Office	Service	Waste	Agriculture
<b>Point Sources</b>				310,156	18,603	423	-	83,520	-
<b>Area-Wide Sources</b>									
Area Sources Total + Off Road Mobile				13,996	11,061	1,287	16,462	1,102	-
Residential		106,184		-	-	-	-	-	-
Agricultural				-	-	-	-	-	162,805
Indirect - Electricity		106,184	-	182,858	28,375	7,330	17,315	1,169	93,085
Indirect - SWP		7,960	-	-	-	-	-	-	-
<b>Mobile Sources</b>									
Air				-	11,008	-	-	-	-
Rail				-	18,629	-	-	-	-
Marine				-	-	-	-	-	-
On Road			496,363						
Agricultural				-	-	-	-	-	84,692
<b>Total</b>	<b>1,780,565</b>	<b>220,327</b>	<b>496,363</b>	<b>507,009</b>	<b>87,677</b>	<b>9,039</b>	<b>33,777</b>	<b>85,791</b>	<b>340,582</b>
% of Total	33.8%	12.4%	27.9%	28.5%	4.9%	0.5%	1.9%	4.8%	19.1%
Direct - Scope 1	1,336,290	106,184	496,363	324,151	59,302	1,710	16,462	84,622	247,497
% of Total	75.0%	7.9%	37.1%	24.3%	4.4%	0.1%	1.2%	6.3%	18.5%
Indirect - Scope 2	444,275	114,144	-	182,858	28,375	7,330	17,315	1,169	93,085
% of Total	27.2%	24.4%	0.0%	39.2%	6.1%	1.6%	3.7%	5.1%	19.9%



## Emissions Forecasts for 2020 and 2035

As discussed previously, forecasts were developed for two future years. A forecast for 2020 corresponds with the legal time horizon in AB 32, and is used by CARB for planning purposes. The 2035 forecast is being used by CARB, and SBCAG, for developing SB 375 emission reductions for local on-road emission reduction targets. The forecast methodology is consistent with CARB's "business as usual" (BAU) assumptions that exclude measures considered to be incorporated into the AB 32 Scoping Plan. In other words, this forecast does not include expected emission reductions from improved vehicle fuel economy, additional renewable power development beyond the existing 20 percent renewable portfolio standard (RPS), or other specified measures. Beyond 2020, emission factors per unit of activity are held constant and emission growth is from economic and population growth.

As with most forecasts, these are intended to be indicative and not predictive. The underlying algorithms are tied to parameters and assumptions that can be varied to see how differences in population and job growth or changes in emission rate coefficients affect the project inventories. Substantial uncertainty exists around both the underlying socio-economic forecasts from SBCAG, and the actual emission rates for different activities. For example, the CH<sub>4</sub> and N<sub>2</sub>O emissions for agriculture are estimates from CARB that are sensitive to many geographic, climatic and cultivation parameters that cannot be easily accounted for in such a broad inventory effort.

Perhaps the largest uncertainty is over future oil and gas production within the County and its effect on emissions. While production fell 56 percent from 1990 to 2007, DOGGR data for District 3 (which includes San Benito, Santa Cruz, Monterey and San Luis Obispo as well as Santa Barbara, counties) shows a recent slowing in production declines. Using historic production and price data, a forecast model with an R<sup>2</sup> correlation of 0.97 (out of 1.0) was developed for the 1981 to 2008 period. Using the U.S Energy Information Administration's crude oil forecast from the *Annual Energy Outlook*, this model forecasts a decline in District 3 production of 17 percent by 2020. This production, however, is likely to require more energy input through various enhanced recovery methods. Forecasting these various interplaying factors will require greater analysis as part of developing the County's *Climate Action Strategy*. Due to this uncertainty, this inventory presumes as being reasonable foreseeable the emission rate per employee for that industry will remain the same into the future.

**Figure 20** shows the emission forecast for the unincorporated County by Scope for 2007 to 2035. Total emissions are projected in the business-as-usual case to grow from 1.78 million metric tons by 0.8 percent per year over the period to 2.23 million tons, increasing 25 percent. Scope 1 emissions grow by 1.1 percent annually while Scope 2 emissions decrease 0.5 percent yearly. Electricity emissions fall through a combination of 1) lower statewide emission rates per kilowatt-hour due to increased renewable resource use, and 2) reduced employment in electricity-intensive industries forecasted by SBCAG. In comparison, total Countywide emissions are forecasted to rise by 1.5 percent per year or by 54 percent over the 28-year period to 8.1 million tons.

Figure 20

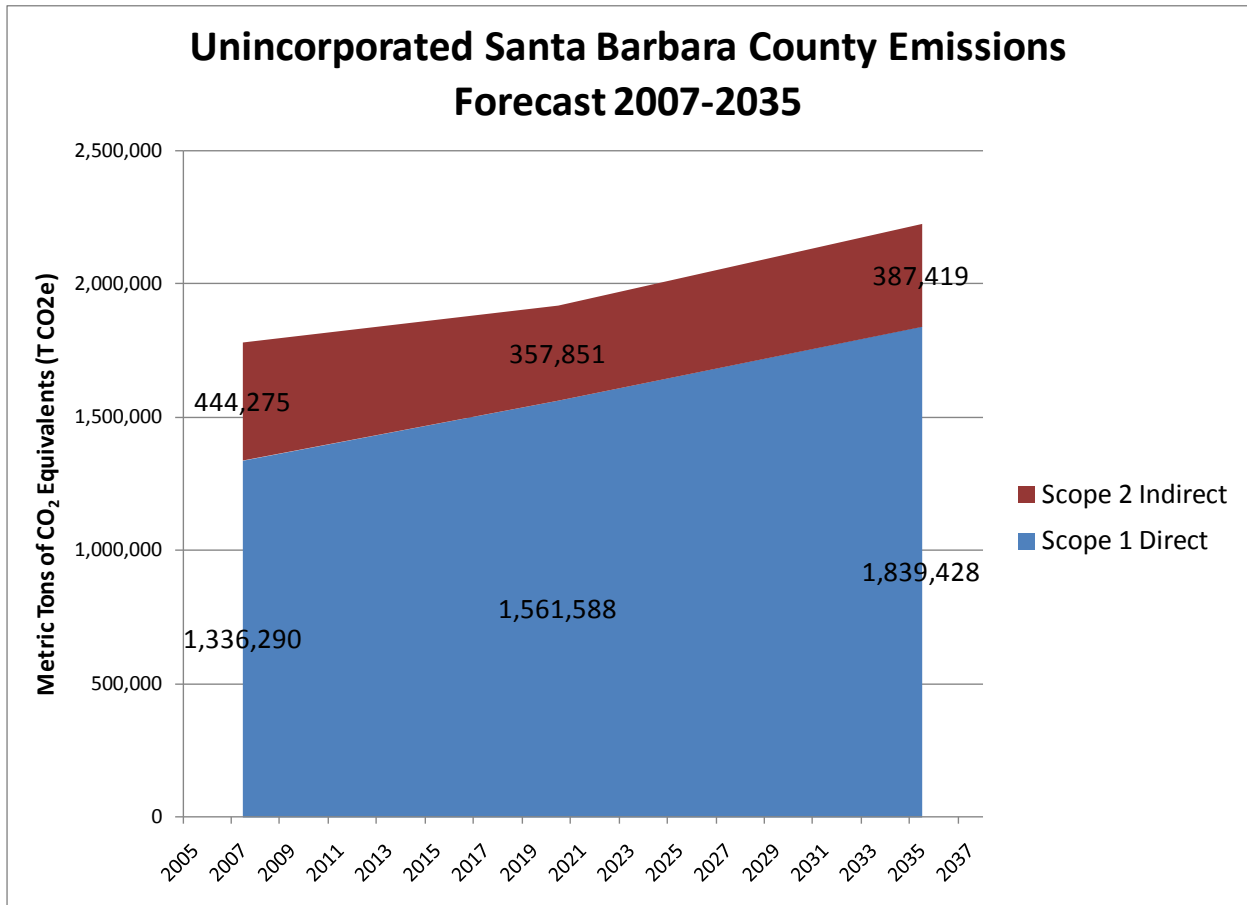
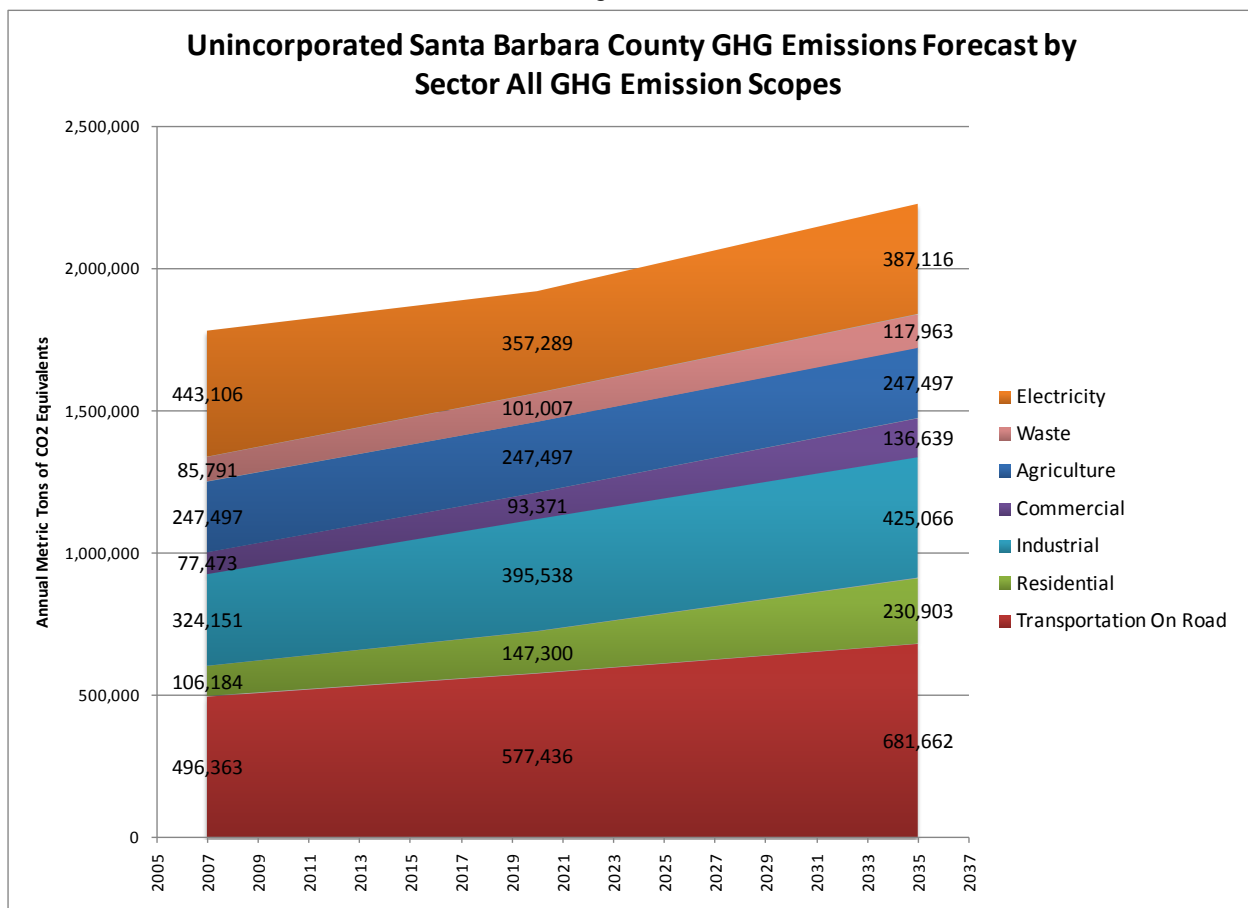


Figure 21 shows the emission forecast by sectors equivalent to Figure 16 with 2007 emissions.

The residential and commercial sectors grow quickly due to the increase substitution of ODS gasses for HFCs in coolants and refrigerants and PFCs in manufacturing. ODS gasses are outside of the IPPC inventory protocols (despite a significant climate-change forcing factor) while HFCs and PFCs are included in the protocol. In other words, the increase is more reflective of accounting treatment than of actual changes in global warming potential from that segment of emission sources.

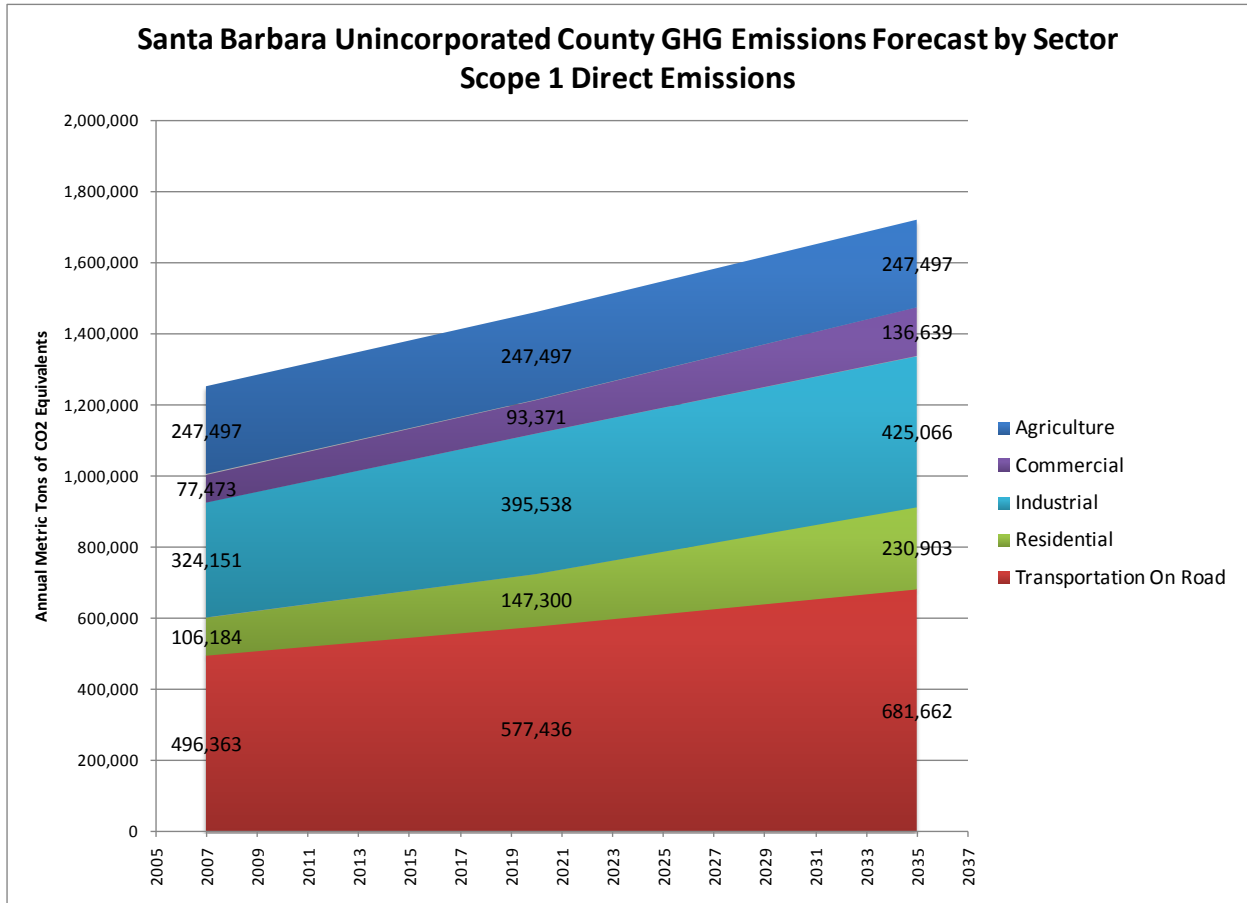
County agricultural emissions are projected to remain flat based on the CEC’s Statewide forecast of 0.07 percent yearly growth in electricity usage to 2020, and a decline in natural gas consumption of 0.3 percent annually. Projecting a change in agricultural emissions from current practices will require a detailed comparative forecast of Santa Barbara and Statewide agricultural activity and energy use.

Figure 21



**Figure 22** shows the emission forecast by sector from Scope 1 direct sources. Residential and commercial emissions more than double over the period, largely due to the increase in HFC and PFC emissions. These are high global warming potential (HGWP) gases, so their weight in the inventory is substantial, i.e., they theoretically have up to several thousand times the effect of CO<sub>2</sub> on potential climate change, as shown in Table 1. The on-road and industrial emissions increase about one-third.

Figure 22



**Figure 23** shows the emission forecast by sector from Scope 2 indirect sources such as electricity and water deliveries. Industrial, commercial and agricultural emissions decline significantly to 2020 as industrial employment falls and Statewide GHG electricity emission factors are reduced through added renewable generation under existing laws. These grow after 2035 based on the assumption that statewide emission factors are unchanged after 2020 because the renewable portfolio standard remains at 20 percent in the base case. Residential emissions increase with a growing population that offsets reduced GHG intensity per kilowatt-hour.

Figure 23

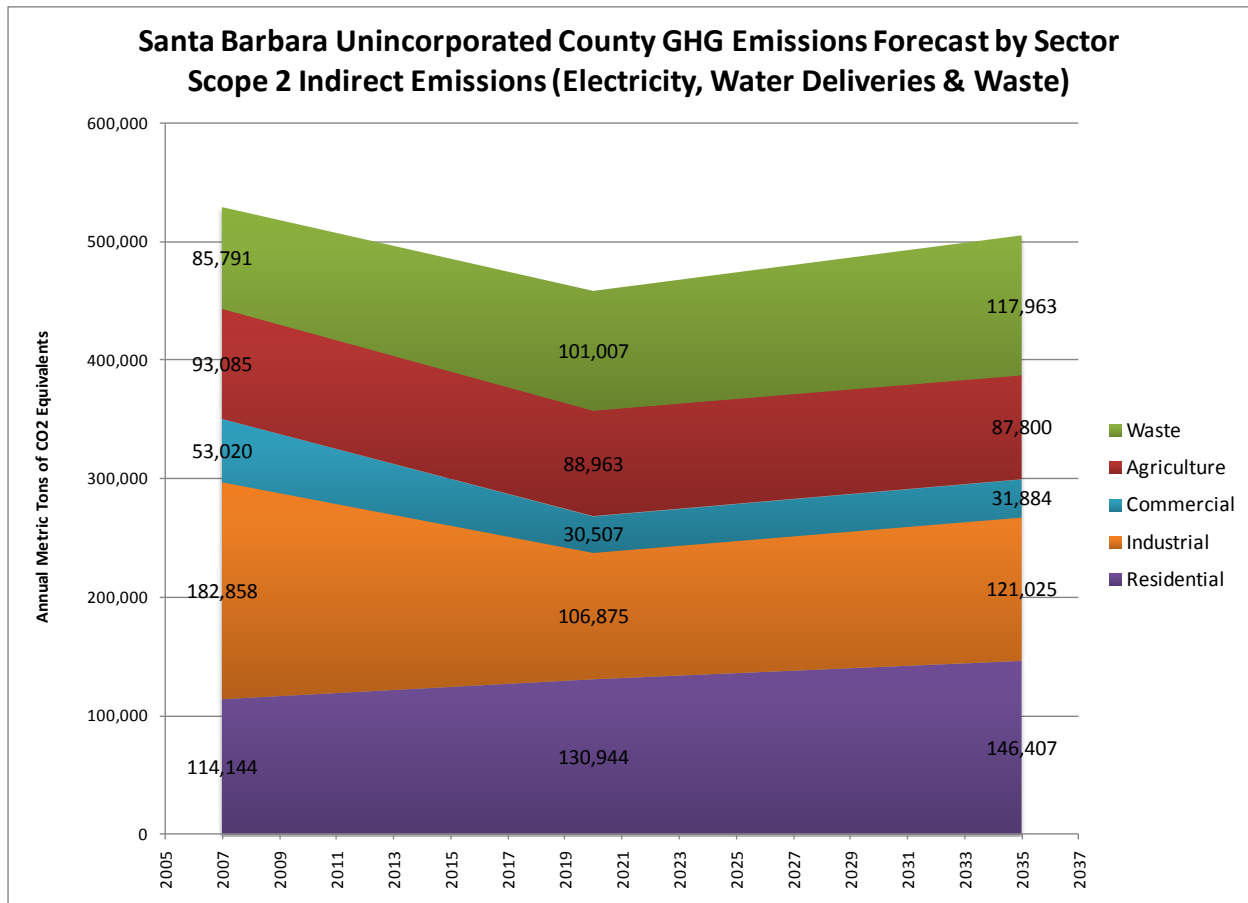
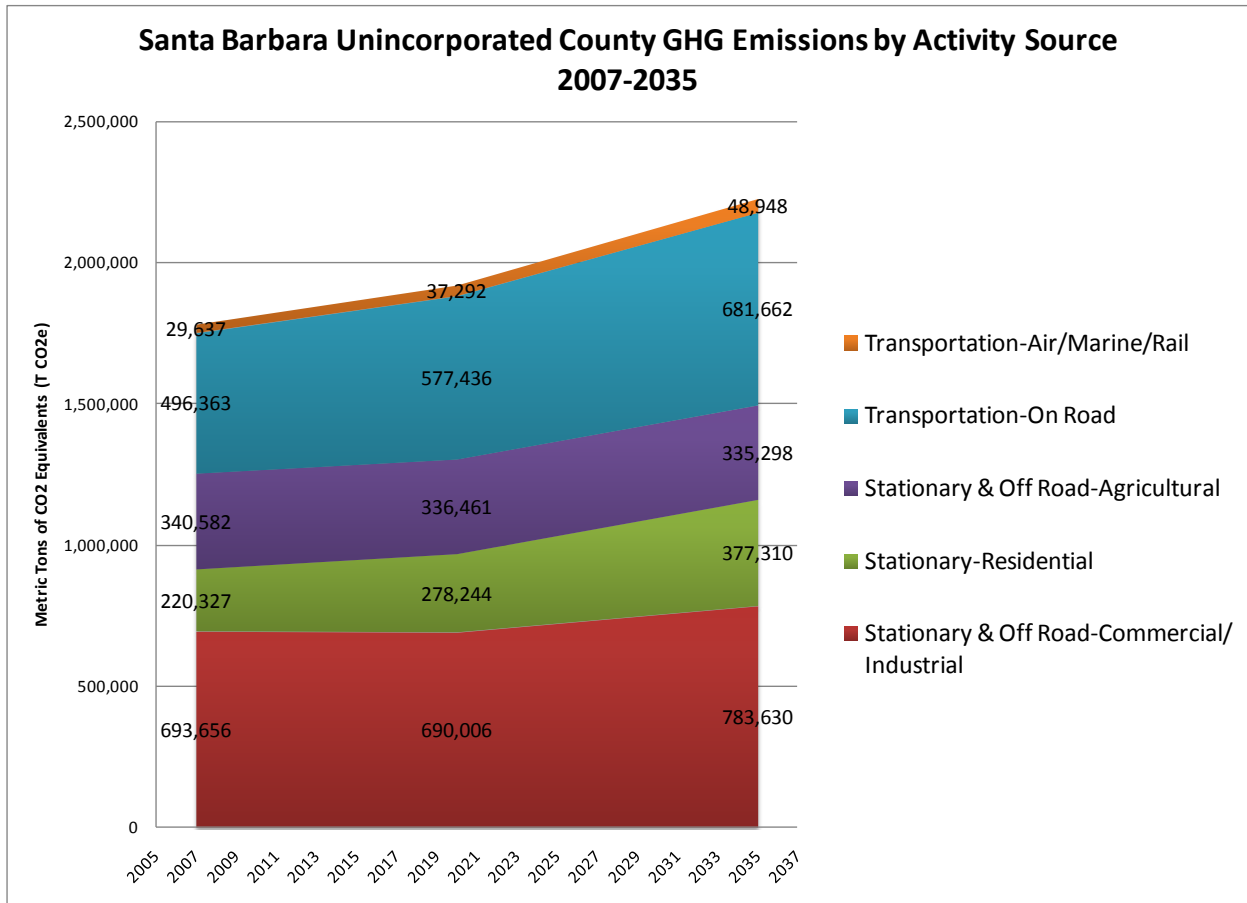


