ATTACHMENT 2

Memo

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Date: August 10, 2010

To: David Morrison, Donald Rust, and Heidi Tschudin (Yolo County)

From: Honey Walters and Heather Phillips (Ascent Environmental, Inc.)

Subject: **DRAFT Yolo County Base-Year Greenhouse Gas Emissions Inventory, Future Year Projections, and Reduction Target Recommendations**

cc: Jeff Henderson (AECOM)

Introduction

Ascent Environmental, Inc. (Ascent) developed a base-year (2008) greenhouse gas (GHG) emissions inventory for sources in unincorporated Yolo County (County) and future-year (i.e., 2020, 2030, 2040, and 2050) GHG emission projections. Options for the County's GHG emission reduction targets were also calculated and evaluated for consideration. This memo presents the results of each of these tasks. For details on the historic (1990) GHG emissions inventory, please see the memo titled *DRAFT Yolo County Historic Greenhouse Gas Emissions Inventory Results and Peer Review of the Base-Year and Build-Out Inventories* (1990 Memo) (August 10, 2010).

The field of emissions inventory development and available tools and methods continue to evolve in the absence of standardized guidance. State-of-the-practice methods underlain by factual historical data were used to develop the inventory, as discussed below. The 2008 base-year inventory and projections were compiled for the following emission sectors: energy use (i.e., electricity, natural gas, propane, and water consumption); transportation; solid waste; stationary sources; construction and mining; agriculture; and wastewater treatment.

The 1990 historic and 2008 base-year inventories were developed using a consistent bottom-up approach to afford an "apples-to-apples" comparison. The 1990 historic inventory is occasionally discussed in the sections that follow; however, for details on preparation of the 1990 inventory, please see the 1990 Memo. Future year GHG emissions projections were developed under a scenario that does not account for emission reductions that would occur associated with CAP implementation, advances in technology, or emission reductions programs initiated by the State or federal government.

Key Assumptions

Emission Factors

An emission factor is a representative constant that relates the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant (EPA 2010); it is typically expressed as a rate of emissions per unit of the activity. Several reputable sources of information can be used to gather emissions information for use in inventory development.

Sources of GHG emission factors relied upon in preparation of the 2008 base-year inventory include the following:

- California Air Resources Board (ARB): On-Road Mobile-Source Emission Factor Model (EMFAC2007), Version 2.3., 2007.
- California Air Resources Board (ARB): Off-Road Mobile-Source Emission Factor Model (OFFROAD2007), Version 2.1., 2007.
- U.S. Environmental Protection Agency (EPA): AP-42 Compilation of Emission Factors. Chapter 2.4 Solid Waste Disposal, 2008.
- The California Climate Action Registry (CCAR): General Reporting Protocol, Version 3.1., 2009.
- Intergovernmental Panel on Climate Change (IPCC): IPCC Guidelines for National Greenhouse Gas Inventories, 2006.

The above-mentioned emission factors represent GHG emissions from activities occurring in unincorporated Yolo County.

Consumption Data

The County's 2008 base-year inventory was prepared using consumption and generation data from the following reputable sources:

- Yolo County Central Landfill (YCCL) Joint Technical Document, 2007.
- Unincorporated Yolo County Waste Generation Study, 1991.
- Yolo-Solano Air Quality Management District (YSAQMD) Permitted Stationary Sources in Yolo County, 2008.
- Yolo County General Plan Background Report, 2005.
- Yolo County General Plan travel demand forecasting (TDF) model, Fehr & Peers, 2010.
- Community Service District Waste Discharge Requirements (Esparto, Knights Landing, Madison Waste Water Treatment Facilities data).
- California Energy Commission (CEC). Refining Estimates of Water-Related Energy Use in California. CEC-500-2006-118, 2006 (December).
- University of California (UC), Davis. Agricultural and Resource Economics: Current Cost and Return Studies, 2010.
- Pacific Gas and Electric (PG&E). Aggregated Community-wide Natural Gas and Electricity Consumption data, 2008.
- Yolo County and Davis Public Works Department for water consumption data.
- Yolo County Agricultural Commissioner. 2008. Crop Reports.

Each of these sources includes data that are applicable to unincorporated Yolo County.

GHG emissions projections were modeled using County-specific activity data, where available, from the County's 2030 General Plan. Because full buildout of the general plan would overestimate likely growth in the unincorporated County by 2030, a more likely population of approximately 48,842 was assumed to estimate GHG emissions projections. Where County-specific activity data were not available (e.g., for years 2040 and 2050), GHG emissions projections were conducted using population growth rate forecast data for Yolo County from the California Department of Finance (DOF) (DOF 2010).

Summary of Results

Countywide 2008 base-year emissions were calculated using a "bottom-up" approach, which involves multiplication of an emission factor for a given process by activity data describing that process. This approach ensures the highest level of control over the quality of the data used to generate the emissions inventory. Table 1 summarizes the magnitude and relative contribution of estimated 2008 base-year emissions for each sector. Methods used to calculate each emission sector are described in the sections that follow. For detailed assumptions, please refer to the attached documentation. The results of the 1990 historic inventory are presented here for informational purposes. Please refer to the 1990 Memo for more detailed information.

Table 1
Unincorporated Yolo County Greenhouse Gas Emissions Inventory

Emissions Sector	1990 Historic Inventory		2008 Base-Year Inventory		
	MT CO_2e	%	MT CO_2e	%	% Change from 1990
Energy Consumption[1]	131,652	21.5%	181,447	27.8%	37.8%
Transportation	155,577	25.4%	105,253	16.2%	-32.3%
Solid Waste	1,654	0.3%	6,871	1.1%	325.5%
Agriculture	292,032	47.6%	297,341	45.6%	1.8%
Residue Burning	14,669	5.0%	13,917	4.7%	-5.1%
Livestock	30,000	10.3%	45,257	15.2%	50.9%
Rice Cultivation	28,389	9.7%	34,131	11.5%	20.2%
Farm Equipment	72,170	24.7%	71,667	24.1%	-0.7%
Agricultural Irrigation Pumps	39,231	13.4%	39,231	13.2%	0.0%
Pesticide Application	83	0.0%	35	0.0%	-58.4%
Fertilizer Application	98,982	33.9%	79,966	26.9%	-19.2%
Lime Application	4,344	1.5%	11,774	4.0%	171.0%
Urea Application	4,164	1.4%	1,362	0.5%	-67.3%
Wastewater Treatment	256	0.0%	974	0.1%	281.1%
Construction & Mining	14,954	2.4%	29,271	4.5%	95.7%
Stationary Sources	17,526	2.9%	30,583	4.7%	74.5%
Facilities	3,974	22.7%	8,220	26.9%	106.9%
Agricultural Processing	10,905	62.2%	16,483	53.9%	51.1%
Equipment	2,647	15.1%	5,880	19.2%	122.2%
Total[2]	**613,651**	**100%**	**651,740**	**100%**	**12.5%**

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons.
[1] The energy consumption sector includes emissions from electricity production, natural gas and propane combustion, and water consumption.
[2] Totals may not match exactly the sum of the numbers in the applicable column due to rounding.
Source: Data compiled by Ascent Environmental, Inc. and AECOM in 2010.

Table 2 summarizes the results of the 1990 historic, 2008 base-year inventory, and projections for 2020, 2030, 2040, and 2050.

Table 2
Unincorporated Yolo County 1990 Historic and 2008 Base-Year Greenhouse Gas Emissions Inventory and Future-Year Projections

Emissions Sector	Unincorporated Yolo County (MT of CO_2e)					
	1990	**2008**	**2020**	**2030**	**2040**	**2050**
Energy Consumption [1]	131,652	181,447	404,929	628,444	689,093	682,679
Transportation	155,577	105,253	285,492	465,731	510,677	554,733
Solid Waste	1,654	6,871	12,660	18,449	20,230	21,975
Agriculture	292,032	297,341	289,482	281,624	281,624	281,624
Wastewater Treatment	256	974	974	709	709	709
Construction & Mining	14,954	29,271	34,414	39,558	39,558	39,558
Stationary Sources	17,526	30,583	31,261	31,938	31,938	31,938
Total [2]	**613,651**	**651,740**	**1,059,213**	**1,466,453**	**1,573,828**	**1,613,216**

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons.
[1] Energy consumption includes emissions from electricity production, from natural gas and propane combustion, and domestic water consumption.
[2] Totals may not match exactly the sum of the numbers in the applicable column due to rounding.
Source: Data compiled by Ascent Environmental, Inc. in 2010.

Figure 1, below, summarizes the relative contributions of each emissions sector to the total 1990 historic emissions in unincorporated Yolo County.

Figure 1

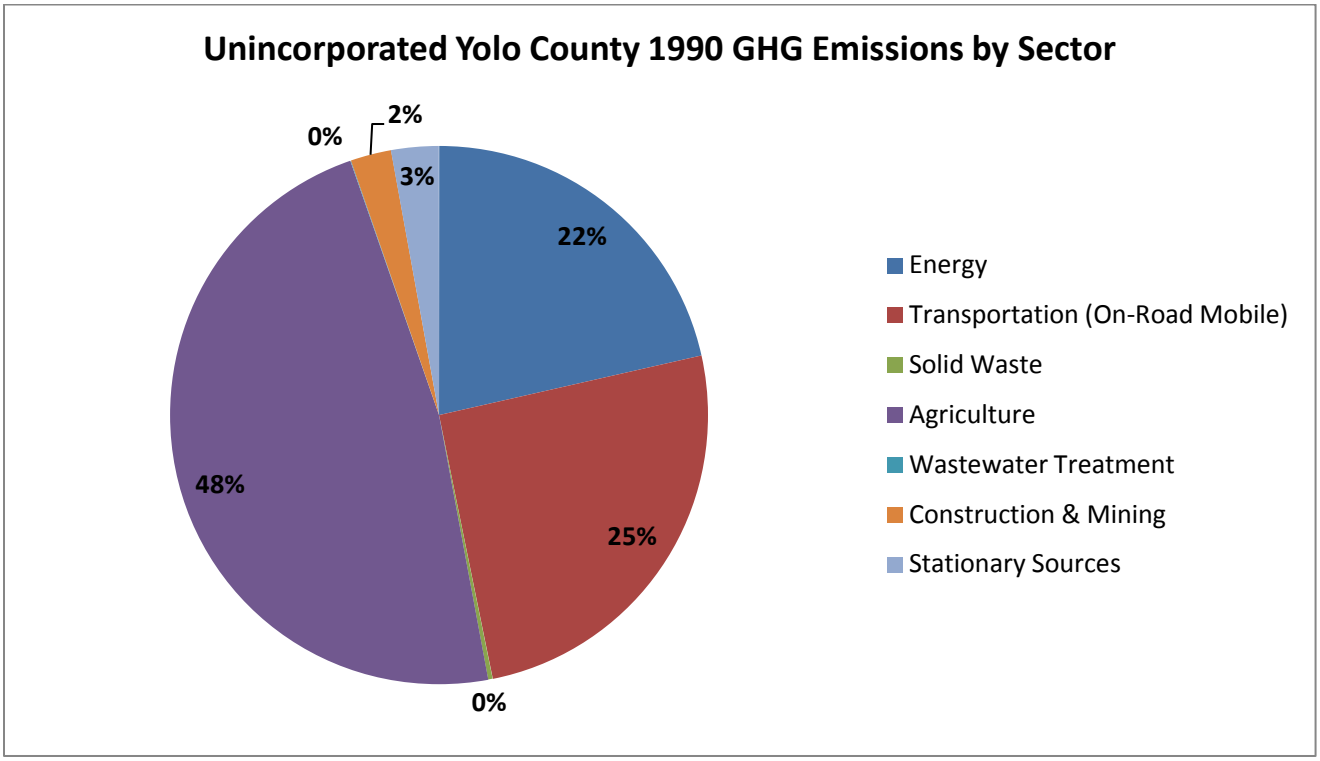


Figure 2, below, summarizes the relative contributions of each emissions sector to the total 2008 base-year emissions in unincorporated Yolo County.

Figure 2

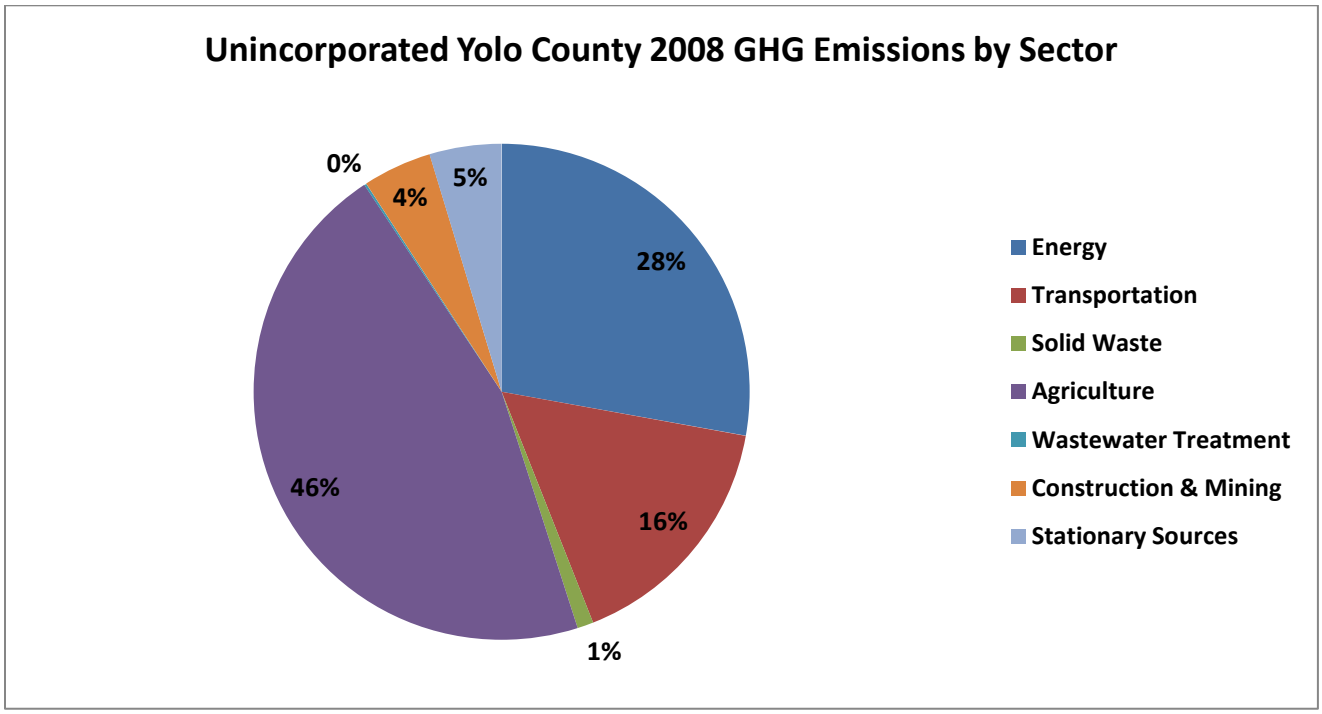
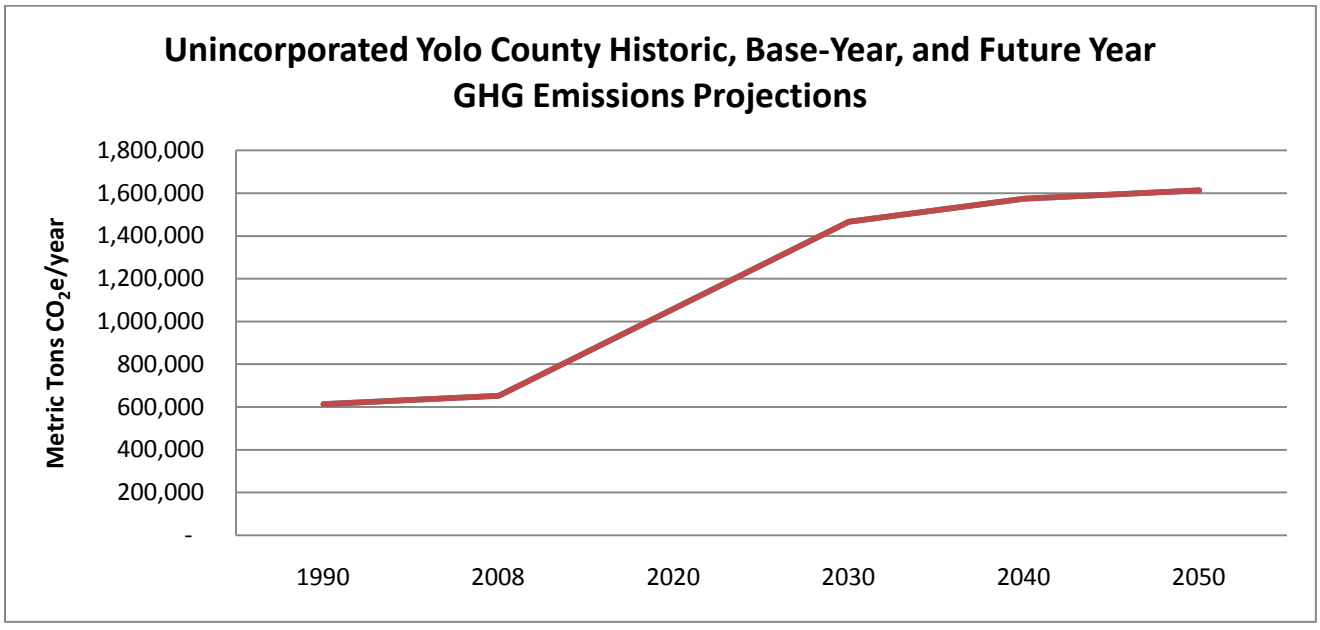


Figure 3 describes the emissions growth trend in unincorporated Yolo County over the inventory and projection periods.

Figure 3



Yolo County Greenhouse Gas Emissions Inventory Methods

This section briefly summarizes the methods applied to each sector in the County's 2008 base-year inventory and the projections. For detailed assumptions and quantification inputs, please refer to the attached documentation. Information on development of the 1990 inventory is provided below where pertinent to the discussion. For complete details on methods used to develop the 1990 inventory, please refer to the 1990 Memo.

Energy Consumption

Inventory Methods

For the 1990 historic inventory, electricity, natural gas, and propane consumption data for residential and non-residential land uses were based on data from the 1982 *Yolo County Energy Plan*. Consumption rates were extrapolated to 1990 using population growth estimates from the DOF (DOF 2010a). Consumption data for the 2008 base-year was obtained directly from PG&E for accounts located within the unincorporated County. Emission factors from the CCAR General Reporting Protocol were used to calculate carbon dioxide equivalent (CO_2e) emissions from these fuel types.

GHG emissions associated with water consumption (i.e., conveyance, treatment, and distribution) were estimated using water consumption data obtained from the County and the City of Davis (for Royal Oaks and El Macero, which are located in unincorporated County territory, but are provided water by the City of Davis). Emission factors from CCAR for electricity consumption were used to calculate CO_2e. Water consumption-related CO_2e emissions were included within the energy sector, because electricity is used to convey, treat, and pump water. Agriculture-related water consumption is included as a subsector under agricultural emissions as agricultural irrigation pumps.

Projection Methods

Energy-related GHG emissions for the 2030 projection are based on data from the Public Utilities section of the Yolo County General Plan EIR and fuel consumption growth rates from the U.S. Department of Energy, Energy Information Administration (2010) for the Pacific Region (which includes California). This value was scaled down by approximately 25%, because it was assumed that only approximately 75% of the general plan would build out by 2030. Energy-related GHG emissions for the 2020 projection were interpolated between 2008 and 2030. Energy consumption growth rates were not available for the 2040 and 2050 projections; thus, population growth rates in Yolo County as projected by DOF were used as an indicator of growth in energy consumption for those years. No emission reductions from statewide energy conservation programs or renewable energy requirements were accounted for in GHG emissions projections in Table 2. See Table 8 for estimates of reductions that may occur associated with State and federal GHG reduction programs and legislation.

Transportation

Inventory Methods

On-road mobile-source emissions for the 1990 historic inventory were calculated using Caltrans Highway Performance Monitoring System (HPMS) data for roadways in the unincorporated County, along with emission factors from EMFAC 2007 by speed bin (i.e., portion of vehicle miles traveled [VMT] that would occur within a range of 5-mile-per-hour increments). HPMS data for 1990 was used in combination with data prepared by Fehr

& Peers (2010) from the Yolo County General Plan Traffic Demand Forecasting (TDF) model, which included 2005 VMT data by speed bin. The dataset obtained from Fehr & Peers accounted for trips that did not originate or terminate in the County by apportioning 50% of VMT and associated GHG emissions to Yolo County for internal-to-external trips, and external-to-internal trips. VMT and associated GHG emissions resulting from internal-to-internal trips were allocated 100% to Yolo County. This methodology is consistent with the Regional Target Advisory Committee (RTAC) recommendations in response to Senate Bill (SB) 375.

These data were used to derive a correction factor to apply to the 1990 Caltrans dataset to achieve a more accurate 1990 VMT number. Another correction was applied to the Caltrans dataset in order to allocate a percentage of VMT that would occur on state highways to the unincorporated County, based on 1990 population.

Transportation-related GHG emissions for the 2008 base-year inventory were calculated using emission factors from EMFAC 2007 by speed bin, and 2005 VMT data from the Yolo County General Plan TDF model. According to Caltrans HPMS traffic counts, VMT did not change significantly between 2005 and 2008, so 2005 VMT is treated as representative of 2008 conditions.

Projection Methods

Mobile-source-related GHG emissions were modeled for 2030 with the same method used to calculate 2008 mobile-source emissions. 2030 VMT data was obtained from Fehr & Peers by speed bin for the full general plan buildout. This value was scaled down by approximately 25% because it was assumed that only approximately 75% of the general plan would build out by 2030. 2020 mobile-source GHG emissions were interpolated between 2008 and 2030 emissions, and 2040 and 2050 emissions were projected using population growth rates from DOF for Yolo County. Table 2 does not account for reductions in emissions from statewide programs related to mobile sources (e.g., Pavley emission standards, low carbon fuel standard, or SB 375). See Table 8 for estimates of reductions that may occur associated with State and federal GHG reduction programs and legislation.

Solid Waste

Inventory Methods

GHG emissions related to solid waste disposal were calculated using methods from EPA for the Yolo County Central Landfill (YCCL), which describes exponential decay of solid waste proportionate to the quantity of waste in place. Waste generation data for the 2008 base-year inventory were obtained from YCCL's Joint Technical Document (2007), from the Yolo County General Plan EIR, and from Yolo County Department of Public Works staff.

Projection Methods

Solid waste-related GHG emissions were modeled for the 2030 projection using waste generation data provided in the Yolo County General Plan EIR, scaled down by approximately 25% because it was assumed that only approximately 75% of the general plan would build out by 2030. The same emissions modeling techniques were used for the YCCL as described above. Solid waste-related GHG emissions for the 2020 projection were interpolated between 2008 and 2030, and emissions for the 2040 and 2050 projections were derived using DOF population growth rates for Yolo County. Projected solid waste disposal data accounts for the County's 75% waste diversion requirement.

