CHAPTER 9

CLIMATE PROTECTION

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9. Climate Protection

9.1 INTRODUCTION

Upon the recommendation of the APCD's Community Advisory Council, and with direction from the Board of Directors, the APCD is for the first time including a discussion of greenhouse gas emissions and climate protection in a clean air plan. This chapter is informational and not regulatory in nature; its inclusion is not mandated by state planning requirements.

This chapter presents an overview of global climate change issues and a baseline 2007 carbon dioxide (CO_2) inventory for the county. This inventory will provide a starting point to track the county's progress in reducing gases that cause global climate change.

9.2 GREENHOUSE GASES AND CLIMATE CHANGE

The greenhouse effect is a natural process by which some of the radiant heat from the Sun is captured in the lower atmosphere of the Earth, thus maintaining the temperature and making Earth habitable. The gases that help capture the heat are called greenhouse gases.

Since the Industrial Revolution human activities such as fossil fuel burning deforestation and other agricultural and industrial practices, as well as activities associated with our growing population (e.g. waste disposal), have been increasing the levels of greenhouse gases in the Earth's atmosphere. The higher levels of these gases are in turn affecting the Earth's climate. The world's temperature has increased up to 1°F (0.5°C) over the past century and some of the colder, more remote spots have warmed much more. This phenomenon is referred to as global warming. Global climate change is perhaps a more accurate term, as higher levels of greenhouse gas emissions in the atmosphere not only raise overall temperatures, but also affect other climate sensitive aspects of the environment, including precipitation, crops, pest populations, sea levels, and the fresh water supply.

Scientists estimate that emissions of greenhouse gases will need to be reduced by 80 percent by 2050 to avoid a 2°C (3.6°F) increase in global temperatures, which would produce a sharp rise in the risk of dangerous impacts. The most common greenhouse gases are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

9.3 RELEVANT CLIMATE PROTECTION ACTION AND LEGISLATION

9.3.1. STATE OF CALIFORNIA LEGISLATION

Assembly Bill 32

In 2006, Governor Schwarzenegger signed into law Assembly Bill 32 (AB 32), which created the first-ever statewide cap on greenhouse gas (GHG) emissions. AB 32 required the California Air Resources Board (CARB) to establish a reporting program for GHG emissions beginning with

the largest sources of emissions, to determine a 1990 GHG emissions baseline and to set that as the statewide limit to be achieved by 2020.

AB 32 also required that CARB publish a list of "Early-Action" GHG reduction measures by June 2007 and adopt regulations for those measures by January 2010. By January 2009, CARB had to prepare a detailed scoping plan outlining the direct reduction measures, market-based mechanisms, and incentives needed to meet the 2020 emissions cap.

By January 1, 2011 CARB has to adopt regulations to meet the 2020 emission cap including provisions for using both market mechanisms ("Cap and Trade") and alternative compliance mechanisms, then by January 1, 2012 CARB is required to enforce regulations to meet the 2020 emissions cap.

CARB adopted a Scoping Plan in December 2008. The key elements include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewable energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long term commitment to AB 32 implementation.

<u>CARB Mandatory Reporting Regulation</u>

To track California's progress in implementing AB 32, CARB adopted a mandatory reporting regulation to obtain facility-level data from the largest sources of greenhouse gas emissions in California. The regulation requires annual reporting of GHG emissions from the largest facilities in the state, accounting for 94 percent of greenhouse gas emissions from industrial and commercial stationary sources in California. There are approximately 800 separate sources that fall under the reporting rules, which include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and industrial sources.

<u>Senate Bill 375</u>

In 2008, California enacted the Sustainable Communities and Climate Protection Act of 2008 (SB 375). This law aims to reduce greenhouse gas emissions by 5 million metric tons by reducing miles traveled by passenger vehicles and light duty trucks. By September 30, 2010,

GHG emission reduction targets will be set by CARB for each Metropolitan Planning Organization. Each Metropolitan Planning Organization such as the Santa Barbara County Association of Governments (SBCAG) must develop a Sustainable Communities Strategy that achieves those targeted GHG reductions.
SB 375 also aligns planning for GHG reductions with regional housing and transportation by 2013. By integrating transportation, land use, and housing planning with a Sustainable Communities Strategy, SB 375 ties together three major planning activities currently conducted by SBCAG:

1. Regional Growth Forecast
2. Regional Transportation Plan
3. Regional Housing Needs Assessment Plan

While SB 375 mandates the actions that SBCAG must undertake, the APCD will assist SBCAG in fulfilling its obligations. However, the role of air districts in the SB 375 process is consultative and limited to the process of setting regional targeted GHG reductions.

SBCAG has provided the mobile source inventory and transportation control measures chapters for APCD Clean Air Plans and SBCAG and APCD staff work closely together on these elements. It is possible that VMT reductions achieved through the implementation of SB 375 targets will also produce reductions of criteria pollutants. It is possible that reductions in vehicle miles traveled achieved thought the implementation of SB 375 targets will also produce reductions of criteria pollutants.