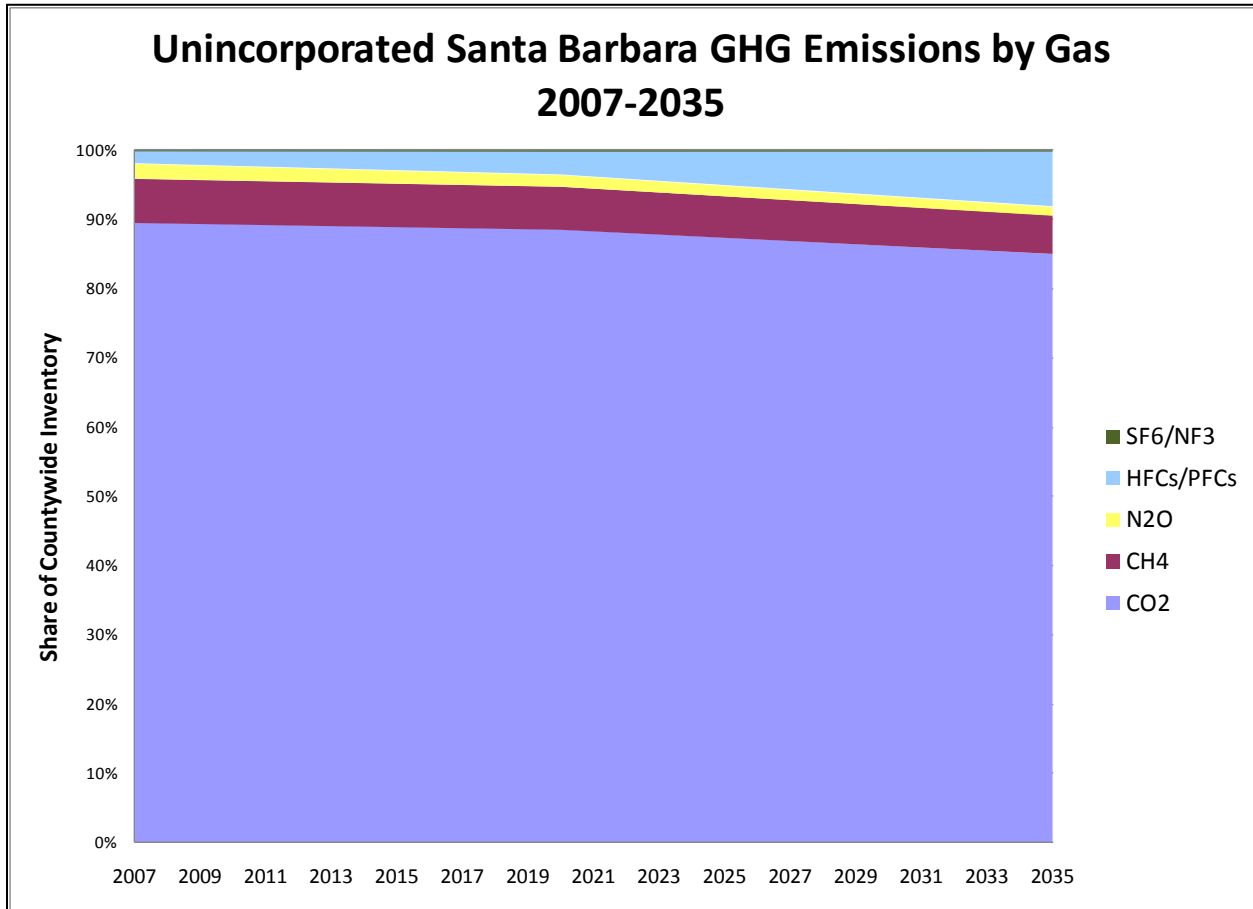
Figure 24 shows the emission forecast by activity source for all Scopes combined. The largest increases are in residential and non-road transportation areas, each about 70 percent. The commercial / industrial sources are projected to rise 10 percent and on-road mobile sources about 40 percent. The agricultural sector declines slightly.

Figure 24



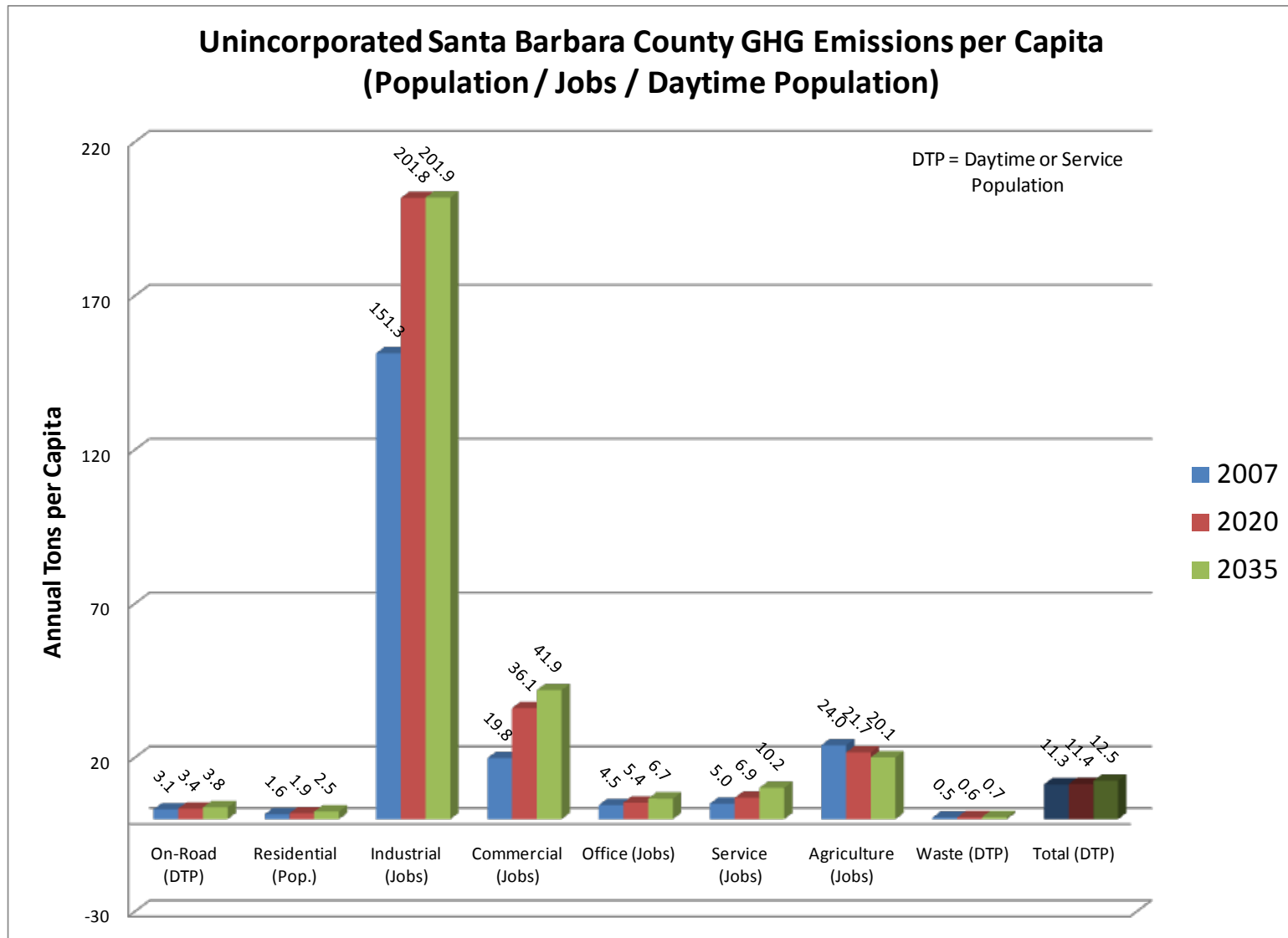
**Figure 25** shows the business-as-usual (BAU) forecast by GHG. CO<sub>2</sub> continues to be the dominant source, but HFC and PFC increase dramatically—by over 650 percent—over the period as ODS gasses are replaced. N<sub>2</sub>O declines as vehicle emission controls improve.

Figure 25



**Figure 26** shows the emission forecast for all Scopes on a per capita basis by sector. For domestic/residential sources, this is on a per resident basis. For business and government sectors (i.e., industrial, commercial, offices, services, and agriculture), this is on a per employee basis. Note that the industrial sector emissions in the unincorporated County are dominated by oil and gas production facilities. These facilities have large emissions from electricity generation and flared gas, and few employees, which is why the emission rates are so high. The emission rates for on-road transportation and waste disposal are on a daytime or service population (DTP) basis because these emissions are not allocated to individual sectors. Finally, total emissions per DTP are shown, with emissions growing from 11.3 tons per population plus jobs in 2007 to 12.5 tons in 2035.

Figure 26





**Table 10** and **Table 11** disaggregate the projected inventories for 2020 and 2035 for the unincorporated County and are comparable to Table 7. **Table 12** summarizes the forecasts for Scope 1 and Scope 2 emissions and compares the demographic and employment forecasts from SBCAG over the same period. Emissions grow faster than population but slower than jobs to 2020, and then faster than either to 2035. This emission growth is driven in large part by the replacement of ODS refrigerants and coolants, which are outside of the inventory, with HFCs and PFCs, which are inside the inventory. Being HGWP gasses, these have a substantial influence on the overall inventory.

Table 10 – 2020 GHG Emission Inventory by Sector, Activity and Scope

Sources	Total	Residential	Transport	Industrial	Commercial	Office	Service	Waste	Agriculture
<u>Point Sources</u>				384,843	28,270	481	-	99,725	-
<u>Area-Wide Sources</u>									
Area Sources Total + Off Road				10,695	9,480	918	16,931	720	-
Residential		147,300		-	-	-	-	-	-
Agricultural				-	-	-	-	-	162,805
Indirect - Electricity		117,554	-	106,875	13,961	3,754	12,792	562	88,963
Indirect - SWP		13,390	-	-	-	-	-	-	-
<u>Mobile Sources</u>									
Air				-	15,192	-	-	-	-
Rail				-	22,100	-	-	-	-
Marine				-	-	-	-	-	-
On Road			577,436						
Agricultural				-	-	-	-	-	84,692
				-	-	-	-	-	-
<b>Total</b>	<b>1,919,438</b>	<b>278,244</b>	<b>577,436</b>	<b>502,413</b>	<b>89,003</b>	<b>5,152</b>	<b>29,723</b>	<b>101,007</b>	<b>336,461</b>
<i>% of Total</i>	<i>29.8%</i>	<i>14.5%</i>	<i>30.1%</i>	<i>26.2%</i>	<i>4.6%</i>	<i>0.3%</i>	<i>1.5%</i>	<i>5.3%</i>	<i>17.5%</i>
Direct - Scope 1	1,561,588	147,300	577,436	395,538	75,042	1,399	16,931	100,445	247,497
<i>% of Total</i>	<i>81.4%</i>	<i>9.4%</i>	<i>37.0%</i>	<i>25.3%</i>	<i>4.8%</i>	<i>0.1%</i>	<i>1.1%</i>	<i>6.4%</i>	<i>15.8%</i>
Indirect - Scope 2 & 3	357,851	130,944	-	106,875	13,961	3,754	12,792	562	88,963
<i>% of Total</i>	<i>18.6%</i>	<i>36.6%</i>	<i>0.0%</i>	<i>29.9%</i>	<i>3.9%</i>	<i>1.0%</i>	<i>3.6%</i>	<i>0.2%</i>	<i>24.9%</i>

Table 11 – 2035 GHG Emission Inventory by Sector, Activity and Scope

Sources	Residential	Transport	Industrial	Commercial	Office	Service	Waste	Agriculture	
<u>Point Sources</u>			411,248	33,572	579	-	117,030	-	
<u>Area-Wide Sources</u>									
Area Sources Total + Off Road			13,818	19,144	1,867	32,530	630	-	
Residential	230,903		-	-	-	-	-	-	
Agricultural			-	-	-	-	-	162,805	
Indirect - Electricity, SWP	132,349	-	121,025	13,821	4,278	13,785	303	87,800	
Indirect - SWP	14,059	-	-	-	-	-	-	-	
<u>Mobile Sources</u>									
Air			-	22,032	-	-	-	-	
Rail			-	26,916	-	-	-	-	
Marine			-	-	-	-	-	-	
On Road		681,662							
Agricultural			-	-	-	-	-	-	
<b>Total</b>	<b>2,226,847</b>	<b>377,310</b>	<b>681,662</b>	<b>546,091</b>	<b>115,485</b>	<b>6,724</b>	<b>46,315</b>	<b>117,963</b>	<b>335,298</b>
<i>% of Total</i>	<i>27.5%</i>	<i>16.9%</i>	<i>30.6%</i>	<i>24.5%</i>	<i>5.2%</i>	<i>0.3%</i>	<i>2.1%</i>	<i>5.3%</i>	<i>15.1%</i>
Direct - Scope 1	1,839,428	230,903	681,662	425,066	101,664	2,445	32,530	117,660	247,497
<i>% of Total</i>	<i>82.6%</i>	<i>12.6%</i>	<i>37.1%</i>	<i>23.1%</i>	<i>5.5%</i>	<i>0.1%</i>	<i>1.8%</i>	<i>6.4%</i>	<i>13.5%</i>
Indirect - Scope 2	387,419	146,407	-	121,025	13,821	4,278	13,785	303	87,800
<i>% of Total</i>	<i>17.4%</i>	<i>37.8%</i>	<i>0.0%</i>	<i>31.2%</i>	<i>3.6%</i>	<i>1.1%</i>	<i>3.6%</i>	<i>0.1%</i>	<i>22.7%</i>

Table 12 Comparison of Forecasted Emissions to Demographic and Economic Forecasts

Unincorporated County GHG Emissions	2007	2020	2035
Scope 1 Direct	1,336,290	1,561,588	1,839,428
Growth		16.9%	37.7%
Scope 2 Indirect	444,275	357,851	387,419
Growth		-19.5%	-12.8%
<b>Total</b>	<b>1,780,565</b>	<b>1,919,439</b>	<b>2,226,848</b>
Growth		7.8%	25.1%
Population (SBCAG)	138,176	145,934	153,993
Growth		5.6%	11.4%
Employment (SBCAG)	19,663	22,188	24,005
Growth		12.8%	22.1%

### GHG Emissions by Geography

Data collected and managed in a geographic information system (GIS) was used to allocate emissions across the County's various jurisdictions. Emission rates varied by energy utility climate zones, identified emission point sources, population and job centers and crop types, all linked to specific geographic identifiers. As a result, the emission inventory can be expressed not only by scope, sector, activity type and gas type, but also geographically. Below are a set of maps showing the distribution of emissions, both for the 2007 baseline year, and for the forecasts in 2020 and 2035. These data can be updated and new maps produced as the analysis evolves.

**Figure 27** shows the 2007 Countywide emission inventory identified by several components. Residential, nonpoint commercial and industrial, and on-road transportation emissions are shown on a per acre basis by traffic analysis zone (TAZ). Agricultural emissions are shown per acre for subparcels. Point source commercial and industrial emissions are shown by relative-sized circles, as well as airports in a separate color. Railroads are shown as red lines.

**Figures 28 to 30** show the unincorporated County emission inventories for 2007, 2020 and 2035. The next three figures distinguish the emission patterns summed in Figures 28 to 30 to show how emissions change in each of the three annual snapshots. **Figure 31** shows the relative amounts of emissions from point sources regulated by the SBAPCD and from airports in the unincorporated County (Santa Ynez and New Cuyama). The largest emissions come from oil production facilities, several of which also have electricity cogeneration plants. **Figure 32** shows the emissions by TAZ from residential and nonpoint plus off-road commercial and industrial sources, as well as the on-road mobile sources. One can see the emissions growing in the communities located around the largest cities in the County. **Figure 33** shows the emissions from the agricultural sector on lands under production. This map covers only those subparcels for which agricultural activities have been identified with a commodity code; non-cultivated lands zoned agricultural are not included.

The advantage of a GIS representation is that the scale can be increased so that greater detail can be viewed. **Figure 34** shows the emissions for unincorporated communities around the cities of Santa Barbara and Goleta. **Figure 35** shows the area around the City of Santa Maria.