Agriculture

Inventory Methods

Agricultural sources of GHG emissions include off-road farm equipment, irrigation pumps, residue burning, livestock, pesticide application, rice cultivation, lime and urea application, and fertilizer volatilization. The process data for Yolo County's agricultural sector were obtained from a variety of sources, as discussed in detail below. GHG emission factors associated with farming equipment were obtained from OFFROAD2007. The GHG emission factor for agricultural irrigation pumps and the number of pumps in the county were obtained from ARB's GHG emissions inventory (ARB 2006, ARB 2003). Fertilizer application data were obtained from UC Davis, Agriculture and Resource Economics Department *Current Cost and Return Studies* (UC Davis 2010). Emission factors and methods to quantify GHG emissions associated with fertilizer application were obtained from ARB's GHG emissions inventory (ARB 2007). Calendar year 1990 and 2008 process data for acres of rice and other crops cultivated and livestock populations in Yolo County were obtained from Yolo County's 1990 and 2008 *Annual Crop Reports* (Yolo County 1990, 2008). Emission factors and quantification methods for enteric fermentation and manure management were obtained from the ARB's GHG emissions inventory (ARB 2007). GHG emissions associated with lime and urea application were obtained from UC Davis. Please see the attached documentation for agricultural GHG emissions by source type.

Projection Methods

Agricultural emissions were not anticipated to increase between the 2008 base-year and 2020 and beyond, because the total amount of agricultural land within Yolo County is not expected to increase above existing conditions. Planned growth in agricultural processing facilities is discussed further under Stationary Sources. Unlike other sectors, agriculture has a high potential for annual emissions variability, because the emission rates for crop types, fertilizer application requirements, and other practices can be considerably different. According to the Land Use and Housing section of the County's 2030 General Plan EIR , approximately 58,821 acres of land would be redesignated from agricultural purposes to other purposes under the 2030 General Plan, as compared with the County's 1983 General Plan (Yolo County 2009). Farmers and ranchers will likely change their crops, activities, and practices multiple times within the 60-year timeframe of these emissions estimates and projections in response to market demand, weather, water availability, and other unpredictable factors. These changes could either increase or decrease GHG emissions. Also, although the total amount of agricultural land is expected to decrease according to the General Plan, this does not necessarily translate to a decrease in GHG emissions, because the variability in GHG-emissions intensity of different crop types can be greater than the predicted acreage decrease. Other factors such as change in livestock populations (e.g., increase in dairy cattle population) change in fertilizer application practices, growth in organic crop production, and change in pesticide application practices in Yolo County between 1990 and 2008 also contribute to changes in overall agricultural-related GHG emissions. For these reasons, it is difficult to project GHG emissions changes over time using agricultural activities. Therefore, reasonable assumptions were made by County staff based on current trends in Yolo County. In general, slight trends away from field crops (e.g., tomatoes, corn, and wheat) toward perennial and orchard crops (e.g., wine grapes, almonds, and olives) were assumed to occur by 2030 based on input from the Agricultural Commissioner's office and from planning staff. In addition, specific anticipated agricultural acreage that would be taken out of production and converted to development was also removed from 2030 agricultural GHG emissions. Beyond 2030, the approach to project future agricultural emissions was to keep the 2030 estimates constant into the future. Refer to Table 3 for the 1990 and 2008 GHG inventories and 2030 projections by subsector.

Table 3
Unincorporated Yolo County 1990 Historic and 2008 Base-Year Greenhouse Gas Emissions Inventory and Future-Year Projections for Agricultural Subsectors

Emissions Subsector	Unincorporated Yolo County (MT of CO_2e)		
	1990	2008	2030
Residue Burning	14,669	13,917	11,366
Livestock	30,000	45,257	38,877
Rice Cultivation	28,389	34,131	38,686
Farm Equipment	72,170	71,667	71,667
Agricultural Irrigation Pumps	39,231	39,231	39,231
Pesticide Application	83	35	35
Fertilizer Application	98,982	79,966	68,625
Lime Application	4,344	11,774	11,774
Urea Application	4,164	1,362	1,362
Total [1]	**292,032**	**297,341**	**281,624**

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons.
[1] Totals may not match exactly the sum of the numbers in the applicable column due to rounding.
Source: Data compiled by Ascent Environmental, Inc. in 2010.

In addition, Ascent calculated GHG emissions by crop type per 100 acres in 2008. The estimates in Table 4 include GHG emissions from fertilizer application, residue burning, and rice cultivation only. Please note that there are other types of emissions associated these crops and the data provided below is for information purposes only.

Table 4
Year 2008 Greenhouse Gas Emissions by Crop Type

Crop Type	MT CO_2e/100 acres/year	Crop Type	MT CO_2e/100 acres/year
Almonds	74	Pistachio Nuts	34
Wine Grapes/Kiwi	3	Plums	21
Walnuts	93	Tangerines	18
Prunes	25	Tomatoes	34
Pears, Bartlett	34	Asparagus	15
Pears, Others/Persimmons	34	Misc Vegetables	17
Apples	4	Misc Fruits	20
Apricots	21	Barley	14
Cherries	26	Beans	18
Figs	13	Corn (and Milo)	19
Kiwi	20	Hay - Alfalfa	1
Nectarines	25	Hay - Grain	7
Olives	15	Oat and Misc Field Crop	10
Peaches (Freestone)	25	Pasture	15
Pluots/Apricots	21	Propogative and Nursery	3
Rice	142	Wheat	39

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons.
Source: Data compiled by Ascent Environmental, Inc. in 2010.

Wastewater Treatment

Inventory Methods

Methane emissions from wastewater treatment facilities were calculated using process data (e.g., treatment capacity, biological oxygen demand) for the three wastewater treatment facilities that serve unincorporated Yolo County. Ascent obtained this information from Esparto, Knights Landing, and Madison Community Service District Waste Discharge Requirements facility permit records from the Central Valley Regional Water Quality Control Board. Base year influent data were obtained from the Public Utilities section of the Yolo County General Plan EIR.

The GHG emissions associated with wastewater treatment processes were quantified using methods and emission factors from IPCC for centralized, aerobic wastewater treatment plants, which are representative of processes at these facilities (IPCC 2006b).

Projection Methods

It was assumed that wastewater treatment facilities within Yolo County would transition from secondary to tertiary treatment processes between 2008 and 2030, with the exception of Esparto's plant. The Esparto plant was assumed to operate at capacity in 2030, as described within the Public Utilities section of the Yolo County General Plan EIR. Additional capacity would likely be needed beyond 2030; however, any new facilities would be packaged tertiary treatment plants, which do not generate methane. Instead, GHG emissions from tertiary treatment facilities would be included in the energy sector. Anticipated tertiary facilities would be associated with the Dunnigan Specific Plan and Elkhorn developments, and the Madison and Knights Landing districts. A tertiary wastewater treatment plant is already serving the Wild Wings development.

Other Sources

Construction & Mining

Ascent calculated 1990 historic and 2008 base-year GHG emissions from construction and mining activities within unincorporated Yolo County using emission factors and inventory data from the OFFROAD model. It was not possible to allocate emissions to the respective activities because the OFFROAD model is equipment-based, rather than activity-based. Thus, it was not possible to determine which pieces of equipment in the OFFROAD model were used for construction and which were used for mining. It is unknown whether construction and mining-related GHG emissions would increase beyond 2030, and thus, were held constant after 2030.

Stationary Sources

GHG emissions from stationary sources within the County were calculated in the 1990 historic and 2008 base-year inventories using facility permit data obtained from YSAQMD. The permit data contained fuel consumption activity information from which GHG emissions were calculated using CCAR emission factors. In addition, the OFFROAD model was used to obtain heavy-duty equipment emissions associated with industrial land uses within the County in both years. In 2008, the pesticide sulfuryl fluoride, which has a high GWP, was applied to commodities during agricultural processing. This was not common practice in 1990. GHG emissions associated with application of sulfuryl fluoride during processing are reported in the stationary source sector, under agricultural processing. According to Table III-11 of the County's General Plan DEIR, agricultural commercial and industrial processing facilities are anticipated to increase during buildout. It was assumed that approximately 35 acres of additional agricultural industrial or agricultural commercial land uses would be built out by 2030; about an 11% increase from 324 acres in 2008. Thus, stationary-source emissions within the County would increase

through 2030. It was unknown whether stationary-source emissions within the County would increase or decrease beyond 2030, and thus, these were held constant after 2030.

Discussion

GHG emissions from most sectors increased between 1990 and 2008, except for transportation-related emissions. The reduction in transportation emissions is attributable to reductions in VMT and a reduction in CO_2 emission factors associated with improved vehicle fuel economy and fleet turnover during this 18-year time frame. The reduction in VMT is also likely attributable to the method by which trips and VMT are allocated to the unincorporated County and to cities. Trips that may have originated or terminated in the unincorporated County in 1990 may have been from land annexed into cities (i.e., Davis, West Sacramento, Winters, or Woodland) by 2008 (e.g., Gibson Ranch [480 acres to City of Woodland in 1992] and Wildhorse [419 acres to City of Davis in 1995]), and thus, associated VMT would be allocated to the respective city per the methodology employed by Fehr & Peers and recommended by the RTAC.

Energy-related GHG emissions were estimated to increase at a higher rate than estimated population growth, despite factors such as annexation of land from County to city jurisdictions; the reduction in GHG emission factors from increased renewable energy in the State's electricity portfolio; and the affect of California energy conservation standards (Title 24) on the County's new building stock. The discrepancy can be explained by the difference in datasets used to derive 1990 and 2008 energy-related GHG emissions. 1990 data was extrapolated from Yolo County's 1982 Energy Plan, whereas 2008 data was obtained directly from PG&E accounts. Nonetheless, these two datasets are applicable to the County, yield reasonable results, and represent the best available data.

GHG emissions associated with agricultural activity in the unincorporated County increased overall between 1990 and 2008, but decreased within the subsectors associated with agricultural equipment, residue burning, pesticide application, and fertilizer application. The heavy-duty agricultural equipment fleet has become more efficient and currently includes better emission controls than in 1990, which explains the decline in emissions from agricultural equipment. Emissions from residue burning decreased, despite an increase in the number of acres of rice harvested, which is explained by implementation of regulations that limit residue burning. Pesticide application to commodities by farmers decreased from 1990 to 2008 because application of GHG-emitting pesticides became more prevalent at the agricultural processing stage rather than application directly to crops (associated agricultural processing emissions are reported under stationary sources). Fertilizer application decreased between 1990 and 2008, in part, due to increased use of drip irrigation systems, the growth in organic crop production, and use of cover crops. Because water used to irrigate crops contains nitrates, farmers began monitoring nitrate content and decreased direct fertilizer application accordingly (Young, pers. comm., 2010). Please note that even though Yolo County has one of the largest percentages of agricultural acres on which organic practices occur, the development of these emission inventories were not able to be performed at a resolution to derive organic- specific information.

Agricultural GHG emissions from, livestock, rice cultivation, urea and lime application all increased from 1990 to 2008. According to County staff, dairy cattle population increased dramatically from 1990 to 2008, approximately 50 head to 2,200 head, respectively. Dairy cattle generate greater GHG emissions per head than beef cattle.

Stationary-source GHG emissions also increased between 1990 and 2008. Notably, GHG emissions from pesticide application increased considerably from 1990 to 2008 due to increased application of the pesticide sulfuryl fluoride, a GHG with high GWP.

Projected GHG emissions in energy, transportation, solid waste, and wastewater treatment sectors are attributable to population growth, as described in the projection methodology discussion of each sector. It is worth noting that a sizable portion of the incremental increase in GHG emissions projections from 2008 and 2030 would be attributable to the Dunnigan Specific Plan development, as will a sizable portion of the County's GHG emission reduction potential.

Jurisdictional Control

Of the sectors studied in the emission inventories, the sectors (and portions thereof) over which the County has jurisdiction are somewhat limited. For example, the County retains discretionary authority over land use decisions in its jurisdiction, which are known to influence VMT, but has no jurisdiction over fuel economy standards, which are controlled by the federal government. Similarly, the County has the ability to implement energy efficiency standards for buildings constructed in the unincorporated County, but it does not control the composition of PG&E's energy portfolio, which is regulated at the State level. The degree to which State and federal regulations may influence GHG emissions within the County is discussed later in this report.

Sectors over which the County has no control include the construction and mining equipment fleet and stationary source process emissions (e.g., authority over these is regulated through the permitting process, the County does not have jurisdiction over equipment emission rates from the tail pipe, and stationary sources are essentially being dealt with through the Cap and Trade regulation). For these reasons, these sectors were removed from the inventory for purposes of GHG emissions reduction target development. The GHG emissions over which the County has some jurisdiction are reported below in Table 5.

Table 5
Unincorporated Yolo County Jurisdictional Greenhouse Gas Emissions Inventory and Future-Year Projections

Emissions Sector	Unincorporated Yolo County (MT of CO_2e)					
	1990	**2008**	**2020**	**2030**	**2040**	**2050**
Energy Consumption [1]	131,652	181,447	404,929	628,444	689,093	682,679
Transportation	155,577	105,253	285,492	465,731	510,677	554,733
Solid Waste	1,654	6,871	12,660	18,449	20,230	21,975
Agriculture	292,032	297,341	289,482	281,624	281,624	281,624
Wastewater Treatment	256	974	974	709	709	709
Total [2]	**581,171**	**591,886**	**993,538**	**1,394,957**	**1,502,332**	**1,541,720**

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons.
[1] Energy consumption includes emissions from electricity production, from natural gas and propane combustion, and water consumption.
[2] Totals may not match exactly the sum of the numbers in the applicable column due to rounding.
Source: Data compiled by Ascent Environmental, Inc. in 2010.

Yolo County Communitywide Greenhouse Gas Emissions Reduction Target Options

The County should strive to create a communitywide GHG emissions reduction target that is effective, yet attainable. The following options present two targets for consideration related to 2020 emission levels.

Option 1: 15% Reduction Below Existing (2008) Levels by 2020

Selecting a 15% below current levels reduction target for communitywide emissions based on the ARB Climate Change Scoping Plan has the following benefits:

- Complies with statewide GHG emissions reduction efforts;
- Consistent with current guidance offered by ARB and the California Attorney General's Office;
- Consistent with the only applicable air quality agency-adopted GHG reduction target guidance in California (i.e., the Bay Area Air Quality Management District's CEQA Air Quality Guidelines 2010)

Attaining a 15% reduction below current (2008) levels would require an emission reduction of approximately 88,783MT CO_2e/year from existing levels by 2020, or approximately a 49% reduction from projected 2020 emission levels. This reduction would need to be achieved in the context of future growth, as the General Plan anticipates approximately 14,000 additional people in the unincorporated County by 2020. GHG emissions in the unincorporated County would be limited on average to approximately 503,103 MT CO_2e/year.

Option 2: Reduction to 1990 Levels by 2020

In 2005, Executive Order S-3-05 proclaimed that California is vulnerable to the impacts of climate change. To combat those concerns, the Executive Order established a long-range GHG reduction target of 80% below the 1990 levels by 2050. Subsequently, Assembly Bill (AB) 32, the *California Global Warming Solutions Act of 2006* was signed. AB 32 requires California to reduce statewide GHG emissions to 1990 levels by 2020.

Selecting a target that would reduce emissions to 1990 levels by 2020 has the following benefits:

- Complies with statewide GHG emissions reduction efforts;
- Consistent with the language and intent of AB 32; and
- Consistent with the only applicable air quality agency-adopted GHG reduction target guidance in California (BAAQMD 2010)

If the County were to adopt this target option, GHG emissions in the unincorporated County would be limited to 581,171 MT CO_2e/year in 2020. This is approximately 10,715 MT CO_2e/year below current (2008) levels, or approximately a 42% reduction from projected 2020 emissions levels.

Table 6 summarizes the results of both options. In addition, please note that a portion of the County's goal will be achieved through reductions associated with implementation of legislative actions as discussed in detail below.

Table 6
Greenhouse Gas Emissions Reduction Target Options

	Option 1: 15% reduction from existing by 2020		Option 2: Return to 1990 emissions levels by 2020	
	MT CO_2e/yr	% reduction	MT CO_2e/yr	% reduction
Emissions Limit:	503,103		581,171	
Reduction from Existing:	88,783	15%	10,715	2%
Reduction from 2020 Projected:	490,435	49%	412,367	42%

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons.
Source: Data compiled by Ascent Environmental, Inc. in 2010.

Interim Future Emission Reduction Targets

Options 1 and 2 presented above would achieve compliance with the intent of AB 32. In order to comply with the intent of Executive Order S-3-05, and set the County on a path toward continued GHG emission reductions beyond 2020, the following interim future GHG emissions reduction targets are worthy of consideration, particularly for the purposes of the 2030 General Plan. S-3-05 requires an 80% reduction in statewide GHG emissions below 1990 levels by 2050. It is not the obligation of the County to comply with S-3-05; rather, the County's obligation is compliance with General Plan Action CO-A123. However, the County could strive to achieve the following interim targets presented in Table 7 that were interpolated linearly from the 80% reduction in emissions by 2050:

Table 7
Yolo County Interim Future Greenhouse Gas Emissions Reduction Targets Projections

Unincorporated Yolo County					
2030		2040		2050	
% Below 1990	MT CO_2e/year Reduction from Existing (2008)	% Below 1990	MT CO_2e/year Reduction from Existing (2008)	% Below 1990	MT CO_2e/year Reduction from Existing (2008)
27%	165,694	53%	320,673	80%	475,652

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons.
Source: Data compiled by Ascent in 2010.

It would be unreasonable to expect that the County could achieve the aggressive emissions reductions without the aid of statewide programs, changes in technology, and/or funding assistance. Identification of potentially feasible, post-2020 actions will require subsequent analysis, County planning decisions, and coordination with state programs.

State and Federal Emissions Reduction Programs

Existing federal regulations addressing GHG emissions from passenger cars and trucks (e.g., Corporate Average Fuel Economy [CAFE)] standards revised in the 2007 House Energy Bill) and State-issued regulations to increase the amount of electricity generated from renewable sources (e.g., California Renewable Energy Portfolio Standard Program) will likely reduce the rate of GHG emissions increase associated with mobile sources and energy consumption.

In December 2008, ARB adopted its Climate Change Scoping Plan (Scoping Plan), which contains the main strategies California will implement to achieve reduction of approximately 169 million metric tons (MMT) of CO_2e, or approximately 30% from the state's projected 2020 emissions level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO_2e, or almost 10%, from 2002–2004 average emissions) (ARB 2008). The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The following GHG emission reductions anticipated at the State level were also anticipated to affect emission factors used to develop Yolo County's GHG emissions inventory projections:

- improved emissions standards for light-duty vehicles (estimated reductions of 27.7 MMT CO_2e),
- energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (15.2 MMT CO_2e),
- a renewable portfolio standard for electricity production (21.3 MMT CO_2e),
- land use planning and Sustainable Communities Strategies (5.0 MMT CO_2e).

Ascent applied the emission reductions estimated in the Scoping Plan to the associated emissions sectors in the County's inventory. See Table 8 for a summary of estimated emission reductions from State and federal programs that would affect the County's projected GHG emissions.

If all programs are implemented as described in the Scoping Plan, the County's 2020 emissions would be reduced by a maximum of 12.2% from projected levels.

Table 8
Estimated Effects of State and Federal Programs on Yolo County Greenhouse Gas Emissions Projections

Unincorporated Yolo County						
Scoping Plan Measure	**Emissions Sector**	**Scoping Plan-Estimated Emission Reduction (MMT CO2e by 2020)**	**Projected 2020 Emissions of Sector (MMT CO2e by 2020)**	**% Reduction**	**% of Yolo County Inventory Affected in 2020**	**Scaled % Reduction from 2020 Projected Emissions**
Federal Fuel Economy Standards; AB 1493 (Pavley)	Transportation	27.7	225.4	12.3%	28.7%	3.5%
Regional Transportation-Related GHG Reduction Targets (SB 375)	Transportation	5	225.4	2.2%	28.7%	0.6%
Energy Efficiency Measures; California Green Building Code	Energy	15.2	185.9	8.2%	40.8%	3.3%
Renewable Electricity Standard; Renewable Portfolio Standard	Energy	21.3	185.9	11.5%	40.8%	4.7%
Total						**12.2%**

Notes: CO_2e = carbon dioxide equivalent; MMT= million metric tons.
Source: ARB 2010; Data compiled by Ascent in 2010.

Conclusion

The target options 1 and 2 presented above would yield similar GHG emission reductions. Both target options have the benefits of consistency with recommendations of relevant agencies and could be interpreted to comply with State legislation. Factors that the County may wish to consider when choosing its target include, but are not limited to, 1) option 2 contains back-casting GHG emissions to reflect 1990 activity within the unincorporated County, whereas option 1 focuses on the base-year inventory which was developed from a more recent dataset. 2) Option 1 could be consistently applied throughout the State (e.g., some cities in California did not exist in 1990 and it would be difficult for those jurisdictions to inventory their 1990 emissions in order to establish their reduction goals. However, 1990 emissions for all the incorporated areas within Yolo County were able to be estimated as discussed in the 1990 Memo. 3) Option 1 would result in a slightly more aggressive GHG reduction scenario than Option 2, which would provide a greater margin of environmental protection in the event that State programs to reduce GHG emissions are not realized. However, option 2 is more reasonable for the County to achieve and, as noted above, is exactly consistent with the language and intent of AB 32.

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Summary

Yolo County Greenhouse Gas Emissions Inventory - 2008

	Unincorporated Yolo County	
Sector	**MT CO2e/yr**	**% of total**
Energy	181,447	27.8%
Transportation (On-Road Mobile)	105,253	16.1%
Solid Waste	6,871	1.1%
Agriculture	297,341	45.6%
Wastewater Treatment	974	0.1%
Construction & Mining	29,271	4.5%
Stationary Sources	30,583	4.7%
Total	**651,740**	**1**

Summary

Yolo County Greenhouse Gas Emissions Inventory - 2020

	Unincorporated Yolo County	
Sector	**MT CO2e/yr**	**% of total**
Energy	404,929	38.2%
Transportation (On-Road Mobile)	285,492	27.0%
Solid Waste	12,660	1.2%
Agriculture	289,482	27.3%
Wastewater Treatment	974	0.1%
Construction & Mining	34,414	3.2%
Stationary Sources	31,261	3.0%
Total	**1,059,213**	**1**

Summary

Yolo County Greenhouse Gas Emissions Inventory - 2030

	Unincorporated Yolo County	
Sector	**MT CO2e/yr**	**% of total**
Energy	628,444	42.9%
Transportation (On-Road Mobile)	465,731	31.8%
Solid Waste	18,449	1.3%
Agriculture	281,624	19.2%
Wastewater Treatment	709	0.0%
Construction & Mining	39,558	2.7%
Stationary Sources	31,938	2.2%
Total	**1,466,453**	**1**

Summary

Yolo County Greenhouse Gas Emissions Inventory - 2040

	Unincorporated Yolo County	
Sector	**MT CO2e/yr**	**% of total**
Energy	689,093	43.8%
Transportation (On-Road Mobile)	510,677	32.4%
Solid Waste	20,230	1.3%
Agriculture	281,624	17.9%
Wastewater Treatment	709	0.0%
Construction & Mining	39,558	2.5%
Stationary Sources	31,938	2.0%
Total	**1,573,828**	**1**

Summary

Yolo County Greenhouse Gas Emissions Inventory - 2050

	Unincorporated Yolo County	
Sector	**MT CO2e/yr**	**% of total**
Energy	682,679	42.3%
Transportation (On-Road Mobile)	554,733	34.4%
Solid Waste	21,975	1.4%
Agriculture	281,624	17.5%
Wastewater Treatment	709	0.0%
Construction & Mining	39,558	2.5%
Stationary Sources	31,938	2.0%
Total	**1,613,216**	**1**

Legislative Reductions						
Scoping Plan Measure	**Emissions Sector**	**Scoping Plan-Estimated Emission Reduction (MMT CO2e by 2020)**	**Projected 2020 Emissions of Sector (MMT CO2e by 2020)**	**% Reduction**	**% of Yolo County Inventory Affected in 2020**	**Scaled % Reduction from 2020 Projected Emissions**
Federal Fuel Economy Standards; AB 1493 (Pavley)	Transportation	27.7	225.4	12.3%	28.7%	3.5%
Regional Transportation-Related GHG Reduction Targets (SB 375)	Transportation	5	225.4	2.2%	28.7%	0.6%
Energy Efficiency Measures; California Green Building Code	Energy	15.2	185.9	8.2%	40.8%	3.3%
Renewable Electricity Standard; Renewable Portfolio Standard	Energy	21.3	185.9	11.5%	40.8%	4.7%
Total						**12.2%**
Sources:						
ARB 2008. AB 32 Scoping Plan Document. Table 1. http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf						
ARB 2010. Scoping Plan Implementation Timeline. http://www.arb.ca.gov/cc/scopingplan/sp_measures_implementation_timeline.pdf.						