9.3.2 FEDERAL ACTIONS

U.S. Environmental Protection Agency Tailoring Rule

On May 13, 2010, the U.S. Environmental Protection Agency (USEPA) issued a final rule that establishes the approach to addressing GHG emissions from stationary sources under the federal Clean Air Act (CAA) permitting programs. This final rule sets thresholds for GHG emissions that define when permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

The CAA permitting program emissions thresholds for criteria pollutants such as lead, sulfur dioxide and nitrogen dioxide, are 100 and 250 tons per year. While these thresholds are appropriate for criteria pollutants, they are not feasible for GHG emissions because GHGs are emitted in much higher volumes. Without this tailoring rule, the criteria pollutants emissions thresholds would take effect automatically for GHGs on January 2, 2011. PSD and Title V requirements at these thresholds would lead to dramatic increases in the number of required permits —tens of thousands of PSD permits and millions of title V permits.

The final USEPA rule “tailors” the requirements of these federal CAA permitting programs to limit the number of facilities that will be required to obtain PSD and Title V permits based on GHG emissions. Only facilities responsible for nearly 70 percent of the national GHG emissions

from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters— power plants, refineries, and cement production facilities.

For the first step of the Tailoring Rule, which will begin on January 2, 2011, PSD or title V requirements will apply to sources' GHG emissions only if the sources are subject to PSD or title V anyway due to their non-GHG conventional pollutants. The applicable requirements of PSD, most notably, the best available control technology (BACT) requirement, will apply to projects that increase net GHG emissions by at least 75,000 tons per year (tpy) carbon dioxide equivalent (CO_2e), but only if the project also significantly increases emissions of at least one non-GHG pollutant. For the title V program, only existing sources with, or new sources obtaining, title V permits for non-GHG pollutants will be required to address GHGs during this first step.

The second step begins on July 1, 2011, will phase-in additional large sources of GHG emissions. New sources as well as existing sources not already subject to title V that emit, or have the potential to emit, at least 100,000 tpy CO_2e will become subject to the PSD and title V requirements. In addition, sources that emit or have the potential to emit at least 100,000 tpy CO_2e and that undertake a modification that increases net emissions of GHGs by at least 75,000 tpy CO_2e will also be subject to PSD requirements.

USEPA Mandatory Reporting Rule

On October 30, 2009, USEPA published the Mandatory Greenhouse Gas Reporting Rule (MRR). The rule requires reporting of GHG emissions from large sources and suppliers in the United States, and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions, are required to submit annual reports to USEPA. The MRR requires reporting of GHG emissions and other relevant information from certain sources beginning in 2010. The rule does not require control of GHGs, it only requires that sources emitting above certain thresholds monitor and report GHGs.

On May 27, 2010, USEPA proposed technical corrections, clarifications, and amendments for this rule.

Nationwide Car and Truck CO_2 Standard

On May 20, 2009, the White House announced that the federal government, major U.S. automakers and California had reached an agreement to establish a single nationwide car and truck emission standard that would require a reduction of 30 percent in CO_2 and other emissions from vehicles sold in the United States by 2016. Capping GHG emissions would effectively require better gas mileage.

9.3.3 COUNTY OF SANTA BARBARA ACTIONS

On March 17, 2009, the Santa Barbara County Board of Supervisors unanimously passed a resolution adopting Santa Barbara County's climate change guiding principles and supporting county efforts to reduce GHG emissions. These principles recognize the county's role in the state climate change arena as threefold: a producer of operational GHGs, and both a regulator and an incentivizer in reducing community-wide GHG emissions. The General Services Department has been charged with developing a plan that would enable the county, as a "producer" of GHG emissions, to achieve the state's 15 percent reduction target for county operations. To address the "regulator" and "incentivizer" roles, the Office of Long Range Planning will develop a countywide Climate Action Strategy.

9.4 CO_2 EMISSIONS INVENTORY

An emissions inventory is a detailed estimate of the amount of air pollutants discharged into the atmosphere from a given area by various emission sources during a specific time period. This inventory builds on the APCD's many years of experience preparing inventories of criteria and toxic air pollutants. This inventory only includes direct emissions of CO_2 due to human activity, and does not account for carbon sinks or sequestration from agricultural and forestry lands. The inventory includes only emissions of CO_2, the most prevalent GHG. The CO_2 emissions are estimated for industrial, commercial, transportation, residential, and agriculture activities in Santa Barbara County. Emissions from electricity consumption for residential, commercial and industrial sectors are also included in the inventory.

Emissions of CO_2 are estimated using the most current activity (e.g., cubic feet of natural gas burned or vehicle miles traveled) and emission factor data from various sources including the USEPA, the California Energy Commission (CEC) and CARB. Table 9.1 presents CO_2 emission factors for common fuels combusted in a variety of emission devices including internal combustion engines, boilers and steam generators. Activity data used in preparing this inventory are the same process rate and throughput data that were used in preparing the APCD's inventories for criteria and toxic air pollutants.