Figure 27

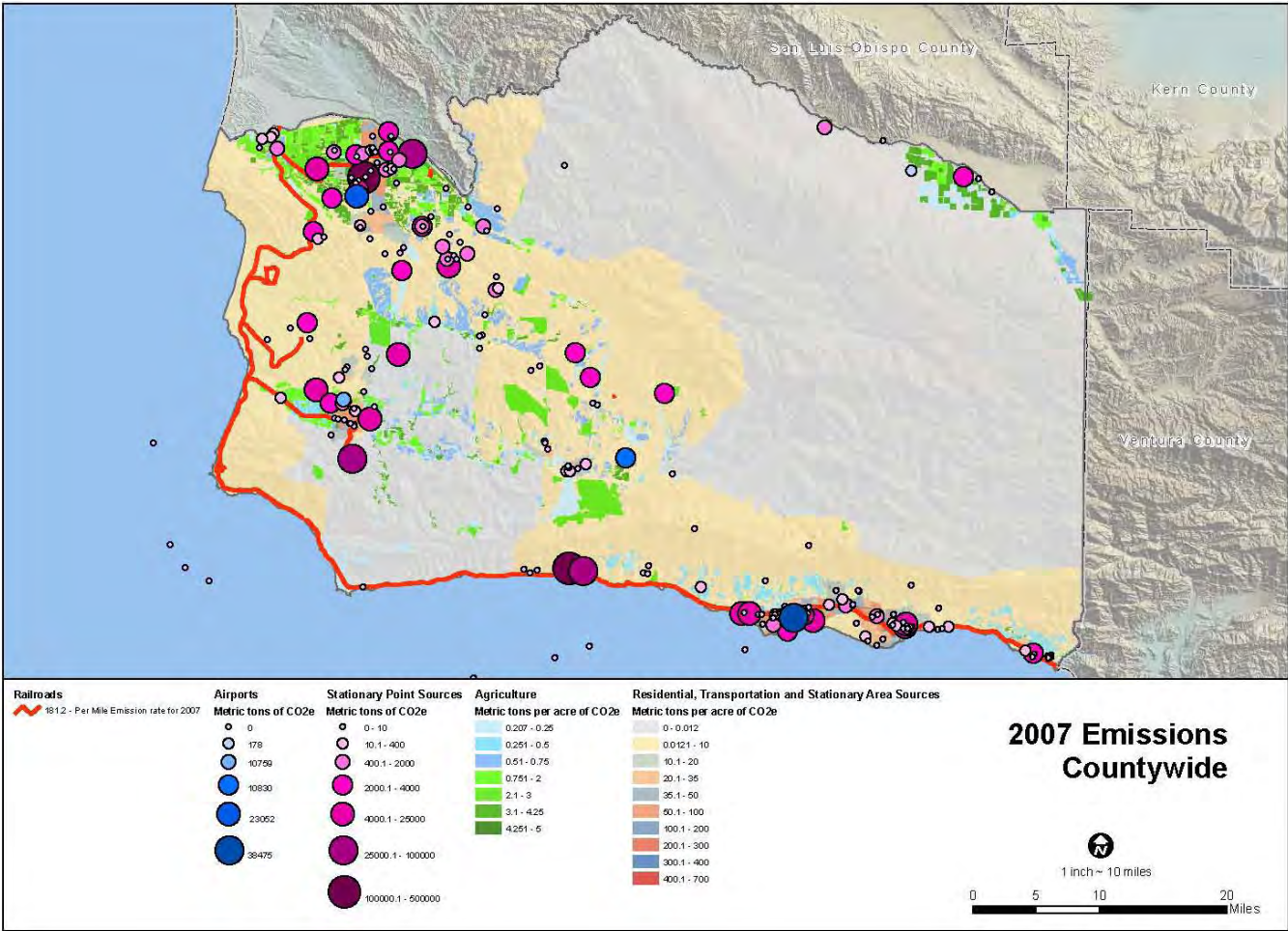


Figure 28

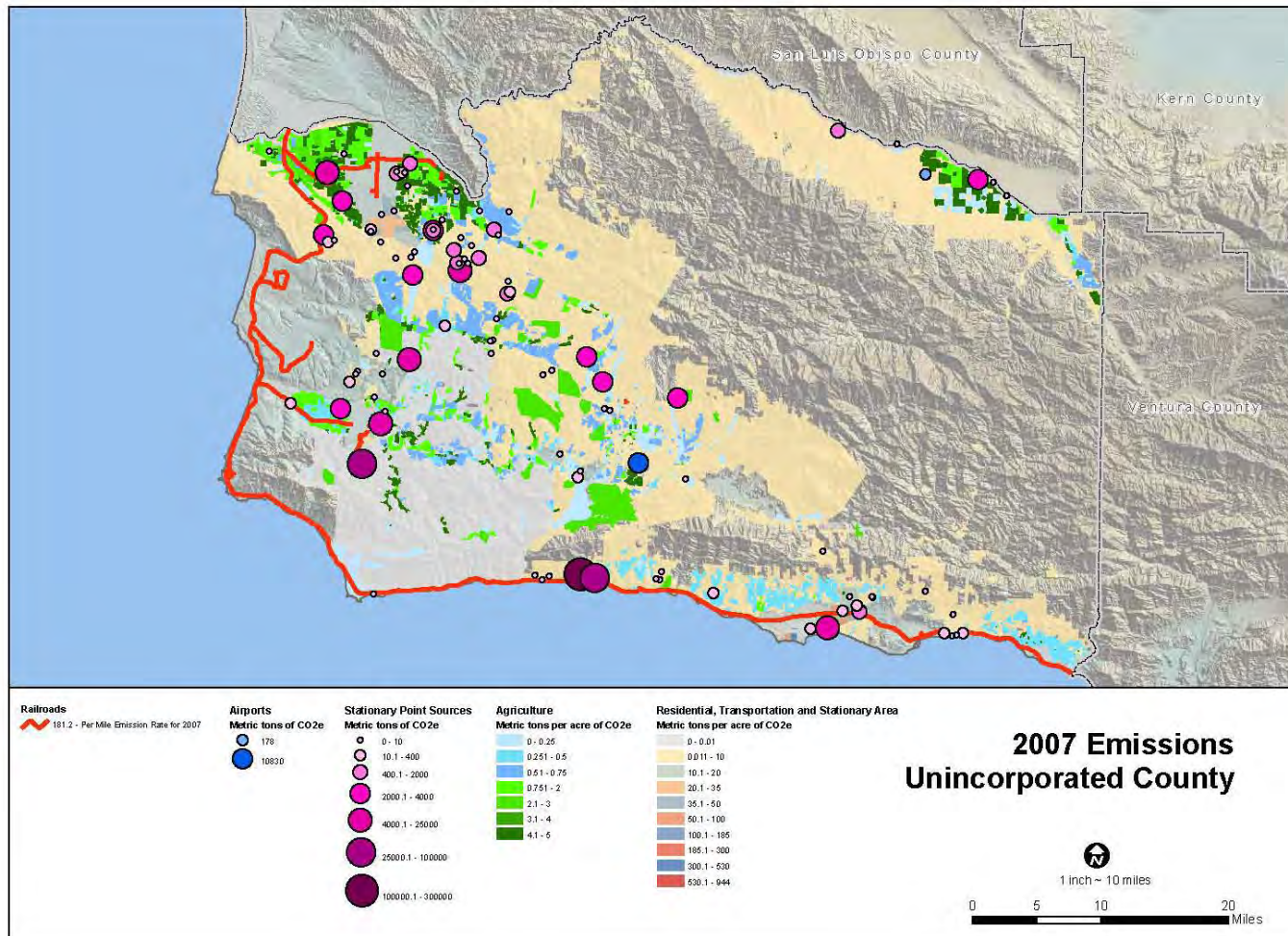


Figure 29

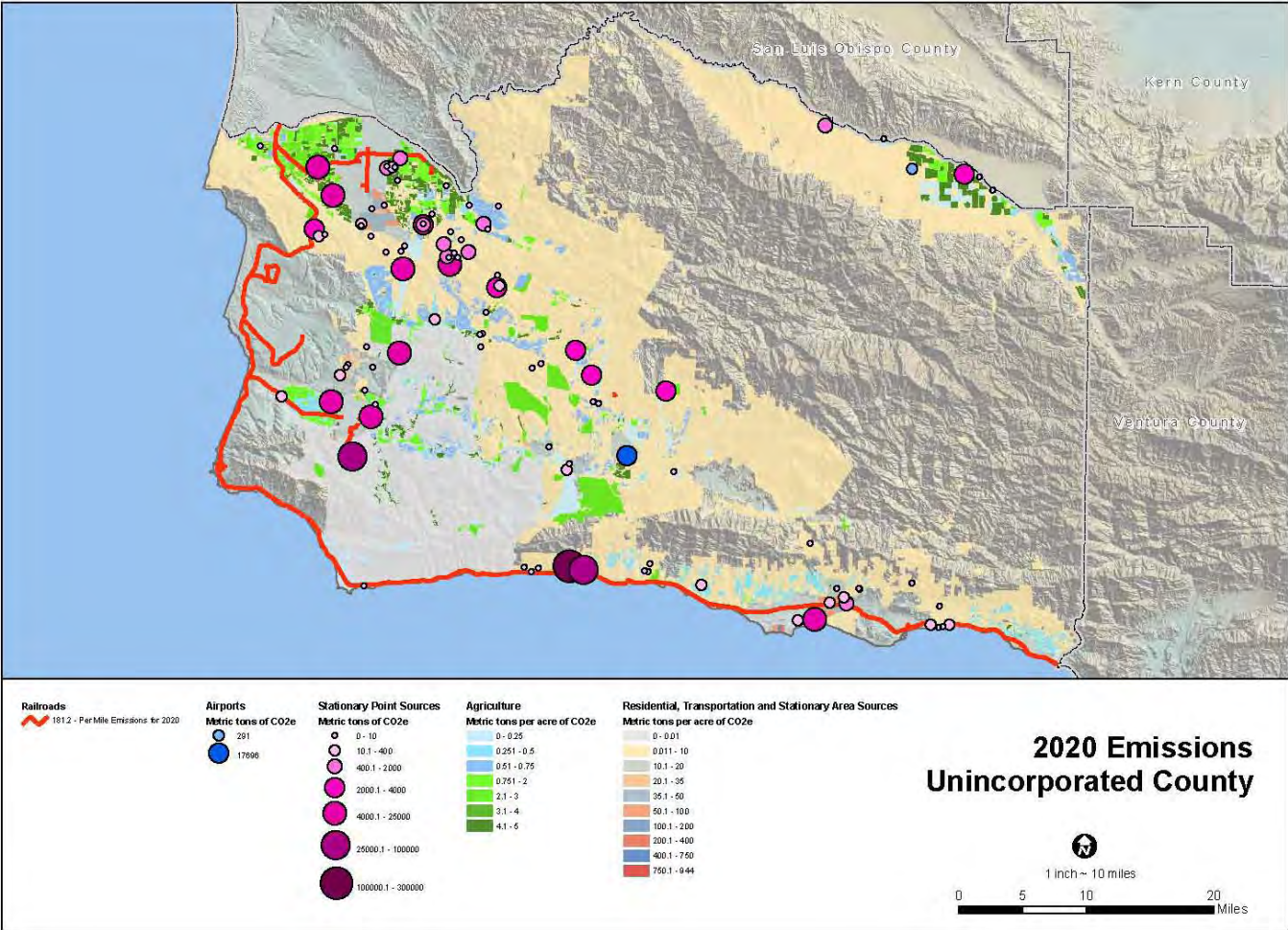




Figure 30

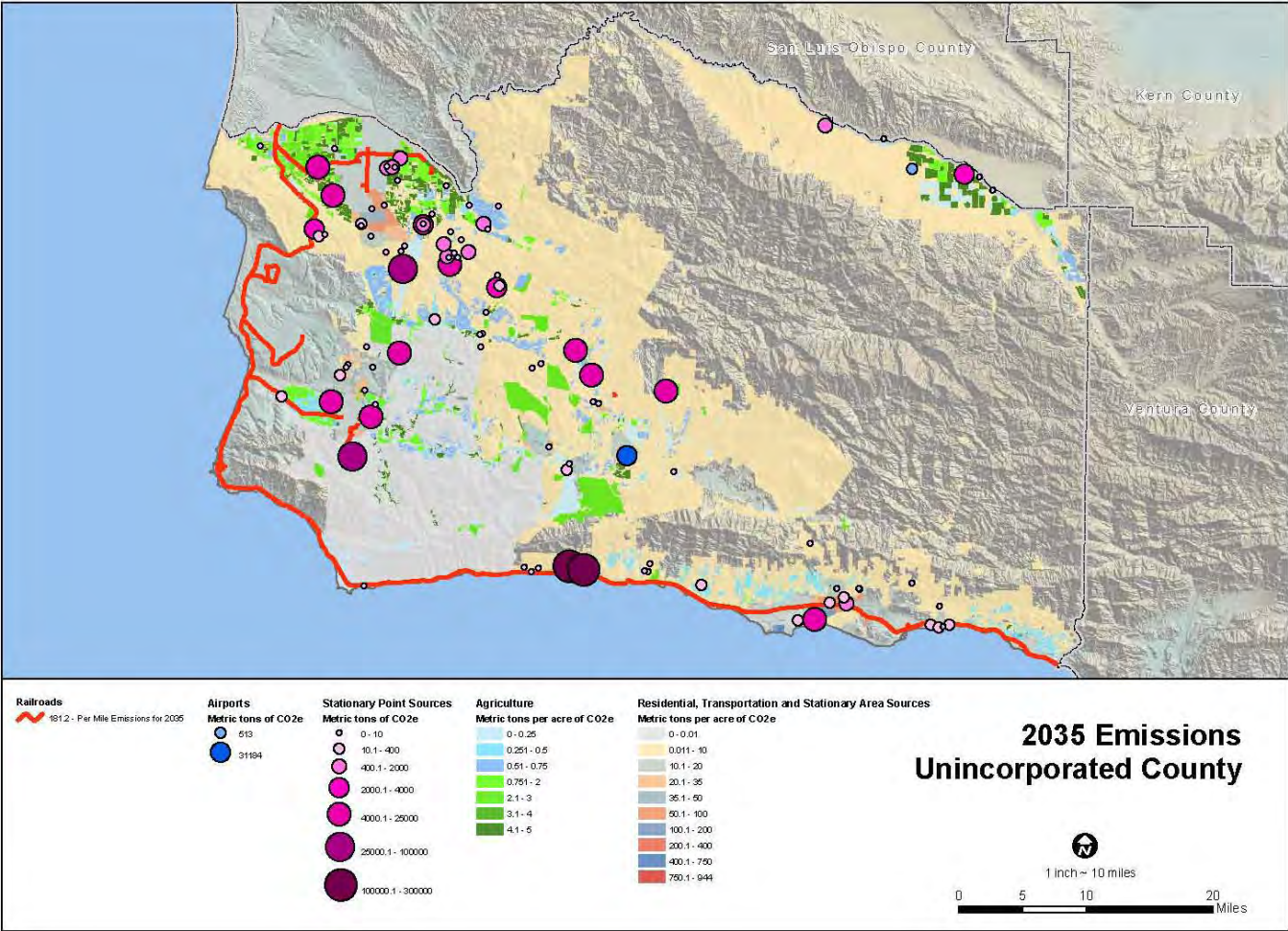


Figure 31

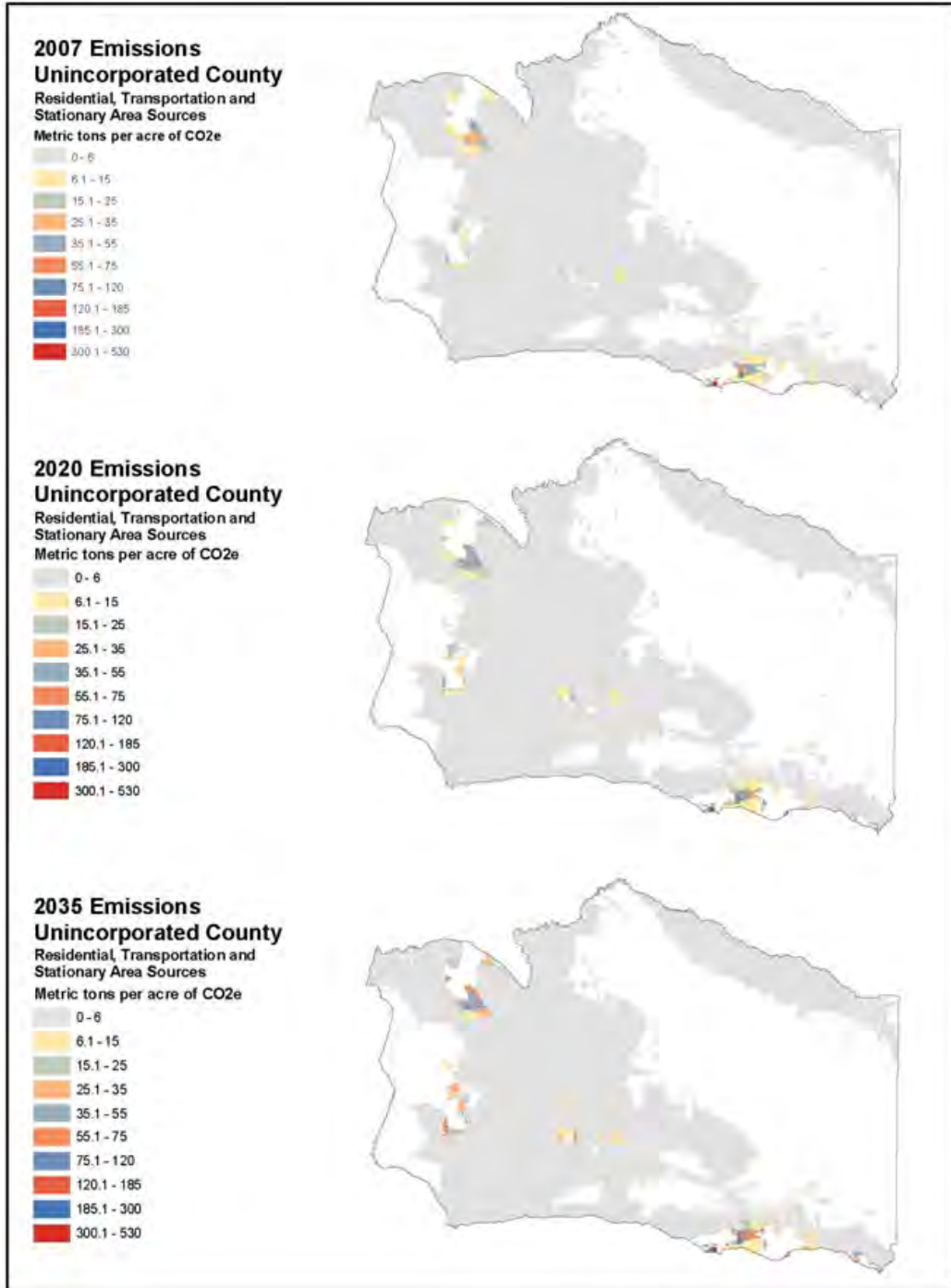


Figure 32

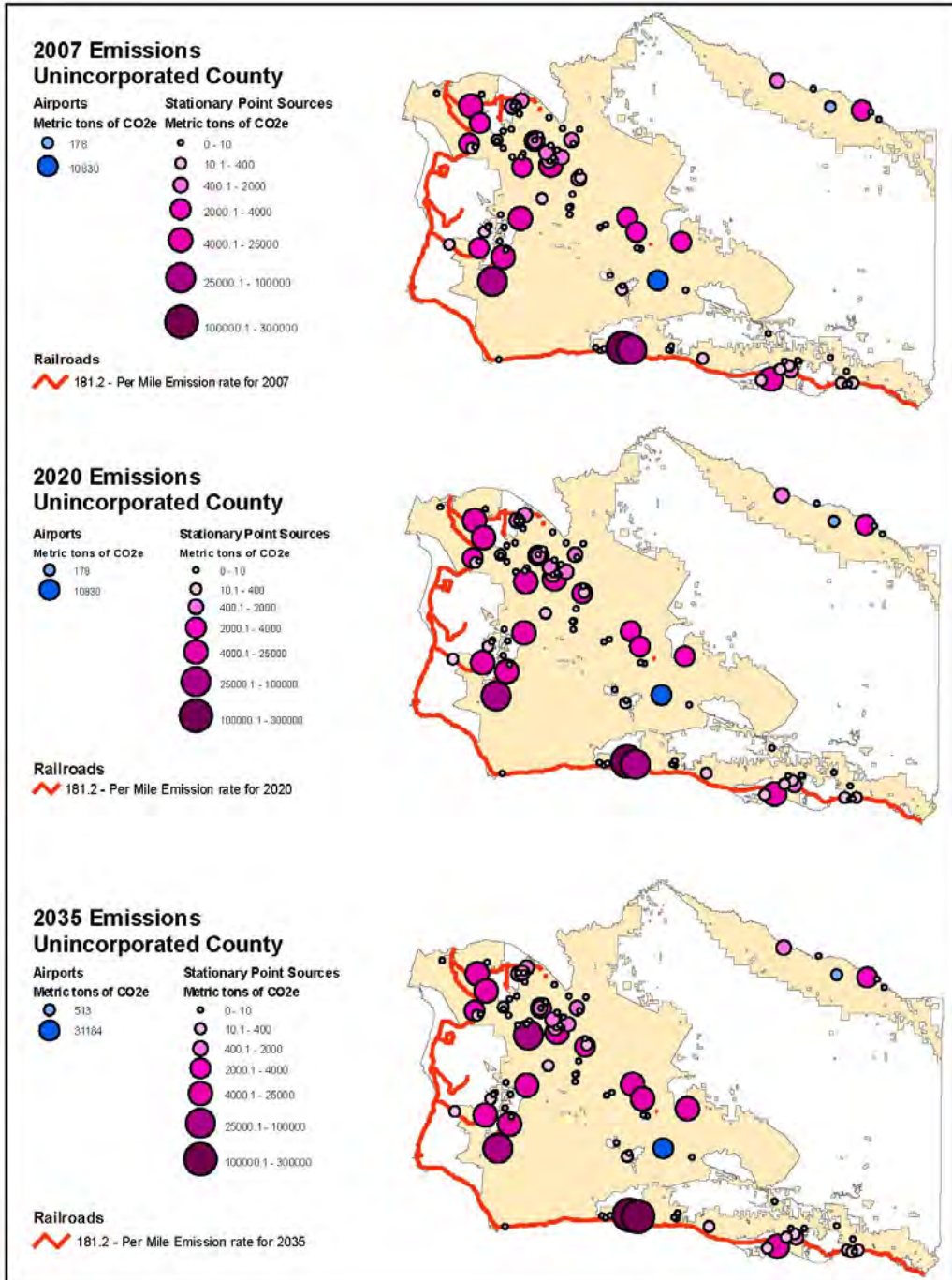


Figure 33

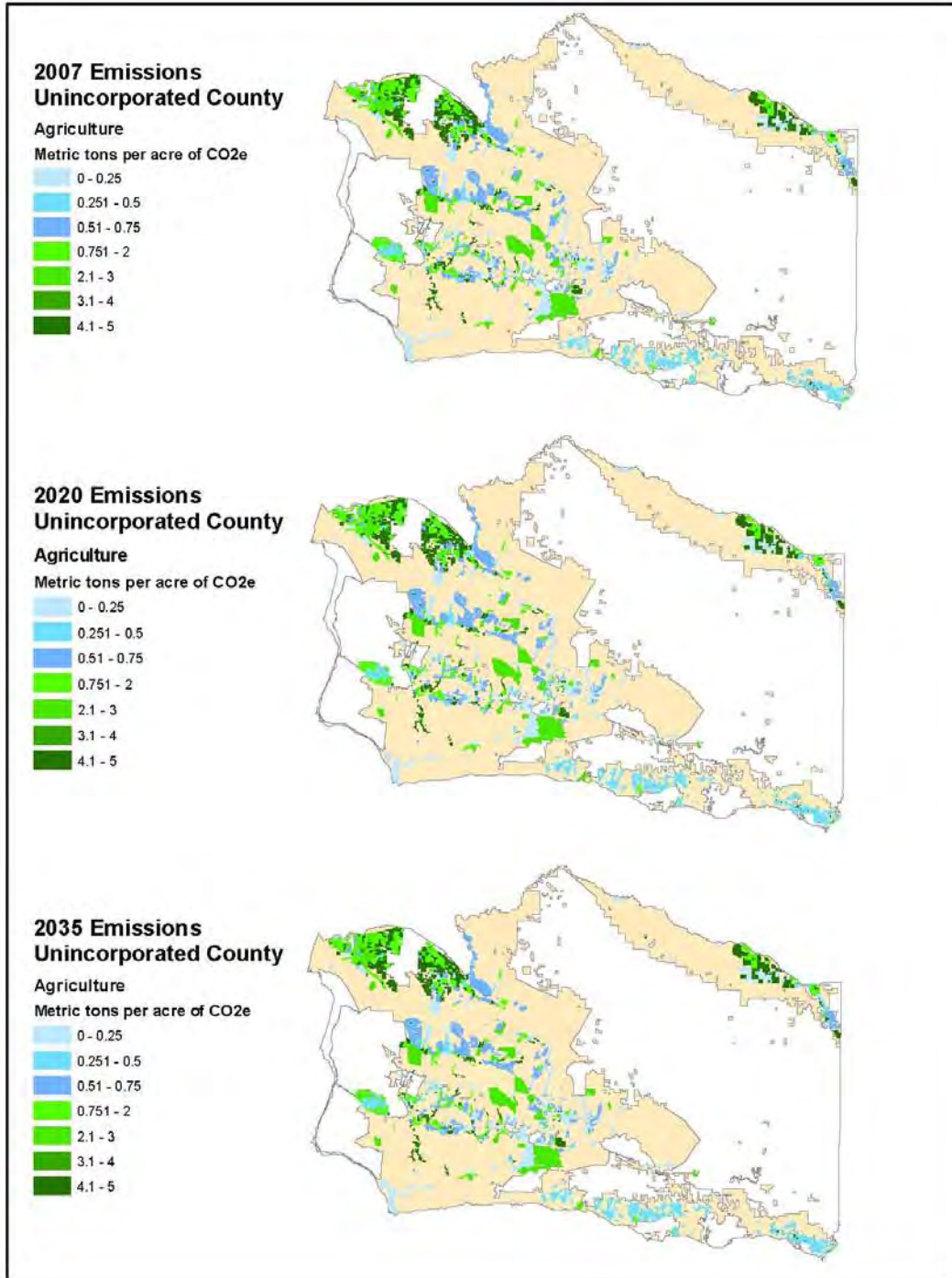


Figure 34

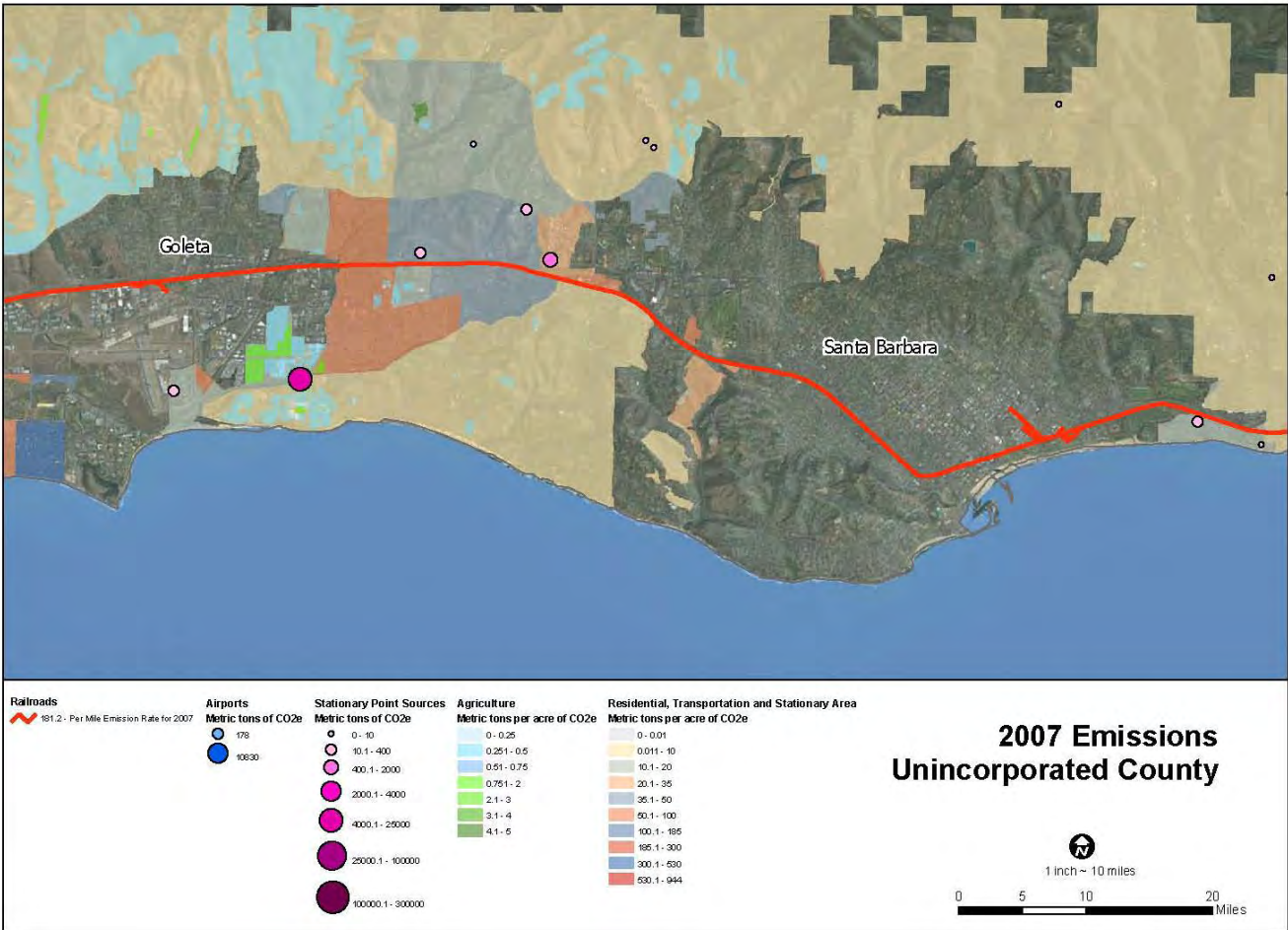
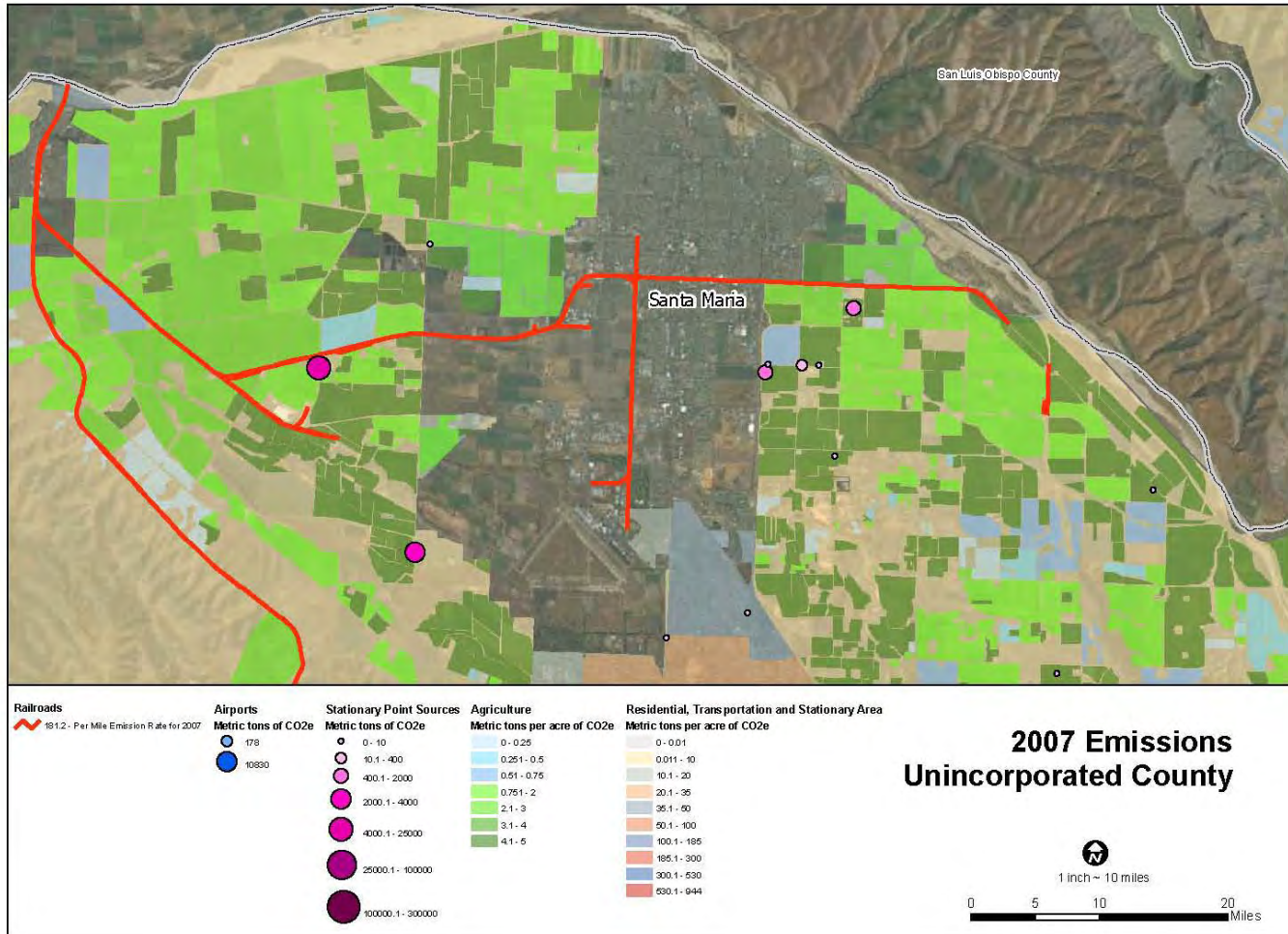


Figure 35



## Appendix A - Inventory Data

Table A-1 lists the data sources used to compile the inventory presented in this report. This list is duplicated in the References section with specific citations.

Table A-1. Inventory Data Sources

Data Item	Type	Gasses	Source
SBAPCD CO <sub>2</sub> Inventory	Total emissions	CO <sub>2</sub>	Joe Petrini, SBAPCD Staff
ARB GHG Inventory Categories	Activity emission rates	All	<a href="http://www.arb.ca.gov/cc/inventory/inventory.htm">http://www.arb.ca.gov/cc/inventory/inventory.htm</a>
ARB EMFAC VMT	Activity level	CO <sub>2</sub>	<a href="http://www.arb.ca.gov/msei/onroad/latest_version.htm">http://www.arb.ca.gov/msei/onroad/latest_version.htm</a>
SBCAG On road VMT	Activity level	CO <sub>2</sub>	<a href="#">From SBCAG for 2007, and CARB EMFAC 2007 modeling</a>
Caltrans highway Performance Monitoring System (HPMS)	Activity level	CO <sub>2</sub>	<a href="http://www.dot.ca.gov/hq/tsip/hpms/index.php">http://www.dot.ca.gov/hq/tsip/hpms/index.php</a> ; <a href="http://www.dot.ca.gov/hq/tsip/dirb.php">http://www.dot.ca.gov/hq/tsip/dirb.php</a>
ARB Refrigerant and coolant inventory	Activity level	HFCs	<a href="http://www.arb.ca.gov/cc/reftrack/reftrackdocs.htm">http://www.arb.ca.gov/cc/reftrack/reftrackdocs.htm</a>
EIA fuel use sales	Fuel Use		<a href="http://tonto.eia.doe.gov/dnav/pet/pet_cons_821use_dcu_sca_a.htm">http://tonto.eia.doe.gov/dnav/pet/pet_cons_821use_dcu_sca_a.htm</a> ; <a href="http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/fuel_oil_and_kerosene_sales/current/pdf/table4.pdf">http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/fuel_oil_and_kerosene_sales/current/pdf/table4.pdf</a> ; <a href="http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/fuel_oil_and_kerosene_sales/current/pdf/table24.pdf">http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/fuel_oil_and_kerosene_sales/current/pdf/table24.pdf</a>
BOE gasoline, diesel and diesel red-dye sales data	Fuel use	CO <sub>2</sub>	Philip Bishop, BOE; <a href="http://www.boe.ca.gov/annual/statindex0708.htm">http://www.boe.ca.gov/annual/statindex0708.htm</a> ; <a href="http://www.boe.ca.gov/annual/pdf/2008/table25a_08.xls">http://www.boe.ca.gov/annual/pdf/2008/table25a_08.xls</a> ;
CEC oil consumption data (+EIA)	Fuel use	CO <sub>2</sub>	<a href="http://www.energyalmanac.ca.gov/petroleum/index.html">http://www.energyalmanac.ca.gov/petroleum/index.html</a>
CEC electricity consumption data (+EIA)	Activity level	CO <sub>2</sub> , HFCs, SF <sub>4</sub>	<a href="http://www.energyalmanac.ca.gov/electricity/total_system_power.html">http://www.energyalmanac.ca.gov/electricity/total_system_power.html</a> ; <a href="http://www.ecdms.energy.ca.gov/utilbynaicselec.aspx">http://www.ecdms.energy.ca.gov/utilbynaicselec.aspx</a> ; <a href="http://www.ecdms.energy.ca.gov/elecbycounty.aspx">http://www.ecdms.energy.ca.gov/elecbycounty.aspx</a>
CEC gas consumption data (+EIA)	Activity level	CO <sub>2</sub> , CH <sub>4</sub>	<a href="http://www.ecdms.energy.ca.gov/gasbycounty.aspx">http://www.ecdms.energy.ca.gov/gasbycounty.aspx</a> ; <a href="http://www.ecdms.energy.ca.gov/utilbynaicsgas.aspx">http://www.ecdms.energy.ca.gov/utilbynaicsgas.aspx</a>
DOGGR oil and gas production data	Activity level	CO <sub>2</sub> (others?)	<a href="http://www.conservation.ca.gov/dog/pubs_stats/annual_reports/Pages/annual_reports.aspx">http://www.conservation.ca.gov/dog/pubs_stats/annual_reports/Pages/annual_reports.aspx</a>

Table A-1. Inventory Data Sources

Data Item	Type	Gasses	Source
Off road activity	Activity level	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O	Starting with EIA, and allocated with industry-specific data.
IWMB landfill data	Activity level	CH <sub>4</sub> , CO <sub>2</sub>	<a href="http://www.calrecycle.ca.gov/WasteChar/">http://www.calrecycle.ca.gov/WasteChar/</a> (2008 Study forthcoming shortly)
County agricultural commissioner crop and livestock production data	Activity level	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O	<a href="http://www.countyofsb.org/agcomm/default.aspx?id=11562">http://www.countyofsb.org/agcomm/default.aspx?id=11562</a> (GIS for 2005-2010 activity)
USDA 2007 Census of Agriculture Table 1	Activity level	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O	<a href="http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/index.asp">http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/index.asp</a>