Jurisdictional Control								
Sector	**1990**	**2008**	**2020**		**2030**	**2040**	**2050**	
Energy (Including Water)	131,652	181,447	404,929	41%	628,444	689,093	682,679	
Transportation (On-Road Mobile)	155,577	105,253	285,492	29%	465,731	510,677	554,733	
Solid Waste	1,654	6,871	12,660	1%	18,449	20,230	21,975	
Agriculture	292,032	297,341	289,482	29%	281,624	281,624	281,624	
Wastewater Treatment	256	974	974	0%	709	709	709	
Total	**581,171**	**591,886**	**993,538**		**1,394,957**	**1,502,332**	**1,541,720**	

GHG Reduction Target-Setting									
Option 1: 15% from Existing by 2020									
		MT CO2e	**% reduction**						
Emissions Limit:		503,103							
Reduction from Existing:		88,783	15%						
Reduction from 2020 projected:		490,435	49%						
Option 2: Return to 1990 Emissions Level by 2020									
		MT CO2e	**% reduction**		2030	2040	2050		reduction/yr
Emissions Limit:		581,171			426,192	271,213	116,234		-15497.9003
Reduction from Existing:		10,715	2%		165,694	320,673	475,652		
Reduction from 2020 projected:		412,367	42%		567,346	722,325	877,304		

Supplemental Tables

Yolo County Greenhouse Gas Emissions Inventory	1990								2008									2030 Projections						
	Unincorporated Yolo County																							
	1990																							
Sector	**Activity Factor**	**Source**	**Emission Factor**	**Source**	**Other Assumptions**	**Source**	**MT CO2e/yr**	**% of total**	**Activity Factor**	**Source**	**Emission Factor**	**Source**	**Other Assumptions**	**Source**	**MT CO2e/yr**	**% of total**	**Change from 1990**	**Projection Indicator**	**Source**	**Emission Factor**	**Source**	**Other Assumptions**	**MT CO2e/yr**	**% of total**
Energy							**131,652**	21.5%							**181,447**	27.8%	37.8%						**628,444**	42.9%
Natural Gas	1,341,973 MMBtu	Yolo County Energy Plan 1982	kg/MMBtu	CCAR GRP 2009. v 3.1.	1978 consumption projected by % population growth between 1978 and 1990 and apportioned to Unincorporated County by population	1990 population from Yolo County Solid Waste Disposal Study			1,765,715 MMBtu/yr	PG&E Account data	kg/MMBtu	CCAR GRP 2009. v 3.1.			93,944			DOE EIA % growth in natural gas consumption for pacific region	US DOE EIA 2010	kg/MMBtu	CCAR GRP 2009. v 3.1.	Emission factor does not account for renewable energy portfolio standards	100,654	
Residential									1,642,157 therms	PG&E Account data								1,932,238 therms						
Nonresidential									16,014,993 therms	PG&E Account data								16,986,064 therms						
Electricity	162,155 MWH	Yolo County Energy Plan 1982	lb/MWH	CCAR GRP 2009. v 3.1.	1978 consumption projected by % population growth between 1978 and 1990 and apportioned to Unincorporated County by population	1990 population from Yolo County Solid Waste Disposal Study			265,121 MWH/yr	PG&E Account data	lb/MWH	CCAR GRP 2009. v 3.1.			87,452			1,589,120 MWH/yr	Yolo County 2030 General Plan Update. 2009 (April). Utilities Chapter.	lb/MWH	CCAR GRP 2009. v 3.1.	Emission factor does not account for renewable energy portfolio standards; assumes 75% of population buildout value from GP	527,609	
Residential									70,428 MWH	PG&E Account data														
Nonresidential									194,692 MWH	PG&E Account data														
Propane	374,978 gal	Yolo County Energy Plan 1982	kg/gal	CCAR GRP 2009. v 3.1.	1978 consumption projected by % population growth between 1978 and 1990 and apportioned to Unincorporated County by population	1990 population from Yolo County Solid Waste Disposal Study			no data									no data						
Water Consumption	no data								875,000 acre-ft/yr	Yolo County, and City of Davis Dept of Public Works	MT CO2e/MWH/yr	CCAR GRP 2009. v 3.1.	KWH/ac-ft/yr from surface and groundwater pumping, respectively	California Energy Commission [CEC] 2006 (December). Refining Estimates of Water-Related Energy Use in California. CEC-500-2006-118; California Agricultural Water Electrical Energy Requirements. 2003 (December);	50			population	Yolo County General Plan EIR				181	
Transportation (On-Road Mobile)	801,503 VMT/day	Caltrans HPMS	531 g/mile	ARB 2007 EMFAC Model run for 1990	Applied adjustment factor derived from difference between 2005 Caltrans HPMS and Fehr & Peers 2005 data to make data set correction, adjusted for speed bins, and applied population adjustment to derive State Hwy VMT allocated to unincorp County		**155,577**	25.4%	562,982 VMT/day	Fehr & Peers 2010.	512 g CO2/mile	ARB 2007 EMFAC Model run for 2008			**105,253**	16.1%	-32.3%	2,610,833 VMT/day	Fehr & Peers 2010.	485 g/mile	ARB 2007 EMFAC Model run for 2030	Emission factor does not account for national fuel economy standards	**465,731**	31.8%
Solid Waste	13,711 tons/year generated by unincorporated county	1991 Unincorporated Waste Generation Study Results; Attachment A	356,219 m3 CH4/yr	EPA 2008. AP-42 Compilation of Emission Factors. Chapter 2.4 Solid Waste Disposal	accounts for County's contribution to waste in place from 1975-1990; assumes methane capture efficiency of 75%	Linda Sinderson	**1,654**	0.3%	21,371 tons/year disposed by unincorporated county	Yolo County General Plan Update EIR. 2009 (April)	1,649,870 m3 CH4/yr	EPA 2008. AP-42 Compilation of Emission Factors. Chapter 2.4 Solid Waste Disposal	accounts for County's contribution to waste in place from 1975-2008; assumes methane capture efficiency of 75%	Linda Sinderson	**6,871**	1.1%	315.5%	10,389 tons/year disposed by unincorporated county	Yolo County General Plan Update EIR. 2009 (April)	5,263,806 m3 CH4/yr	EPA 2008. AP-42 Compilation of Emission Factors. Chapter 2.4 Solid Waste Disposal	accounts for County's contribution to waste in place from 1975-2030; assumes methane capture efficiency of 75% and assumes 75% of General Plan buildout by 2030	**18,449**	1.3%

Supplemental Tables

Yolo County Greenhouse Gas Emissions Inventory	1990								2008									2030 Projections						
	Unincorporated Yolo County																							
	1990																							
Sector	**Activity Factor**	**Source**	**Emission Factor**	**Source**	**Other Assumptions**	**Source**	**MT CO2e/yr**	**% of total**	**Activity Factor**	**Source**	**Emission Factor**	**Source**	**Other Assumptions**	**Source**	**MT CO2e/yr**	**% of total**	**Change from 1990**	**Projection Indicator**	**Source**	**Emission Factor**	**Source**	**Other Assumptions**	**MT CO2e/yr**	**% of total**
Agriculture					All agricultural emissions allocated to Unincorporated Yolo County		**292,032**	47.6%					All agricultural emissions allocated to Unincorporated Yolo County		**297,341**	45.6%	1.8%					County staff provided % change in crop/livestock trends from 2008; other subsectors held constant	**281,624**	19.2%
Residue Burn	11,368 tons residue burned	1990 Yolo County Crop Report	ton/ton burned by crop type	ARB 1990 GHG Inventory	Fraction burned	ARB 1990 GHG Inventory	14,669		9,208 tons residue burned	2008 Yolo County Crop Report	ton/ton burned by crop type	ARB 2008 GHG Inventory	Fraction burned	ARB 2008 GHG Inventory	13,917		-5.1%	7,867 tons residue burned	County staff				11,366	
Livestock	head cattle, sheep, lambs, swine	1990 Yolo County Crop Report	kg CH4/head/year	ARB 1990 GHG Inventory			30,000		head cattle, sheep, lambs, swine	2008 Yolo County Crop Report	kg CH4/head/year	ARB 2008 GHG Inventory			45,257		50.9%	head cattle, sheep, lambs, swine	County staff				38,877	
Beef Cattle	13,180 beef cattle	County Staff	73.8 kg CH4/head/year (enteric fermentation); 2.2 kg CH4/head/year (manure management)	ARB 1990 GHG Inventory			23,027		15,600 beef cattle	County Staff	73.8 kg CH4/head/year (enteric fermentation); 2.2 kg CH4/head/year (manure management)	ARB 2008 GHG Inventory			27,254		18.4%	12,480 beef cattle	County Staff	73.8 kg CH4/head/year (enteric fermentation); 2.2 kg CH4/head/year (manure management)	ARB 2008 GHG Inventory		21,804	
Dairy Cattle	50 dairy cattle	County Staff	128.7 kg CH4/head/year (enteric fermentation); 171.5 kg CH4/head/year (manure management)	ARB 1990 GHG Inventory			349		2,200 dairy cattle	County Staff	128.7 kg CH4/head/year (enteric fermentation); 171.5 kg CH4/head/year (manure management)	ARB 2008 GHG Inventory			15,349		4300.0%	2,200 dairy cattle	County Staff	128.7 kg CH4/head/year (enteric fermentation); 171.5 kg CH4/head/year (manure management)	ARB 2008 GHG Inventory		15,349	
Rice Cultivation	25,000 acres rice	1990 Yolo County Crop Report	g CH4/acre	ARB 1990 GHG Inventory			28,389		30,057 acres rice	1990 Yolo County Crop Report	g CH4/acre	ARB 1990 GHG Inventory			34,131		20.2%	36,068 acres rice	County staff				38,686	
Farm Equipment	Agricultural Equipment Population	ARB 2007 OFFROAD Model	tons CO2, CH4, N2O/day	ARB 2007 OFFROAD Model			72,170		Agricultural Equipment Population	ARB 2007 OFFROAD Model	tons CO2, CH4, N2O/day	ARB 2007 OFFROAD Model			71,667		-0.7%	Agricultural Equipment Population	ARB 2007 OFFROAD Model	tons CO2, CH4, N2O/day	ARB 2007 OFFROAD Model		71,667	
Agricultural Pumps	643 Ag pumps in Yolo County	ARB 2003	tons/day/pump	ARB 2006			39,231		643 Ag pumps in Yolo County	ARB 2003	tons/day/pump	ARB 2006			39,231		0.0%	643 Ag pumps in Yolo County	ARB 2003	tons/day/pump	ARB 2006		39,231	
Pesticide Application	36,731 lb methyl bromide applied	California Dept of Pesticide Regulation 1990	GWP	IPCC 2007			83		15,281 lb methyl bromide applied	California Dept of Pesticide Regulation 2008	GWP	IPCC 2007			35		-58.4%	15,281 lb methyl bromide applied	California Dept of Pesticide Regulation 2008	GWP	IPCC 2007		35	
Fertilizer	29,488 tons fertilizer applied; acres/crop	UCD Extension. 2010. Cost Return Studies; 2008 Yolo County Crop Report	g N2O/g N	ARB 1990 GHG Inventory	0.0125 g N volatilization/g N applied	ARB 1990 GHG Inventory	98,982		23,823 tons fertilizer applied; acres/crop	UCD Extension. 2010. Cost Return Studies; 2008 Yolo County Crop Report	g N2O/g N	ARB 2008 GHG Inventory	0.0125 g N volatilization/g N applied	ARB 2008 GHG Inventory	79,966		-19.2%	21,578 tons fertilizer applied; acres/crop	UCD Extension. **2010. Cost** Return Studies; 2008 Yolo County Crop Report	g N2O/g N	ARB 2008 GHG Inventory	0.0125 g N volatilization/g N applied	68,625	
Liming	9,879 MT Lime applied	CFDA 1990 Yolo Tonnage Report	tons C/ton dolomite				4,344		26,777 MT Lime applied	CFDA 2006-2008 Yolo Tonnage Report	tons C/ton dolomite				11,774		171.0%	26,777 MT Lime applied	CFDA 2006-2008 Yolo Tonnage Report	tons C/ton dolomite			11,774	
Urea Application	5,682 MT Urea applied	CFDA 1990 Yolo Tonnage Report	tons C/ton urea				4,164		1,858 MT Urea applied	CFDA 2006-2008 Yolo Tonnage Report	tons C/ton urea				1,362		-67.3%	1,858 MT Urea applied	CFDA 2006-2008 Yolo Tonnage Report	tons C/ton urea			1,362	
Wastewater Treatment	WWTP influent mgd	Esparto, Madison, and Knights Landing CSD Wastewater Discharge Requirements	0.12 kg CH4/L BOD	IPCC 2006	BOD (mg/L)	Esparto, Madison, and Knights Landing CSD Wastewater Discharge Requirements	**256**	0.0%	WWTP influent mgd	Esparto, Madison, and Knights Landing CSD Wastewater Discharge Requirements	0.12 kg CH4/L BOD	IPCC 2006	BOD (mg/L)	Esparto, Madison, and Knights Landing CSD Wastewater Discharge Requirements	**974**	0.1%	281.1%	WWTP capacity	Yolo County General Plan EIR; Utilities Chapter	0.12 kg CH4/L BOD	IPCC 2006	BOD (mg/L); assumes Madison and Knights Landing plants are transitioned to tertiary plants, for which GHG emissions are embedded in energy sector.	**709**	0.0%
Construction & Mining	1990 Construction & Mining Equipment Population	ARB 2007 OFFROAD Model	tons CO2, CH4, N2O/day	ARB 2007 OFFROAD Model			**14,954**	2.4%	2008 Construction & Mining Equipment Population	ARB 2007 OFFROAD Model run for 2008	tons CO2, CH4, N2O/day	ARB 2007 OFFROAD Model			**29,271**	4.5%	95.7%	2030 Construction & Mining Equipment Population	ARB 2007 OFFROAD Model run for 2030	tons CO2, CH4, N2O/day	ARB 2007 OFFROAD Model		**39,558**	2.7%
Stationary Sources							**17,526**	2.9%							**30,583**	4.7%	74.5%						**31,938**	2.2%
Facilities	throughput	YSAMQD 1990 facility permit data	various	CCAR GRP 2009. v 3.1.	does not include ag processing facilities. See below.		3,974	22.7%	throughput	YSAMQD 2008 facility permit data	various	CCAR GRP 2009. v 3.1.	does not include ag processing facilities. See below.		8,220	26.9%	106.9%					assumes stationary sources held constant	8,220	
Agricultural Processing	0 lb/yr Sulfuryl Fluoride applied to commodities	California Department of Pesticide Regulation 1990	GWP	IPCC 2007; Journal of Geophysical Research 2009	includes ag processing facility emissions; commodity fumigation was 0 in 1990 (only used for structural pest control)		10,905	62.2%	7,191 lb/yr Sulfuryl Fluoride applied to commodities	California Department of Pesticide Regulation 2008	GWP	IPCC 2007; Journal of Geophysical Research 2009	includes ag processing facility emissions and commodity fumigation		16,483	53.9%	51.1%					assumes pesticide application to commodities held constant	18,264	
Equipment	1990 Stationary Equipment Population	ARB 2007 OFFROAD Model run for 1990	tons CO2, CH4, N2O/day	ARB 2007 OFFROAD Model run for 1990	Allocated partially to County and partially to Woodland based on stationary source facility data		2,647	15.1%	2008 Stationary Equipment Population	ARB 2007 OFFROAD Model run for 2008	tons CO2, CH4, N2O/day	ARB 2007 OFFROAD Model			5,880	19.2%	122.2%	2030 Stationary Equipment Population	ARB 2007 OFFROAD Model run for 2030	tons CO2, CH4, N2O/day	ARB 2007 OFFROAD Model		5,454	
Total							**613,651**	**100%**							**651,740**	**100%**	6.2%						**1,466,453**	**100%**

Demographic Data

Yolo County Greenhouse Gas Emissions Inventory

Population Data

	1990	2008	2020	2030	2040	2050
YOLO	**140,000**	**198,349**	245,052	275,360	301,934	327,982
Davis	45,850	65,575				
West Sacramento	28,700	46,893				
Winters	4,540	7,026				
Woodland	39,500	55,664				
Incorporated	118,600	175,158				
Unincorporated	21,350	23,191	37,182	48,842	53,556	58,176

growth rate from 2008-2030 (unincorporated only):	1,166	people/year	5.0%
growth rate from 2030-2040 (total Yolo County):	2,657	people/year	1.0%
growth rate from 2040-2050 (total Yolo County):	2,605	people/year	0.9%
GP Buildout population	64,700	people	75%

Source: California Department of Finance. REPORT 90 E-4. Population Estimates for California State and Counties. http://www.dof.ca.gov/research/demographic/reports/estimates/e-4/1981-90/

Source: California Department of Finance. Population Projections by Race / Ethnicity, Gender and Age for California and Its Counties 2000–2050. http://www.dof.ca.gov/research/demographic/reports/projections/p-3/

Source: California Department of Finance. Table 2: E-4 Population Estimates for Cities, Counties and State, 2001-2010. http://www.dof.ca.gov/research/demographic/reports/estimates/e-4/2001-10/

Source: Yolo County General Plan DEIR. Land Use and Housing. Prepared by LSA Associates. 2009.

Source: David Morrison, Yolo County. 2010. 2030 projected GP Buildout population

= interpolated or extrapolated

Agricultural GHG Emissions - Residue Burning

Yolo County Greenhouse Gas Emissions Inventory - 2008

Residue Burning

Crop	Total Acres Harvested (acre/yr)	Residue Burned (tons/acre)	Moisture Content	Percent Acres Burned	Residue Burned (tons/yr)	Emission Factors (ton/ton burned) CO2	CH4	N2O	Total CO2E Emissions (MT CO2e/yr)
Corn	8,118	4.2	0.086	0.03	87.97	1.31	1.75E-03	1.00E-04	110
Rice	30,057	3	0.086	0.16	1,240.75	1.16	7.20E-04	2.00E-04	1,391
Almonds	15,249	1	0.183	0.84	2,344.08	1.83	1.17E-03	2.00E-04	4,075
Walnuts	12,294	1.2	0.331	0.95	4,639.02	1.64	1.64E-03	2.00E-04	7,310
Wheat	42,398	1.9	0.073	0.11	646.87	1.19	1.82E-03	1.00E-04	740
Barley	30,416	1.7	0.069	0.07	249.75	1.17	2.47E-03	2.00E-04	291
Total					**9,208.43**				**13,917**

Conversion Factor:

1 MT 1.1023 ton

GWP

Methane (CH_4)	23
Nitrous Oxide (N_2O)	296

Sources

California Air Resources Board. 2008 Greenhouse Gas Emissions Inventory: Agriculture and Forestry. Ag Residue Burned.

Yolo County 2008 Agricultural Crop Report

Agricultural GHG Emissions - Livestock

Yolo County Greenhouse Gas Emissions Inventory - 2008

Livestock

		Enteric Fermentation			Manure Management						Total GHG Emissions
Livestock Type	**Population**	**Emission Factor (kg CH_4/head-year)**	**kg CH_4/year**	**MT CO_2e/year**	**Emission Factor (kg CH_4/head-year)**	**kg CH_4/year**	**MT CO_2e/year**	**Emission Factor (kg N_2O/head-year)**	**kg N_2O/year**	**MT CO_2e/year**	**MT CO_2e/year**
Beef Cattle	15,600	73.8	1,151,280	26,479	2.2	33,696	775	0.00	0.00	0	27,254
Dairy Cattle	2,200	128.7	283,230	6,514	171.5	377,219	8,676	0.24	534.60	158	15,349
Lambs	13,016	8	104,128	2,395	0.781	10,165	234	0.01	86.04	25	2,654
Slaughter Sheep	0	8	0	0	0.781	0	0	0.01	0.00	0	0
Hogs	0	1.5	0	0	18.9	0	0	0.02	0.00	0	0
Poultry	0										
Total											**45,257**

GWP

Methane (CH_4)	23
Nitrous Oxide (N_2O)	296

Sources

Yolo County 2008 Agricultural Crop Report

California Air Resources Board. 2008 Greenhouse Gas Emissions Inventory: Agriculture and Forestry. Livestock Population.

Agricultural GHG Emissions - Rice Cultivation

Yolo County Greenhouse Gas Emissions Inventory - 2008

Rice Cultivation

Acres of Rice	Hectares of Rice	Rice Field Emission Factor (g CH4/hectare)	Total GHG Emission (MT CO2e/yr)
30,057	12,164	122,000	34,131

Sources

California Air Resources Board. 2008 Greenhouse Gas Emissions Inventory: Agriculture and Forestry. CH4 from Harvested Rice Area.

Yolo County 2008 Agricultural Crop Report

Agricultural GHG Emissions - Agricultural Equipment

Yolo County Greenhouse Gas Emissions Inventory - 2008

GHG	Emissions (tons/day)	Emissions (MT/yr)
Carbon Dioxide (CO_2)	215	71,103
Methane (CH_4)	0	2
Nitrous Oxide (N_2O)	0	2
CO_2E	216	**71,667**

Source: OFFROAD 2007: Annual 2008 Agricultural Equipment in Yolo County

GWP	
Methane (CH_4)	23
Nitrous Oxide (N_2O)	296

Agricultural Pumps

Yolo County Greenhouse Gas Emissions Inventory - 2008

# Pumps in Yolo County	Emission Factor (avg tpd/pump) Diesel CO2	Total Emissions (MT CO2e/yr)
643	0.184298584	39,231.34
Total		**39,231.34**

Total YSAQMD pumps

777

Total YSAQMD CO2 Emissions (tpd)

143.2

Sources:

California Air Resources Board 2003. Fuel Consumption Methodologies for Agricultural Irrigation Engines (category 052-042-1200-0000). Available at: http://www.arb.ca.gov/ei/areasrc/FULLPDF/FULL1-1.pdf

California Air Resources Board 2006. Rulemaking to Consider Proposed Amendments to the Stationary Diesel Engine Control Measure - Appendix D: Emission Inventory Methodology Agricultural Irrigation Pumps - Diesel. Available at: http://www.arb.ca.gov/regact/agen06/append.pdf

Agricultural GHG Emissions - Pesticide Application

Yolo County Greenhouse Gas Emissions Inventory - 2008

Pesticide Application

Year	Pesticide (Chemical Name)	Commodity Application lbs/yr	lbs/MT Conversion Factor	GWP of 1 MT SO_2F_2	MT CO2e/yr	CO2e Range	MT CO2e Range
2008	METHYL BROMIDE	15,281.26	0.000454	5	35		
TOTAL					**35**		

Source:

California Department of Pesticide Regulation. 2008. Pesticide Use Reporting in Yolo County. http://www.cdpr.ca.gov/docs/pur/pur08rep/chemcnty/yolo08_ai.pdf

Agricultural GHG Emissions - Fertilizer Application

Yolo County Greenhouse Gas Emissions Inventory - 2008

Nitrogen Applied in Fertilizer (tons)	Nitrogen Applied (grams)	Nitrogen Emitted As N_2O (g/g)	MT CO2e/yr
23,823	21,612,436,062	270,155,451	**79,966**

Nitrogen Volatilization (g/g)	0.0125
Nitrous Oxide (N_2O) GWP	296

Sources

California Air Resources Board. 2008 Greenhouse Gas Emissions Inventory: Agriculture and Forestry. N_2O from Nitrogen Applied in Fertilizer.