9.4.1 METHODOLOGY

Emission sources can be broadly divided between stationary and mobile sources. Stationary sources can be further divided between point and area sources.

Stationary emission sources identified on an individual basis, or as a single source, are called point sources. Oil and gas processing facilities, and sand, rock and gravel plants are examples of point sources. The APCD maintains a computer database with detailed information on operations and emission characteristics for many facilities, in connection with their APCD permits. Activity data on the sources are collected at the process level from each facility and are updated annually for emissions inventory requirements. The CO_2 emissions from these sources are calculated by multiplying activity data by a CO_2

emission factor. These emission factors take into account fuel-specific carbon content, and the percent of carbon that oxidizes to convert to CO_2emissions.

Stationary emission sources that are not identified individually are called area sources. Area sources are groups of small emission sources, which individually do not emit significant amounts of pollutants, but which together make an appreciable contribution to the emissions inventory. Many area sources do not require permits from the APCD. These include residential heating sources and restaurants, as well as a wide range of consumer products such as paints, solvents, and cleaners. Some facilities considered as area sources require permits from the APCD, such as gas stations and dry cleaners. Emissions estimates for area sources are developed based on estimated activities and emission factors for various categories.

Mobile sources include: on-road motor vehicles and other sources such as boats, ships, trains and aircraft, as well as garden, farm and construction equipment.

Electricity consumption emissions are based on 2007 countywide consumption data obtained from the CEC. These data were allocated to the appropriate portions of the county by assuming that the northern part of the county is serviced by Pacific Gas & Electric, with the exception of Lompoc, which is serviced by Lompoc City Electric. The southern portion of the county is assumed to be serviced by Southern California Edison. Utility-specific electricity CO_2 emission factors (see Table 9-1) based on the power mix of the utility were then applied to the consumption data to determine CO_2 emissions for each portion of the county. For the Lompoc area, the CO_2 emissions were determined from the actual power mix for that utility since a utility-specific emission factor is not available. Approximately 51percent of the Lompoc power is generated from renewable or other zero-emitting sources such as nuclear and hydro-electric. The remaining 49 percent of the electricity is generated from coal (22 percent) and natural gas (27 percent). Lompoc electricity consumption CO_2 emissions were calculated by applying the fuel-specific emission factor to the appropriate percentage of CO_2 generating electricity consumption.

The "On-Road Motor Vehicles" CO_2 emission inventory was developed from the latest working draft version of CARB's Emission Factor (EMFAC) model, which incorporates county-specific vehicle activity data generated by SBCAG's Santa Barbara Travel Model, CARB, and vehicle demographic data from the Department of Motor Vehicles (DMV). SBCAG coordinates with CalTrans and CARB to estimate vehicle emissions by vehicle class. The EMFAC model provides a number for CO_2 emissions for specified inventory years.

As stated above, the "Other Mobile Sources" category includes emission sources that do not produce emissions on roads and highways, such as ships, boats, airplanes, trains, residential utility equipment, and construction and mining equipment. CARB has the

primary responsibility for estimating the emissions from these categories; however, the APCD currently estimates the CO_2 emissions from ships, diesel commercial boats, Outer Continental Shelf (OCS) crew and supply boats, and aircraft. GHG emissions for ships are calculated for ship travel within 24 miles of the Santa Barbara coastline using the same emission estimation methodology discussed in Chapter 3.

The CARB "OFFROAD" model was used to calculate emissions from sources in the *Other Mobile Sources* category. The OFFROAD model consists of three main modules: equipment population (encompassing pieces of equipment, equipment types and ages), activity, and emission factor. The base year equipment population is adjusted for growth and scrappage, producing distributions for specified calendar years from 1970 through 2040. The statewide equipment population is allocated to each geographic region, including air basin and county. The base emission factors are corrected for in-use and ambient conditions. The annual equipment emissions are adjusted for seasonal and diurnal factors, producing the base emissions output. Emissions are produced for fuel type (e.g., gasoline, diesel, compressed natural gas, etc.), engine type (e.g., two-stroke and four-stroke), equipment category and horsepower group.

Aircraft CO_2 emissions were estimated using the Emissions and Dispersion Modeling System (EDMS) that was developed in the mid-1980s as a complex source computer model designed to assess the air quality impacts of proposed airport development projects. EDMS is a combined emissions and dispersion model for assessing air quality at civilian airports and military air bases. The model was developed by the Federal Aviation Administration in cooperation with the United States Air Force. EDMS utilizes the latest aircraft engine emission factors from the International Civil Aviation Organization Engine Exhaust Emissions Data Bank.