USDA 2007 Census of Agriculture Table 10	Activity level	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O	<a href="http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/index.asp">http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/index.asp</a>
USDA 2007 Census of Agriculture Table 41	Activity level	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O	<a href="http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/index.asp">http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/index.asp</a>
USDA 2007 Census of Agriculture Table 42	Activity level	N <sub>2</sub> O	<a href="http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/index.asp">http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/index.asp</a>
UC Coop Extension Crop Budgets	Activity emission rates	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O	(Compiled data)
CDWR groundwater well data	Use parameter	CO <sub>2</sub> , SF <sub>6</sub>	<a href="http://www.cd.water.ca.gov/groundwater/wellcompletionrpts.cfm">http://www.cd.water.ca.gov/groundwater/wellcompletionrpts.cfm</a> ; <a href="http://www.water.ca.gov/groundwater/#">http://www.water.ca.gov/groundwater/#</a> ; <a href="http://www.water.ca.gov/waterdatalibrary/">http://www.water.ca.gov/waterdatalibrary/</a> ;
SWP Bulletin 132-08 water delivery data	Activity level	CO <sub>2</sub> , SF <sub>6</sub>	<a href="http://www.water.ca.gov/swpao/bulletin.cfm">http://www.water.ca.gov/swpao/bulletin.cfm</a>

Source: Aspen Environmental Group, June 2010

## GIS Data

The Aspen Team compiled potentially relevant geographic information system (GIS) data on activity and emission sources available from publicly available data sets, and mapped the sources in a format usable by the OLRP. The Table A-2 lists 35 GIS data layers compiled to date. These layers are tied to data tables that allow the emission inventory data and forecasts to be distributed to individual parcels around the County. This data was used to allocate emissions among jurisdictions.



Table A-2. GIS Data Layers Compiled for This Project

Name	Description
County Boundary	Santa Barbara County
County Jurisdiction	Political Jurisdiction
Study Area	Project PA, Name, Source.
Study Area Exclusions	Project PA, Name, Source.
Cities	City polygons
DOD Lands	Department of Defense lands
USFS Lands	USFS Lands and non-USFS Lands
BLM Lands	BLM Lands
Parcels	Land use, usecode, TRA.
Streets	All road centerlines
General Plan	Land use, Type
Zone	Land Use Zone, Zone description, Gen class.
TAZ	Transportation Zones, TAZCODE, County, Subregion.
Census	Track & block groups
Facilities	Different facilities per SBAPCD
Coastal Comp Plan	Facility and industries
Electric Service Areas	Name
Climate Zones	Climate zones throughout the county
Transmission	Transmission Lines, Company, Voltage.
Substations	Name, company, circuit.
Powerplants	Powerplants
Railroads	Railroads
Airports	Airports

Table A-2. GIS Data Layers Compiled for This Project

Name	Description
Mineral Parcels	APN, Owner, Land use, usecode, TRA.
DOGGR Wells	Oil & Gas Wells, Operator, Lease, Well Number.
BLM Grazing Allotments	Grazing allotments on BLM Land
CDWR Wells	State Test Groundwater Wells (Only coordinate information - linked to well depth table.
Soil	Name, farmland, Muname.
Agriculture	Prime, Non-Prime, TRA, APN.
Solvang Agriculture	Ranches, Orchards, Vineyards, Wineries, etc., with Commodity Code
SBC Agriculture	Ranches, Orchards, Vineyards, Wineries, etc., with Commodity Code
Santa Maria Agriculture	Ranches, Orchards, Vineyards, Wineries, etc., with Commodity Code
Santa Barbara Agriculture	Ranches, Orchards, Vineyards, Wineries, etc., with Commodity Code
Lompoc Agriculture	Ranches, Orchards, Vineyards, Wineries, etc., with Commodity Code
Carpinteria Agriculture	Ranches, Orchards, Vineyards, Wineries, etc., with Commodity Code

Source: Aspen Environmental Group, 2010

### Methodology for Developing Individual Inventory Components

Table A-3 shows the 2007 GHG emission inventory segmented by source type and gas. The sources are delineated by CARB source accounts. (The inventory accounting further segments this by fuel type or other emission sources.) The CO<sub>2</sub> emissions from combustion come directly from the SBAPCD unless stated otherwise in the report (e.g., for electricity consumption, off-road and agricultural activities.) Other combustion-related gases are estimated by calculating the relationship to CO<sub>2</sub> shown in CARB's 2000-2008 GHG Inventory. Non combustion emissions are derived from the relationships between activity levels and emission rates shown in CARB's GHG Inventory. Electricity emissions are the sum of all GHGs per CARB's GHG Inventory divided by Statewide electricity consumption.