UC Davis Agricultural and Resource Economics. 2010. Current Cost and Return Studies. Available < http://coststudies.ucdavis.edu/current.php>.

Agricultural GHG Emissions - Liming

Yolo County Greenhouse Gas Emissions Inventory - 2008

Sector	**Agriculture, Forestry and Other Land Use**						
Category	**Liming: Annual CO_2-C emissions from Liming**						
Category code	**3C2**						
Sheet	**1 of 1**						
Equation	**Equation 11.12**						
Type of lime applied	Annual amount of calcic limestone ($CaCO_3$)	Emission factor	Annual amount of dolomite ($CaMg(CO_3)_2$)	Emission factor	Annual C emissions from liming		**Annual CO2 emissions from liming**
	(tonnes yr^{-1})	[tonnes of C (tonne of limestone)$^{-1}$]	(tonnes yr^{-1})	[tonnes of C (tonne of dolomite)$^{-1}$]	(tonnes C yr^{-1})		**tonnes CO2 yr-1**
		default is 0.12		default is 0.13	CO_2-C Emission = ($M_{Limestone}$ * $EF_{Limestone}$) + ($M_{Dolomite}$ * $EF_{Dolomite}$)		
	$M_{Limestone}$	**$EF_{Limestone}$**	**$M_{Dolomite}$**	**$EF_{Dolomite}$**	**CO_2-C Emission**	mol wt ratio	
Limestone	**26776.75**	**0.12**			**3213.21**	**3.6642**	**11,774**
Dolomite			0		0		-
Total							**11,774**

Agricultural GHG Emissions - Urea Fertilization

Yolo County Greenhouse Gas Emissions Inventory - 2008

Sector	**Agriculture, Forestry and Other Land Use**				
Category	**Urea Fertilization: Annual CO_2 emissions from Urea Fertilization**				
Category code	**3C3**				
Sheet	**1 of 1**				
Equation	**Equation 11.13**				Annual CO2 emissions from urea fertilization
Subcategories for reporting year	Annual amount of Urea Fertilization	Emission factor	Annual CO_2-C emissions from Urea Fertilization		tonns CO2 yr-1
	(tonnes urea yr^{-1})	[tonnes of C (tonne of urea)$^{-1}$]	(tonnes C yr^{-1})		
		default is 0.20	CO_2-C Emission = M * EF		**1,362**
	M	**EF**	**CO_2-C Emission**	**molar wt ratio**	
(a)	1858.22	**0.2**	**371.644**	**3.6642**	
(b)					**1,362**
(c)					
Total					

Yolo Urea Sales Data (CDFA tonnage reports 2006-2008)

Year	us tons	metric tons
2008	2042	1858.22

Source:
UC Davis. Department of Land, Air and Water Resources. 2010.

Agricultural GHG Emissions - Summary

Yolo County Greenhouse Gas Emissions Inventory - 2008

	MT CO2e/yr	% of total Ag
Residue Burning	13,917	4.7%
Livestock	45,257	15.2%
Rice Cultivation	34,131	11.5%
Farm Equipment	71,667	24.1%
Agricultural Irrigation Pumps	39,231	13.2%
Pesticide Application	35	0.0%
Fertilizer	79,966	26.9%
Lime Application	11,774	4.0%
Urea Fertilization	1,362	0.5%
Total	**297,341**	100.0%

Agricultural GHG Emissions - Residue Burning

Yolo County Greenhouse Gas Emissions Inventory - 2030

Residue Burning

Crop	Total Acres Harvested (acre/yr)	Residue Burned (tons/acre)	Moisture Content	Percent Acres Burned	Residue Burned (tons/yr)	Emission Factors (ton/ton burned) CO2	CH4	N2O	Total CO2E Emissions (MT CO2e/yr)
Corn	6,494	4.2	0.086	0.03	70.37	1.31	1.75E-03	1.00E-04	88
Rice	34,068	3	0.086	0.16	1,406.34	1.16	7.20E-04	2.00E-04	1,577
Almonds	11,788	1	0.183	0.84	1,812.11	1.83	1.17E-03	2.00E-04	3,150
Walnuts	9,802	1.2	0.331	0.95	3,698.72	1.64	1.64E-03	2.00E-04	5,828
Wheat	24,733	1.9	0.073	0.11	377.35	1.19	1.82E-03	1.00E-04	432
Barley	30,416	1.7	0.069	0.07	249.75	1.17	2.47E-03	2.00E-04	291
Total					**7,614.65**				**11,366**

Conversion Factor:

1 MT 1.1023 ton

GWP

Methane (CH_4) 23

Nitrous Oxide (N_2O) 296

Sources

California Air Resources Board. 2008 Greenhouse Gas Emissions Inventory: Agriculture and Forestry. Ag Residue Burned.

Yolo County 2008 Agricultural Crop Report

Agricultural GHG Emissions - Livestock

Yolo County Greenhouse Gas Emissions Inventory - 2030

Livestock

		Enteric Fermentation			Manure Management						Total GHG Emissions
Livestock Type	**Population**	**Emission Factor (kg CH_4/head-year)**	**kg CH_4/year**	**MT CO_2e/year**	**Emission Factor (kg CH_4/head-year)**	**kg CH_4/year**	**MT CO_2e/year**	**Emission Factor (kg N_2O/head-year)**	**kg N_2O/year**	**MT CO_2e/year**	**MT CO_2e/year**
Beef Cattle	12,480	73.8	921,024	21,184	2.2	26,957	620	0.00	0.00	0	21,804
Dairy Cattle	2,200	128.7	283,230	6,514	171.5	377,219	8,676	0.24	534.60	158	15,349
Lambs	8,460	8	67,683	1,557	0.781	6,608	152	0.01	55.92	17	1,725
Slaughter Sheep	0	8	0	0	0.781	0	0	0.01	0.00	0	0
Hogs	0	1.5	0	0	18.9	0	0	0.02	0.00	0	0
Poultry	0										
Total											**38,877**

GWP

Methane (CH_4)	23
Nitrous Oxide (N_2O)	296

Notes

Assumes 35% decrease in lambs from 2008

Assumes 20% decrease in beef cattle from 2008

Sources

Yolo County 2008 Agricultural Crop Report

California Air Resources Board. 2008 Greenhouse Gas Emissions Inventory: Agriculture and Forestry. Livestock Population.

Agricultural GHG Emissions - Rice Cultivation

Yolo County Greenhouse Gas Emissions Inventory - 2030

Rice Cultivation

Acres of Rice	Hectares of Rice	Rice Field Emission Factor (g CH4/hectare)	Total GHG Emission (MT CO2e/yr)
34,068	13,787	122,000	38,686

Notes

Assumes 20% increase in rice from 2008

Sources

California Air Resources Board. 2008 Greenhouse Gas Emissions Inventory: Agriculture and Forestry. CH4 from Harvested Rice Area.

Yolo County 2008 Agricultural Crop Report

Agricultural GHG Emissions - Agricultural Equipment

Yolo County Greenhouse Gas Emissions Inventory - 2030

GHG	Emissions (tons/day)	Emissions (MT/yr)
Carbon Dioxide (CO_2)	215	71,103
Methane (CH_4)	0	2
Nitrous Oxide (N_2O)	0	2
CO_2E	216	**71,667**

Source: OFFROAD 2007: Annual 2008 Agricultural Equipment in Yolo County

GWP	
Methane (CH_4)	23
Nitrous Oxide (N_2O)	296

Agricultural Pumps

Yolo County Greenhouse Gas Emissions Inventory - 2030

# Pumps in Yolo County	Emission Factor (avg tpd/pump) Diesel CO2	Total Emissions (MT CO2e/yr)
643	0.184298584	39,231.34
Total		**39,231.34**

Total YSAQMD pumps

777

Total YSAQMD CO2 Emissions (tpd)

143.2

Sources:

California Air Resources Board 2003. Fuel Consumption Methodologies for Agricultural Irrigation Engines (category 052-042-1200-0000). Available at: http://www.arb.ca.gov/ei/areasrc/FULLPDF/FULL1-1.pdf

California Air Resources Board 2006. Rulemaking to Consider Proposed Amendments to the Stationary Diesel Engine Control Measure - Appendix D: Emission Inventory Methodology Agricultural Irrigation Pumps - Diesel. Available at: http://www.arb.ca.gov/regact/agen06/append.pdf

Agricultural GHG Emissions - Pesticide Application

Yolo County Greenhouse Gas Emissions Inventory - 2030

Pesticide Application

Year	Pesticide (Chemical Name)	Commodity Application lbs/yr	lbs/MT Conversion Factor	GWP of 1 MT SO_2F_2	MT CO2e/yr	CO2e Range	MT CO2e Range
2008	METHYL BROMIDE	15,281.26	0.000454	5	35		
TOTAL					**35**		

Source:

California Department of Pesticide Regulation. 2008. Pesticide Use Reporting in Yolo County. http://www.cdpr.ca.gov/docs/pur/pur08rep/chemcnty/yolo08_ai.pdf

Agricultural GHG Emissions - Fertilizer Application

Yolo County Greenhouse Gas Emissions Inventory - 2030

Nitrogen Applied in Fertilizer (tons)	Nitrogen Applied (grams)	Nitrogen Emitted As N_2O (g/g)	MT CO2e/yr
20,445	18,547,355,613	231,841,945	**68,625**

Nitrogen Volatilization (g/g)	0.0125
Nitrous Oxide (N_2O) GWP	296

Sources

California Air Resources Board. 2008 Greenhouse Gas Emissions Inventory: Agriculture and Forestry. N_2O from Nitrogen Applied in Fertilizer.

UC Davis Agricultural and Resource Economics. 2010. Current Cost and Return Studies. Available < http://coststudies.ucdavis.edu/current.php>.

Agricultural GHG Emissions - Liming

Yolo County Greenhouse Gas Emissions Inventory - 2030

Sector	**Agriculture, Forestry and Other Land Use**						
Category	**Liming: Annual CO_2-C emissions from Liming**						
Category code	**3C2**						
Sheet	**1 of 1**						
Equation	**Equation 11.12**						
Type of lime applied	Annual amount of calcic limestone ($CaCO_3$)	Emission factor	Annual amount of dolomite ($CaMg(CO_3)_2$)	Emission factor	Annual C emissions from liming		**Annual CO2 emissions from liming**
	(tonnes yr^{-1})	[tonnes of C (tonne of limestone)$^{-1}$]	(tonnes yr^{-1})	[tonnes of C (tonne of dolomite)$^{-1}$]	(tonnes C yr^{-1})		**tonnes CO2 yr-1**
		default is 0.12		default is 0.13	CO_2-C Emission = ($M_{Limestone}$ * $EF_{Limestone}$) + ($M_{Dolomite}$ * $EF_{Dolomite}$)		
	$M_{Limestone}$	**$EF_{Limestone}$**	**$M_{Dolomite}$**	**$EF_{Dolomite}$**	**CO_2-C Emission**	mol wt ratio	
Limestone	**26776.75**	**0.12**			**3213.21**	**3.6642**	**11,774**
Dolomite			0		0		-
Total							**11,774**

Agricultural GHG Emissions - Urea Fertilization

Yolo County Greenhouse Gas Emissions Inventory - 2030

Sector	**Agriculture, Forestry and Other Land Use**				
Category	**Urea Fertilization: Annual CO_2 emissions from Urea Fertilization**				
Category code	**3C3**				
Sheet	**1 of 1**				
Equation	**Equation 11.13**				Annual CO2 emissions from urea fertilization
Subcategories for reporting year	Annual amount of Urea Fertilization	Emission factor	Annual CO_2-C emissions from Urea Fertilization		tonns CO2 yr-1
	(tonnes urea yr^{-1})	[tonnes of C (tonne of urea)$^{-1}$]	(tonnes C yr^{-1})		
		default is 0.20	CO_2-C Emission = M * EF		**1,362**
	M	**EF**	**CO_2-C Emission**	**molar wt ratio**	
(a)	1858.22	**0.2**	**371.644**	**3.6642**	
(b)					**1,362**
(c)					
Total					

Yolo Urea Sales Data (CDFA tonnage reports 2006-2008)

Year	us tons	metric tons
2008	2042	1858.22

Source:
UC Davis. Department of Land, Air and Water Resources. 2010.

Agricultural GHG Emissions - Summary

Yolo County Greenhouse Gas Emissions Inventory - 2030

	MT CO2e/yr	% of total Ag
Residue Burning	11,366	4.0%
Livestock	38,877	13.8%
Rice Cultivation	38,686	13.7%
Farm Equipment	71,667	25.4%
Agricultural Irrigation Pumps	39,231	13.9%
Pesticide Application	35	0.0%
Fertilizer	68,625	24.4%
Lime Application	11,774	4.2%
Urea Fertilization	1,362	0.5%
Total	**281,624**	100.0%

Yolo County Staff; John Young (Ag Commissioner) and David Morrison. Estimates of projected % changes in crop trends.

1 Yolo County Department of Agriculture. 2008. *Yolo County 2008 Crop and Livestock Report* . Available at <http://www.yolocounty.org/Index.aspx?page=1419>.

2 University of California Cooperative Extension. 2006. *Sample Costs to Establish an Orchard and Produce Almonds, Sacramento Valley, Low-Volume Sprinkler* . Available at <http://coststudies.ucdavis.edu/current.php>. Item #AM-SV-06. See Table A.

3 University of California Cooperative Extension. 2008. *Sample Costs to Establish a Vineyard and Produce Wine grapes, Chardonnay Variety, Sacramento Valley, Sacramento River Delta, Sacramento and Yolo Counties - Crush District 17.* Available at <http://coststudies.ucdavis.edu/current.php>. Item #GR-SV-08. See page 6.

4 University of California Cooperative Extension. 2009. *Sample Costs to Establish a Vineyard and Produce Wine grapes, Cabernet Sauvignon, North Coast Region, Napa County* . Available at <http://coststudies.ucdavis.edu/current.php>. Item #GR-NC-09. See page 6.

5 University of California Cooperative Extension. 2007. *Sample Costs to Establish a Walnut Orchard and Produce Walnuts, English Walnuts, Sacramento Valley, Sprinkler Irrigated* . Available at <http://coststudies.ucdavis.edu/current.php>. Item #WN-SV-07-R. See page 6.

6 University of California Cooperative Extension. 2008. *Sample Costs to Produce Prunes (Dried Plums), Sacramento Valley, French Variety & Low-Volume Irrigation* . Available at <http://coststudies.ucdavis.edu/current.php>. Item #PU-SV-08. See page 3.

7 University of California Cooperative Extension. 2006. *Sample Costs to Establish and Produce Pears, Green Bartlett, North Coast Region, Lake and Mendocino Counties* . Available at <http://coststudies.ucdavis.edu/current.php>. Item #PR-NC-06-2. See page 6.

8 University of California Cooperative Extension. 2006. *Sample Costs to Establish and Produce Specialty Pears, Standard Planting with Standard Trees, North Coast Region, Lake and Mendocino Counties* . Available at <http://coststudies.ucdavis.edu/current.php>. Item #PR-NC-06-2R. See page 6.

9 University of California Cooperative Extension. 2007. *Sample Costs to Establish and Produce Apples, Intermountain Region - El Dorado County* . Available at <http://coststudies.ucdavis.edu/files/appleir2007.pdf>. See page 4.

10 University of California Cooperative Extension. 2005. *Sample Costs to Establish an Orchard and Produce Sweet Cherries, San Joaquin Valley - North* . Available at <http://coststudies.ucdavis.edu/files/cherryvn2005.pdf>. See page 3.

11 University of California Cooperative Extension. 2005. *Sample Costs to Establish an Fig Orchard and Produce Figs, San Joaquin Valley (Mission and Calimyrna Variety)* . Available at <http://coststudies.ucdavis.edu/files/figmissionsjv05.pdf>. See page 4. <http://coststudies.ucdavis.edu/files/figcalimyrnasjv05.pdf>. See page 4.

12 University of California Cooperative Extension. 2005. *Sample Costs to Establish and Produce Nectarines, San Joaquin Valley - South* . Available at <http://coststudies.ucdavis.edu/files/nectarinevs09.pdf>. See page 4.

13 University of California Cooperative Extension. 2005. *Sample Costs to Establish and Produce Table Olives, Manzanillo Variety - San Joaquin Valley* . Available at <http://coststudies.ucdavis.edu/files/olivetblsjv2005.pdf>. See page 4. <http://coststudies.ucdavis.edu/files/olivesv09.pdf>. See page 11.

14 University of California Cooperative Extension. 2005. *Sample Costs to Establish and Produce Peaches, San Joaquin Valley - South* . Available at <http://coststudies.ucdavis.edu/files/peachesvs09.pdf>. See page 4.

15 University of California Cooperative Extension. 2005. *Sample Costs to Establish and Produce Pistachios, San Joaquin Valley - South* . Available at <http://coststudies.ucdavis.edu/files/PistachioVS08.pdf>. See page 5.

16 University of California Cooperative Extension. 2009. *Sample Costs to Establish and Produce Plums, San Joaquin Valley - South* . Available at <http://coststudies.ucdavis.edu/files/plumvs09.pdf>. See page 4.

17 University of California Cooperative Extension. 2008. *Sample Costs to Establish and Produce Prunes, Sacramento Valley* . Available at <http://coststudies.ucdavis.edu/files/prunesv2008.pdf>. See page 12.

18 University of California Cooperative Extension. 2009. *Sample Costs to Establish an Orange Orchard and Produce Oranges, San Joaquin Valley - South* . Available at <http://coststudies.ucdavis.edu/files/orangevs2009.pdf>. See page 4.

19 <http://coststudies.ucdavis.edu/files/beansvs2_2008.pdf>, <http://coststudies.ucdavis.edu/files/beansvs1_2008.pdf>,

20 University of California Cooperative Extension. 2008. *Sample Costs to Produce Wheat for Grain (Irrigated), San Joaquin Valley - South* . Available at <http://coststudies.ucdavis.edu/files/wheatsjv2008.pdf>. See page 9.

21 University of California Cooperative Extension. 2007. *Sample Costs to Establish and Produce Asparagus, San Joaquin Valley - North* . Available at <http://coststudies.ucdavis.edu/files/asparagusvn2007.pdf>. See page 13.

22 University of California Cooperative Extension. 2007. *Sample Costs to Produce Rice, San Joaquin Valley - North* . Available at <http://coststudies.ucdavis.edu/files/asparagusvn2007.pdf>. See page 13.

Fertilizer Application/Soil Management Summary

Crop Type	Nitrogen Applied Per Year (lbs/yr)	Nitrogen Applied Per Year (tons/yr)	Grams Applied Per Year	Nitrogen Emitted as N2O	Total GHG Emissions (MT CO2e/yr)
Almonds	3,522,805	1,761	1,597,944,499	19,974,306	5,912
Wine Grapes/Kiwi	70,168	35	31,827,978	397,850	118
Walnuts	2,171,294	1,086	984,898,807	12,311,235	3,644
Prunes	315,300	158	143,020,080	1,787,751	529
Pears, Bartlett	0	0	0	0	0
Pears, Others/Persimmons	0	0	0	0	0
Apples	0	0	0	0	0
Apricots	0	-	0	-	-
Cherries	0	0	0	0	0
Figs	0	0	0	0	0
Kiwi	0	-	0	-	-
Nectarines	0	0	0	0	0
Olives	257,400	129	116,756,640	1,459,458	432
Peaches (Freestone)	0	0	0	0	0
Pluots/Apricots	0	0	0	0	0
Rice	4,867,523	2,434	2,207,908,274	27,598,853	8,169
Pistachio Nuts	0	0	0	0	0
Plums	0	0	0	0	0
Tangerines	0	0	0	0	0
Tomatoes	4,873,233	2,437	2,210,498,383	27,631,230	8,179
Asparagus	0	0	0	0	0
Misc Vegetables	0	0	0	0	0
Misc Fruits	786,903	393	356,939,319	4,461,741	1,321
Barley	2,433,280	1,217	1,103,735,808	13,796,698	4,084
Beans	0	0	0	0	0
Corn (and Milo)	669,345	335	303,615,044	3,795,188	1,123
Hay - Alfalfa	1,242,035	621	563,387,274	7,042,341	2,085
Hay - Grain	1,940,928	970	880,404,941	11,005,062	3,257
Oat and Misc Field Crop	0	0	0	0	0
Pasture	12,297,824	6,149	5,578,292,966	69,728,662	20,640
Propogative and Nursery	0	0	0	0	0
Wheat	5,441,194	2,721	2,468,125,598	30,851,570	9,132
Total	**40,889,232**	**20,445**	**18,547,355,613**	**231,841,945**	**68,625**

Nitrogen Emitted As N_2O (g/g)	0.0125	g/g	IPCC. N2O: Direct Emissions From Agricultural Soils. Available: <http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/4_5_N2O_Agricultural_Soils.pdf>
Global Warming Potential of N2O	296	N20:CO2	Intergovernmental Panel on Climate Change. 2001. Climate Change 2001: The Scientific Basis. Geneva, Switzerland. Available: <http://www.ipcc.ch/ipccreports/tar/>. *in* Table C.1 of California Climate Action Registry. 2009 (January). California Climate Action Registry General Reporting Protocol, Version 3.1. Los Angeles, CA. Available: <http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf>. Last updated January 2009.