Aircraft activity data (operations) were obtained from each of the five airports in the county (Santa Barbara, Santa Maria, Lompoc, Santa Ynez and Cuyama). Activity by commercial aircraft type for Santa Barbara and Santa Maria airports was determined through 2007 airport operating schedules that specify aircraft type for each flight. For general aviation activity, a composite fleet of aircraft was assumed utilizing information from local flight schools. The general aviation fleet consists of approximately 15 aircraft including Beech, Cessna, Piper and Gulfstream. It is assumed that the emission characteristics of the composite fleet are representative of actual CO_2 emissions from general aviation aircraft.

EDMS allows the user to specify the mixing height as appropriate for the local region. The mixing height is defined as the portion of the lower atmosphere that undergoes mechanical or turbulent mixing and is generally equivalent to the height of the base of the inversion. An appropriate mixing height for the Santa Barbara County area is approximately 3,000 feet given the geography and the meteorological conditions of the region. In order to allow sufficient time for climb-out and approach emissions from

aircraft within the county borders, however, the mixing height was set to 10,000 feet. It is assumed that once the aircraft reaches the top of the mixing height it will be beyond Santa Barbara County borders.

9.4.2 2007 CO_2 EMISSION INVENTORY

The 2007 Santa Barbara County CO_2 emissions inventory is presented in Table 9-2 in units of metric tons per year. The Santa Barbara County inventory represents onshore and State Tidelands emission sources. Figure 9-3 shows each major source category's relative contribution for each pollutant during 2007. Sources of CO_2 emissions and their relative contribution are as shown below.

2007 Santa Barbara County CO_2 Emissions: 4,349,932 metric tons per year

- **20 percent Stationary Sources: 859,248 metric tons per year**
  Sources include oil and gas production (natural gas Internal Combustion, or IC engines), manufacturing and industrial (diesel IC engines), agricultural irrigation (diesel and natural gas IC engines) and external combustion sources (boilers and heaters).

- **20 percent Electricity Consumption: 874,869 metric tons per year**
  Residential, commercial and industrial electricity consumption account for these emissions.

- **7 percent Area-Wide Sources: 319,042 metric tons per year**
  These emissions are primarily from residential fuel combustion (natural gas space heating and water heating).

- **44 percent Mobile Sources – On-Road Motor Vehicles: 1,894,350 metric tons per year**
  The majority of CO_2 emissions are from light duty passenger cars, light duty trucks, and diesel trucks.

- **9 percent Other Mobile Sources: 402,423 metric tons per year**
  Contributors include trains, diesel construction and mining equipment, and diesel agricultural equipment.

In summary, on-road motor vehicles contribute 44 percent of the CO_2 emissions within the onshore portion of Santa Barbara County. The on-road emissions are primarily from light duty passenger cars, light duty trucks, diesel trucks. About 20 percent of the CO_2 emissions, or 874,869 metric tons, are from county-wide electricity consumption. The stationary source category includes emissions from internal and external combustion sources including natural gas and diesel engines, boilers and process heaters. These onshore stationary sources also contribute 20 percent of the total onshore CO_2 emissions.

The 2007 Outer Continental Shelf CO_2 emission inventory is presented in Table 9-3. The OCS emissions are summarized separately from the onshore emission inventory for clarity. Figure 9-3

shows each major source's relative contribution for each pollutant during 2007. The largest sources of CO_2 and their contribution percentages are discussed below.

2007 OCS CO_2 Emissions: 835,118 metric tons per year

- **18 percent Stationary Sources: 146,406 metric tons per year**
  Primarily oil and gas production (natural gas turbine IC engines).

- **82 percent Mobile Sources: 688,712 metric tons per year**
  Predominantly ships (foreign-flagged motor ships).

Ocean-going ships, primarily foreign motor ships, account for most of the CO_2 emissions within the OCS. Emissions from marine shipping alone at 675,670 metric tons per year comprise 98 percent of the Mobile Source CO_2 emissions and 81percent of the entire CO_2 inventory on the OCS.

The combined Santa Barbara and OCS CO_2 inventory is presented in Figure 9-4. The largest contributor of CO_2 emissions to the combined inventory is on-road mobile sources, which make up 37 percent of the CO_2 inventory. Other mobile sources contribute 1,091,135 metric tons per year, which is equivalent to 21 percent of the combined inventory. Combined Santa Barbara County and OCS stationary source CO_2 emissions are 1,005,654 metric tons per year or 19 percent of the combined CO_2 inventory. CO_2 emissions from electricity consumption at 874,869 metric tons per year comprise 17 percent of the overall inventory, while area-wide sources account for 319,042 metric tons per year or 6 percent of the combined CO_2 inventory.