Table A-3 Santa Barbara County 2007 Detailed GHG Inventory by Source and Gas

GHG Emissions Inventory	Combustion	Non combustion				Electric	Total GHGs	Total CO2	Total Non-CO2
	CO2 + CH4 + N2O	CH4	N2O	HFCs	SF6/NF3	Indirect			
Stationary Sources									
Indirect Emissions - Electricity						1,216,565			
Indirect Emissions - SWP						30,879.7			
<b>Point Sources</b>									
010 Electric Utilities	1,767.8						1,767.8	1,759.4	8.4
020 Cogeneration	189,576.7						189,576.7	188,673.9	902.8
030 Oil & Gas Production	101,712.3						101,712.3	101,256.7	455.6
040 Petroleum Refining	12,951.8						12,951.8	12,890.1	61.7
050 Manufacturing & Industrial	60,358.1	1,875.5					62,233.6	60,066.2	2,167.4
052 Food & Agricultural Processing	70,537.0						70,537.0	67,389.3	276.4
060 Service & Commercial	264,309.0			116,207.0			380,516.0	263,462.0	117,054.0
099 Other	85.7						85.7	85.4	0.3
<b>Waste Disposal</b>									
110 Sewage Treatment	1,246.1	13,558.8	8,799.7				23,604.7	1,243.0	22,361.7
120 Landfills	7,349.7	73,644.3	15.5				81,009.6	7,275.9	73,733.7
130 Incinerators	549.2						549.2	547.8	1.4
<b>Petroleum Production &amp; Marketing</b>									
310 Oil & Gas Production	143,482.8	9,837.2					153,320.0	143,146.4	10,173.5
320 Petroleum Refining	65.0	2,048.6					2,113.6	64.8	2,048.8
330 Petroleum Marketing		646.3					646.3		646.3
<b>Industrial Processes</b>									
410 Chemical Manufacturing			763.5				763.5		763.5
430 Mineral Processes	8,528.2						8,528.2	8,528.2	
499 Other Industrial Processes				8,539.7	2,915.9		11,455.7		11,455.7

Baseline and Forecasted GHG Emissions Inventory for the Unincorporated County

PREPARED FOR THE COUNTY OF SANTA BARBARA OFFICE OF LONG RANGE PLANNING

GHG Emissions Inventory	Combustion		Non combustion			Electric	Total GHGs	Total CO2	Total Non-CO2
	CO2 + CH4 + N2O	CH4	N2O	HFCs	SF6/NF3	Indirect			
<b>Stationary Sources</b>									
<b>Area-Wide Sources</b>									
530 Pesticides / Fertilizers			15,765.8				15,765.8		15,765.8
<b>Miscellaneous Processes</b>									
610 Residential Fuel Combustion	320,565.6			43,837.6			364,403.2	319,042.0	45,361.2
620 Farming Operations		77,998.5	3,167.2				81,165.6		81,165.6
630 Construction & Demolition		72.1					72.1		72.1
660 Fires		3,036.0	261.2				3,297.2		3,297.2
670 Managed Burning & Disposal	117.9						117.9	117.9	
<b>Mobile Sources</b>									
700 On Road Mobile Sources	1,925,638.9	6,456.5	54,640.7				1,925,638.9	1,864,541.7	61,097.2
<b>Other Mobile Sources</b>									
810 Aircraft	83,294.1	73.7	688.4				83,294.1	82,532.1	762.1
820 Trains	38,127.7	32.7	96.5				38,127.7	37,998.6	129.2
830 Ships & Commercial Boats	9,476.9	5.4	15.9				9,476.9	9,455.6	21.3
840 Recreational Boats	4,194.1	3.7	11.0				4,194.1	4,179.4	14.7
850 Off-Road Recreational Vehicles	3,541.4	3.1	9.3				3,541.4	3,529.0	12.4
860 Off-Road Equipment	87,886.5	73.1	204.0				87,886.5	87,609.4	277.1
870 Farm Equipment	85,620.5	73.4	216.8				85,620.5	85,330.3	290.2

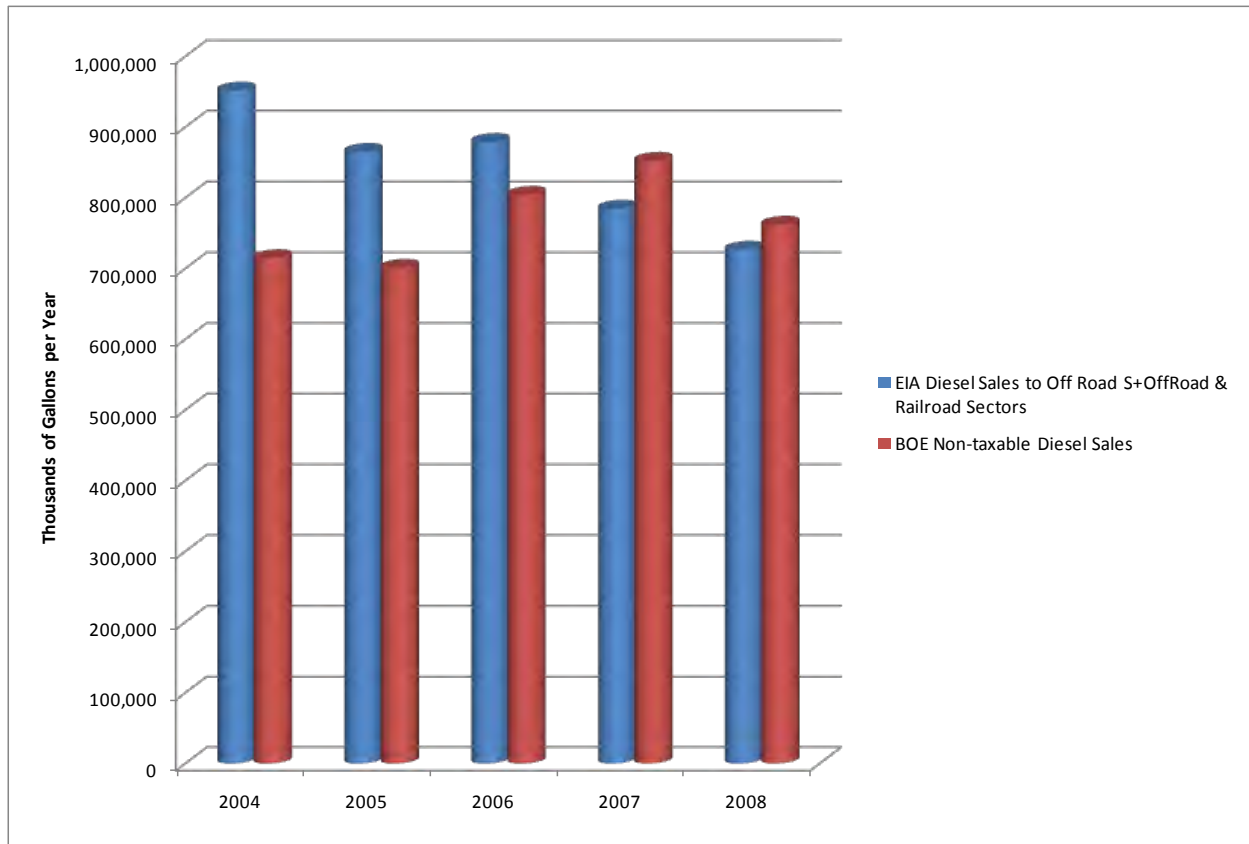
### *Stationary and area sources*

SBAPCD has prepared CO<sub>2</sub> emission levels for the relevant sectors for the 2007 baseline. In particular, SBAPCD's inventory covers large "point" sources that can be identified individually, smaller "area" sources that are aggregates of individual sources, such as residential dwellings and commercial retail businesses, and non-road transportation such as aviation, marine, rail, construction and agriculture.

### *Off-road sources*

CARB historically has forecasted emissions from off-road sources such as construction, oil drilling, agriculture, airport ground support equipment and other activities and sectors. However, recent analysis has indicated that the fuel use estimates derived from the model differ significantly from other sources of fuel use estimates in those sectors from the U.S. Energy Information Administration (EIA) and the State Board of Equalization (BOE). Figure A-1 compares the EIA and BOE fuel sales data over the 2004 to 2008 period, indicating close correlation. In comparing CARB's OFFROAD model estimates with the comparable sectors in the EIA, the OFFROAD model predicts that 1,583.9 million gallons of diesel were used in 2007, while the EIA data shows that 640 million gallons were consumed. Based on correlation of the EIA data with the independently-gathered BOE data (shown in Figure A-1), we have revised the GHG inventory for the off-road sectors to conform with the EIA data, and then allocated the Statewide total to the County based on several County-specific indicators.

Figure A-1. California Off Road Fuel Use Data for 2004-2008 from EIA and BOE



Off-road equipment is segmented into agriculture, industry, and off-highway sectors according to EIA fuel use sectors. Using a comparison of EIA diesel fuel deliveries and Board of Equalization non-taxable diesel sales, total fuel use was collected for each sector for 1990 and 2007. EIA total sector fuel use was distributed to individual equipment within the sector based on the proportion of fuel used by the equipment with respect to the entire sector. CARB's OFFROAD emission inventory simulation model for California and Santa Barbara County was run for the years 1990 and 2007. From this, diesel fuel use gathered from and CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions were estimated for that implied fuel use. These are the emission factors applied to the fuel use estimates ultimately developed. To scale the state emissions, the ratio of the EIA and CARB OFFROAD model fuel use estimates for each sector and equipment type was multiplied the ratio by the off-road emissions estimates.

EIA estimates were not available at the county level, so a variety of resources and measures were used to scale the 2007 Santa Barbara off-road fuel and emissions estimates.

- Agricultural Operational Expenditures:** Aspen used the 2007 US Census of Agriculture to calculate the ratio of the expenditures on fuel, utilities and fertilizers in Santa Barbara County to the values for California. The average expenditures per farm were similar between the state and County

data, so this measure was presumed to be a reasonable proxy for the relative investment and intensity in equipment use and emissions. Emissions are allocated within the County based on the estimated fuel use and emissions per acre of crop type from the University of California Cooperative Extension's Return and Cost Studies.<sup>12</sup>

- **Construction and Mining Equipment:** We calculated the ratio of valuation (in thousands of dollars) of residential and non-residential construction authorized by permits in Santa Barbara County to those authorized in California in 2007 according to the Department of Finance California Statistical Abstract, Tables I-3 to I-8. The emissions are further allocated between jurisdictions based on the residential and non-residential permit data from the U.S. Census for the whole County and unincorporated County.
- **Oil Drilling and Workover:** We calculated the share of new oil wells drilled in Santa Barbara County in 2007 relative to those built in the state from Division of Oil, Gas and Geothermal Resources (DOGGR).
- **Lawn and Garden, Commercial, Industrial Equipment, Entertainment, and Other Portable Equipment:** The same ratio was used for each of these equipment types. We used information on total employment by industry from the Bureau of Economic Analysis. We aggregated employment in the wholesale trade, manufacturing, transportation and warehousing, and art, entertainment and recreation industries for the County and State. The ratio of Santa Barbara employment for these industries to California employment in these industries was calculated for the year 2007. The emissions within the County will be allocated based on SBCAG analysis by NAICS employment.
- **Airport and Ground Equipment:** Using information from SBAPCD and the OFFROAD model, the ratio of CO<sub>2</sub> emissions estimates for this equipment from SBAPCD to those from the OFFROAD model was calculated. However, no commercial airplane operations occur in the County jurisdiction, so no emissions are allocated to this sector to the unincorporated County.

These ratios were multiplied by state fuel use estimates to obtain fuel use estimates for Santa Barbara County. We then calculated the ratio of these fuel estimates to those from the OFFROAD model. Finally, to get scaled emissions, we multiplied the fuel ratio for each category by each emission amount for the respective category.

### *Scope 2 Indirect*

- **Electricity:** Indirect emissions from electricity use are estimated using data from the California Energy Commission for Statewide and county-level usage and CARB's GHG inventory for Statewide GHG emissions in 2007. Average usage per household is derived from the CEC's *2010 Integrated Energy Policy Report Update* demand forecast to allocate emissions around the county based on average usage per household. This forecast is then used to forecast emissions to 2020.

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<sup>12</sup> As a cross-check the total emissions estimated from the Return and Cost Studies were about 90 percent of the emissions estimates with this method.

- **State Water Project:** Electricity use for water deliveries to the County are derived from the California Department of Water Resources Bulletin 132-07. This report shows water delivered to individual State Water Contractors on each reach of the State Water Project, and the energy required to pump the water. Deliveries to individual cities and water districts are listed in a study by the Santa Barbara Department of Public Works. The forecasted usage assumes that Santa Barbara will take its full SWP allotment of 45,000 acre-feet in future years.

## Non-CO<sub>2</sub> Emissions

Emissions for the non-CO<sub>2</sub> emissions are tied to the same activity parameters that drive the CO<sub>2</sub> emissions for the County where feasible. As with the CO<sub>2</sub> emissions, the emissions per unit of activity parameter are calculated on a Statewide basis, then applied to the County-level activity data specified for the activity. SBAPCD's inventory is the template for identifying and segmenting the individual sectors so as to be consistent across gasses. The emissions are expressed in both actual tons and CO<sub>2</sub>-equivalence (CO<sub>2</sub>e) in greenhouse effect.

- The most important added sector is emissions from waste disposal, primarily methane (CH<sub>4</sub>) and nitrogen dioxide (N<sub>2</sub>O). Data from the County Department of Public Works on waste disposal at Tajiguas Landfill is key activity parameter in this sector. Other drivers include agricultural production, food processing and wastewater treatment. The former reflects harvested crops and livestock production. CARB's GHG Inventory has emission rates per acre and livestock head for fertilizer application, waste residue burning and manure management. Wastewater treatment emissions are tied to either food product tons processed or the number of households.
- Emissions from coolants and refrigerants, which are the sources for HFCs and PFCs, are derived from CARB's estimate of commercial and industrial facilities and allocated on the basis of employment in each relevant industry.
- Fugitive emissions from fuel combustion and production are derived from CARB's GHG inventory and allocated on the basis of the relevant activity parameter, e.g., electricity use, oil well production, natural gas pipeline transmission, etc. Oil and gas well production data is collected from DOGGR.

Table A-4 shows the emission source categories maintained by SBAPCD.



Table A-4. Emission Source Categories Maintained by SBAPCD

Sector	2007 Emission Date Sources	
	CO <sub>2</sub>	Non-CO <sub>2</sub> GHGs
<b>Stationary Point Sources</b>		
010 Electric Utilities	SBAPCD	ARB rate
020 Cogeneration	SBAPCD	ARB rate
030 Oil And Gas Production	SBAPCD	ARB rate
040 Petroleum Refining	SBAPCD	ARB rate
050 Manufacturing And Industrial	SBAPCD	ARB rate
052 Food And Agricultural Processing	SBAPCD	ARB rate
060 Service And Commercial	SBAPCD	ARB rate
099 Other	SBAPCD	ARB rate
<b>Waste Disposal</b>		
110 Sewage Treatment	SBAPCD	ARB rate
120 Landfills	SBAPCD	ARB rate
130 Incinerators	SBAPCD	ARB rate
<b>Petroleum Production and Marketing</b>		
310 Oil And Gas Production	SBAPCD	ARB rate
320 Petroleum Refining	SBAPCD	ARB rate
330 Petroleum Marketing	SBAPCD	ARB rate
<b>Industrial Processes</b>		
430 Mineral Processes	SBAPCD	ARB rate
<b>Area-Wide Sources</b>		
<b>Miscellaneous</b>		
610 Residential	SBAPCD	ARB rate
620 Farming Operations	SBAPCD	ARB rate

Table A-4. Emission Source Categories Maintained by SBAPCD

Sector	2007 Emission Date Sources	
670 Managed Burning And Disposal	SBAPCD	ARB rate
<b>On Road Mobile Sources</b>		
710 Light Duty Vehicles	SBCAG	ARB rate
720 Heavy Duty Vehicles	SBCAG	ARB rate
<b>Other Mobile Sources</b>		
810 Aircraft	SBAPCD	ARB rate
820 Trains	SBAPCD	ARB rate
830 Ships And Commercial Boats	SBAPCD	ARB rate
840 Recreational Boats	SBAPCD	ARB rate
850 Off-Road Recreational Vehicles	SBAPCD	ARB rate
860 Off-Road Equipment	<i>EIA / Aspen</i>	ARB rate
870 Farm Equipment	<i>EIA / Aspen</i>	ARB rate

Source: Aspen Environmental Group, June 2010

### Data for 1990 Inventory

Table A-5 shows the statewide data from CARB's 1990 GHG Inventory and the drivers used to allocate the emissions down to the County and Unincorporated levels. For residential, emissions are allocated on a population basis. For the commercial and industrial sectors, employment aggregated by goods producing (assumed to be industrial) and services (assumed to be commercial) were used. VMT was used for on-road transport. For agricultural and off-road, the same methods were used as for the 2007 inventory.