Almonds

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	11,788	acres	1	assumes 10% increase from 2008 and 822 acres converted to development
area harvested in 2008, non-bearing	4,164	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	280	lb/acre	2	It is assumed that the average age of bearing orchards is 6 years or older.
Nitrogen application rate for fertilization of established plantings, non-bearing	53	lb/acre	2	It is assumed that the average age of non-bearing plantings is 4 years.
Total nitrogen applied	3,522,805	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	1,597.9	MT/year	conversion calculation	

Wine Grapes

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	3,810	acres	1	assumes 20% increase from 2008
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	3,810	acres	summation	
Nitrogen application rate for fertilization of established plantings, Chardonnay	18	lb/acre	3	
Total nitrogen applied	70,168	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	31.8	MT/year	conversion calculation	

12	Intermountain (Shasta-Trinity)	2005	
	North Coast (Napa) organic	2005	
12	San Joaquin N&S	2005	
10	North Coast (Lake)	2008	
40	Sac/Yolo	2008	

Walnuts

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	9,802	acres	1	assumes 10% increase from 2008
area harvested in 2008, non-bearing	3,721	acres	1	
area harvested in 2008, bearing and non-bearing	13,523	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	5	This guide for purchase at http://anrcatalog.ucdavis.edu/Nuts/21623.aspx may also be useful.
Nitrogen application rate for fertilization of established plantings, non-bearing	57			
Total nitrogen applied	2,171,294	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	984.9	MT/year	conversion calculation	

Pears, Bartlett

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	7	
Nitrogen application rate for fertilization of established plantings, non bearing	52			
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Pears, Others/Persimmons

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	8	
Nitrogen application rate for fertilization of established plantings, non bearing	52			
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Apples

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	21	lb/acre	9	Using El Dorado County application rates
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Cherries

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	Assume cherry trees are 10+ years for maximum fertilizer application
area harvested in 2008, non-bearing		acres	1	Assumes non-bearing trees are 1-3 years old and use average of 1-3 year application rates
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	154	lb/acre	10	
Nitrogen application rate for fertilization of established plantings, non-bearing	15	lb/acre	10	
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Figs

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	75	lb/acre	11	Average of Mission and Calimyrna application rate for 5+ year old trees
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Nectarines

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	151	lb/acre	12	Use application rate of 4+ year old trees
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Olives

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	2,860	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	2,860	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	90	lb/acre	13	Used average application rate from San Joaquin and Sacramento Valley reports
Total nitrogen applied	257,400	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	116.8	MT/year	conversion calculation	

Peaches

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	151	lb/acre	14	Used application rate from 4+ year old trees
Nitrogen application rate for fertilization of established plantings, non-bearing	53	lb/acre	14	Used average application rate for 1-3 year old trees
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Pistachios

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	15	Used application rate from 7+ year old trees
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Plums

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	125	lb/acre	15	Used application rate from 4+ year old trees
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Prunes

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	2,102	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	2,102	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	150	lb/acre	17	
Total nitrogen applied	315,300	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	143.0	MT/year	conversion calculation	

Tangerines

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	110	lb/acre	18	Used Cost Study for oranges as surrogate
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Beans

	value	units	source	notes/questions/assumptions				
area harvested in 2008, bearing	0	acres	1		no fertilizer needed		http://coststudies.ucdavis.edu/files/beansvs2_2008.pdf	blackeye double
area harvested in 2008, non-bearing		acres	1		no fertilizer needed		http://coststudies.ucdavis.edu/files/beansvs1_2008.pdf	blackeye single
area harvested in 2008, bearing and non-bearing	0	acres	1		32.36	209 lb/ac @ 4%; 120 lb/ac @ 20%	http://coststudies.ucdavis.edu/files/beansdryvn2005.pdf	common dry double
Nitrogen application rate for fertilization of established plantings, bearing	110	lb/acre	19	Used Blackeye, common dry, green, and Chinese long beans	29.6	20 gal/ac @ 8%; 60 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/Beans_SC_SV08.pdf	single cropped
Total nitrogen applied	0	lb/year	calculation		33.6	21 gal/ac @ 8%; 80 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/Beans_DC_SV08.pdf	double cropped
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm		90.3	500 lbs/ac @ 15%; 90lbs/ac @17%	http://coststudies.ucdavis.edu/files/beangrsjv2005-1.pdf	green blue lake
Total nitrogen applied	0.0	MT/year	conversion calculation		2	10 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/beanchlongsjv2005.pdf	Chinese long bean
					fertilizer gal-weight conversion		http://www.agry.purdue.edu/ext/corn/news/articles.02/Fert_Math-0326.html	

Corn

	value	units	source	notes/questions/assumptions				
area harvested in 2008, bearing	6,494	acres	1	assumes 20% decrease from 2008	91.36	342 lb/ac @ 8%; 200 lb/ac	http://coststudies.ucdavis.edu/files/cornsilagevs08_3.pdf	silage, reduced till, double cropped
area harvested in 2008, non-bearing		acres	1		164	200lb/ac @ 10%;180lbs/ac @ 80%	http://coststudies.ucdavis.edu/files/cornsilagevs2008.pdf	silage, double cropped
area harvested in 2008, bearing and non-bearing	6,494	acres	1		60.1	151 lb/ac @ 10%; 225 lb/ac @ 20%	http://coststudies.ucdavis.edu/files/CornSV2008.pdf	field, mineral soil
Nitrogen application rate for fertilization of established plantings, bearing	103	lb/acre	18		96.8	200lb/ac @ 10%; 240 lbs/ac	http://coststudies.ucdavis.edu/files/CornVS08_2.pdf	grain/field corn
Total nitrogen applied	669,345	lb/year	calculation					
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm					
Total nitrogen applied	303.6	MT/year	conversion calculation					

Wheat

	value	units	source	notes/questions/assumptions
area harvested in 2008, irrigated	24,733	acres	1	assumes 35% decrease from 2008 and 2,826 acres of field crops converted to development
area harvested in 2008, dryland		acres	1	
area harvested in 2008, bearing and non-bearing	24,733	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	220	lb/acre	20	
Total nitrogen applied	5,441,194	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	2,468.1	MT/year	conversion calculation	

Hay

	value	units	source	notes/questions/assumptions			
area harvested in 2008, alfalfa	69,485	acres	1	assumes 25% increase in alfalfa and 1,403 acres converted to develo	150 lb/ac @ 11%; 75 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfa300sjv2008.pdf	est and production alfalfa
area harvested in 2008, grain (and safflower)	24,262	acres	1	assumes 20% decrease in safflower	151 lb/ac @ 11%; 75 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfa50sjv2008.pdf	est and production alfalfa
area harvested in 2008, grass	0	acres	1		100 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfa_im_scott2007.pdf	hay, mixed irrigation alfalfa
area harvested in 2008, bearing and non-bearing	93,746	acres	1		100 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfaim_butte2007.pdf	hay, center pivot irrigation alfalfa
Nitrogen application rate for fertilization of established plantings, alfalfa	18	lb/acre			no need	http://coststudies.ucdavis.edu/files/alfalfaorg2007.pdf	organic alfalfa, est and production
Nitrogen application rate for fertilization of established plantings, grain	80	lb/acre			100 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/AlfalfaSV08.pdf	alfalfa
Nitrogen application rate for fertilization of established plantings, dryland	12	lb/acre			80 lbs/ac	http://coststudies.ucdavis.edu/files/grainhay_ir2007.pdf	grain hay
Total nitrogen applied - alfalfa	1,242,035	lb/year	calculation		60 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/oathaysv05.pdf	dryland
Total nitrogen applied - grain	1,940,928						
Total nitrogen applied - dryland	0						
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm				
Total nitrogen applied	563.4	MT/year	conversion calculation				

Mixed Vegetables/Bell Peppers

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	104	lb/acre		http://coststudies.ucdavis.edu/files/MixedVegIR09.pdf
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Tomatoes

	value	units	source	notes/questions/assumptions				
area harvested in 2008, bearing	23,852	acres	1	assumes 35% decrease from 2008 and 569 acres convert	280.2	100 lb/ac @ 11%; 15lb/ac @ 8%; 150 lb/ac @ 32%	http://coststudies.ucdavis.edu/files/tomatoessv1_2008.pdf	processing tomatoes
area harvested in 2008, non-bearing		acres	1		155.13	1000lb/ac @ 8%;41.3lb/ac @ 10%; 70lb/ac @32%	http://coststudies.ucdavis.edu/files/tomatofrmktsj07.pdf	fresh market
area harvested in 2008, bearing and non-bearing	23,852	acres	1		177.6	100lb/ac @11%; 15gal/ac @8%; 20lb/ac @17%;15	http://coststudies.ucdavis.edu/files/tomatods_sv2007.pdf	processing
Nitrogen application rate for fertilization of established plantings, bearing	204	lb/acre	18	Used Cost Study for oranges as surrogate	10	10 lb/ac @20%	http://coststudies.ucdavis.edu/files/tomatochsjv2004.pdf	cherry
Total nitrogen applied	4,873,233	lb/year	calculation					
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm					
Total nitrogen applied	2,210.5	MT/year	conversion calculation					

Apricots/Pluots

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	125	lb/acre	18	Used Plums as surrogate
Nitrogen application rate for fertilization of established plantings, non-bearing	60			non-bear assumed to be trees 1-3 years old
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Barley

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	30,416	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	30,416	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	80	lb/acre	18	Use Hay-Grain as surrogate
Total nitrogen applied	2,433,280	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	1,103.7	MT/year	conversion calculation	

Rice

	value	units	source	notes/questions/assumptions		
area harvested in 2008, bearing	34,068	acres	1	assumes 20% increase from 2008 and 2,000 acres conver	185.625	Sac Valley North (rotation)
area harvested in 2008, non-bearing		acres	1		121.5	Sac Valley North (continuous)
area harvested in 2008, bearing and non-bearing	34,068	acres	1		121.5	Sac Valley North (2-yr rotation)
Nitrogen application rate for fertilization of established plantings, bearing	143	lb/acre	22			
Total nitrogen applied	4,867,523	lb/year	calculation			
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm			
Total nitrogen applied	2,207.9	MT/year	conversion calculation			

Asparagus

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	90	lb/acre	21	
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Pecans

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	211	lb/acre		
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Misc Fruits (apples, apricots, blackberries, blueberries, cherries, chestnuts, citrus, figs, kiwi, nectarines, olives, oranges, peaches, pears, pecans, persimmons, pistachios, pomegranate, strawberries, table grapes, melons, cabbage, cantaloupes, corn, cucumbers, lettuce, peppers, pumpkins, squash, sweet corn, tomatoes (fresh), watermelon, and other truck crops)

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	6,539	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	6,539	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	120	lb/acre		
Total nitrogen applied	786,903	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	356.9	MT/year	conversion calculation	

Oat				
	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	60	lb/acre		
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Pasture				
	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	139,748	acres	1	assumes 9,027 acres converted to development
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	139,748	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	88	lb/acre	http://coststudies.ucdavis.edu/files/pastureir2008.pdf	
Total nitrogen applied	12,297,824	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	5,578.2	MT/year	conversion calculation	

Christmas Tree (Propagative and Nursery Stock)				
	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	20	lb/acre	http://coststudies.ucdavis.edu/files/christmastreesn2005.pdf	
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

	Covell	Dunnigan	Elkhorn	Esparto	Knights Landing	Madison	Wetlands	Other Unincorporated	TOTAL
2020									
Units									
Population									
Jobs									
Acres									
2030									
New Homes	0	4,144	1,653	787	464	707	0	1,745	9,500
Population	0	11,189	4,463	2,125	1,253	1,909	0	4,253	25,651
New Jobs	0	5,877	2,112	424	416	1,050	0	4,887	14,766
Jobs/Housing Balance	0	1.4	1.3	0.5	0.9	1.5	0	2.8	1.6
Acres Developed									
Residential	0	588	0	106	58	63	0	3,938	4,753
Comm/Ind	0	350	127	27	26	65	0	881	1,476
Public/quasi-public	0	162	20	0	51	25	0	0	258
Ag Comm/Ind	0	0	0	0	0	22	0	13	35
Parks/Open Space	0	172	35	11	0	32	0	513	763
Wetlands	0	0	0	0	0	0	10,000	0	10,000
TOTAL	0	1,272	182	144	135	207	10,000	5,345	17,285
Acres of Ag Lost									
Field crops	0	650	142	40	54	46	0	1,894	2,826
Pasture/rangeland	0	100	0	47	16	46	8,000	818	9,027
Alfalfa	0	200	0	15	27	115	0	1,046	1,403
Tomatoes	0	0	40	0	0	0	0	529	569
Orchards	0	275	0	10	8	0	0	529	822
Nursery	0	25	0	0	0	0	0	0	25
Seed	0	0	0	0	0	0	0	529	529
Rice	0	0	0	0	0	0	2,000	0	2,000
Vacant	0	22	0	32	30	0	0	0	84
TOTAL	0	1,272	182	144	135	207	10,000	5,345	17,285
2040									
Units									
Population									
Jobs									
Acres									
2050									
Units									
Population									
Jobs									
Acres									
TOTAL									

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Fertilizer Application/Soil Management Summary

Crop Type	Nitrogen Applied Per Year (lbs/yr)	Nitrogen Applied Per Year (tons/yr)	Grams Applied Per Year	Nitrogen Emitted as N2O	Total GHG Emissions (MT CO2e/yr)
Almonds	28,000	14	12,700,800	158,760	47
Wine Grapes/Kiwi	1,842	1	835,380	10,442	3
Walnuts	20,000	10	9,072,000	113,400	34
Prunes	15,000	8	6,804,000	85,050	25
Pears, Bartlett	20,000	10	9,072,000	113,400	34
Pears, Others/Persimmons	20,000	10	9,072,000	113,400	34
Apples	2,100	1	952,560	11,907	4
Apricots	12,500	6	5,670,000	70,875	21
Cherries	15,372	8	6,972,739	87,159	26
Figs	7,500	4	3,402,000	42,525	13
Kiwi	12,034	6	5,458,622	68,233	20
Nectarines	15,100	8	6,849,360	85,617	25
Olives	9,000	5	4,082,400	51,030	15
Peaches (Freestone)	15,100	8	6,849,360	85,617	25
Pluots/Apricots	12,500	6	5,670,000	70,875	21
Rice	14,288	7	6,480,810	81,010	24
Pistachio Nuts	20,000	10	9,072,000	113,400	34
Plums	12,500	6	5,670,000	70,875	21
Tangerines	11,000	6	4,989,600	62,370	18
Tomatoes	20,431	10	9,267,502	115,844	34
Asparagus	9,000	5	4,082,400	51,030	15
Misc Vegetables	10,400	5	4,717,440	58,968	17
Misc Fruits	12,034	6	5,458,622	68,233	20
Barley	8,000	4	3,628,800	45,360	13
Beans	11,000	6	4,989,600	62,370	18
Corn (and Milo)	10,307	5	4,675,028	58,438	17
Hay - Alfalfa	894	0	405,405	5,068	1
Hay - Grain	4,000	2	1,814,400	22,680	7
Oat and Misc Field Crop	6,000	3	2,721,600	34,020	10
Pasture	8,800	4	3,991,680	49,896	15
Propogative and Nursery	2,044	1	927,360	11,592	3
Wheat	22,000	11	9,979,200	124,740	37
Total	**388,745**	**194**	**176,334,669**	**2,204,183**	**652**

Nitrogen Emitted As N_2O (g/g)	0.0125	g/g	IPCC. N2O: Direct Emissions From Agricultural Soils. Available: <http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/4_5_N2O_Agricultural_Soils.pdf>
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Almonds

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	Is fertilizer applied to non-bearing acreage? Need to ask Ag Commissioner.
area harvested in 2008, non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	280	lb/acre	2	It is assumed that the average age of bearing orchards is 6 years or older.
Nitrogen application rate for fertilization of established plantings, non-bearing	53	lb/acre	2	It is assumed that the average age of non-bearing plantings is 4 years.
Total nitrogen applied	28,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	12.7	MT/year	conversion calculation	

Wine Grapes

	value	units	source	notes/questions/assumptions			
area harvested in 2008, bearing	100	acres	1				
area harvested in 2008, non-bearing		acres	1				
area harvested in 2008, bearing and non-bearing	100	acres	summation		12	Intermountain (Shasta-Trinity)	2005
						North Coast (Napa) organic	2005
Nitrogen application rate for fertilization of established plantings, Chardonnay	18	lb/acre	3		12	San Joaquin N&S	2005
Total nitrogen applied	1,842	lb/year	calculation		10	North Coast (Lake)	2008
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm		40	Sac/Yolo	2008
Total nitrogen applied	0.8	MT/year	conversion calculation				

Walnuts

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing	0	acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	5	This guide for purchase at http://anrcatalog.ucdavis.edu/Nuts/21623.aspx may also be useful.
Nitrogen application rate for fertilization of established plantings, non-bearing	57			
Total nitrogen applied	20,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	9.1	MT/year	conversion calculation	

Pears, Bartlett

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	7	
Nitrogen application rate for fertilization of established plantings, non bearing	52			
Total nitrogen applied	20,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	9.1	MT/year	conversion calculation	

Pears, Others/Persimmons

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	8	
Nitrogen application rate for fertilization of established plantings, non bearing	52			
Total nitrogen applied	20,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	9.1	MT/year	conversion calculation	

Apples

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	21	lb/acre	9	Using El Dorado County application rates
Total nitrogen applied	2,100	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	1.0	MT/year	conversion calculation	

Cherries

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	Assume cherry trees are 10+ years for maximum fertilizer application
area harvested in 2008, non-bearing		acres	1	Assumes non-bearing trees are 1-3 years old and use average of 1-3 year application rates
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	154	lb/acre	10	
Nitrogen application rate for fertilization of established plantings, non-bearing	15	lb/acre	10	
Total nitrogen applied	15,372	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	7.0	MT/year	conversion calculation	

Figs

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	75	lb/acre	11	Average of Mission and Calimyrna application rate for 5+ year old trees
Total nitrogen applied	7,500	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	3.4	MT/year	conversion calculation	

Nectarines

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	151	lb/acre	12	Use application rate of 4+ year old trees
Total nitrogen applied	15,100	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	6.8	MT/year	conversion calculation	

Olives

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	90	lb/acre	13	Used average application rate from San Joaquin and Sacramento Valley reports
Total nitrogen applied	9,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	4.1	MT/year	conversion calculation	

Peaches

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	151	lb/acre	14	Used application rate from 4+ year old trees
Nitrogen application rate for fertilization of established plantings, non-bearing	53	lb/acre	14	Used average application rate for 1-3 year old trees
Total nitrogen applied	15,100	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	6.8	MT/year	conversion calculation	

Pistachios

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	15	Used application rate from 7+ year old trees
Total nitrogen applied	20,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	9.1	MT/year	conversion calculation	

Plums

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	125	lb/acre	15	Used application rate from 4+ year old trees
Total nitrogen applied	12,500	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	5.7	MT/year	conversion calculation	

Prunes

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	150	lb/acre	17	
Total nitrogen applied	15,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	6.8	MT/year	conversion calculation	

Tangerines

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	110	lb/acre	18	Used Cost Study for oranges as surrogate
Total nitrogen applied	11,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	5.0	MT/year	conversion calculation	

Beans

	value	units	source	notes/questions/assumptions			
area harvested in 2008, bearing	100	acres	1		no fertilizer needed	http://coststudies.ucdavis.edu/files/beansvs2_2008.pdf	blackeye double
area harvested in 2008, non-bearing		acres	1		no fertilizer needed	http://coststudies.ucdavis.edu/files/beansvs1_2008.pdf	blackeye single
area harvested in 2008, bearing and non-bearing	100	acres	1		32.36 209 lb/ac @ 4%; 120 lb/ac @ 20%	http://coststudies.ucdavis.edu/files/beansdryvn2005.pdf	common dry double
Nitrogen application rate for fertilization of established plantings, bearing	110	lb/acre	19	Used Blackeye, common dry, green, and Chinese long beans	29.6 20 gal/ac @ 8%; 60 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/Beans_SC_SV08.pdf	single cropped
Total nitrogen applied	11,000	lb/year	calculation		33.6 21 gal/ac @ 8%; 80 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/Beans_DC_SV08.pdf	double cropped
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm		90.3 500 lbs/ac @ 15%; 90lbs/ac @17%	http://coststudies.ucdavis.edu/files/beangrsjv2005-1.pdf	green blue lake
Total nitrogen applied	5.0	MT/year	conversion calculation		2 10 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/beanchlongsjv2005.pdf	Chinese long bean
					fertilizer gal-weight conversion	http://www.agry.purdue.edu/ext/corn/news/articles.02/Fert_Math-0326.html	

Corn

	value	units	source	notes/questions/assumptions			
area harvested in 2008, bearing	100	acres	1		91.36 342 lb/ac @ 8%; 200 lb/ac	http://coststudies.ucdavis.edu/files/cornsilagevs08_3.pdf	silage, reduced till, double cropped
area harvested in 2008, non-bearing		acres	1		164 200lb/ac @ 10%;180lbs/ac @ 80%	http://coststudies.ucdavis.edu/files/cornsilagevs2008.pdf	silage, double cropped
area harvested in 2008, bearing and non-bearing	100	acres	1		60.1 151 lb/ac @ 10%; 225 lb/ac @ 20%	http://coststudies.ucdavis.edu/files/CornSV2008.pdf	field, mineral soil
Nitrogen application rate for fertilization of established plantings, bearing	103	lb/acre	18		96.8 200lb/ac @ 10%; 240 lbs/ac	http://coststudies.ucdavis.edu/files/CornVS08_2.pdf	grain/field corn
Total nitrogen applied	10,307	lb/year	calculation				
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm				
Total nitrogen applied	4.7	MT/year	conversion calculation				

Wheat

	value	units	source	notes/questions/assumptions
area harvested in 2008, irrigated	100	acres	1	
area harvested in 2008, dryland		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	220	lb/acre	20	
Total nitrogen applied	22,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	10.0	MT/year	conversion calculation	

Hay

	value	units	source	notes/questions/assumptions			
area harvested in 2008, alfalfa	50	acres	1		150 lb/ac @ 11%; 75 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfa300sjv2008.pdf	est and production alfalfa
area harvested in 2008, grain (and safflower)	50	acres	1		151 lb/ac @ 11%; 75 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfa50sjv2008.pdf	est and production alfalfa
area harvested in 2008, grass	0	acres	1		100 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfa_im_scott2007.pdf	hay, mixed irrigation alfalfa
area harvested in 2008, bearing and non-bearing	100	acres	1		100 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfaim_butte2007.pdf	hay, center pivot irrigation alfalfa
Nitrogen application rate for fertilization of established plantings, alfalfa	18	lb/acre			no need	http://coststudies.ucdavis.edu/files/alfalfaorg2007.pdf	organic alfalfa, est and production
Nitrogen application rate for fertilization of established plantings, grain	80	lb/acre			100 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/AlfalfaSV08.pdf	alfalfa
Nitrogen application rate for fertilization of established plantings, dryland	12	lb/acre			80 lbs/ac	http://coststudies.ucdavis.edu/files/grainhay_ir2007.pdf	grain hay
Total nitrogen applied - alfalfa	894	lb/year	calculation		60 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/oathaysv05.pdf	dryland
Total nitrogen applied - grain	4,000						
Total nitrogen applied - dryland	0						
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm				
Total nitrogen applied	0.4	MT/year	conversion calculation				

Mixed Vegetables/Bell Peppers

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	104	lb/acre		http://coststudies.ucdavis.edu/files/MixedVegIR09.pdf
Total nitrogen applied	10,400	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	4.7	MT/year	conversion calculation	

Tomatoes

	value	units	source	notes/questions/assumptions				
area harvested in 2008, bearing	100	acres	1		280.2	100 lb/ac @ 11%; 15lb/ac @ 8%; 150 lb/ac @ 32%	http://coststudies.ucdavis.edu/files/tomatoessv1_2008.pdf	processing tomatoes
area harvested in 2008, non-bearing		acres	1		155.13	1000lb/ac @ 8%;41.3lb/ac @ 10%; 70lb/ac @32%	http://coststudies.ucdavis.edu/files/tomatofrmktsj07.pdf	fresh market
area harvested in 2008, bearing and non-bearing	100	acres	1		177.6	100lb/ac @11%; 15gal/ac @8%; 20lb/ac @17%;15	http://coststudies.ucdavis.edu/files/tomatods_sv2007.pdf	processing
Nitrogen application rate for fertilization of established plantings, bearing	204	lb/acre	18	Used Cost Study for oranges as surrogate	10	10 lb/ac @20%	http://coststudies.ucdavis.edu/files/tomatochsjv2004.pdf	cherry
Total nitrogen applied	20,431	lb/year	calculation					
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm					
Total nitrogen applied	9.3	MT/year	conversion calculation					