9.5 GREENHOUSE GAS INDICATORS

Activity data used to prepare the inventory along with their annual trends since year 2000 are presented in Table 9-4 and Figure 9.5. In addition to population, the data include county-wide energy statistics such as natural gas and electricity consumption that are directly related to greenhouse gas emissions. Although population has increased from 2000 through 2007, the energy-related data show no distinctive trend over the period. Factors such as year-to-year variations in weather and the economy have an impact on annual energy consumption trends. For example, a mild winter could lead to lower natural gas and electricity usage while a weakened economy or higher gas prices could affect both vehicle miles traveled and gasoline sales. Since the energy statistics provide a surrogate of actual emissions, however, we will continue to track these indicators on an annual basis to evaluate countywide greenhouse gas emission trends.

9.6 CONCLUSION

This chapter provides an inventory of CO_2 emissions from point, area and mobile sources for both onshore Santa Barbara and the OCS. The inventory only provides an estimate of CO_2 emissions from combustion sources and does not include emissions of any other Kyoto greenhouse gases (methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur

hexafluoride). The largest contributor to the overall (onshore and OCS) 2007 Santa Barbara County CO_2 inventory is on-road mobile sources, which account for 37 percent of the emissions. Other mobile sources, which include off-road vehicles and marine shipping, comprise 21 percent of the CO_2 inventory. Electricity consumption and stationary sources account for 17 percent and 19 percent of the CO_2 emissions, respectively, while area sources account for the remaining 6 percent of the overall CO_2 inventory.

As discussed above, the inventory in this chapter only includes direct emissions of CO_2 due to human activity and does not account for carbon sinks or sequestration from agricultural and forestry lands. The CO_2 emissions are estimated for industrial, commercial, transportation, residential, and agriculture activities and electricity consumption in Santa Barbara County. This inventory could be improved in the future with the addition of and inventory of emissions of additional Kyoto greenhouse gases, including methane from fugitive sources such as seeps, landfills and oil and gas equipment.

Table 9-1 Greenhouse Gas Emission Factors (Source: California Air Resources Board)

Fuel Type	**kg CO_2/MMBtu**
Natural Gas (by heat content)	
975-1,000 BTU/scf	53.97
1,000-1,025 BTU/scf	52.87
1,025-1,050 BTU/scf	53.02
1,050-1,075 BTU/scf	53.42
1,075-1,100 BTU/scf	53.68
> 1,100 BTU/scf	54.67
Petroleum Products	
Distillate Fuel Oil (#1,2,&4)	73.1
Residual Fuel Oil (#5 & 6)	78.74
Propane	63.02
Marine Shipping	**g CO_2/kW-hr**
All Marine Fuels	620
Electricity Consumption	**lb CO_2/MW-hr**
PG&E	635.67
SCE	630.89

TABLE 9 – 2 2007 CO_2 EMISSION INVENTORY – SANTA BARBARA COUNTY	CO_2 (*metric tons per year)*

STATIONARY SOURCES

Fuel Combustion

010	ELECTRIC UTILITIES	1,759
020	COGENERATION	188,674
030	OIL AND GAS PRODUCTION (COMBUSTION)	101,257
040	PETROLEUM REFINING (COMBUSTION)	12,890
050	MANUFACTURING AND INDUSTRIAL	60,066
052	FOOD AND AGRICULTURAL PROCESSING	70,249
060	SERVICE AND COMMERCIAL	263,462
099	OTHER (FUEL COMBUSTION)	85
	Fuel Combustion Total	**698,442**

Waste Disposal

110	SEWAGE TREATMENT	1,243
120	LANDFILLS	7,276
130	INCINERATORS	548
140	SOIL REMEDIATION	0
199	OTHER (WASTE DISPOSAL)	0
	Waste Disposal Total	**9,067**

Cleaning and Surface Coatings

210	LAUNDERING	0
220	DEGREASING	0
230	COATINGS AND RELATED PROCESS SOLVENTS	0
240	PRINTING	0
250	ADHESIVES AND SEALANTS	0
299	OTHER (CLEANING AND SURFACE COATINGS)	0
	Cleaning and Surface Coatings Total	**0**

Petroleum Production and Marketing

310	OIL AND GAS PRODUCTION	143,146
320	PETROLEUM REFINING	65
330	PETROLEUM MARKETING	0
	Petroleum Production and Marketing Total	**143,211**

Industrial Processes

410	CHEMICAL	0
420	FOOD AND AGRICULTURE	0
430	MINERAL PROCESSES	8,528
470	ELECTRONICS	0
499	OTHER (INDUSTRIAL PROCESSES)	0
	Industrial Processes Total	**8,528**

	STATIONARY SOURCES TOTAL	**859,248**

TABLE 9 – 2 2007 CO_2 EMISSION INVENTORY – SANTA BARBARA COUNTY	CO_2 (*metric tons per year)*

AREA-WIDE SOURCES

Solvent Evaporation

510	CONSUMER PRODUCTS	0
520	ARCHITECTURAL COATINGS AND SOLVENTS	0
530	PESTICIDES/FERTILIZERS	0
540	ASPHALT PAVING/ROOFING	0
	Solvent Evaporation Total	**0**