Table A-5 – 1990 Greenhouse Gas Emissions Data and Results

Statewide Accounting		<i>million metric tons (Tg) of CO2 equivalent</i>			
Sector Level 1	Statewide	CA	GHG/unit	CA GWH	GHG/unit
<i>Electricity Generation (All)</i>	110.63			229,868	0.481
Residential	29.66	29,758,213	1.00	67,667	2,274
Agriculture & Forestry	16.93		1.22%	12,603	1.89%
Industrial	103.03	2,645,500	20.32	54,664	20,663
Commercial	14.43	9,854,300	1.46	85,183	8,644
Not Specified	1.27	12,499,800	0.10	1,580	126
Transportation (Air/Marine/Rail)	12.68				
On Road Transportation	137.99	259,003.0	532.78		
<b>Total</b>	<b>426.60</b>				

County Level Accounting		<i>metric tons (Tg) of CO2 equivalent</i>			<i>metric tons (Tg) of CO2 equivalent</i>	
Sector Level 1	SB-All	Scope 1	Scope 2	SB County	Scope 1	Scope 2
	<i>Pop/Emp</i>			<i>Pop/Emp</i>		
Residential	369,608	368,352	404,477	130,167	129,724	142,447
Agriculture & Forestry	11,300	230,728	114,417	4,868	230,728	114,417
Industrial	29,100	810,330	289,378	9,989	358,054	99,329
Commercial	119,200	174,511	495,887	7,516	11,003	31,266
Not Specified	159,600	16,184	9,709	39,701	4,026	2,415
Transportation (Air/Marine/Rail)		136,206			36,143	
On Road Transportation (VMT)	3,018.2	1,608,030		870.0	463,498	
<b>Total by Sector</b>		<b>3,344,340</b>	<b>1,313,867</b>		<b>1,233,177</b>	<b>389,874</b>
<b>Grand Total</b>		<b>4,658,207</b>			<b>1,623,051</b>	

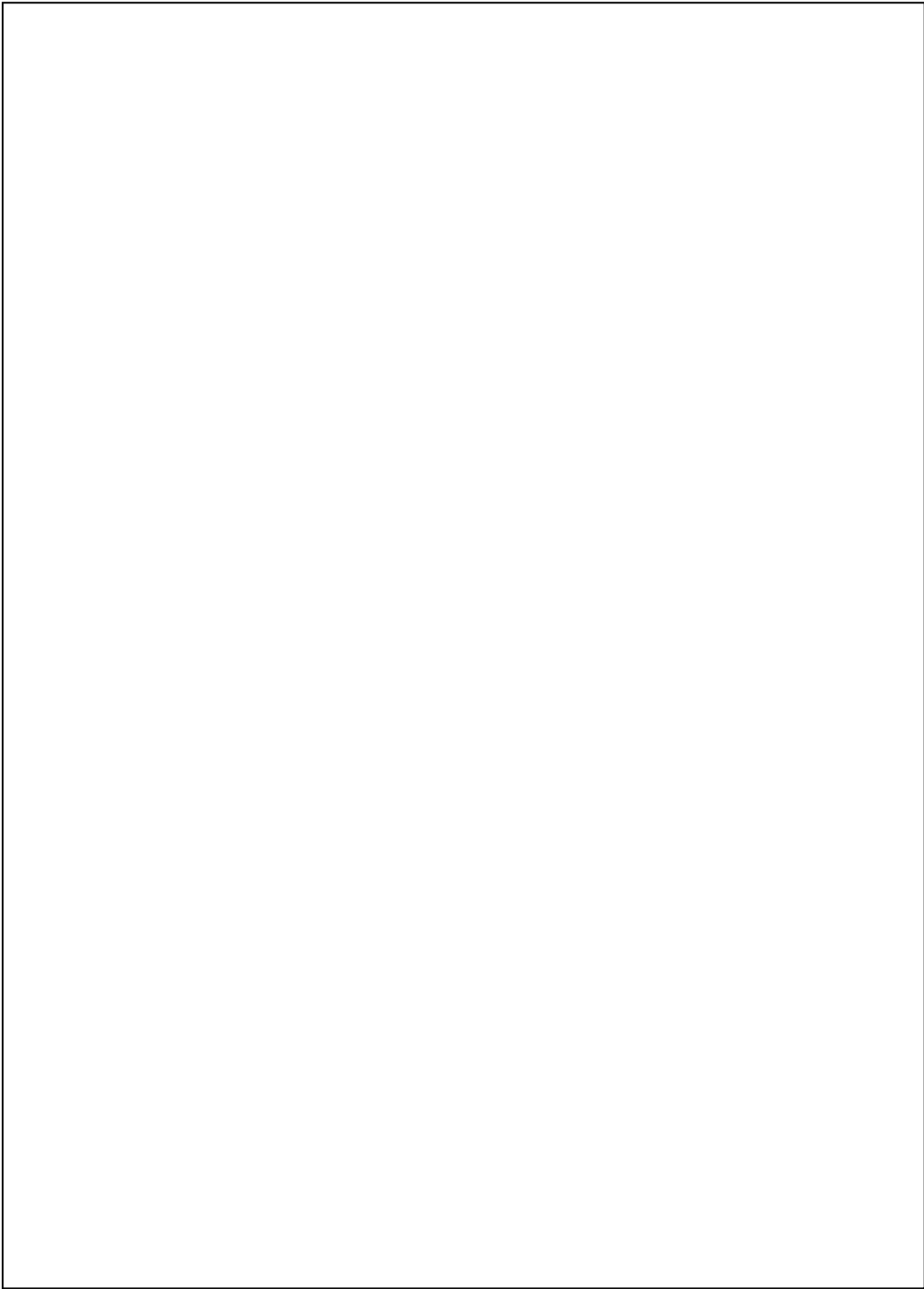
## Appendix B - Available Data Sources and Forecasts for the Socio-economic Forecast

The Aspen Team initially identified and evaluated a number of potentially significant data and forecast sources for the GHG Inventory, listed in **Table B-1**. These sources provide a variety of demographic and economic data for years ranging from 2000 to 2050. The current methodology is based primarily on SBCAG's RGF 2007 but also incorporates information and relationships derived from selected other sources, most notably:

- Census 2000 block-level counts of population, dwelling units and households.
- California Department of Finance (DOF) Demographic Research Unit historical estimates of population and housing.
- EDD Industry Employment & Labor Force reports.
- Local Employment Dynamics (LED) and Longitudinal Employer-Household Dynamics (LEHD) datasets

The following sections present the step-by-step methodology used to prepare the socioeconomic forecasts. The key tasks, issues, and corresponding decisions associated with this demographic and economic forecasting that drives the inventory forecasting process are illustrated in **Figure B-1**.

Figure B-1 Steps to Allocate Demographic and Economic Forecasts to Unincorporated County



## Interpolation/Extrapolation of Preferred Growth Forecast to Base and Horizon Years

The SBCAG Regional Growth Forecast for 2005-2040 projects demographic and economic changes at five-year intervals: 2010, 2015, etc. to 2040. With the Base Year chosen as 2007 for the GHG Inventory, the RGF2007 forecasts required interpolation to produce a Year 2007 ‘existing conditions’ dataset.

Interpolation is frequently implemented so as to reflect the proportional or trend-line distances between the established forecast dates (e.g., 2005 and 2010) and a selected intermediate date (e.g., 2007), calculating the interpolated variables as direct functions of the relative time intervals (e.g.:

$$\text{Interpolation}_{2007} = [2007-2005] / [2010-2005] = 2/5 \times \text{the corresponding 2005-2010 changes in the socioeconomic variables} + \text{the 2005 milestone values}.$$

It is now clear that RGF2007 original forecasts differ from actual existing conditions in 2010, due to the effects of the on-going national economic recession.<sup>13</sup> the Aspen Team has therefore calculated interpolations of RGF2007 to the selected Base Year 2007 using DOF estimates of Year 2007 total Countywide population and housing, and EDD estimates of Year 2007 total Countywide employment by place of work. This approach effectively ‘moves’ the interpolations of Year 2007 employment closer to the original 2005 milestone values and, for Year 2007, Population and Households closer to the original 2010 milestone values, reflecting the actual demographic and economic growth the County has experienced.

The interpolation calculations were performed using draft TAZ allocations of RGF2007 provided by SBCAG staff to the Aspen Team in May 2010. SBCAG provided draft TAZ allocation tables for the Years 2005, 2020 and 2035. the Aspen Team calculated the 2005-2020 incremental changes, by TAZ, for Total Population, Total Housing, and for each of the SBCAG 5-Category employment types. Interpolations were then made to adjust the TAZ-level increments (or decrements) to match Year 2007 Countywide target totals from DOF Population and Household estimates for January 1, 2007 and from EDD’s annual Total Employment estimates for 2007.

Countywide interpolation factors were tested iteratively (and separately) for Total Population, Total Households, and for Total Employment, and then applied uniformly to the increments/decrements for all 268 TAZs. Adjusting the incremental changes rather than base totals for each variable and TAZ prevents unintended ‘virtual demolition’ of existing development, prevents unintended re-allocation of Countywide forecast growth to built-out TAZs, and maintains the general patterns and distribution of change among TAZs present in the original source projections.

For the Horizon Year, a decision was made by County staff and the Aspen Team to adopt Year 2035. Projection of new post-recessionary growth forecasts is beyond the scope of the current study, and the RGF2007 forecasts for Future Years 2020 and 2035 are those provided by SBCAG.

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<sup>13</sup> RGF2007 projected Santa Barbara County to have 200,000 total jobs and 148,000 households by 2010. The most recent employment estimates available from EDD indicate 184,500 total jobs in SBC in May 2010. DOF occupied housing estimates for SBC in January 2010 are 149,574 households, more than the 147,961 households projected for 2010 in RGF2007.

Table B-1. Demographic and Economic Data and Forecast Sources for Santa Barbara County (2000-2020)

Demographic Estimates and Projections	Pub. Date	Geographic Detail	Year 2000			Year 2005			Year 2007			Year 2010			Year 2020		
			Pop.	HH	Jobs	Pop.	HH	Jobs	Pop.	HH	Jobs	Pop.	HH	Jobs	Pop.	HH	
L O C A L	SBCAG: Regional Growth Forecast 2005-2040 (RGF2007)	Aug-07	County City Uninc. Subregion	TP HP GQ AGE (000)	HH	Total NAICS, 1	TP HP GQ AGE (000)	HH	Total NAICS, 1				TP HP GQ AGE (000)	HH	Total NAICS, 1	TP HP GQ AGE (000)	HH
	SBCAG: The 2030 Travel Forecast for Santa Barbara County (Final Report)	Sep-04	County South Coast	TP	HH	Total SIC, 1											
	SBCAG: Regional Growth Forecast 2000-2030 (RGF2000)	Mar-02	County City Uninc. Subregion	TP HP GQ AGE (000)	HH	Total SIC, 1	TP HP GQ AGE	HH	Total SIC, 1				TP HP GQ AGE (000)	HH	Total SIC, 1	TP HP GQ AGE (000)	HH
	SBCGIS: Spatial Data	2008-2010	County/City boundaries, Tax Parcels, TRA, Land Use, Zoning														
Santa Barbara County Agricultural Commissioner: Crop Report Information	1926-2009	County			AgPd			AgPd			AgPd						
S T A T E	Caltrans: Long-Term Socio-Economic Forecasts	2010	County	TP	HH (000)	NAICS (000), 1	TP	HH (000)	NAICS (000), 1	TP	HH (000)	NAICS (000), 1	TP	HH (000)	NAICS (000), 1	TP	HH (000)
	DOF: E-6 City/County Population and Housing Estimates	May-09	County, City, Uninc.	TP HP GQ	DU HH SF MF MH		TP HP GQ	SF MF MH		TP HP GQ	SF MF MH						
	DOF: Race/Ethnic Population with Age and Sex Detail, 2000-2050	Jul-07	County	TP AGE SEX RACE									TP AGE SEX RACE			TP AGE SEX RACE	
	EDD: Industry Employment & Labor Force - by Annual Average	Mar-09	County			LF NAICS, 2-4+			LF NAICS, 2-4+			LF NAICS, 2-4+					
N A T I O N A L	Census Bureau: American Community Survey	Apr-00	County, Place (>25K Pop.)				TP AGE RACE SEX	DU HH SF MF	LF	TP AGE RACE SEX	DU HH SF MF	LF					
	Census Bureau: Economic Census 2002 & 2007, Economy-Wide Statistics (2007 Data Releases in Progress, Utilities, Manufacturing among sectors not yet available for California)	2009-2011	County, Economic Place (> 25K Pop.)												NAICS, 2-6 EST. SALES (000)		
	Census 2000, CTPP 2000, EPS: Block Group Demographics, Employment (POR) and Workers (POW)	Apr-00	CA @ BG Level	TP AGE RACE SEX	DU HH SF MF MH GQ	LF NAICS, 1-2	TP										
	Census Bureau: County and ZIP Business Patterns	Dec-09	County, ZIP			NAICS, 2-6 EST			NAICS, 2-6 EST			NAICS, 2-6 EST					
	Census Bureau: LED/LEHD 'OnTheMap' Version 4 (Experimental)	Dec-09	County, City, ZIP, Tract, BG, Blk						LF NAICS, 1-2			LF NAICS, 1-2					
	Woods & Poole Economics: County Forecasts to 2040	2008 - 2009	County, MSA	TP AGE RACE SEX	HH	LF NAICS, 1-2	TP AGE RACE SEX	HH	LF NAICS, 1-2	TP AGE RACE SEX	HH	NAICS, 1-2	TP AGE RACE SEX	HH	LF NAICS, 1-2	TP AGE RACE SEX	HH

Table B-1 (cont.). Demographic and Economic Data and Forecast Sources for Santa Barbara County (2030-2050)

Demographic Estimates and Projections	Pub. Date	Geographic Detail	Year 2030			Year 2035			Year 2040			Year 2050			
			Jobs	Pop.	HH	Jobs	Pop.	HH	Jobs	Pop.	HH	Jobs	Pop.	HH	Jobs
LOCAL	SBCAG: Regional Growth Forecast 2005-2040 (RGF2007)	Aug-07	County City Uninc. Subregion	Total NAICS, 1	TP HP GO AGE (000)	HH	Total NAICS, 1	TP HP GO AGE (000)	HH	Total NAICS, 1	TP HP GO AGE (000)	HH	Total NAICS, 1	TP HP GO AGE (000)	HH
	SBCAG: The 2030 Travel Forecast for Santa Barbara County (Final Report)	Sep-04	County South Coast		TP	HH	Total SIC, 1								
	SBCAG: Regional Growth Forecast 2000-2030 (RGF2000)	Mar-02	County City Uninc. Subregion	Total SIC, 1	TP HP GO AGE (000)	HH	Total SIC, 1								
	SBCGIS: Spatial Data	2008-2010	County/City boundaries, Tax Parcels, TRA, Land Use Zoning												
	Santa Barbara County Agricultural Commissioner: Crop Report Information	1926-2008	County												
STATE	Caltrans: Long-Term Socio-Economic Forecasts	2010	County	NAICS (000), 1	TP	HH (000)	NAICS (000), 1	TP	HH (000)	NAICS (000), 1					
	DDP: E-6 City/County Population and Housing Estimates	May-09	County, City, Uninc.												
	DDP: Race/Ethnic Population with Age and Sex Detail, 2000-2050	Jul-07	County		TP AGE SEX RACE					TP AGE SEX RACE				TP AGE SEX RACE	
	EDD: Industry Employment & Labor Force - by Annual Average	Mar-09	County												
NATIONAL	Census Bureau: American Community Survey	Apr-00	County, Place (> 25K Pop.)												
	Census Bureau: Economic Census 2002 & 2007, Economy-Wide Statistics (2007 Data Released in Progress; Utilities, Manufacturing among sectors not yet available for California)	2009-2011	County, Economic Place (> 25K Pop.)												
	Census 2000, CYP 2000, EPS: Block Group Demographics, Employment (POR) and Workers (POW)	Apr-00	CA @ B/C Level												
	Census Bureau: County and ZIP Business Patterns	Dec-09	County, ZIP												
	Census Bureau: LED/LEHD 'OnTheMap' Version 4 (Experimental)	Dec-09	County, City, ZIP, Tract, BG, Bk												
	Woods & Poole Economics: County Forecasts to 2040	2008 - 2009	County, MSA	LP NAICS, 1-2	TP AGE RACE SEX	HH	LP NAICS, 1-2	TP AGE RACE SEX	HH	LP NAICS, 1-2	TP AGE RACE SEX	HH	LP NAICS, 1-2	TP AGE RACE SEX	HH



Table B-2. Abbreviation Key for Demographic and Economic Data and Forecast Sources

Abbreviation Key	Description
#	1 to 6: SIC or NAICS Grouping Level(s); segmentation increases with #
AGE	Population by Age
AgPd	Agricultural Production: Harvested Acres, Crop and Livestock Yields
DU	Dwelling Units
GQ	Group Quarters Population
HH	Households (Occupied Dwelling Units)
HP	Household Population
LF	Labor Force
MF	Multi-Family Housing
MH	Mobile Homes
NAICS	Employment by North American Industry Classification System
RACE	Population by Race
SEX	Population by Gender
SF	Single Family Housing
SIC	Employment by Standard Industrial Classification (obsolete)
Total	Total Employment (Aggregate of all sectors)
TP	Total Population

Source: the Aspen Team, June 2010

### Definition of Demographic and Economic Measures for Linkage to Emission Rates

Area and point sources of economic activity to be *included* in the forecasts, and not encompassed by the 'default' demographic and economic forecasts for the unincorporated County, have been treated analogous to 'Special Generators' in a Transportation Forecasting Model (TFM). That is, if their demographic and economic measures are required components of the Base Year estimates and Future Year forecasts, these are handled as discrete additions to the Study Area growth forecast, from dataset records created for the Base and Future Years. The inclusion datasets are self-documenting in that they

show the specific assumptions for the inclusions by forecast year, facilitate review and adjustments, and are, therefore, preferable to assumptions ‘buried’ in the forecast spreadsheet or model formulas or code.

A quick review of *The 2030 Travel Forecast for Santa Barbara County Final Report* confirmed the existing SBCAG Travel Demand Model (TDM) uses substantially the same demographic and economic measures as documented in the RGF2000 Final Report, i.e., employment forecasts by major Standard Industrial Classification (SIC) groups.<sup>14</sup> SIC classifications have been superseded by NAICS classifications for the last decade, and employment groupings for the two systems are not interchangeable. As an example, Retail Trade employment sector forecasts from RGF2000 include restaurant (Food Services) workers; in the RGF2007 Countywide and subregional summary tables presented in the 2009 RGF Final Report, restaurant workers are tabulated in the **Services** employment group, but in the draft RGF2007 TAZ allocations provided to the Aspen Team by SBCAG in May of 2010, restaurant workers are tabulated in the **Commercial** employment group.

### Conversion of Available Data to Emission Rate Linkage Measures

The derivation of key demographic and economic measures not directly obtainable from the proposed reference forecast, RGF2007, has been accomplished through application of various conversion factors and ratios. Using more detailed data from alternate well-established socioeconomic profiles for the same geographic area and time, the Aspen Team has first calculated the ratios of key socioeconomic subcategories to the encompassing category in the alternative profile, and then applied the derived ratios to the control totals representing the comparable category in the preferred forecast.

A moderate degree of segmentation of historical employment by industry subcategory is available from the Census Transportation Planning Package data for the Year 2000 at the Census Block Group level. Newer CTPP data are only available for Public Use Microdata Areas (PUMAs), which are much larger than census block groups<sup>15</sup>. Provisional segmentation of most employment categories for the Years 2002-2008, by 2-digit NAICS sector and at the census-block level of geography, is currently available from the Census Bureau’s OnTheMap website and from Local Employment Dynamics (LED) and Longitudinal Employer-Household Dynamics (LEHD) data.

Significantly finer segmentation of historical employment, including the Base Year 2007, are available for several industrial categories and at the county level from the 2007 Economic Census and for nearly all industrial categories at the county and ZIP Code level from the Census Bureau’s County and Zip Patterns.

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<sup>14</sup> Per the *SBCAG Model Improvement Plan: An Application for Proposition 84 Funds* (September 22, 2009), planned improvements of the Travel Demand Model include TDM linkage to RGF2007, tentatively scheduled for the 1<sup>st</sup> Quarter, 2010. If SBCAG has been able to acquire the needed funding and has completed or is nearing completion of the TAZ allocations of RGF2007, and/or the update of the InfoUSA employment by workplace estimates for the County, also proposed in the Model Improvement Plan, access to these resources would greatly facilitate preparation of Demographic and Economic Forecasts for the GHG Emissions Inventory.

<sup>15</sup> Only 2 PUMAs were defined for all of Santa Barbara County for the 2000 Census, as compared to 315 census block groups or nearly 7,500 census blocks.

The EDD Industry Employment & Labor Force reports also provide detailed segmentation of historical employment at the County level.

After obtaining and evaluating all of these available reference sources, the Aspen Team selected the EDD annual reports and the Census LEHD datasets for 2007 as the most suitable for deriving the factors needed to segment RGF2007 employment. As a first step, centroids or internal points for all of SBC's census blocks were mapped and geocoded as to their location with reference to the Study Area and to SBCAG TAZs, as shown in **Figure 2** in the report. The center points for the 7,500 Census 2000 blocks are depicted as small black stars. Census block polygons are defined for both near-shore water bodies and for offshore islands, and so some of the block centers are (correctly) shown as outside the county mainland. Each of the block centers was tagged as either contained by or outside the Study Area (shown in bright red) and by the TAZ which contained it (TAZ boundaries are outlined in blue.) This double-coding of the census blocks makes them a 'least common denominator' between the Study Area and SBCAG TAZs, and thereby enables proportional segmentation of quantitative measures linked to the TAZs between the Study Area and excluded lands.

As an example, TAZ #17 shown in Figure 2 has been primarily defined by the County's transportation modelers to contain the Los Padres National Forest, but the TAZ #17 boundary extends to cover areas outside of the National Forest and within the Study Area. Household, population and employment data associated with each of the census blocks which have centers enclosed by the boundary of TAZ #17 can also be identified as either inside or outside the Study Area. The Study Area/Whole TAZ ratio, or allocation factor for each type of socioeconomic measure related to the census blocks centroids within TAZ #17 (and the other SBC TAZs) can be calculated from:

$$\sum Measure_{N\_TAZ\_Study\_Area} / \sum Measure_{N\_TAZ}$$

These allocation factors can then be applied to equivalent socioeconomic measures from the RGF2007 TAZ allocations to estimate the proportion of population, households and employment for each TAZ that should be allocated to the Study Area.

To reconcile the differences and facilitate conversions between the 5-category/SIC-compatible employment categories available from SBCAG's Draft TAZ allocations of RGF2007 and the 2-digit NAICS-compatible employment categories preferred for GHG Emissions calculations, the Aspen Team created a 'Crosswalk' correspondence table to map out relationships among the different employment typologies. EDD's annual report of Industry Employment & Labor Force has been used as a template and 'least common denominator' to outline the connections among the other employment classification schemes. The EDD tabulation provides the greatest detail in breakout of employment by subsector, is NAICS-compatible, retains some SIC-compatibility due to its origins in earlier EDD tabulations, and provides Year 2007 checksums for employment by type that can be used to test the closeness of fit for the correlations.