Apricots/Pluots

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	125	lb/acre	18	Used Plums as surrogate
Nitrogen application rate for fertilization of established plantings, non-bearing	60			non-bear assumed to be trees 1-3 years old
Total nitrogen applied	12,500	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	5.7	MT/year	conversion calculation	

Barley

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	80	lb/acre	18	Use Hay-Grain as surrogate
Total nitrogen applied	8,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	3.6	MT/year	conversion calculation	

Rice

	value	units	source	notes/questions/assumptions		
area harvested in 2008, bearing	100	acres	1		185.625	Sac Valley North (rotation)
area harvested in 2008, non-bearing		acres	1		121.5	Sac Valley North (continuous)
area harvested in 2008, bearing and non-bearing	100	acres	1		121.5	Sac Valley North (2-yr rotation)
Nitrogen application rate for fertilization of established plantings, bearing	143	lb/acre	22			
Total nitrogen applied	14,288	lb/year	calculation			
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm			
Total nitrogen applied	6.5	MT/year	conversion calculation			

Asparagus

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	90	lb/acre	21	
Total nitrogen applied	9,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	4.1	MT/year	conversion calculation	

Pecans

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	211	lb/acre		
Total nitrogen applied	21,104	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	9.6	MT/year	conversion calculation	

Misc Fruits (apples, apricots, blackberries, blueberries, cherries, chestnuts, citrus, figs, kiwi, nectarines, olives, oranges, peaches, pears, pecans, persimmons, pistachios, pomegranate, strawberries, table grapes, melons, cabbage, cantaloupes, corn, cucumbers, lettuce, peppers, pumpkins, squash, sweet corn, tomatoes (fresh), watermelon, and other truck crops)

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	120	lb/acre		
Total nitrogen applied	12,034	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	5.5	MT/year	conversion calculation	

Oat				
	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	60	lb/acre		
Total nitrogen applied	6,000	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	2.7	MT/year	conversion calculation	

Pasture				
	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	88	lb/acre	http://coststudies.ucdavis.edu/files/pastureir2008.pdf	
Total nitrogen applied	8,800	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	4.0	MT/year	conversion calculation	

Christmas Tree (Propagative and Nursery Stock)				
	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	100	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	100	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	20	lb/acre	http://coststudies.ucdavis.edu/files/christmastreesn2005.pdf	
Total nitrogen applied	2,044	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.9	MT/year	conversion calculation	

Agricultural GHG Emissions - Residue Burning

Yolo County Greenhouse Gas Emissions Inventory - 2008

Residue Burning

Crop	Total Acres Harvested (acre/yr)	Residue Burned (tons/acre)	Moisture Content	Percent Acres Burned	Residue Burned (tons/yr)	Emission Factors (ton/ton burned) CO2	CH4	N2O	Total CO2E Emissions (MT
Corn	100	4.2	0.086	0.03	1.08	1.31	1.75E-03	1.00E-04	1
Rice	100	3	0.086	0.16	4.13	1.16	7.20E-04	2.00E-04	5
Almonds	100	1	0.183	0.84	15.37	1.83	1.17E-03	2.00E-04	27
Walnuts	100	1.2	0.331	0.95	37.73	1.64	1.64E-03	2.00E-04	59
Wheat	100	1.9	0.073	0.11	1.53	1.19	1.82E-03	1.00E-04	2
Barley	100	1.7	0.069	0.07	0.82	1.17	2.47E-03	2.00E-04	1
Total					**60.66**				**95**

Conversion Factor:

1 MT 1.1023 ton

GWP

Methane (CH_4) 23

Nitrous Oxide (N_2O) 296

Sources

California Air Resources Board. 2008 Greenhouse Gas Emissions Inventory: Agriculture and Forestry. Ag Residue Burned.

Yolo County 2008 Agricultural Crop Report

Agricultural GHG Emissions - Rice Cultivation

Yolo County Greenhouse Gas Emissions Inventory - 2008

Rice Cultivation

Acres of Rice	Hectares of Rice	Rice Field Emission Factor (g CH4/hectare)	Total GHG Emission (MT CO2e/yr)
100	40	122,000	114

Sources

California Air Resources Board. 2008 Greenhouse Gas Emissions Inventory: Agriculture and Forestry. CH4 from Harvested Rice Area.

Yolo County 2008 Agricultural Crop Report

GHG Emissions/100 acres by crop type

Crop Type	MT CO2e/100 acres/year
Almonds	74
Wine Grapes/Kiwi	3
Walnuts	93
Prunes	25
Pears, Bartlett	34
Pears, Others/Persimmons	34
Apples	4
Apricots	21
Cherries	26
Figs	13
Kiwi	20
Nectarines	25
Olives	15
Peaches (Freestone)	25
Pluots/Apricots	21
Rice	142
Pistachio Nuts	34
Plums	21
Tangerines	18
Tomatoes	34
Asparagus	15
Misc Vegetables	17
Misc Fruits	20
Barley	14
Beans	18
Corn (and Milo)	19
Hay - Alfalfa	1
Hay - Grain	7
Oat and Misc Field Crop	10
Pasture	15
Propogative and Nursery	3
Wheat	39

Sources

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Fertilizer Application/Soil Management Summary

Crop Type	Nitrogen Applied Per Year (lbs/yr)	Nitrogen Applied Per Year (tons/yr)	Grams Applied Per Year	Nitrogen Emitted as N2O	Total GHG Emissions (MT CO2e/yr)
Almonds	3,411,787	1,706	1,547,586,432	19,344,830	5,726
Wine Grapes/Kiwi	58,473	29	26,523,315	331,541	98
Walnuts	1,973,903	987	895,362,552	11,192,032	3,313
Prunes	315,300	158	143,020,080	1,787,751	529
Pears, Bartlett	0	0	0	0	0
Pears, Others/Persimmons	0	0	0	0	0
Apples	0	0	0	0	0
Apricots	0	-	0	-	-
Cherries	0	0	0	0	0
Figs	0	0	0	0	0
Kiwi	0	-	0	-	-
Nectarines	0	0	0	0	0
Olives	0	0	0	0	0
Peaches (Freestone)	0	0	0	0	0
Pluots/Apricots	0	0	0	0	0
Rice	4,294,394	2,147	1,947,937,062	24,349,213	7,207
Pistachio Nuts	0	0	0	0	0
Plums	0	0	0	0	0
Tangerines	0	0	0	0	0
Tomatoes	7,676,131	3,838	3,481,893,026	43,523,663	12,883
Asparagus	0	0	0	0	0
Misc Vegetables	0	0	0	0	0
Misc Fruits	786,903	393	356,939,319	4,461,741	1,321
Barley	2,433,280	1,217	1,103,735,808	13,796,698	4,084
Beans	0	0	0	0	0
Corn (and Milo)	836,682	418	379,518,806	4,743,985	1,404
Hay - Alfalfa	1,013,691	507	459,810,351	5,747,629	1,701
Hay - Grain	2,426,160	1,213	1,100,506,176	13,756,327	4,072
Oat and Misc Field Crop	0	0	0	0	0
Pasture	13,092,200	6,546	5,938,621,920	74,232,774	21,973
Propogative and Nursery	0	0	0	0	0
Wheat	9,327,560	4,664	4,230,981,216	52,887,265	15,655
Total	**47,646,464**	**23,823**	**21,612,436,062**	**270,155,451**	**79,966**

Nitrogen Emitted As N_2O (g/g)	0.0125	g/g	IPCC. N2O: Direct Emissions From Agricultural Soils. Available: <http://www.ipcc-nggip.iges.or.jp/public/gp/bgp/4_5_N2O_Agricultural_Soils.pdf>
Global Warming Potential of N2O	296	N20:CO2	Intergovernmental Panel on Climate Change. 2001. Climate Change 2001: The Scientific Basis. Geneva, Switzerland. Available: <http://www.ipcc.ch/ipccreports/tar/>. *in* Table C.1 of California Climate Action Registry. 2009 (January). California Climate Action Registry General Reporting Protocol, Version 3.1. Los Angeles, CA. Available: <http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf>. Last updated January 2009.

Almonds

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	11,464	acres	1	Is fertilizer applied to non-bearing acreage? Need to ask Ag Commissioner.
area harvested in 2008, non-bearing	3,785	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	280	lb/acre	2	It is assumed that the average age of bearing orchards is 6 years or older.
Nitrogen application rate for fertilization of established plantings, non-bearing	53	lb/acre	2	It is assumed that the average age of non-bearing plantings is 4 years.
Total nitrogen applied	3,411,787	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	1,547.6	MT/year	conversion calculation	

Wine Grapes

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	3,175	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	3,175	acres	summation	
Nitrogen application rate for fertilization of established plantings, Chardonnay	18	lb/acre	3	
Total nitrogen applied	58,473	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	26.5	MT/year	conversion calculation	

12	Intermountain (Shasta-Trinity)	2005
	North Coast (Napa) organic	2005
12	San Joaquin N&S	2005
10	North Coast (Lake)	2008
40	Sac/Yolo	2008

Walnuts

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	8,911	acres	1	
area harvested in 2008, non-bearing	3,383	acres	1	
area harvested in 2008, bearing and non-bearing	12,294	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	5	This guide for purchase at http://anrcatalog.ucdavis.edu/Nuts/21623.aspx may also be useful.
Nitrogen application rate for fertilization of established plantings, non-bearing	57			
Total nitrogen applied	1,973,903	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	895.3	MT/year	conversion calculation	

Pears, Bartlett

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	7	
Nitrogen application rate for fertilization of established plantings, non bearing	52			
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Pears, Others/Persimmons

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	8	
Nitrogen application rate for fertilization of established plantings, non bearing	52			
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Apples

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	21	lb/acre	9	Using El Dorado County application rates
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Cherries

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	Assume cherry trees are 10+ years for maximum fertilizer application
area harvested in 2008, non-bearing		acres	1	Assumes non-bearing trees are 1-3 years old and use average of 1-3 year application rates
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	154	lb/acre	10	
Nitrogen application rate for fertilization of established plantings, non-bearing	15	lb/acre	10	
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Figs

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	75	lb/acre	11	Average of Mission and Calimyrna application rate for 5+ year old trees
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Nectarines

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	151	lb/acre	12	Use application rate of 4+ year old trees
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Olives

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	90	lb/acre	13	Used average application rate from San Joaquin and Sacramento Valley reports
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Peaches

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	151	lb/acre	14	Used application rate from 4+ year old trees
Nitrogen application rate for fertilization of established plantings, non-bearing	53	lb/acre	14	Used average application rate for 1-3 year old trees
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Pistachios

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	200	lb/acre	15	Used application rate from 7+ year old trees
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Plums

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	125	lb/acre	15	Used application rate from 4+ year old trees
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Prunes

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	2,102	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	2,102	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	150	lb/acre	17	
Total nitrogen applied	315,300	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	143.0	MT/year	conversion calculation	

Tangerines

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing		acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	110	lb/acre	18	Used Cost Study for oranges as surrogate
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Beans

	value	units	source	notes/questions/assumptions				
area harvested in 2008, bearing	0	acres	1			no fertilizer needed	http://coststudies.ucdavis.edu/files/beansvs2_2008.pdf	blackeye double
area harvested in 2008, non-bearing		acres	1			no fertilizer needed	http://coststudies.ucdavis.edu/files/beansvs1_2008.pdf	blackeye single
area harvested in 2008, bearing and non-bearing	0	acres	1		32.36	209 lb/ac @ 4%; 120 lb/ac @ 20%	http://coststudies.ucdavis.edu/files/beansdryvn2005.pdf	common dry double
Nitrogen application rate for fertilization of established plantings, bearing	110	lb/acre	19	Used Blackeye, common dry, green, and Chinese long beans	29.6	20 gal/ac @ 8%; 60 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/Beans_SC_SV08.pdf	single cropped
Total nitrogen applied	0	lb/year	calculation		33.6	21 gal/ac @ 8%; 80 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/Beans_DC_SV08.pdf	double cropped
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm		90.3	500 lbs/ac @ 15%; 90lbs/ac @17%	http://coststudies.ucdavis.edu/files/beangrsjv2005-1.pdf	green blue lake
Total nitrogen applied	0.0	MT/year	conversion calculation		2	10 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/beanchlongsjv2005.pdf	Chinese long bean
					fertilizer gal-weight conversion		http://www.agry.purdue.edu/ext/corn/news/articles.02/Fert_Math-0326.html	

Corn

	value	units	source	notes/questions/assumptions				
area harvested in 2008, bearing	8,118	acres	1		91.36	342 lb/ac @ 8%; 200 lb/ac	http://coststudies.ucdavis.edu/files/cornsilagevs08_3.pdf	silage, reduced till, double cropped
area harvested in 2008, non-bearing		acres	1		164	200lb/ac @ 10%;180lbs/ac @ 80%	http://coststudies.ucdavis.edu/files/cornsilagevs2008.pdf	silage, double cropped
area harvested in 2008, bearing and non-bearing	8,118	acres	1		60.1	151 lb/ac @ 10%; 225 lb/ac @ 20%	http://coststudies.ucdavis.edu/files/CornSV2008.pdf	field, mineral soil
Nitrogen application rate for fertilization of established plantings, bearing	103	lb/acre	18		96.8	200lb/ac @ 10%; 240 lbs/ac	http://coststudies.ucdavis.edu/files/CornVS08_2.pdf	grain/field corn
Total nitrogen applied	836,682	lb/year	calculation					
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm					
Total nitrogen applied	379.5	MT/year	conversion calculation					

Wheat

	value	units	source	notes/questions/assumptions
area harvested in 2008, irrigated	42,398	acres	1	
area harvested in 2008, dryland		acres	1	
area harvested in 2008, bearing and non-bearing	42,398	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	220	lb/acre	20	
Total nitrogen applied	9,327,560	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	4,230.9	MT/year	conversion calculation	

Hay

	value	units	source	notes/questions/assumptions			
area harvested in 2008, alfalfa	56,710	acres	1		150 lb/ac @ 11%; 75 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfa300sjv2008.pdf	est and production alfalfa
area harvested in 2008, grain (and safflower)	30,327	acres	1		151 lb/ac @ 11%; 75 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfa50sjv2008.pdf	est and production alfalfa
area harvested in 2008, grass	0	acres	1		100 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfa_im_scott2007.pdf	hay, mixed irrigation alfalfa
area harvested in 2008, bearing and non-bearing	87,037	acres	1		100 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/alfalfaim_butte2007.pdf	hay, center pivot irrigation alfalfa
Nitrogen application rate for fertilization of established plantings, alfalfa	18	lb/acre			no need	http://coststudies.ucdavis.edu/files/alfalfaorg2007.pdf	organic alfalfa, est and production
Nitrogen application rate for fertilization of established plantings, grain	80	lb/acre			100 lb/ac @ 11%	http://coststudies.ucdavis.edu/files/AlfalfaSV08.pdf	alfalfa
Nitrogen application rate for fertilization of established plantings, dryland	12	lb/acre			80 lbs/ac	http://coststudies.ucdavis.edu/files/grainhay_ir2007.pdf	grain hay
Total nitrogen applied - alfalfa	1,013,691	lb/year	calculation		60 lbs/ac @ 20%	http://coststudies.ucdavis.edu/files/oathaysv05.pdf	dryland
Total nitrogen applied - grain	2,426,160						
Total nitrogen applied - dryland	0						
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm				
Total nitrogen applied	459.8	MT/year	conversion calculation				

Mixed Vegetables/Bell Peppers

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	104	lb/acre		http://coststudies.ucdavis.edu/files/MixedVegIR09.pdf
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Tomatoes

	value	units	source	notes/questions/assumptions				
area harvested in 2008, bearing	37,571	acres	1		280.2	100 lb/ac @ 11%; 15lb/ac @ 8%; 150 lb/ac @ 32%	http://coststudies.ucdavis.edu/files/tomatoessv1_2008.pdf	processing tomatoes
area harvested in 2008, non-bearing		acres	1		155.13	1000lb/ac @ 8%;41.3lb/ac @ 10%; 70lb/ac @32%	http://coststudies.ucdavis.edu/files/tomatofrmktsj07.pdf	fresh market
area harvested in 2008, bearing and non-bearing	37,571	acres	1		177.6	100lb/ac @11%; 15gal/ac @8%; 20lb/ac @17%;15	http://coststudies.ucdavis.edu/files/tomatods_sv2007.pdf	processing
Nitrogen application rate for fertilization of established plantings, bearing	204	lb/acre	18	Used Cost Study for oranges as surrogate	10	10 lb/ac @20%	http://coststudies.ucdavis.edu/files/tomatochsjv2004.pdf	cherry
Total nitrogen applied	7,676,131	lb/year	calculation					
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm					
Total nitrogen applied	3,481.8	MT/year	conversion calculation					

Apricots/Pluots

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	125	lb/acre	18	Used Plums as surrogate
Nitrogen application rate for fertilization of established plantings, non-bearing	60			non-bear assumed to be trees 1-3 years old
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Barley

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	30,416	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	30,416	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	80	lb/acre	18	Use Hay-Grain as surrogate
Total nitrogen applied	2,433,280	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	1,103.7	MT/year	conversion calculation	

Rice

	value	units	source	notes/questions/assumptions		
area harvested in 2008, bearing	30,057	acres	1		185.625	Sac Valley North (rotation)
area harvested in 2008, non-bearing		acres	1		121.5	Sac Valley North (continuous)
area harvested in 2008, bearing and non-bearing	30,057	acres	1		121.5	Sac Valley North (2-yr rotation)
Nitrogen application rate for fertilization of established plantings, bearing	143	lb/acre	22			
Total nitrogen applied	4,294,394	lb/year	calculation			
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm			
Total nitrogen applied	1,947.9	MT/year	conversion calculation			

Asparagus

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	90	lb/acre	21	
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Pecans

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	211	lb/acre		
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Misc Fruits (apples, apricots, blackberries, blueberries, cherries, chestnuts, citrus, figs, kiwi, nectarines, olives, oranges, peaches, pears, pecans, persimmons, pistachios, pomegranate, strawberries, table grapes, melons, cabbage, cantaloupes, corn, cucumbers, lettuce, peppers, pumpkins, squash, sweet corn, tomatoes (fresh), watermelon, and other truck crops)

	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	6,539	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	6,539	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	120	lb/acre		
Total nitrogen applied	786,903	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	356.9	MT/year	conversion calculation	

Oat				
	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	60	lb/acre		
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Pasture				
	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	148,775	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	148,775	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	88	lb/acre	http://coststudies.ucdavis.edu/files/pastureir2008.pdf	
Total nitrogen applied	13,092,200	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	5,938.5	MT/year	conversion calculation	

Christmas Tree (Propagative and Nursery Stock)				
	value	units	source	notes/questions/assumptions
area harvested in 2008, bearing	0	acres	1	
area harvested in 2008, non-bearing		acres	1	
area harvested in 2008, bearing and non-bearing	0	acres	1	
Nitrogen application rate for fertilization of established plantings, bearing	20	lb/acre	http://coststudies.ucdavis.edu/files/christmastreesn2005.pdf	
Total nitrogen applied	0	lb/year	calculation	
weight conversion	0.000454	lb/MT	http://www.onlineconversion.com/weight.htm	
Total nitrogen applied	0.0	MT/year	conversion calculation	

Construction & Mining

Yolo County Greenhouse Gas Emissions Inventory - 2008

GHG	Emissions (tons/day)	Emissions (MT/yr)
Carbon Dioxide (CO_2)	88	29,123
Methane (CH_4)	0	4
Nitrous Oxide (N_2O)	0	0
CO_2E	88	**29,271**

OFFROAD 2007: Annual 2008 Construction & Mining Equipment in Yolo County

GWP	
Methane (CH_4)	23
Nitrous Oxide (N_2O)	296

Yolo County Greenhouse Gas Emissions Inventory - 2030

GHG	Emissions (tons/day)	Emissions (MT/yr)
Carbon Dioxide (CO_2)	119	39,467
Methane (CH_4)	0	2
Nitrous Oxide (N_2O)	0	0
CO_2E	119	**39,558**

OFFROAD 2007: Annual 2030 Construction & Mining Equipment in Yolo County

GWP	
Methane (CH_4)	23
Nitrous Oxide (N_2O)	296

Energy Consumption

Yolo County Greenhouse Gas Emissions Inventory - 2008

			Emission Factors and GWP (lb/MWh delivered), (kg/MMBtu)						
fuel		**units**	**CO_2**	**GWP**	**N_2O**	**GWP**	**CH_4**	**GWP**	**Total County-wide Emissions (MTCO2e/yr)**
electricity	**265,121**	MWH/yr	724.12	1	0.0081	296	0.0302	23	87,452
natural gas	**1,765,715**	MMBtu/yr	53.06	1	0.0001	296	0.005	23	93,944
Total									**181,396**

Source:
CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

	2008 Consumption		
Sector	**Electricity (kWh)**	**Natural Gas (therms)**	**Natural Gas (therms)**
Residential	70,428,483	1,642,157	
Commercial	193,030,014	16,014,993	
Industrial*			275,119,419
Direct Access	1,662,411		
Total 2008 Consumption	265,120,908	17,657,150	

Source: PG&E.

* if value is not reported in industrial, usage is incorporated into commercial due to 15/15 rule.
The 15/15 rule requires that any aggregated information provided by the utility must be madeup of at least 15 customers and a single customer's load must be less than 15% of the total data for each category.