Miscellaneous

610	RESIDENTIAL FUEL COMBUSTION	319,042
620	FARMING OPERATIONS (LIVESTOCK HUSBANDRY)	0
630	CONSTRUCTION AND DEMOLITION	0
640	PAVED ROAD DUST	0
645	UNPAVED ROAD DUST	0
650	FUGITIVE WINDBLOWN DUST	0
660	FIRES	0
670	MANAGED BURNING AND DISPOSAL	0
690	COOKING	0
699	OTHER (MISCELLANEOUS PROCESSES)	0
	Miscellaneous Total	**319,042**

	AREA-WIDE SOURCES TOTAL	**319,042**

ELECTRICITY CONSUMPTION

Electricity Consumption

NA	RESIDENTIAL, COMMERCIAL AND INDUSTRIAL	874,869
	ELECTRICITY CONSUMPTION TOTAL	**874,869**

TABLE 9 – 2 2007 CO_2 EMISSION INVENTORY – SANTA BARBARA COUNTY	CO_2 (*metric tons per year)*

MOBILE SOURCES

On-Road Motor Vehicles

710	LIGHT DUTY PASSENGER	682,550
722	LIGHT DUTY TRUCKS – 1	292,000
723	LIGHT DUTY TRUCKS – 2	368,650
724	MEDIUM DUTY TRUCKS	211,700
732	LIGHT HEAVY DUTY GAS TRUCKS – 1	32,850
733	LIGHT HEAVY DUTY GAS TRUCKS – 2	14,600
734	MEDIUM HEAVY DUTY GAS TRUCKS	7,300
736	HEAVY HEAVY DUTY GAS TRUCKS	7,300
742	LIGHT HEAVY DUTY DIESEL TRUCKS – 1	14,600
743	LIGHT HEAVY DUTY DIESEL TRUCKS – 2	10,950
744	MEDIUM HEAVY DUTY DIESEL TRUCKS	98,550
746	HEAVY HEAVY DUTY DIESEL TRUCKS	94,900
750	MOTORCYCLES	3,650
760	HEAVY DUTY DIESEL URBAN BUSES	18,250
762	HEAVY DUTY GAS URBAN BUSES	3,650
770	SCHOOL BUSES	14,600
776	OTHER BUSES	7,300
780	MOTOR HOMES	10,950
	On-Road Motor Vehicles Total	**1,894,350**

Other Mobile Sources

810	AIRCRAFT	82,532
820	TRAINS	37,999
830	SHIPS AND COMMERCIAL BOATS	9,456
840	RECREATIONAL BOATS	4,173
850	OFF-ROAD RECREATIONAL VEHICLES	3,529
860	OFF-ROAD EQUIPMENT	196,858
870	FARM EQUIPMENT	67,876
890	FUEL STORAGE AND HANDLING	0
	Other Mobile Sources Total	**402,423**

	MOBILE SOURCES TOTAL	**2,296,773**

2007 SANTA BARBARA COUNTY TOTAL	**4,349,932**

TABLE 9 – 3 2007 CO_2 EMISSION INVENTORY – OUTER CONTINENTAL SHELF	CO_2 (*metric tons per year)*