**Table B-1** shows the correlations among the EDD, LEHD, SBCAG 10-Category (Subregional NAICS-Compatible) and SBCAG 5-Category (TAZ SIC-Compatible) employment typologies, with 'roll-ups' of the associated EDD, RGF2007 and LEHD employment estimates for the Base Year 2007. The EDD and

LEHD Year 2007 employment numbers were taken directly from the source data; SBCAG 10-Category and 5-Category employment numbers for the Year 2007 were interpolated by the Aspen Team from the RGF2007 published and draft TAZ allocations for Years 2005 and 2010, using interpolation methods that will be explained below. The several employment typologies can and do use similar words and phrases to define different groupings of industrial employment. The Aspen Team has therefore applied a color scheme, based on SBCAG's 5-Category groups of employment, to aid the tracing of correspondences among the typologies:

- Agricultural Employment – **Green**
- Industrial Employment – **Red**
- Commercial Employment – **Aqua**
- Office Employment – **Gray**
- Services Employment - **Magenta**

After reviewing the technical documentation for all of the typologies, and using experience gained from similar assignments, the Aspen Team staff has worked out the following correspondence of the SBCAG 5-Category types to 2-Digit NAICS equivalents:

- Agricultural Employment – **Green**
  - NAICS sector 11 (Agriculture, Forestry, Fishing and Hunting)
- Industrial Employment – **Red**
  - NAICS sector 21 (Mining, Quarrying, and Oil and Gas Extraction)
  - NAICS sector 23 (Construction)
  - NAICS sector 31-33 (Manufacturing)
- Commercial Employment – **Aqua**
  - NAICS sector 42 (Wholesale Trade)
  - NAICS sector 44-45 (Retail Trade)
  - NAICS sector 48-49 (Transport. and Warehousing)
  - NAICS sector 22 (Utilities)
  - NAICS sector 71 (Arts, Entertainment, and Recreation)
  - NAICS sector 72 (Accommodation and Food Services)
- Office Employment – **Gray**
  - NAICS sector 51 (Information)
  - NAICS sector 52 (Finance and Insurance)
  - NAICS sector 53 (Real Estate and Rental and Leasing)

- NAICS sector 54 (Professional, Scientific, and Technical Services)
- NAICS sector 55 (Management of Companies and Enterprises)
- NAICS sector 92 (Public Administration)
- Services Employment - **Magenta**
  - NAICS sector 56 (Administration and Support and Waste Management and Remediation Svcs)
  - NAICS sector 61 (Educational Services)
  - NAICS sector 62 (Health Care and Social Assistance)
  - NAICS sector 81 (Other Services [except Public Administration])

This analysis uses actual and adjusted employment data for Year 2007 to compare EDD, SBCAG and LEHD estimates for the Base Year, applying the correspondence scheme shown above to ‘roll-up’ the different source estimates to SBAG 5-Category and 10-Category levels. The results are reasonably consistent across the compared typologies and are considered by the Aspen Team as acceptable for the intended purpose.<sup>16</sup>

Some residual differences among the data sources may be reduced in the future as the SBCAG draft TAZ allocations are revised – it appears the ~1,700 Agricultural Job difference between the RGF2007 Countywide and the aggregate TAZ allocations for Year 2005 (and as interpolated, Base Year 2007) was unintended by SBCAG modelers, and is currently being investigated by SBCAG staff. Other residual differences are explainable as ‘artifacts’ of the different approaches and different universes of coverage in the source data; EDD counts include government workers and proprietorships not covered by LEHD statistics. SBCAG employment types, particularly for the 5-Category TAZ allocations, reflect a mix of job-based and land-based calculations that are fundamentally different from the purely worker-based data EDD and LEHD use.<sup>17</sup>

As the Countywide Travel Demand Model Improvement Plan is implemented and when newer estimates of employment by workplace and specific type (perhaps eventually by parcel) are available, future modelers may be able to revisit and improve the assumed correspondences for problematic sectors such as NAICS 48, 49 and 22, which are often reported only as a ‘lumped’ Transportation, Warehousing and Utilities job category, and NAICS Sector 72, which ‘lumps’ Accommodation/Lodging jobs treated as Service work by both SIC and NAICS classifications with Food Service/Restaurant jobs treated as Retail work by SIC and as Service work by NAICS.

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<sup>16</sup> In mapping out the proposed correspondences, the Aspen Team has attempted to conform to SBCAG usages and practices as understood from the RGF2007 documentation and projection tables, from correspondence and discussions with SBCAG modelers, and as tested by comparing ‘roll-ups’ of RGF2007, EDD and LEHD employment estimates for 2007. In instances of apparent difference between NAICS conventions and parlance and SBCAG employment groupings and estimates, the Aspen Team has used and conformed to RGF2007 employment projections.

<sup>17</sup> The ‘fuzziness’ of distinctions for some categories (e.g., Commercial/Office/Service workers and land use designations are not perfectly comparable across all SBC jurisdictions) make it effectively impossible to reconcile all residual differences among independent counts of employment by type for the same area and time.

## Preparation of Socioeconomic Forecast Variables for GHG Inventory

With the selection of preferred source projections, output variables, forecast years, and interpolation methodology accomplished, the unincorporated Study Area mapped and a draft correspondence table proposed to facilitate conversion of SBCAG employment forecasts to NAICS 2-Digit equivalents, the Aspen Team proceeded to build an Excel spreadsheet workbook to implement the allocation of the RGF2007 projections to the Study area.

The Excel 'Allocation Engine' workbook comprises 12 spreadsheet tables, organized in four sets of three tables, each set assembling the SBCAG RGF2007 TAZ forecasts ('TAZData'), Study Area Allocation Factors ('Factors'), and Study Area Allocations ('TAZAlloc') for one of the four projection intervals: 2005, 2007, 2020 and 2035. The workbook is relatively simple in design and function, and has been designed to be modular, to allow extensive and rapid updates if and as the SBCAG draft TAZ allocations of RGF2007 are revised, or should adjustments of the Study Area Allocation Factors be required.

The 12 spreadsheets in the Allocation Engine workbook are large and available in the set of spreadsheets in the inventory model. Each of the 12 spreadsheet tables contains cells for 268 row-records representing the TAZs located within Santa Barbara County, 4 column records representing TAZ location identifiers, and 9- to 24- column records representing socioeconomic projections, allocation factors, or allocations. The 12 spreadsheets share the following socioeconomic elements:

- Total Population
- Total Households
- Total Employment
- Daytime Population

The first three of these shared elements are familiar from RGF2007; the last, 'Daytime Population,' is a simple sum of Total Population + Total Employment,<sup>18</sup> used to serve as means of allocating VMT measures by TAZ from the Countywide Travel Demand Model.

The employment sector elements shown in the four spreadsheets which have names containing 'TAZData' are the 5-Category SBCAG types described above: Agriculture, Industrial, Commercial, Offices and Services. The employment sector elements in the four spreadsheets which have names containing 'Factors' and the four spreadsheets which have names containing 'TAZAlloc' are the 20-category NAICS two-digit groups described in the correspondence explanations above.

The allocation factors in the 'Factors' spreadsheets were derived from the geocoded census block population, household and employment data described above. For each geocoded socioeconomic element

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<sup>18</sup> Daytime Population is often estimated as (Total Population – Employed Residents) + Total Employment to avoid double-counting workers at their TAZs of residence as well as their TAZs of work. Employed resident data projections at the TAZ level are not currently available from SBCAG's draft RGF2007 TAZ allocations. Future modelers may wish to revise the Daytime Population calculations and related allocation factors and VMT allocations described herein, should TAZ projections of employed residents become available at a later time.

(Census 2000 counts for population and households, LEHD 2007 estimates for employment by place of work) and TAZ, the Aspen Team calculated the ratio of aggregated attributes for census blocks geocoded as in the Study Area AND in the TAZ to the aggregated attributes for all blocks geocoded as in the TAZ. To provide 'Crosswalk' conversion factors to breakout 20-category NAICS employment groups from equivalent 5-category SBCAG employment groups, the Aspen Team first 'rolled up' the LEHD 2007 employment estimates by census block by TAZ to the corresponding SBCAG 5-Category group before calculating the ratios of LEHD employment by Study Area by TAZ by NAICS 2-digit sector to LEHD employment by TAZ by corresponding SBCAG 5-category group<sup>19</sup>. The resulting factors represent both the proportion of NAICS sector employment within corresponding SBCAG 5-category employment group by TAZ AND the proportion of NAICS sector employment within the Study Area by TAZ to the total TAZ employment for the same NAICS sector.

Regional Growth Forecasts at the TAZ level often anticipate futures where specific types of development are projected to occur in TAZs which have no similar development in the Base Year. Allocation factors derived from Base Year or 'existing conditions' data, as outlined above, may therefore have zero default allocation factors which would, if unadjusted, nullify the 'new' types of development when they appeared in the Regional Forecast. To avoid this problem, the Aspen Team reviewed the 'first-pass' allocation factor tables, forced allocation factors to 1.00 for population and households for TAZs significantly located in the Study Area and with zero Base Year population and housing, and selectively forced employment allocation factors to non-zero for TAZs wholly or partially in the Study Area but with no employment, or no employment in one of the SBCAG 5-category groups, in the Base Year. For employment in such instances, the 20-category NAICS sector allocation factors were set to reflect the proportional distribution between Study Area and non-Study Area lands by TAZ in the Base Year, and the overall distribution of employment by subsector between Study Area and non-Study Area lands in the same County subregion in the Base Year.

The values for individual allocation factors can range from 0.00 to 1.00, i.e., from 0 percent of a TAZ socioeconomic measure allocated to the Study Area to 100 percent of that measure allocated to the Study Area. SBCAG allocations of RGF2007 are retained in the allocation calculations, that is, the allocation factors only function within TAZs and no re-allocation of SBCAG's growth forecast from one TAZ to another occurs in the process. The allocation factors are stored and displayed separate from the TAZData inputs and TAZAlloc outputs (and allocation formulae), to facilitate replacement of the May 2010 draft TAZ allocations with revised/final SBCAG TAZ allocations of RGF2007 as those revisions become available.

The current version of the Excel workbook Allocation Engine uses the same Study Area allocation factor tables for all four projection intervals: 2005, 2007, 2020, and 2035, all derived from Census 2000 and LEHD 2007 socioeconomic data as described immediately above. This means that the same proportional allocations of SBCAG projections by TAZ to the Study Area are assumed to remain constant during the

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<sup>19</sup> All of the census block tables and GIS layers with Census 2000 population and household counts and 2007 LEHD employment estimates have been retained in detail and can be turned over to the County as work products of this analysis.

2005-2035 forecast interval. To the extent specific proposed development project data, community general plan and zoning GIS layers, detailed site use and development capacity estimates by parcel may be available in the future, the allocation factors may be revisited and refined<sup>20</sup>.

For each of the four projection intervals, the calculations implemented within the Excel workbook Allocation Engine proceed in the same manner. The modeler copies in the SBCAG RGF projections at the TAZ-level for 2005, 2020 and 2035 into the corresponding TAZData sheets, and the Study Area allocation factors by TAZ into the corresponding 'Factors' sheets. The 2007 Base Year interpolations of 'TAZData' and 'Factors' are updated automatically from the 2005 and 2020 inputs, as long as the interpolation controls remain set to the original EDD and DOF estimates of 2007 population, household and employment conditions. The Study Area allocations of the forecast socioeconomic elements by TAZ are calculated for each interval as the product of SBCAG source allocations times the defined allocation factors.

Each of the 2005, 2007, 2020 and 2035 'TAZAlloc' tables includes summary totals and subtotals for the County and SBCAG planning subregions, and a row at the bottom of the table presenting the percentage of the Countywide forecast allocated to the Study Area. At the time this report is written, using SBCAG draft TAZ allocations from early May of 2010, and allocation factors and formulae developed by the Aspen Team through mid-July, 2010, at Year 2035 the Study Area is allocated the following percentages of the RGF2007 Countywide totals:

- Study Area Population: 31.6 % of the SBC total for 2035
- Study Area Households: 31.9% of the SBC total for 2035
- Study Area Agricultural Employment: 23.1% of the SBC total for 2035
- Study Area Industrial Employment: 14.7% of the SBC total for 2035
- Study Area Commercial Employment: 7.5% of the SBC total for 2035
- Study Area Office Employment: 5.2% of the SBC Total for 2035
- Study Area Services Employment: 11.1% of the SBC total for 2035
- Study Area Total Employment: 10.1% of the SBC total for 2035
- Study Area Daytime Population: 24.5% of the SBC total for 2035

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<sup>20</sup> Although beyond the Scope of Work and time and budget resources available for the current analysis, a dasymetric approach to allocation may be possible for County modelers to implement at a later time. See: Mapping Population Distribution in the Urban Environment: The Cadastral-based Expert Dasymetric System (CEDS): [http://www.lehman.cuny.edu/deannss/geography/publications/Dasymetric\\_CaGIS\\_Maantay.pdf](http://www.lehman.cuny.edu/deannss/geography/publications/Dasymetric_CaGIS_Maantay.pdf)



## Appendix C - ICLEI Methodology and the Clean Air & Climate Protection (CACP) Software

The ICLEI framework provides a simplified representation of the economy and related activity with which the aggregate community emissions are estimated. ICLEI has prepared software packages to develop GHG inventories for both local government municipal operations and for community wide GHG emissions.<sup>21</sup> The inventory prepared for the County follows the principles specified by ICLEI. However, the data and parameters used in the CACP software are too general to be accurate for the County, particularly when analyzing sub-county jurisdictional areas.

### INPUTS

#### Community Analysis

##### *Sectors*

- Residential
  - Energy use per fuel type (electricity, commercial coal, fuel oil, kerosene, landfill gas or biogas, natural gas, propane, stationary gasoline, stationary LPG, wood 12 pct moisture, carbon dioxide, methane, nitrous oxide, sulphur hexafluoride)
- Commercial
  - Energy use per fuel type (electricity, commercial coal, fuel oil, kerosene, landfill gas or biogas, natural gas, propane, stationary gasoline, stationary LPG, wood 12 pct moisture, carbon dioxide, methane, nitrous oxide, sulphur hexafluoride)
- Industrial
  - Energy use per fuel type (electricity, commercial coal, fuel oil, kerosene, landfill gas or biogas, natural gas, propane, stationary gasoline, stationary LPG, wood 12 pct moisture, carbon dioxide, methane, nitrous oxide, sulphur hexafluoride)
- Transportation
  - Quantity of vehicle type (i.e. heavy duty vehicle, passenger car, aircraft) per fuel type (biodiesel, compressed natural gas, diesel, ethanol, gasoline, LNG, LPG, methanol, electricity, off road aviation gasoline, off road diesel, off road gasoline, off road jet fuel, off road residential fuel oil)
- Waste
  - Amount of waste per waste disposal technology (uncollected, open dump, open burning, managed landfill, controlled incineration, and compost)
    - percent waste share per waste type (paper products, food debris, plant debris, wood or textiles, all other waste)

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<sup>21</sup> <http://www.icleiusa.org/action-center/tools/cacp-software>

- Other
  - Amount of direct emission type (i.e. COS, HFC types, methane, perfluorocarbons, etc.)

#### For all sectors

- Reference year
- Forecast year
- Indicator growth rates (%)
  - Residential: households
  - Commercial: floor area, commercial employees, commercial establishments
  - Industrial: floor area, industrial employees, industrial establishments
  - Transportation: growth multiplier per fuel type
  - Waste: growth rate
  - Other: growth multiplier per emission type
- Building or group location
- Indicator inputs (#)
  - Residential: households
  - Commercial: floor area, commercial employees, commercial establishments
  - Industrial: floor area, industrial employees, industrial establishments
- Coefficients
  - 1990-2050 for CO<sub>2</sub>, N<sub>2</sub>O, NO<sub>x</sub>, CH<sub>4</sub>, SO<sub>x</sub>, VOC, CO, PM10, PM2.5
  - Drop down options for
    - Residential: average grid electricity set, marginal grid electricity set, average CHP heat set, RCI average set, fuel CO<sub>2</sub> set, user-defined set
    - Commercial: average grid electricity set, marginal grid electricity set, average CHP heat set, RCI average set, fuel CO<sub>2</sub> set, user-defined set
    - Industrial: average grid electricity set, marginal grid electricity set, average CHP heat set, RCI average set, fuel CO<sub>2</sub> set, user-defined set
    - Transportation: average grid electricity set, marginal grid electricity set, transport average set, fuel CO<sub>2</sub> set, user-defined set
    - Waste: waste products set
    - Other: N/A

#### Community Measures

- Set community targets
  - Base year
  - Target year
  - Target reduction (%)

#### OUTPUTS

- Energy consumption (MMBtu) (except for waste sector)

- Vehicle distance (transportation sector only)
- Passenger distance (transportation sector only)

## Emissions

- Equivalent CO<sub>2</sub> production (all sectors)
- NO<sub>x</sub> production (except for waste sector)
- SO<sub>x</sub> production (except for waste sector)
- CO production (except for waste sector)
- VOC production (except for waste sector)
- PM10 production (except for waste sector)
- PM2.5 production (except for waste sector)

## References

- Association of Environmental Professionals (2010). 2010 California Environmental Quality Act (CEQA) Statute and Guidelines. Palm Desert, California,  
<http://www.califaep.org/resources/Documents/FINAL%20CEQA%20Handbook%20HighQuality.pdf>.
- Bishop, Phil. (2009). State Board of Equalization, Fuel Taxes Division to Richard McCann. June.
- California Air Resources Board. (2007). "EMFAC2007 Release."  
[http://www.arb.ca.gov/msei/onroad/latest\\_version.htm](http://www.arb.ca.gov/msei/onroad/latest_version.htm). Accessed October, 2010.
- \_\_\_\_\_. (2007). "Greenhouse Gas Inventory Data - 1990 to 2004: 1990-2004 inventory by economic sector - Full Detail " [http://www.arb.ca.gov/cc/inventory/data/tables/ghg\\_inventory\\_by\\_sector\\_00-08\\_2010-05-12.xls](http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_by_sector_00-08_2010-05-12.xls). Accessed June 3, 2010, November.
- \_\_\_\_\_. (2008). Climate Change Scoping Plan: A Framework for Change. Pursuant to AB 32, The California Global Warming Solutions Act of 2006, California Environmental Protection Agency.  
<http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>.
- \_\_\_\_\_. (2010). CARB Staff Release: Draft Regional Greenhouse Gas Emission Reduction Targets For Automobiles and Light Trucks Pursuant to Senate Bill 375. Sacramento, California. June 30.
- \_\_\_\_\_. (2010). "California takes the first step toward more livable, sustainable communities."  
<http://www.arb.ca.gov/newsrel/newsrelease.php?id=154>.
- \_\_\_\_\_. (2010). "Documentation of California's Greenhouse Gas Inventory: Railroads."  
[http://www.arb.ca.gov/cc/inventory/doc/docs1/1a3c\\_rail\\_fuelcombustion\\_distillate\\_co2\\_2006.htm](http://www.arb.ca.gov/cc/inventory/doc/docs1/1a3c_rail_fuelcombustion_distillate_co2_2006.htm). Accessed June 1, 2010, May 12.
- \_\_\_\_\_. (2010). "Greenhouse Gas Inventory Data - 2000 to 2008: 2000-2008 inventory by economic sector - Full Detail " [http://www.arb.ca.gov/cc/inventory/data/tables/ghg\\_inventory\\_by\\_sector\\_00-08\\_2010-05-12.xls](http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_by_sector_00-08_2010-05-12.xls). Accessed June 3, 2010, May 12.
- \_\_\_\_\_. (2010, May 28). "Greenhouse Gas Inventory Data - Graphs." Accessed June 7, 2010.
- \_\_\_\_\_. (2010). In-Use Off-Road Diesel Vehicle Rule Public Meetings, Workshop Presentation,  
[http://www.arb.ca.gov/msprog/ordiesel/documents/emissions\\_inventory\\_presentation\\_full\\_10\\_09\\_03.pdf](http://www.arb.ca.gov/msprog/ordiesel/documents/emissions_inventory_presentation_full_10_09_03.pdf). September 3.
- \_\_\_\_\_. (2010). "Off-Road Emissions Inventory Program."  
<http://www.arb.ca.gov/msei/offroad/offroad.htm>. Accessed May 15, 2010.