Conversion Factors

1,029	Btu	1	scf natural gas		
1	MMBtu	1,000,000	Btu		
2,205	lb	1	MT	1,000	kg
1	therm	100,000	Btu		

RATE DATA ANALYSIS: GHG_PHASE1 GAS AND ELECTRIC GHG SUMMARY FOR INC CITIES AND UNINC PORTIONS OF YOLO COUNTY

TOTCITY	YEAR	CATEGORY	RES ELEC AVG(KWH)	RES ELEC USE(KWH)	RES ELEC CO2(metric tonnes)	RES ELEC CLIM USE(KWH)	RES ELEC CLIM(lbs)	COM ELEC AVG(KWH)	COM ELEC USE(KWH)	COM ELEC CO2(metric tonnes)	COM ELEC CLIM USE(KWH)	COM ELEC CLIM(lbs)	IND ELEC AVG(KWH)	IND ELEC USE(KWH)	IND ELEC CO2(metric tonnes)	IND ELEC CLIM USE(KWH)	IND ELEC CLIM(lbs)	IND ELEC 1515
DAVIS	2008	(3) COUNTY	110	73,927	21			5,894	707,479	206								
DAVIS	2008	Non-County	496	156,719,281	45,567	850,114	445,460		112,185,135	32,618	1,126,559	590,317						
UNINC YOLO COUNTY	2008	(3) COUNTY	100	4,848	1			3,801	4,011,592	1,166								
UNINC YOLO COUNTY	2008	Non-County		70,242,538	20,423	291,530	152,762		177,534,448	51,620	119,071	62,393						
WEST SACRAMENTO	2008	(3) COUNTY	1,370	82,210	24			8,941	1,755,658	510								
WEST SACRAMENTO	2008	Non-County		120,255,422	34,965	417,914	218,987		336,162,196	97,741	7,093,422	3,716,953	459,313	5,511,755	1,603			
WINTERS	2008	(3) COUNTY						1,768	42,422	12								
WINTERS	2008	Non-County	669	17,617,849	5,122	41,163	21,569		14,801,244	4,303								
WOODLAND	2008	(3) COUNTY	2,080	24,960	7			11,507	8,978,415	2,611								
WOODLAND	**2008**	**Non-County**		**141,031,379**	**41,006**	**512,312**	**268,451**		**204,052,508**	**59,329**	**292,609**	**153,327**						

Total Yolo County	Electricity (KWH/yr)	Natural Gas (Therms/yr)
R	70,428,483	1,642,157
C	193,030,014	16,014,993
I		0
DA	1,662,411	
Total	**265,120,908**	**17,657,150**
CO2	56,178	1,553,790

* Please note that natural gas transported by a pipeline in Yolo County that is not consumed in Yolo County was excluded (Husband [SMUD], pers comm. August 10, 2010)

RATE DATA ANALYSIS: GHG_PHASE1 GAS AND ELECTRIC GHG SUMMARY FOR INC CITIES AND UNINC PORTIONS OF YOLO COUNTY

TOTCITY	YEAR	CATEGORY	DA KWH	RES GAS AVG(THM)	RES GAS USE(THM)	RES GAS CO2(metric tonnes)	RES GAS CLIM USE(THM)	RES GAS CLIM(lbs)	COM GAS AVG(THM)	COM GAS USE(THM)	COM GAS CO2(metric tonnes)	COM GAS CLIM USE(THM)	COM GAS CLIM(lbs)	IND GAS AVG(THM)	IND GAS USE(THM)	IND GAS CO2(metric tonnes)	IND GAS CLIM USE(THM)	IND GAS CLIM(lbs)	IND GAS 1515
DAVIS	2008	(3) COUNTY							376	9,034	48								
DAVIS	2008	Non-County	19,009,716	32	9,032,346	47,935	44,934	604,183		3,161,153	16,777	66,703	896,889						
UNINC YOLO COUNTY	2008	(3) COUNTY		1	1	0			474	68,310	363								
UNINC YOLO COUNTY	2008	Non-County	1,662,411		1,635,174	8,678	5,534	74,410		14,896,042	79,055				275,119,419	1,460,082			
WEST SACRAMENTO	2008	(3) COUNTY		582	6,982	37			309	27,216	144								
WEST SACRAMENTO	2008	Non-County			6,814,811	36,167	19,078	256,523		5,921,267	31,425	72,347	972,778						
WINTERS	2008	(3) COUNTY							109	1,312	7								
WINTERS	2008	Non-County		35	855,918	4,542	1,685	22,657		196,667	1,044								
WOODLAND	2008	(3) COUNTY							2,450	1,013,079	5,376								
WOODLAND	**2008**	**Non-County**			**7,750,473**	**41,133**	**23,655**	**318,065**		**11,555,865**	**61,328**	**9,626**	**129,431**						

Total Yolo County	Electricity (KWH/yr)	Natural Gas (Therms/yr)
R	70,428,483	1,642,157
C	193,030,014	16,014,993
I		0
DA	1,662,411	
Total	**265,120,908**	**17,657,150**
CO2	56,178	1,553,790

Energy Consumption

Yolo County Greenhouse Gas Emissions Inventory - Projections

2030

fuel		units	Emission Factors and GWP (lb/MWh delivered), (kg/MMBtu) CO_2	GWP	N_2O	GWP	CH_4	GWP	Total County-wide Emissions (MTCO2e/yr)
electricity	**1,599,502**	MWH/yr	724.12	1	0.0081	296	0.0302	23	527,609
natural gas	**1,891,830**	MMBtu/yr	53.06	1	0.0001	296	0.005	23	100,654
Total									**628,263**

Sources:

Yolo County 2030 General Plan Update. 2009 (April). Utilities Chapter. Prepared by LSA.

CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

	2030 Consumption		
Sector	**Electricity (kWh)**	**Natural Gas (therms)**	**Natural Gas (therms)**
Residential		1,932,238	
Commercial		16,986,064	
Industrial*			
Direct Access			
Total 2030 Consumption	2,118,827,000	18,918,302	

Source: PG&E.

Energy Information Administration. 2010. Pacific Region. Available: http://www.eia.doe.gov/oiaf/aeo/supplement/supref.html

Conversion Factors

1,029	Btu	1	scf natural gas		
1	MMBtu	1,000,000	Btu		
2,205	lb	1	MT	1,000	kg
1	therm	100,000	Btu		

Department of Energy - Energy Information Administration

Report Annual Energy Outlook 2010
Scenario aeo2010r Reference case
Datekey d111809a
Release Date December 2009

Table 9. Energy Consumption by Sector and Source

(quadrillion Btu, unless otherwise noted)
Pacific

Sector and Source	*Annual Growth Rate (%/yr between 2008-2030)*	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2008-2035
Residential																															
Liquefied Petroleum Gases		0.037	0.037	0.035	0.036	0.035	0.034	0.033	0.032	0.032	0.031	0.031	0.030	0.030	0.029	0.029	0.029	0.028	0.028	0.028	0.027	0.027	0.027	0.026	0.026	0.026	0.026	0.025	0.025	0.025	-1.5%
Kerosene		0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	-4.4%
Distillate Fuel Oil		0.019	0.019	0.018	0.019	0.018	0.017	0.017	0.016	0.015	0.015	0.015	0.014	0.014	0.013	0.013	0.012	0.012	0.012	0.011	0.011	0.010	0.010	0.010	0.009	0.009	0.009	0.008	0.008	0.008	-3.3%
Liquid Fuels Subtotal		0.058	0.058	0.055	0.056	0.054	0.052	0.051	0.049	0.048	0.047	0.046	0.045	0.044	0.043	0.042	0.042	0.041	0.040	0.039	0.039	0.038	0.037	0.037	0.036	0.035	0.035	0.034	0.034	0.033	-2.1%
Natural Gas	**0.8%**	0.645	0.659	0.646	0.664	0.660	0.665	0.672	0.681	0.690	0.699	0.705	0.712	0.720	0.729	0.734	0.740	0.747	0.757	0.763	0.768	0.771	0.775	0.774	0.776	0.778	0.781	0.780	0.781	0.783	0.6%
Coal		0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.9%
Renewable Energy 1/		0.053	0.056	0.052	0.051	0.048	0.050	0.051	0.052	0.053	0.053	0.054	0.054	0.055	0.055	0.056	0.056	0.056	0.057	0.057	0.057	0.057	0.058	0.058	0.058	0.059	0.060	0.060	0.060	0.060	0.3%
Electricity	**0.7%**	0.509	0.519	0.517	0.512	0.527	0.529	0.516	0.513	0.513	0.517	0.521	0.527	0.534	0.539	0.543	0.548	0.554	0.562	0.567	0.574	0.580	0.587	0.591	0.596	0.602	0.608	0.612	0.617	0.622	0.7%
Delivered Energy		**1.266**	**1.293**	**1.270**	**1.283**	**1.290**	**1.296**	**1.290**	**1.296**	**1.304**	**1.317**	**1.326**	**1.339**	**1.353**	**1.367**	**1.375**	**1.386**	**1.399**	**1.417**	**1.427**	**1.438**	**1.447**	**1.458**	**1.461**	**1.467**	**1.475**	**1.484**	**1.486**	**1.492**	**1.499**	**0.5%**
Electricity Related Losses		0.789	0.822	0.842	0.886	0.925	0.968	0.994	0.991	1.002	1.006	1.015	1.025	1.034	1.028	1.040	1.042	1.049	1.074	1.089	1.096	1.122	1.122	1.131	1.137	1.148	1.159	1.161	1.163	1.169	1.3%
Total		**2.055**	**2.116**	**2.112**	**2.169**	**2.214**	**2.265**	**2.284**	**2.288**	**2.307**	**2.323**	**2.341**	**2.364**	**2.387**	**2.395**	**2.415**	**2.428**	**2.447**	**2.491**	**2.516**	**2.534**	**2.568**	**2.580**	**2.591**	**2.604**	**2.623**	**2.643**	**2.647**	**2.655**	**2.668**	**0.9%**
Commercial																															
Liquefied Petroleum Gases		0.007	0.007	0.006	0.006	0.006	0.006	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.2%
Motor Gasoline 2/		0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.5%
Kerosene		0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	-0.5%
Distillate Fuel Oil		0.025	0.024	0.023	0.020	0.020	0.021	0.020	0.020	0.020	0.020	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.018	0.018	0.018	0.018	0.018	-1.1%
Residual Fuel Oil		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	6.0%
Liquid Fuels Subtotal		0.037	0.035	0.033	0.030	0.031	0.032	0.031	0.031	0.031	0.031	0.031	0.031	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	-0.6%
Natural Gas	**0.3%**	0.359	0.368	0.363	0.366	0.365	0.363	0.363	0.366	0.367	0.368	0.369	0.370	0.371	0.371	0.373	0.374	0.376	0.380	0.384	0.385	0.386	0.387	0.389	0.390	0.391	0.393	0.395	0.396	0.398	0.3%
Coal		0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.0%
Renewable Energy 3/		0.015	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.0%
Electricity	**1.4%**	0.600	0.604	0.590	0.600	0.616	0.626	0.628	0.633	0.640	0.650	0.659	0.670	0.680	0.689	0.699	0.708	0.718	0.728	0.739	0.749	0.760	0.770	0.780	0.790	0.801	0.811	0.821	0.832	0.843	1.2%
Delivered Energy		**1.017**	**1.031**	**1.011**	**1.020**	**1.037**	**1.046**	**1.047**	**1.054**	**1.063**	**1.073**	**1.084**	**1.094**	**1.106**	**1.116**	**1.126**	**1.137**	**1.149**	**1.163**	**1.178**	**1.190**	**1.201**	**1.212**	**1.224**	**1.236**	**1.247**	**1.258**	**1.270**	**1.283**	**1.296**	**0.8%**
Electricity Related Losses		0.929	0.956	0.961	1.038	1.080	1.147	1.211	1.222	1.250	1.264	1.285	1.302	1.317	1.315	1.338	1.346	1.359	1.391	1.418	1.431	1.469	1.471	1.492	1.507	1.527	1.545	1.559	1.569	1.583	1.9%
Total		**1.947**	**1.987**	**1.972**	**2.059**	**2.117**	**2.194**	**2.258**	**2.276**	**2.314**	**2.337**	**2.368**	**2.396**	**2.422**	**2.430**	**2.465**	**2.483**	**2.508**	**2.555**	**2.596**	**2.621**	**2.670**	**2.683**	**2.716**	**2.743**	**2.774**	**2.803**	**2.830**	**2.852**	**2.878**	**1.4%**
Industrial 4/																															
Liquefied Petroleum Gases		0.009	0.009	0.009	0.003	0.004	0.003	0.004	0.004	0.003	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.006	0.007	0.007	0.007	0.007	0.007	0.007	0.008	0.008	0.008	0.010	0.011	0.011	0.6%
Motor Gasoline 2/		0.034	0.033	0.034	0.033	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.1%
Distillate Fuel Oil		0.118	0.110	0.101	0.097	0.102	0.107	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.107	0.107	0.106	0.107	0.107	0.107	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.107	-0.1%
Residual Fuel Oil		0.005	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-13.2%
Petrochemical Feedstocks		0.036	0.031	0.029	0.025	0.031	0.027	0.030	0.030	0.028	0.029	0.029	0.029	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.029	0.029	0.029	0.028	-0.4%
Other Petroleum 5/		0.633	0.598	0.578	0.684	0.741	0.735	0.746	0.743	0.751	0.787	0.819	0.822	0.832	0.838	0.845	0.847	0.842	0.841	0.844	0.850	0.825	0.823	0.824	0.831	0.830	0.831	0.845	0.809	0.846	1.3%
Liquid Fuels Subtotal		0.835	0.786	0.756	0.842	0.912	0.907	0.921	0.918	0.924	0.962	0.993	0.997	1.007	1.014	1.021	1.023	1.018	1.019	1.021	1.027	1.002	1.000	1.001	1.008	1.008	1.008	1.024	0.989	1.026	1.0%
Natural Gas	**-0.8%**	0.914	0.890	0.720	0.723	0.724	0.747	0.772	0.788	0.785	0.757	0.728	0.724	0.722	0.723	0.717	0.710	0.714	0.719	0.718	0.714	0.734	0.734	0.733	0.729	0.727	0.724	0.723	0.761	0.729	-0.7%
Natural-Gas-to-Liquids Heat and Power		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	- -
Lease and Plant Fuel 6/		0.337	0.332	0.316	0.303	0.290	0.279	0.269	0.262	0.255	0.249	0.244	0.243	0.246	0.245	0.247	0.247	0.304	0.367	0.367	0.375	0.370	0.367	0.361	0.361	0.358	0.357	0.356	0.360	0.353	0.2%
Natural Gas Subtotal		1.251	1.222	1.036	1.025	1.013	1.026	1.041	1.050	1.041	1.006	0.971	0.966	0.968	0.967	0.964	0.956	1.019	1.086	1.085	1.089	1.104	1.101	1.094	1.090	1.085	1.081	1.080	1.121	1.082	-0.4%
Metallurgical Coal		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	- -
Other Industrial Coal		0.050	0.048	0.038	0.038	0.039	0.041	0.043	0.044	0.044	0.044	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.044	0.044	0.044	0.044	-0.3%
Coal-to-Liquids Heat and Power		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.041	0.061	- -
Net Coal Coke Imports		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	- -
Coal Subtotal		0.050	0.048	0.038	0.038	0.039	0.041	0.043	0.044	0.044	0.044	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.044	0.064	0.085	0.105	3.0%
Biofuels Heat and Coproducts		0.003	0.036	0.022	0.019	0.016	0.016	0.017	0.018	0.019	0.026	0.044	0.064	0.063	0.093	0.094	0.116	0.111	0.111	0.111	0.110	0.110	0.110	0.113	0.113	0.113	0.118	0.156	0.178	0.178	6.2%
Renewable Energy 7/		0.122	0.109	0.101	0.102	0.108	0.113	0.116	0.118	0.120	0.122	0.124	0.126	0.127	0.129	0.130	0.130	0.131	0.132	0.134	0.136	0.137	0.137	0.138	0.139	0.140	0.140	0.141	0.143	0.144	1.0%
Electricity	**0.4%**	0.306	0.293	0.275	0.274	0.283	0.291	0.297	0.300	0.303	0.305	0.307	0.309	0.312	0.314	0.315	0.314	0.315	0.315	0.316	0.317	0.318	0.318	0.318	0.318	0.319	0.319	0.320	0.321	0.323	0.4%
Delivered Energy		**2.567**	**2.493**	**2.228**	**2.299**	**2.372**	**2.395**	**2.435**	**2.448**	**2.451**	**2.465**	**2.484**	**2.507**	**2.523**	**2.563**	**2.568**	**2.585**	**2.638**	**2.708**	**2.712**	**2.725**	**2.716**	**2.711**	**2.708**	**2.713**	**2.709**	**2.711**	**2.786**	**2.837**	**2.857**	**0.5%**
Electricity Related Losses		0.474	0.464	0.448	0.474	0.496	0.534	0.572	0.580	0.591	0.593	0.598	0.601	0.605	0.600	0.603	0.597	0.596	0.603	0.607	0.606	0.614	0.607	0.607	0.607	0.608	0.608	0.608	0.606	0.607	1.0%
Total		**3.041**	**2.957**	**2.677**	**2.773**	**2.867**	**2.929**	**3.008**	**3.028**	**3.043**	**3.058**	**3.082**	**3.109**	**3.128**	**3.163**	**3.172**	**3.183**	**3.233**	**3.311**	**3.320**	**3.331**	**3.330**	**3.318**	**3.316**	**3.320**	**3.316**	**3.319**	**3.395**	**3.443**	**3.464**	**0.6%**

Projections: EIA, AEO2010 National Energy Modeling System run aeo2010r.d111809a.

Solid Waste

Yolo County Greenhouse Gas Emissions Inventory - 2008

Yolo County Central Landfill

Waste Disposed	tons/yr	
Total	254,793	Source: YCCL's Joint Technical Document, 2007
Unincorporated County-Disposed	21,371	Source: Yolo County Planning and Public Works Division of Integrated Waste Management 2010.

GHG Emissions

$Q_{CH4} = 1.3Lo\ R(e^{-kc} - e^{-kt})$

where:

Q_{CH4} = Methane generation rate [m3/yr]

Lo = Methane generation potential [m3 CH4/Mg of "wet" refuse]	100	default
R = Average annual refuse acceptance rate during active life of landfill [Mg of "wet" refuse/yr]		
k = Methane generation rate constant [yr^{-1}]	0.02	for regions receiving < 25 inches of rain/year
c = Time since landfill closure [yrs] (c = 0 for active landfill)	0	
t = Time since initial refuse placement [yrs]	33	

Source: EPA 2008. AP-42 Compilation of Emission Factors. Chapter 2.4 Solid Waste Disposal

Facility			**Jurisdiction**		
Yolo County Central Landfill	17,644,296	m3 CH4/yr	Unincorporated	1,479,932	m3/yr
	12,603	MT CH4/yr		1,057	MT CH4/yr
Methane Capture Efficiency	75%			75%	
	81,920	**MT CO2e/yr**		**6,871**	**MT CO2e/yr**

Conversion Factors

	1	MT	0.907	tons	1,000,000 g
	1	Mg	1	MT	
	1000	L	1	m3	
Ideal Gas Law	22.4	L/mol			
molecular weight of CH4	16	g/mol			

GWP

Methane (CH4)	23
Nitrous Oxide (N2O)	296

Solid Waste

Yolo County Greenhouse Gas Emissions Inventory - 2030

Yolo County Central Landfill

Waste Disposed	tons/yr	
Total	254,793	Source: YCCL's Joint Technical Document, 2007
Unincorporated County-Disposed	10,389	Assumes 75% diversion of total waste generated; 25% is disposed
Unincorporated County-Generated	41,557	Source: Yolo County General Plan Update EIR. 2009 (April). Prepared by LSA. Assumes 75% of General Plan Buildout in 2030

GHG Emissions

$Q_{CH4} = 1.3Lo\ R(e^{-kc} - e^{-kt})$

where:

Q_{CH4} = Methane generation rate [m3/yr]

Lo = Methane generation potential [m3 CH4/Mg of "wet" refuse]	100	default
R = Average annual refuse acceptance rate during active life of landfill [Mg of "wet" refuse/yr]		
k = Methane generation rate constant [yr^{-1}]	0.02	for regions receiving < 25 inches of rain/year
c = Time since landfill closure [yrs] (c = 0 for active landfill)	0	
t = Time since initial refuse placement [yrs]	55	

Source: EPA 2008. AP-42 Compilation of Emission Factors. Chapter 2.4 Solid Waste Disposal

Facility			**Jurisdiction**		
Yolo County Central Landfill	24,363,143	m3 CH4/yr	Unincorporated	3,973,645	m3/yr
	17,402	MT CH4/yr		2,838	MT CH4/yr
Methane Capture Efficiency	75%			75%	
	113,115	**MT CO2e/yr**		**18,449**	**MT CO2e/yr**

Conversion Factors

	1	MT	0.907	tons	1,000,000	g	2204 lb
	1	Mg	1	MT			
	1000	L	1	m3			
Ideal Gas Law	22.4	L/mol					
molecular weight of CH4	16	g/mol					

GWP

Methane (CH4)	23
Nitrous Oxide (N2O)	296

Waste Disposed in Yolo County (in tons)				
Year	**County Total**	**UCD Total**	**YCCL Total**	**Unincorporated County Only**
2000	178,368	13,296	165,072	27,207
2001	178,132	12,260	165,872	26,858
2002	177,058	12,075	164,983	26,986
2003	189,740	11,338	178,402	28,310
2004	195,910	12,904	183,006	28,139
2005	210,758	13,651	197,107	29,301
2006	191,919	11,846	180,073	25,868
2007	183,437	11,628	171,809	23,825
2008	192,733	10,437	182,296	21,371
2009	209,552	10,767	198,785	20,412

Source: Yolo County Planning and Public Works Division of Integrated Waste Management 2010.