STATIONARY SOURCES

Fuel Combustion

030	OIL AND GAS PRODUCTION (COMBUSTION)	138,780
	Fuel Combustion Total	**138,780**

Cleaning and Surface Coatings

230	COATINGS AND RELATED PROCESS SOLVENTS	0
	Cleaning and Surface Coatings Total	**0**

Petroleum Production and Marketing

310	OIL AND GAS PRODUCTION	7,626
	Petroleum Production and Marketing Total	**7,626**

	STATIONARY SOURCES TOTAL	**146,406**

MOBILE SOURCES

Other Mobile Sources

810	AIRCRAFT	82
830	SHIPS AND COMMERCIAL BOATS	688,630
840	RECREATIONAL BOATS	0
	Other Mobile Sources Total	**688,712**

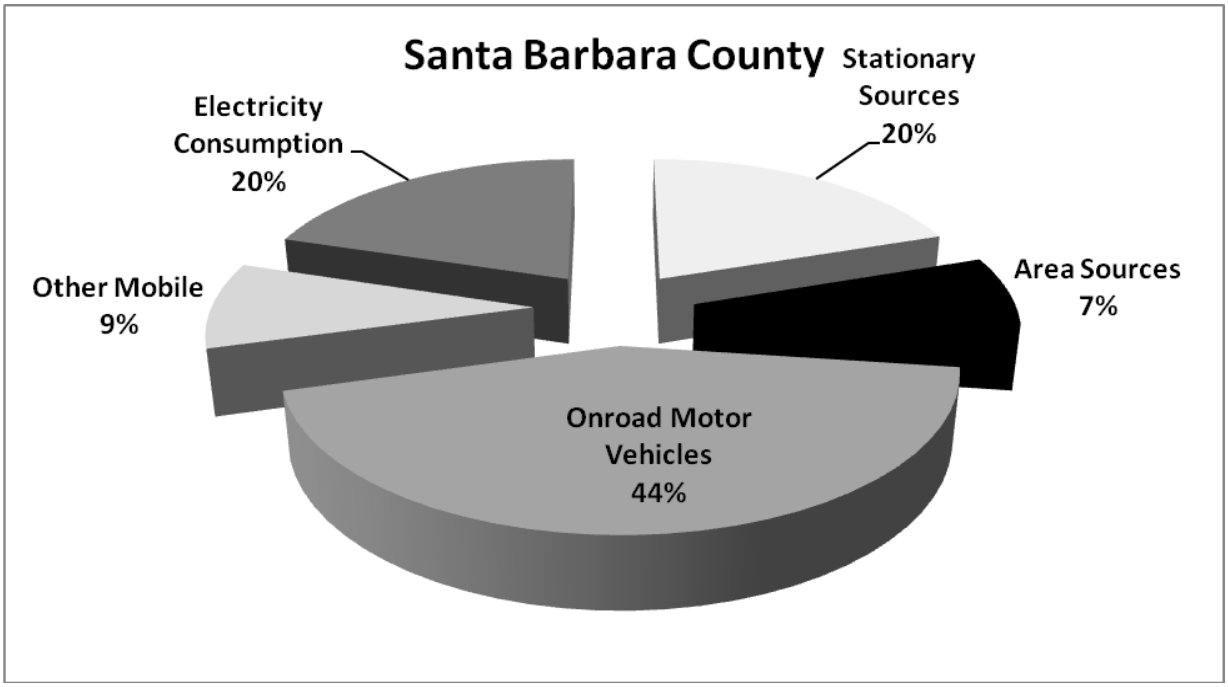
	MOBILE SOURCES TOTAL	**688,712**

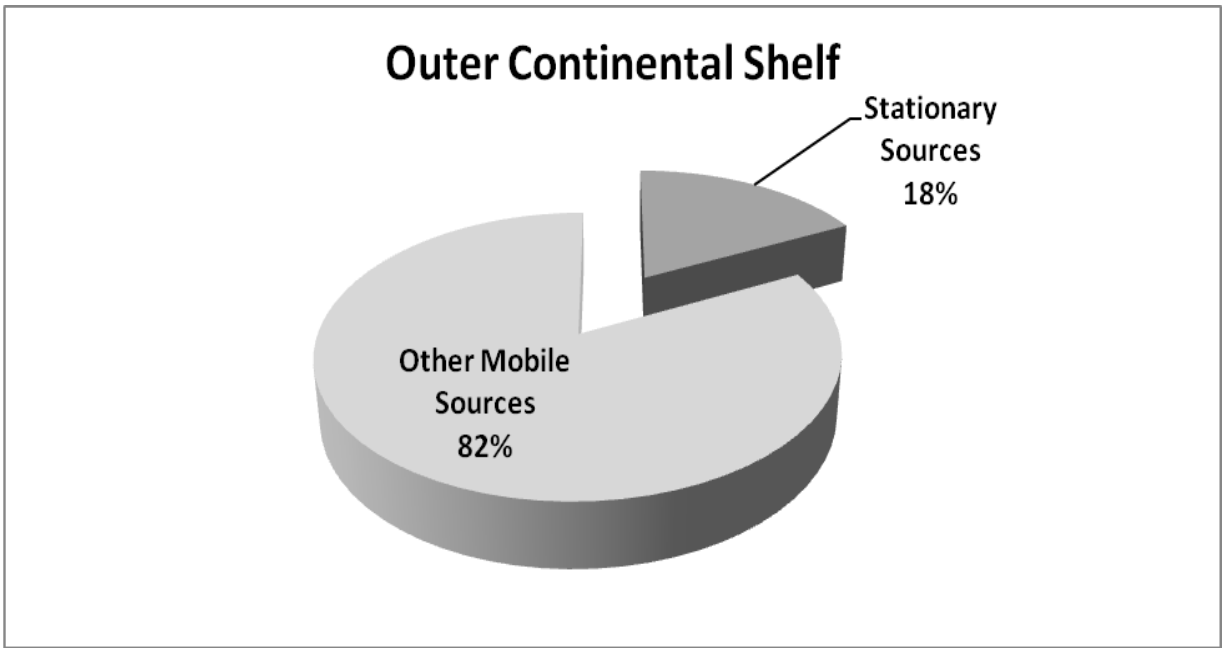
2007 OUTER CONTINENTAL SHELF TOTAL	**835,118**