- \_\_\_\_\_. (2010). Regional Greenhouse Gas Emission Reduction Targets Pursuant to SB 375. Resolution 10-31 September 23.
- \_\_\_\_\_. (2010). "2009 Almanac Emission Projection Data."  
<http://www.arb.ca.gov/app/emsmv/emssumcat.php>. Accessed September, 2010.
- California Department of Finance. (2009). "California Statistical Abstract."  
[http://www.dof.ca.gov/HTML/FS\\_DATA/STAT-ABS/Toc\\_xls.htm](http://www.dof.ca.gov/HTML/FS_DATA/STAT-ABS/Toc_xls.htm). 2010.
- California Department of Water Resources (2009). Management of the State Water Project. Sacramento, California, <http://www.water.ca.gov/swpao/bulletin.cfm>. December.
- California Department of Transportation (2009). 2008 California Motor Vehicle Stock, Travel And Fuel Forecast (MVSTAFF). Sacramento, California, Division of Transportation System Information, Office of Travel Forecasting and Analysis, Statewide Modeling Branch,  
<http://www.dot.ca.gov/hq/tsip>. June.
- California Department of Forestry and Fire Protection (2005). Forest and Range 2003 Assessment. Sacramento, California, <http://frap.fire.ca.gov/assessment2003/index.html>.
- California Division of Oil, Gas and Geothermal Resources (1991). 1990 Annual Report.  
[http://www.conservation.ca.gov/dog/pubs\\_stats/annual\\_reports/Pages/annual\\_reports.aspx](http://www.conservation.ca.gov/dog/pubs_stats/annual_reports/Pages/annual_reports.aspx).
- \_\_\_\_\_. (2010). 2008 Annual Report.  
[ftp://ftp.consrv.ca.gov/pub/oil/annual\\_reports/2008/PR06\\_Annual\\_2008.pdf](ftp://ftp.consrv.ca.gov/pub/oil/annual_reports/2008/PR06_Annual_2008.pdf);  
[http://www.conservation.ca.gov/dog/pubs\\_stats/annual\\_reports/Pages/annual\\_reports.aspx](http://www.conservation.ca.gov/dog/pubs_stats/annual_reports/Pages/annual_reports.aspx).
- \_\_\_\_\_. (2010). "Oil, Gas & Geothermal - District Map Index."  
[http://www.conservation.ca.gov/dog/maps/Pages/goto\\_welllocation.aspx](http://www.conservation.ca.gov/dog/maps/Pages/goto_welllocation.aspx);  
[ftp://ftp.consrv.ca.gov/pub/oil/maps/All-CAL-Wells\\_mdb.exe](ftp://ftp.consrv.ca.gov/pub/oil/maps/All-CAL-Wells_mdb.exe);  
[ftp://ftp.consrv.ca.gov/pub/oil/maps/dist3/Dist3wells\\_mdb.exe](ftp://ftp.consrv.ca.gov/pub/oil/maps/dist3/Dist3wells_mdb.exe). Accessed April 25, 2010.
- California Employment Development Department. (2010). "Employment by Industry Data."  
<http://www.labormarketinfo.edd.ca.gov/?Pageid=166>. Accessed June, 2010.
- California Energy Commission. (2008). "Energy Almanac: California's Oil Refineries."  
<http://energyalmanac.ca.gov/petroleum/refineries.html>. Accessed June, 2010.
- \_\_\_\_\_. (2010). "California Energy Consumption Database: Electricity Consumption by County (Santa Barbara)." <http://www.ecdms.energy.ca.gov/elecbycounty.aspx>. Accessed June 1, 2010.
- \_\_\_\_\_. (2010). "California Energy Consumption Database: Electricity Consumption by Planning Area."  
<http://ecdms.energy.ca.gov/elecbyplan.aspx>. Accessed November 9, 2010.

- \_\_\_\_\_. (2010). "California Energy Consumption Database: Natural Gas Consumption by County (Santa Barbara)." <http://ecdms.energy.ca.gov/gasbycounty.aspx>. Accessed June 1, 2010.
- \_\_\_\_\_. (2010). "California Energy Consumption Database: County Electricity Deliveries by NAICS (Santa Barbara)." <http://ecdms.energy.ca.gov/utilbynaicselec.aspx>. Accessed June 1, 2010.
- California Natural Resources Agency (2010). Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB97, State of California.  
[http://ceres.ca.gov/ceqa/docs/Final\\_Statement\\_of\\_Reasons.pdf](http://ceres.ca.gov/ceqa/docs/Final_Statement_of_Reasons.pdf).
- Federal Aviation Administration. (2010). "FAA Airport Data & Contact Information."  
[http://www.faa.gov/airports/airport\\_safety/airportdata\\_5010/](http://www.faa.gov/airports/airport_safety/airportdata_5010/).
- National Agricultural Statistical Service (1993). 1992 Census of Agriculture, California-State and County Data. U. S. D. o. Agriculture.
- \_\_\_\_\_ (2003). 2002 Census of Agriculture, California-State and County Data. U. S. D. o. Agriculture.
- \_\_\_\_\_ (2009). 2007 Census of Agriculture, California-State and County Data. U. S. D. o. Agriculture.
- Petrini, Joseph. (2010). Santa Barbara County Air Pollution Control District. to R. McCann. Spreadsheet file. April 26.
- Santa Barbara County Agricultural Commissioner (2008). 2007 Agricultural Production Report.  
<http://www.countyofsb.org/agcomm/cropRpt/2007.pdf>.
- Santa Barbara County Association of Governments (2004). The 2030 Travel Forecast for Santa Barbara County Final Report. Santa Barbara, California. September.
- Santa Barbara County Association of Governments (2007). Regional Growth Forecast 2005-2040 Final Report, Appendix 8: Tri-County Growth Comparison and Appendix 9: Forecast Comparisons. Santa Barbara, California.
- Santa Barbara County Public Works Department (2009). 2008 Santa Barbara County Groundwater Report. Santa Barbara, California, Water Resources Division, Water Agency. Accessed June 2010,  
[https://countyofsb.org/uploadedFiles/pwd/Water/2008%20groundwater%20report%20ver5\\_CommentsAccepted\\_Final.pdf](https://countyofsb.org/uploadedFiles/pwd/Water/2008%20groundwater%20report%20ver5_CommentsAccepted_Final.pdf). December 1.
- U.S. Bureau of the Census. (2010). "Building Permits." <http://censtats.census.gov/bldg/bldgprmt.shtml>. Accessed June, 2010.

U.S. Bureau of the Census. (2010). "Census Data for Transportation Planning: Older Census Data (pre-2000)." <http://www.trbcensus.com/olddata.html>. Accessed September, 2010.

U.S. Bureau of Economic Affairs. (2010). "Regional Economic Accounts: Local Area Personal Income." <http://bea.gov/regional/reis/default.cfm?selTable=CA25>. Accessed May 25, 2010. April 22

U.S. Energy Information Administration. (2009). "Distillate Fuel Oil and Kerosene Sales by End Use " [http://tonto.eia.doe.gov/dnav/pet/pet\\_cons\\_821use\\_dcu\\_sca\\_a.htm](http://tonto.eia.doe.gov/dnav/pet/pet_cons_821use_dcu_sca_a.htm), December 22.

University of California Agricultural and Resource Economics. (2010). "Current Cost and Return Studies." <http://coststudies.ucdavis.edu/current.php>. Accessed April, 2010.

**Appendix C – Existing Comprehensive Plan and  
Community Plan Policies**



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## Comprehensive Plan Policies

Policies & Recommendations	Adopted Language	Reduction Category
<b>Agricultural Element</b>		
Policy I.D	The use of the Williamson Act (Agricultural Preserve Program) shall be strongly encouraged and supported. The County shall also explore and support other agricultural land protection programs.	Resource Conservation
<b>Conservation Element</b>		
Energy Recommendation 2	Identify the potential for energy conservation measures and for the promotion of policies to convert to non-fossil fuel energy sources.	Air and Energy
Energy Recommendation 4	Implement an aggressive conservation and alternative energy program for County and public facilities.	Air and Energy
Energy Recommendation 5	Establish on-going public education energy conservation outreach programs.	Air and Energy
Energy Recommendation 6	Actively participate in the energy conservation programs of the local, state, and federal agencies.	Air and Energy
<b>Energy Element</b>		
Policy 2.1	Establish mechanisms and incentives to encourage architects and builders to exceed the energy efficiency standards of the California Building Code (Title 24) in new and existing buildings by implementing energy efficiency measures	Green Building
Policy 2.2	Assist architects, builders, and others in using state-of-the-art energy technology, design and spatial orientation for more efficient buildings	Green Building
Policy 2.3	Provide information and education to the general public, businesses, and organizations on the importance of energy conservation, and available programs, products, and incentives regarding energy efficiency and alternatives	Air and Energy
Policy 2.4	Encourage increased use of passive, solar design and daylighting in existing and new structures	Green Building
Policy 2.5	The County shall maintain and strengthen the existing training of Planning & Development, Building & Safety Division personnel to remain proficient in reviewing plans for compliance with the energy code	Green Building
Policy 2.6	Encourage homeowners, and commercial and industrial building owners to improve energy efficiency upon renovation of buildings.	Green Building
Policy 2.7	The County shall maintain and expand the tree population to enhance the cooling benefits	Resource Conservation
Policy 3.1	Enhance opportunities for alternative transportation.	Land Use and Transportation
Policy 3.2	The County should continue to research and support opportunities for telecommunication and computer-based communication that reduce the need for travel.	Land Use and Transportation

## Comprehensive Plan Policies

Policies & Recommendations	Adopted Language	Reduction Category
Energy Element (cont.)		
Policy 3.3	Reduce vehicular miles traveled and peak traffic trips by encouraging employers to voluntarily prepare and implement a Transportation Demand Management Program for their employees. (This policy is focused at areas not governed by Tier 3 of the TDM Ordinance.)	Land Use and Transportation
Policy 3.4	Encourage coordination of scheduling recreational events (e.g., organized sports, arts and handicrafts for minors) at locations that would reduce recreation-related transportation by automobile	Land Use and Transportation
Policy 3.5	The County shall consider the completion of an integrated bikeway system, linking residences with commercial centers, work locations, schools, parks and mass transit facilities to be a high priority for promoting the use of the bicycle as an alternative mode of transportation	Land Use and Transportation
Policy 3.6	The County shall improve the convenience, comfort and safety for pedestrians	Land Use and Transportation
Policy 3.7	Planning efforts shall focus on mixed-use development to reduce vehicular trips, where appropriate	Land Use and Transportation
Policy 3.8	The County shall coordinate office, commercial and industrial developments with mass transit service and existing or proposed bikeways	Land Use and Transportation
Policy 3.9	The County shall coordinate high density residential developments with mass transit service and existing or proposed bikeways	Land Use and Transportation
Policy 4.1	Encourage recycling and reuse of construction waste to reduce energy consumption associated with extracting and manufacturing virgin materials	Resource Conservation
Policy 4.2	The County shall require adequate areas for collecting and loading recyclable materials in development projects, and shall further address recycling logistics in its zoning ordinance	Resource Conservation
Policy 4.3	Promote reuse of asphalt removed from roads and paved structures within the county and use of recycled materials in roadway and paved surface construction	Resource Conservation
Policy 4.4	The County shall procure products made from recycled materials to the maximum extent feasible, and as budget constraints allow	Resource Conservation
Policy 4.5	The County shall continue to support the programs associated with efficient waste collection and recycling, public school education, and composting	Resource Conservation
Policy 4.6	The County shall continue to support the programs of the Soil Conservation Service, Resource Conservation District, U.C. Cooperative Extension/Farm Advisor, utility companies, and others that address efficient irrigation because of their associated energy benefits	Resource Conservation
Policy 4.7	The County shall encourage water purveyors and water customers to continue their efforts to install more efficient options to increase energy benefits associated with reduced pumping, distribution, heating and treatment of water and wastewater	Resource Conservation

## Comprehensive Plan Policies

Policies & Recommendations	Adopted Language	Reduction Category
<b>Energy Element (cont.)</b>		
Policy 5.1	In the consideration of alternative energy, the County shall consider the full life-cycle environmental effects and embedded energy requirements to provide such alternative energy. The County shall encourage the use of those alternatives determined to present sufficient environmental benefits.	Air and Energy
Policy 5.2	The County shall encourage the use of alternative energy technology in appropriate new and existing development.	Air and Energy
Policy 5.3	The County shall encourage installation and use of cogenerating systems where they are cost-effective and appropriate	Air and Energy
Policy 5.5	The County shall continue to investigate means to install methane recovery systems at landfills and sewage treatment plants, where appropriate	Air and Energy
Policy 5.7	During the regulatory review of a proposed project, when appropriate, use mobile alternative energy projects as mitigation for impacts to air quality	Air and Energy
Policy 5.8	Support the efforts of transit providers to develop electric shuttle programs	Land Use and Transportation
Policy 5.9	Encourage electric vehicle recharging infrastructure	Land Use and Transportation
Policy 5.10	The County shall encourage the use of alternatively fueled vehicles by individuals	Land Use and Transportation
Policy 5.11	Encourage the use of fuel cells in appropriate new development, consistent with sound community planning principles. Hotels, resorts, condominiums, apartments, governmental and industrial facilities are potential candidates for fuel cells	Air and Energy
<b>Housing Element</b>		
Policy 1.5	The County shall support the efforts of employers in the development of on- or near-site employee housing	Land Use and Transportation
Policy 1.8	The County shall promote development with a mix of complementary land uses including housing, retail, office, commercial services and civic uses.	Land Use and Transportation
Policy 1.9	The County shall promote moderate to higher density residential or mixed use development on in-fill sites within the urban boundaries of the county to encourage efficient use of land and existing infrastructure.	Land Use and Transportation
Policy 5.5	The County shall continue to encourage development within existing urban boundaries of the county and the preservation and/ or protection of rural land uses outside the urban boundaries.	Land Use and Transportation
Policy 5.3	The County shall encourage well-designed, energy efficient units in new residential development that will minimize maintenance costs over time. All projects shall comply with the Development Standard at right.	Green Building

## Comprehensive Plan Policies

Policies & Recommendations	Adopted Language	Reduction Category
<b>Land Use Element: Air Quality Supplement</b>		
Policy C	Increase the attractiveness of bicycling, walking, transit, and ridesharing	Land Use and Transportation
Policy D	Restrict the development of auto-dependent facilities.	Land Use and Transportation
Policy E	Improve the integration of long-range planning and project approval procedures with air quality planning requirements.	Land Use and Transportation

## Comprehensive Plan - Community Plan Policies

Policies & Recommendations	Adopted Language	Reduction Category
<b>Santa Ynez Community Plan</b>		
Policy CIRC-SYV-4	The County shall encourage development of all feasible forms of alternative transportation in the Santa Ynez Valley Community Plan Area	Land Use and Transportation
Policy CIRC-SYV-10	Development shall be sited and designed to provide maximum access to non-motor vehicle forms of transportation, including well designed walkways, paths and trails between residential development and adjacent and nearby commercial uses and employment centers, where feasible.	Land Use and Transportation
Policy RSW-SYV-1	Resource conservation and recovery shall be implemented in the SYVCPA to divert the waste stream from area landfills to the maximum extent feasible. Diversion shall be maximized through source reduction, recycling and composting.	Resource Conservation
<b>Montecito Community Plan</b>		
Policy CIRC-M-1.7	The County shall continue to develop programs that encourage the use of alternative modes of transportation including, but not limited to, an updated bicycle route plan, park and ride facilities, and transportation demand management ordinances.	Land Use and Transportation
Policy CIRC-M-1.8	New development shall be sited and designed to provide maximum access to non-motor vehicle forms of transportation.	Land Use and Transportation
Policy RRC-M-1.1	The County shall work with the community to develop recycling programs.	Resource Conservation
Policy AQ-M-1.2	The County shall encourage Transportation Management techniques.	Land Use and Transportation
Policy AQ-M-1.3	Air pollution emissions from new development and associated construction activities shall be minimized to the maximum extent feasible. These activities shall be consistent with the Air Quality Attainment Plan and Air Pollution Control District Guidelines.	Air and Energy
Policy BIO-M-1.16	All existing native trees regardless of size that have biological value shall be preserved to the maximum extent feasible.	Resource Conservation
<b>Goleta Valley Community Plan</b>		
Policy RRC-GV-1	Opportunities for community wide resource recovery and conservation shall be provided.	Resource Conservation

## Comprehensive Plan - Community Plan Policies

Policies & Recommendations	Adopted Language	Reduction Category
<b>Goleta Valley Community Plan (cont.)</b>		
Policy RRC-GV-2	All new residential development in the Urban area and, where feasible, outside the Urban area shall participate in yard waste collection programs as may be provided by the County of Santa Barbara. Such programs may include yard waste accumulation bins, curbside pickups and backyard composting.	Resource Conservation
Policy RRC-GV-3	Recycling bins shall be provided at all construction sites to minimize construction-generated waste which goes to the landfill.	Resource Conservation
Policy CIRC-GV-4	New development shall be sited and designed to provide maximum access to non-motor vehicle forms of transportation, including well designed walkways, paths and trails between new residential development and adjacent and nearby commercial uses and employment centers.	Land Use and Transportation
Policy CIRC-GV-5	The County shall facilitate the use of the bicycle as an alternate mode of transportation and shall provide adequate, safe bike-routes in the Goleta Area to meet the transportation and recreation needs of Goleta cyclists.	Land Use and Transportation
Policy CIRC-GV-9	Commercial uses shall be encouraged within major employment centers to provide basic food and shopping amenities to employees in close proximity to their workplace.	Land Use and Transportation
Policy AQ-GV-1	The County shall impose appropriate restrictions and control measures upon construction activities associated with each future development project, in order to avoid significant deterioration of air quality.	Land Use and Transportation
Policy AQ-GV-3	The County shall implement those land use patterns and transportation programs which will serve to reduce vehicle trips and total vehicle miles traveled.	Land Use and Transportation
Policy AQ-GV-4	The County shall make mixed use development, which would encourage less commuting, a priority of land use planning.	Land Use and Transportation
Policy AQ-GV-5	The County shall require the use of techniques designed to conserve energy and minimize pollution.	Air and Energy
<b>Orcutt Community Plan</b>		
Policy CIRC-O-6	The County shall encourage development of all feasible forms of alternative transportation in the Orcutt/Santa Maria area.	Land Use and Transportation
Policy CIRC-O-7	The County shall encourage Caltrans to accommodate planned bicycle facilities in the design and construction of new highway overpasses and/or widening of existing overpasses.	Land Use and Transportation
Policy CIRC-O-9	Development shall be sited and designed to provide maximum access to non-motor vehicle forms of transportation, including well designed walkways, paths and trails between residential development and adjacent and nearby commercial uses and employment centers, where feasible.	Land Use and Transportation
Policy AQ-O-1	The County shall encourage land use planning and development design which reduces air pollution through development of transportation infrastructure supportive of alternative modes of transportation and pedestrian oriented developments.	Land Use and Transportation

## Comprehensive Plan - Community Plan Policies

Policies & Recommendations	Adopted Language	Reduction Category
<b>Orcutt Community Plan (cont.)</b>		
Policy AQ-O-3	The County should promote the use of alternative fuels, solar energy systems, and the use of construction techniques which are designed to conserve energy and minimize pollution in Orcutt, consistent with, but not limited to the provisions of the CA Building Code.	Air and Energy
<b>Summerland Community Plan</b>		
Policy RRC-S-1	Opportunities for community wide resource recovery and conservation shall be provided.	Resource Conservation
Policy CIRC-S-6	The County shall continue to develop programs that encourage the use of alternative modes of transportation including, but not limited to, an updated bicycle plan, park and ride facilities and transportation demand management ordinances.	Land Use and Transportation
Policy CIRC-S-7	New development shall be sited and designed to provide maximum access to non-motor vehicle forms of transportation.	Land Use and Transportation
Policy AQ-S-1	The County shall impose appropriate restrictions and control measures upon construction activities associated with each future development project, in order to avoid significant deterioration of air quality.	Land Use and Transportation
Policy AQ-S-2	The County shall, in its land use decisions, protect and enhance the air quality in Summerland consistent with CAAQS and NAAQS.	Land Use and Transportation
<b>Los Alamos Community Plan</b>		
Policy CIRC-LA-2.1	New development shall be sited and designed to encourage pedestrian and bicycle travel and provide maximum access to facilities that offer alternative modes of transportation (e.g. park and ride areas, bus stops).	Land Use and Transportation
Policy CIRC-LA-2.2	In its long range land use planning efforts, the County should seek methods to link commercial, recreational and educational facilities with transit lines, bikeways and pedestrian trails.	Land Use and Transportation
Policy RRC-LA-1.1	The County shall maintain recycling programs in Los Alamos and enhance programs when feasible.	Resource Conservation
Policy AQ-LA-1.1	The County shall impose appropriate restrictions and control measures upon construction activities associated with each future development project, in order to avoid significant deterioration of air quality.	Land Use and Transportation
Policy AQ-LA-1.3	The County shall implement those land use patterns and transportation programs which will serve to reduce vehicle trips and total vehicle miles traveled.	Land Use and Transportation
Policy AQ-LA-1.4	The County, when reviewing discretionary projects, shall require the use of techniques designed to conserve energy and minimize pollution.	Air and Energy
<b>Toro Canyon Plan</b>		
Policy CIRC-TC-4	The County shall encourage development of all feasible forms of alternative transportation in the Toro Canyon area.	Land Use and Transportation
Policy CIRC-TC-5	The County shall encourage Caltrans to accommodate planned bicycle facilities in the design and construction of new highway overpasses and/or work on existing overpasses.	Land Use and Transportation