Table 9-4 Greenhouse Gas Indicators

			Santa Barbara County GHG Indicator Data		
			2000-2007		
Year	Population	VMT	Gasoline Dispensed (gal)	Natural Gas Consumption (MCF)	Electricity Usage (GWh)
2000	399,347	9,771	143,452,072	13,761,912	2,851
2001	403,400	10,129	146,879,267	12,387,239	2,712
2002	407,774	10,151	148,324,842	12,714,492	2,987
2003	411,887	10,106	164,839,504	11,540,042	2,966
2004	415,339	9,994	161,199,191	11,791,094	3,150
2005	417,870	10,123	161,838,060	11,414,793	3,243
2006	419,942	10,110	153,701,106	11,210,971	3,178
2007	422,835	10,410	139,366,961	11,446,510	3,242
2008	426,900	10,027	146,507,845	11,530,028	3,261

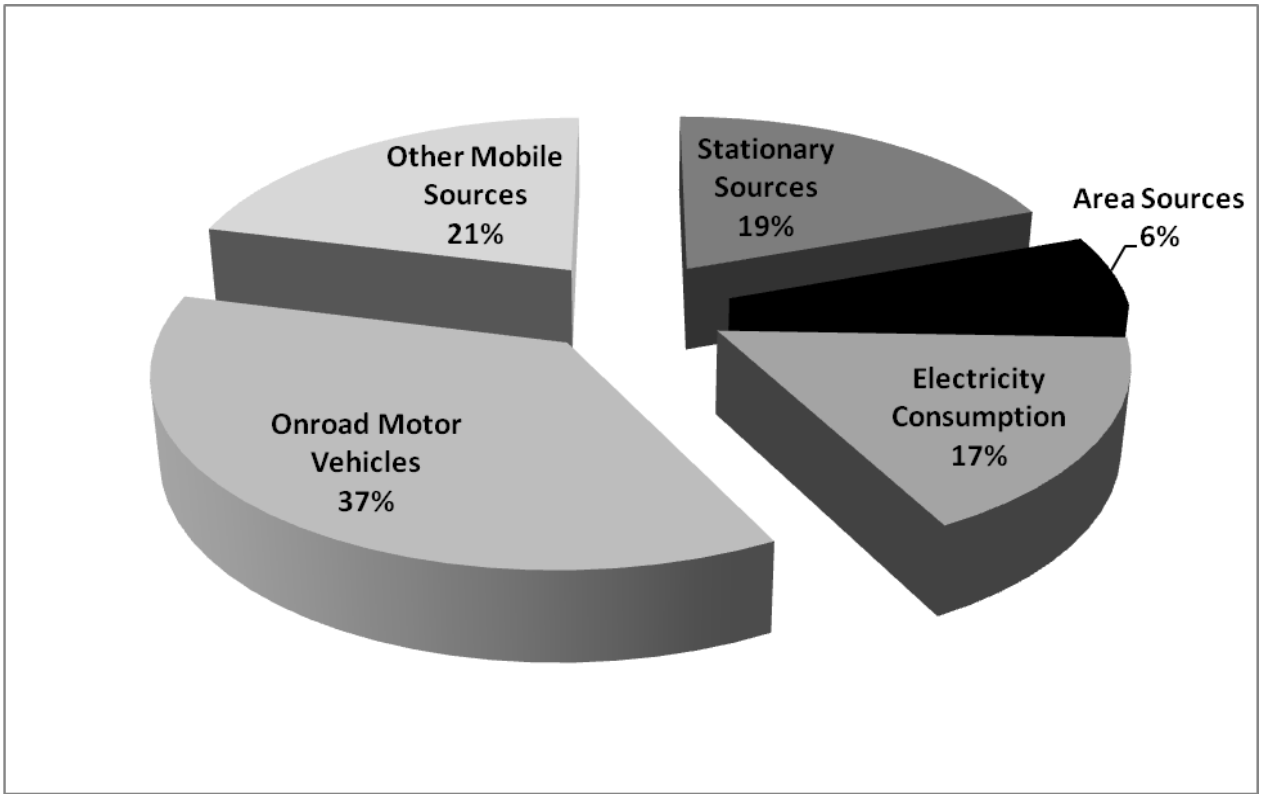
FIGURE 9-3
2007 CO_2 Emissions
Santa Barbara County and Outer Continental Shelf





	Santa Barbara County (MT CO_2/year)	OCS (MT CO_2/year)
Stationary Sources	**859,248**	**146,406**
Area-wide Sources	**319,042**	**0**
Electricity Consumption	**874,869**	**0**
On-road Motor Vehicles	**1,894,350**	**0**
Other Mobile Sources	**402,423**	**688,712**
Total	**4,349,932**	**835,118**

FIGURE 9-4
2007 Combined OCS and Santa Barbara County CO_2 Emissions



	Combined Santa Barbara County and OCS Inventory (MT CO_2/year))
Stationary Sources	**1,005,654**
Area-wide Sources	**319,042**
Electricity Consumption	**874,869**
On-road Motor Vehicles	**1,894,350**
Other Mobile Sources	**1,091,135**
Total	**5,185,050**

FIGURE 9-5
2000 -2008 Greenhouse Gas Indicator Trends