Stationary Sources

Yolo County Greenhouse Gas Emissions Inventory - 2008

Industrial Equipment

GHG	Emissions (tons/day)	Emissions (MT/yr)
Carbon Dioxide (CO_2)	17	5,679
Methane (CH_4)	0	4
Nitrous Oxide (N_2O)	0	0
CO_2e	18	**5,880**

Source: OFFROAD 2007: Annual 2008 Industrial Equipment in Yolo County

Industrial Facilities **8,220**

see YSAQMD data worksheet

Agricultural Processing **16,483**

see Ag Processing worksheet
Assumes 324 acres ag industrial land uses (Table 4 Appendix B GP FEIR)

Total **30,583**

Yolo County Greenhouse Gas Emissions Inventory - 2030

Industrial Equipment

GHG	Emissions (tons/day)	Emissions (MT/yr)
Carbon Dioxide (CO_2)	16	5,331
Methane (CH_4)	0	2
Nitrous Oxide (N_2O)	0	0
CO_2e	16	**5,454**

Source: OFFROAD 2007: Annual 2030 Industrial Equipment in Yolo County

Industrial Facilities **8,220**

see YSAQMD data worksheet

Agricultural Processing **18,264**

% increase in Ag Industrial land use 10.8%
Assumes 35 additional acres of ag processing is developed under 2030 GP

Total **31,938**

GWP

Methane (CH_4)	23
Nitrous Oxide (N_2O)	296

Conversion Factors

1	MMBtu	1,000,000	Btu
1	therm	100,000	Btu

Sources

CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Stationary Sources - Permitted Sources

Yolo County Greenhouse Gas Emissions Inventory - 2008

CO	AB	DIS	FACID	FNAME	FSTREET	FCITY	FZIP	FSIC	DEV	PROID	SIC	SCC	SICN	SCC1N	SCC3N	SCC6N	SCC8N	CONF	SCCUN	PR	PRDESC	Consumption	Units	Emission Factor	Units	GHG Emissions (MT/CO2e/yr)	TOGT	ROGT	VOCT	COT	NOXT	SOXT	PMT	PM10T	PM2_5T	NH3T
57	SV	YS	803	AT&T	26120 COUNTY	DUNNIGAN	95937	4813	49	1	4813	20100102	TELEPHONE CO	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATIN	N	1000 GALLONS BURNED	1.15	BACK-UP POWER	1,150	gal/yr	0.01	MT CO2e/gal/yr	12	0.011951715	0.01	0.01	0.03	0.24	0	0	0	0	0
57	SV	YS	803	AT&T	26120 COUNTY	DUNNIGAN	95937	4813	1049	1	4813	20100102	TELEPHONE CO	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.6	EMERGENCY BACK-UP POWER	600	gal/yr	0.01	MT CO2e/gal/yr	6	0	0	0	0.02	0.13	0	0	0	0	0
57	SV	YS	844	BALD MOUNTAIN COMMUNICATIONS	3 MI N. E. OF T	YOLO COUNTY		4813	49	1	4813	20100902	TELEPHONE CO	INTERNLCOMB	ELECTRIC GENERATN	KERONAPTHA JET FI	RECIPROCATIN	Y	1000 GALLONS BURNED	0	BACK-UP POWER	-	gal/yr	0.01	MT CO2e/gal/yr	-	0	0	0	0	0	0	0	0	0	0
57	SV	YS	89	BOLA MARKETS II, INC.	17776 COUNTY	MADISON	95653	5541	1	1	5541	40600403	GASOLINE SER\	PETROLEUM M	SERVICE STATIONS	STAGE II	VAPOR-CONTROLLED		1000 GALLONS TRANSFERRE	315.738	GASOLINE STORAGE & DISPENSING						0.281039847	0.28	0.28	0	0	0	0	0	0	0
57	SV	YS	1007	CALIFORNIA DEPARTMENT OF TRANSP	17240 YOLO A\	ESPARTO	95627	9621	43	1	9621	40600706	REG, ADMIN OI	PETROLEUM M	CORP FLEET REFUELII	STAGE I	BALANCED SUB FILLING		1000 GALS TRANSFERRED	1.923	GASOLINE STORAGE & DISPENSING						0	0	0	0	0	0	0	0	0	0
57	SV	YS	1452	CAPAY CANYON RANCH	14650 COUNTY	YOLO COUNTY		723	62	1	723	30201713	CROP PREPARA	FOOD/AGRICUI	NUT PROCESSING	ALMONDS	HULL RMVL/SEPARATION		TONS FIELD WEIGHT	114	ALMOND PROCESS OPERATION						0	0	0	0	0	0	0.514285714	0.36	0.216	0
57	SV	YS	1648	CAPITOL OIL CORPORATION	SECTION 8, TO\	YOLO COUNTY		1311	42	1	1311	31000302	CRUDE PETRO /	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER BURNER STK		MILLION CUBIC FEET OF GAS	73.93	NATURAL GAS DEHYDRATION SYSTEM						0	0	0	0	0	0	0	0	0	0
57	SV	YS	1579	CAPITOL OIL CORPORATION	SECTION 30, TC	YOLO COUNTY		1311	49	1	1311	20100202	CRUDE PETRO /	INTERNLCOMB	ELECTRIC GENERATN	NATURAL GAS	RECIPROCATING		MILLION CUBIC FEET	1.9242007	COMPRESSOR	1,980	MMBTu/yr	0.05	MT CO2e/MMBtu/yr	105	3.172866521	0.29	0.29	5.18	0.29	0.01	0.010060362	0.01	0.009979879	0
57	SV	YS	582	CITIZENS TELECOMMUNICATIONS CON	52961 NETHER	CLARKSBURG	95612	4939	49	1	4939	20100102	COMBINATION	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.002	BACK-UP POWER	2	gal/yr	0.01	MT CO2e/gal/yr	0	0	0	0	0	0	0	0	0	0	0
57	SV	YS	1462	CLARKSBURG INVESTMENT PROPERTIE	35265 WILLOW	CLARKSBURG	95612	2084	1049	1	2084	20100102	WINES, BRAND	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.002	IC ENGINE	2	gal/yr	0.01	MT CO2e/gal/yr	0	0	0	0	0	0	0	0	0	0	0
57	SV	YS	1462	CLARKSBURG INVESTMENT PROPERTIE	35265 WILLOW	CLARKSBURG	95612	2084	49	1	2084	20100102	WINES, BRAND	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.002	IC ENGINE	2	gal/yr	0.01	MT CO2e/gal/yr	0	0	0	0	0	0	0	0	0	0	0
57	SV	YS	228	COUNTY LINE WAREHOUSE	1075 HIGHWA\	DUNNIGAN	95937	723	27	1	723	30200604	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	DRYING		TONS GRAIN PROCESSED	5000	SECTION NO. 5: RICE DRYING						0.014314343	0.01	0.01	0.07	0.57	0	9.851851852	5.32	3.940740741	0
57	SV	YS	228	COUNTY LINE WAREHOUSE	1075 HIGHWA\	DUNNIGAN	95937	723	1081	1	723	30200606	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	LOADING		TONS GRAIN PROCESSED	6000	WAREHOUSING-SHIPPING						0	0	0	0	0	0	3.379310345	0.98	0.033793103	0
57	SV	YS	228	COUNTY LINE WAREHOUSE	1075 HIGHWA\	DUNNIGAN	95937	723	81	1	723	30200605	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	UNLOADING		TONS GRAIN PROCESSED	6000	WHEAT/RICE RECEIVING						0	0	0	0	0	0	0.965517241	0.28	0.009655172	0
57	SV	YS	228	COUNTY LINE WAREHOUSE	1075 HIGHWA\	DUNNIGAN	95937	723	15	1	723	30200603	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	CLEANING		TONS GRAIN PROCESSED	1500	GRAIN CLEANING						0	0	0	0	0	0	0.931034483	0.27	0.009310345	0
57	SV	YS	1290	COUNTY OF YOLO, PARKS DIVISION	1475 STATE HI(	YOLO	95697	7033	49	1	7033	20100902	TRAILERING PA	INTERNLCOMB	ELECTRIC GENERATN	KERONAPTHA JET FI	RECIPROCATING		1000 GALLONS BURNED	1.133	BACK-UP POWER	1,133	gal/yr	0.01	MT CO2e/gal/yr	11	0.022419011	0.02	0.02	0.26	0.02	0	0	0	0	0
57	SV	YS	1064	CPN PIPELINE COMPANY	COUNTY ROAD:	YOLO COUNTY		1311	42	1	1311	31000227	CRUDE PETRO /	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER STILL STACK		MILLION CUBIC FEET OF GAS	2030.984	NAT'L GAS DEHYDRATION						0.032467532	0.01	0.01	0	0	0	0	0	0	0
57	SV	YS	194	EL MACERO COUNTRY CLUB	44571 CLUBHO	EL MACERO	95618	7997	43	1	7997	40600706	MEMBERSHIP S	PETROLEUM M	CORP FLEET REFUELII	STAGE I	BALANCED SUB FILLING		1000 GALS TRANSFERRED	5.335	GASOLINE STORAGE & DISPENSING						0.014314343	0.01	0.01	0	0	0	0	0	0	0
57	SV	YS	1146	ELECTRIC LIGHTWAVE	8194 COUNTY I	KNIGHTS LAND	95645	4813	49	1	4813	20201001	TELEPHONE CO	INTERNLCOMB	INDUSTRIAL	PROPANE	RECIPROCATING		1000 GALLONS BURNED	228.5	BACK-UP POWER	228,500	gal/yr	0.01	MT CO2e/gal/yr	1,324	0	0	0	0.88	0.01	0	0	0	0	0
57	SV	YS	1103	ESPARTO COMMUNITY SERVICES DISTF	500' WEST OF (	ESPARTO	95627	4941	49	1	4941	20100102	WATER SUPPLY	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.193	EMERGENCY BACK-UP POWER	193	gal/yr	0.01	MT CO2e/gal/yr	2	0	0	0	0.01	0.01	0	0	0	0	0
57	SV	YS	1102	FARMERS GRAIN ELEVATOR	29039 CR 26	MADISON	95653	723	153	1	723	30200802	CROP PREPARA	FOOD/AGRICUI	FEED MANUFACTURE	OTHER GRAIN FEED	GRAIN RECEIVING		TONS GRAIN RECEIVED	2839	WAREHOUSING-RECEIVING FEED GRAIN STORAGE						0	0	0	0	0	0	0.448275862	0.13	0.004482759	0
57	SV	YS	1102	FARMERS GRAIN ELEVATOR	29039 CR 26	MADISON	95653	723	1153	1	723	30200803	CROP PREPARA	FOOD/AGRICUI	FEED MANUFACTURE	OTHER GRAIN FEED	SHIPPING		TONS GRAIN RECEIVED	6497	GRAIN SHIPPING/STORAGE						0	0	0	0	0	0	0.724137931	0.21	0.007241379	0
57	SV	YS	490	FARMERS GRAIN ELEVATOR	SECTION 27, TC	YOLO	95697	723	2081	1	4221	30200605	FARM PRODUC	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	UNLOADING		TONS GRAIN PROCESSED	4936	SHIPPING/STORAGE/RECEIVING						0	0	0	0	0	0	0.551724138	0.16	0.005517241	0
57	SV	YS	490	FARMERS GRAIN ELEVATOR	SECTION 27, TC	YOLO	95697	723	15	1	2044	30200603	RICE MILLING	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	CLEANING	Y	TONS GRAIN PROCESSED	2050	RECEIVING/CLEANING/SHIPPING/STORING						0	0	0	0	0	0	0.482758621	0.14	0.004827586	0
57	SV	YS	490	FARMERS GRAIN ELEVATOR	SECTION 27, TC	YOLO	95697	723	1081	1	723	30200605	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	UNLOADING		TONS GRAIN PROCESSED	1512	RECEIVING/SHIPPING/STORAGE						0	0	0	0	0	0	1.24137931	0.36	0.012413793	0
57	SV	YS	490	FARMERS GRAIN ELEVATOR	SECTION 27, TC	YOLO	95697	723	81	1	723	30200605	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	UNLOADING	Y	TONS GRAIN PROCESSED	15292	GRAIN STORAGE SILOS						0	0	0	0	0	0	1.034482759	0.3	0.010344828	0
57	SV	YS	489	FARMERS GRAIN ELEVATOR	COUNTY ROAD	YOLO COUNTY		2044	81	1	723	30200605	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	UNLOADING		TONS GRAIN PROCESSED	10166	RECEIVING/SHIPING TO RAILCARS						0	0	0	0	0	0	0.172413793	0.05	0.001724138	0
57	SV	YS	489	FARMERS GRAIN ELEVATOR	COUNTY ROAD	YOLO COUNTY		2044	153	1	2044	30200611	RICE MILLING	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	GENERAL	Y	TONS GRAIN SHIPPED OR RE(	0	GRAIN WAREHOUSING						0	0	0	0	0	0	0	0	0	0
57	SV	YS	1014	FEDERAL AVIATION ADMINISTRATION	0.45 MI WEST (	CLARKSBURG		9621	49	1	9621	20100902	REG, ADMIN OI	INTERNLCOMB	ELECTRIC GENERATN	KERONAPTHA JET FI	RECIPROCATING		1000 GALLONS BURNED	0.33	BACK-UP POWER	330	gal/yr	0.01	MT CO2e/gal/yr	3	0	0	0	0.01	0	0	0	0	0	0
57	SV	YS	512	FIVE RIVERS HULLING	COUNTY ROAD	YOLO COUNTY		723	62	1	723	30201713	CROP PREPARA	FOOD/AGRICUI	NUT PROCESSING	ALMONDS	HULL RMVL/SEPARATION		TONS FIELD WEIGHT	1300	ALMOND HULLING AND SEPARATING						0	0	0	0	0	0	3.428571429	2.4	1.44	0
57	SV	YS	1082	GRANITE CONSTRUCTION COMPANY	15560 COUNTY	ESPARTO	95607	1442	2	1	1442	30502511	CONSTRUCTIOI	MINING OPERA	NONMETALLIC MINR	SAND/GRAVEL	SCREENING	Y	TONS PRODUCT PRODUCED	956312	AGGREGATE PROCESSING						0	0	0	0	0	0	15.96	7.98	1.197	0
57	SV	YS	1074	HALEH AMIRI DBA DUNNIGAN STATIOI	4040 COUNTY I	DUNNIGAN	95937	5541	43	1	5541	40600403	GASOLINE SER\	PETROLEUM M	SERVICE STATIONS	STAGE II	VAPOR-CONTROLLED		1000 GALLONS TRANSFERRE	1080.692	GASOLINE STORAGE/DISPENSING						0.953528054	0.95	0.95	0	0	0	0	0	0	0
57	SV	YS	1212	J-W POWER COMPANY	TODD HUNTER,	YOLO COUNTY		1311	49	1	1311	20200202	CRUDE PETRO /	INTERNLCOMB	INDUSTRIAL	NATURAL GAS	RECIPROCATING		MILLION CUBIC FEET	10.9814	POWER FOR NATURAL GAS COMPF	11,300	MMBTu/yr	0.05	MT CO2e/MMBtu/yr	601	29.32166302	2.68	2.68	10.1	1.08	0.08	0.060362173	0.06	0.059879276	0
57	SV	YS	1212	J-W POWER COMPANY	TODD HUNTER,	YOLO COUNTY		1311	1049	1	1311	20200202	CRUDE PETRO /	INTERNLCOMB	INDUSTRIAL	NATURAL GAS	RECIPROCATING		MILLION CUBIC FEET	14.0984	POWER FOR NATURAL GAS COMPF	14,507	MMBTu/yr	0.05	MT CO2e/MMBtu/yr	772	37.63676149	3.44	3.44	12.96	1.38	0.1	0.070422535	0.07	0.069859155	0
57	SV	YS	845	MCI COMMUNICATION SERVICES, INC.	7985 COUNTY I	DUNNIGAN	95937	4813	49	1	4813	20100902	TELEPHONE CO	INTERNLCOMB	ELECTRIC GENERATN	KERONAPTHA JET FI	RECIPROCATING		1000 GALLONS BURNED	0.074	INTERNAL COMBUSTION ENGINE	74	gal/yr	0.01	MT CO2e/gal/yr	1	0	0	0	0	0	0	0	0	0	0
57	SV	YS	511	MEZGER BROTHERS	COUNTY ROAD	YOLO	95697	723	1081	1	723	30200611	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	GENERAL	Y	TONS GRAIN SHIPPED OR RE(	25175	WAREHOUSE-RECEIVE & SHIP BULK FEED GRAIN						0	0	0	0	0	0	34.51724138	10.01	0.345172414	0
57	SV	YS	511	MEZGER BROTHERS	COUNTY ROAD	YOLO	95697	723	81	1	723	30200603	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	CLEANING	Y	TONS GRAIN PROCESSED	1825	WAREHOUSE RECEIVE & SHIP AT CLEAN PLANT						0	0	0	0	0	0	0.137931034	0.04	0.00137931	0
57	SV	YS	259	MM YOLO POWER LLC	44090 COUNTY	YOLO COUNTY		4911	49	1	4911	20100802	ELECTRIC SERVI	INTERNLCOMB	ELECTRIC GENERATN	LANDFILL GAS	RECIPROCATING		MILLION CUBIC FEET		LANDFILL GAS						30.08752735	2.75	2.75	10.89	3.77	2.6	2.45472837	2.44	2.435090543	0
57	SV	YS	259	MM YOLO POWER LLC	44090 COUNTY	YOLO COUNTY		4911	3049	1	4911	20100802	ELECTRIC SERVI	INTERNLCOMB	ELECTRIC GENERATN	LANDFILL GAS	RECIPROCATING		MILLION CUBIC FEET		LANDFILL GAS IC ENGINE						19.25601751	1.76	1.76	11.62	3.2	2.12	1.539235412	1.53	1.526921529	0
57	SV	YS	259	MM YOLO POWER LLC	44090 COUNTY	YOLO COUNTY		4911	4049	1	4911	20100802	ELECTRIC SERVI	INTERNLCOMB	ELECTRIC GENERATN	LANDFILL GAS	RECIPROCATING		MILLION CUBIC FEET		LANDFILL GAS IC ENGINE						19.03719912	1.74	1.74	10.77	2.51	2.1	1.519114688	1.51	1.506961771	0
57	SV	YS	259	MM YOLO POWER LLC	44090 COUNTY	YOLO COUNTY		4911	2049	1	4911	20100802	ELECTRIC SERVI	INTERNLCOMB	ELECTRIC GENERATN	LANDFILL GAS	RECIPROCATING		MILLION CUBIC FEET		BACK-UP POWER						0	0	0	0	0	0	0	0	0	0
57	SV	YS	259	MM YOLO POWER LLC	44090 COUNTY	YOLO COUNTY		4911	1049	1	4911	20100802	ELECTRIC SERVI	INTERNLCOMB	ELECTRIC GENERATN	LANDFILL GAS	RECIPROCATING		MILLION CUBIC FEET		LANDFILL GAS IC ENGINE						21.11597374	1.93	1.93	6.01	1.77	1.82	1.720321932	1.71	1.706559356	0
57	SV	YS	1335	PACIFIC BELL	COUNTY ROAD	DUNNIGAN	95937	4939	49	1	4939	20100102	COMBINATION	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.271	BACK-UP POWER	271	gal/yr	0.01	MT CO2e/gal/yr	3	0.011951715	0.01	0.01	0.01	0.04	0	0	0	0	0
57	SV	YS	597	PACIFIC BELL	NW CORNER O	ESPARTO	95607	4939	49	1	4939	20100102	COMBINATION	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.103	BACK-UP POWER	103	gal/yr	0.01	MT CO2e/gal/yr	1	0	0	0	0.01	0.03	0	0	0	0	0
57	SV	YS	584	PACIFIC GAS & ELECTRIC COMPANY	HERSHEY JUNC	DUNNIGAN		4931	42	1	4931	31000228	ELECTRIC & OTI	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER BURNER		MILLION CUBIC FEET OF GAS	0.0021	NAT'L GAS DEHYDRATION						0	0	0	0	0	0	0	0	0	0
57	SV	YS	272	PILOT CORPORATION	30035 COUNTY	DUNNIGAN	95937	5541	43	2	5541	40600403	GASOLINE SER\	PETROLEUM M	SERVICE STATIONS	STAGE II	VAPOR-CONTROLLED		1000 GALLONS TRANSFERRE	14724.224	GASOLINE STORAGE & DISPENSING - DIESEL						2.358727291	2.35	2.35	0	0	0	0	0	0	0
57	SV	YS	272	PILOT CORPORATION	30035 COUNTY	DUNNIGAN	95937	5541	43	1	5541	40600403	GASOLINE SER\	PETROLEUM M	SERVICE STATIONS	STAGE II	VAPOR-CONTROLLED		1000 GALLONS TRANSFERRE	4373.033	GASOLINE STORAGE & DISPENSING - GASOLINE						2.800361337	2.79	2.79	0	0	0	0	0	0	0
57	SV	YS	313	PLUG & JUG	9425 LOCUST S	KNIGHTS LAND	95645	5541	43	1	5541	40600403	GASOLINE SER\	PETROLEUM M	SERVICE STATIONS	STAGE II	VAPOR-CONTROLLED		1000 GALLONS TRANSFERRE	109.4							0.100371374	0.1	0.1	0	0	0	0	0	0	0
57	SV	YS	1457	R.H. PHILLIPS, INC.	26836 COUNTY	ESPARTO	95627	2084	1009	1	2084	20100902	WINES, BRAND	INTERNLCOMB	ELECTRIC GENERATN	KERONAPTHA JET FI	RECIPROCATING		1000 GALLONS BURNED	42.768	BOILER	42,768	gal/yr	0.01	MT CO2e/gal/yr	409	0.011209506	0.01	0.01	0.04	0.3	0.03	0.010245902	0.01	0.009907787	0
57	SV	YS	1457	R.H. PHILLIPS, INC.	26836 COUNTY	ESPARTO	95627	2084	9	1	2084	20100902	WINES, BRAND	INTERNLCOMB	ELECTRIC GENERATN	KERONAPTHA JET FI	RECIPROCATING		1000 GALLONS BURNED	71.761	BOILER	71,761	gal/yr	0.01	MT CO2e/gal/yr	687	0.022419011	0.02	0.02	0.07	0.5	0.05	0.010245902	0.01	0.009907787	0
57	SV	YS	1465	RALPH HAYES AND SON, INC.	35265 WILLOW	CLARKSBURG	95612	3523	50	1	3523	30201699	FARM MACHIN	FOOD/AGRICUI	SUGAR BEET PROCES	NOT CLASSIFIED	OTHER		TONS RAW BEETS	23725	SUGAR BEET LIME HARVESTING/PILING/LOADING						0	0	0	0	0	0	2.142857143	1.05	0.3	0
57	SV	YS	40	RINKER MATERIALS	30288 STATE H	MADISON	95653	1442	6	2	2951	30500209	PAVING MIXTU	PETROLEUM IN	ASPHALT CONCRETE	ASPHALT HEATER	LPG		1000 GALLONS BURNED	580.989	PROPANE	580,989	gal/yr	0.01	MT CO2e/gal/yr	3,385	0.03029844	0.02	0.02	0.07	0.48	0	0.01	0.01	0.01	0
57	SV	YS	40	RINKER MATERIALS	30288 STATE H	MADISON	95653	1442	6	1	2951	30500202	PAVING MIXTU	PETROLEUM IN	ASPHALT CONCRETE	HOT ELEVATORS	SCREENS,BINS,MIXR		TONS PRODUCED	241454	ASPHALT BATCH PLANT						0.99	0.99	0.99	41.03	5.66	0.56	8.15	3.26	2.71395	0
57	SV	YS	1455	RITCHIE BROS. AUCTIONEERS AMERICA	5500 COUNTY I	DUNNIGAN	95937	7389	49	1	7389	20100102	BUSINESS SERV	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.108	IC ENGINE	108	gal/yr	0.01	MT CO2e/gal/yr	1	0	0	0	0	0.01	0	0	0	0	0
57	SV	YS	1455	RITCHIE BROS. AUCTIONEERS AMERICA	5500 COUNTY I	DUNNIGAN	95937	7389	68	2	7389	39990003	BUSINESS SERV	INDUSTRIAL PR	MIS IND-FUEL EQPT	PROCESS HEATERS	NAT GAS		MILLION CUBIC FEET BURNEI	2.1583	NATURAL GAS HEATER	2,221	MMBTu/yr	0.05	MT CO2e/MMBtu/yr	118	0.023685457	0.01	0.01	0.09	0.11	0	0.010526316	0.01	0.009789474	0
57	SV	YS	1455	RITCHIE BROS. AUCTIONEERS AMERICA	5500 COUNTY I	DUNNIGAN	95937	7389	68	1	7389	40201606	BUSINESS SERV	ORGANIC SOLV	SURFACE COATING	AUTOS/LIGHT TRUC	TOPCOAT OPERATION		TONS SOLVENT IN COATING		COATING OPERATION: AUTOMOTIVE						2.834294969	2.8	2.8	0	0	0	0.427083333	0.41	0.395052083	0
57	SV	YS	1455	RITCHIE BROS. AUCTIONEERS AMERICA	5500 COUNTY I	DUNNIGAN	95937	7389	8	1	7389	30900299	BUSINESS SERV	FABRICATED M	ABRASIVE BLASTING	OF METAL PARTS	GENERAL		EACH	732.5	CONFINED ABRASIVE BLASTING						0	0	0	0	0	0	0	0	0	0
57	SV	YS	32	RIVER GARDEN FARMS COMPANY	37060 ROAD 6	KNIGHTS LAND	95645	723	27	1	723	30200604	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	DRYING		TONS GRAIN PROCESSED	35743.65	CONVEYING						0	0	0	0	0	0	2.481481481	1.34	0.992592593	0
57	SV	YS	32	RIVER GARDEN FARMS COMPANY	37060 ROAD 6	KNIGHTS LAND	95645	723	81	1	723	30200604	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	DRYING		TONS GRAIN PROCESSED	38133.8	SHIPPING AND RECEIVING						0	0	0	0	0	0	0.018518519	0.01	0.007407407	0
57	SV	YS	32	RIVER GARDEN FARMS COMPANY	37060 ROAD 6	KNIGHTS LAND	95645	723	81	2	723	30200604	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	DRYING		TONS GRAIN PROCESSED	31533.8	DRYING						0	0	0	0	0	0	0.407407407	0.22	0.162962963	0
57	SV	YS	32	RIVER GARDEN FARMS COMPANY	37060 ROAD 6	KNIGHTS LAND	95645	723	81	3	723	30290005	CROP PREPARA	FOOD/AGRICUI	FUEL-FIRED EQPMNT	PROCESS HEATERS	LPG		1000 GALLONS BURNED	25.318	LPG	25,318	gal/yr	0.01	MT CO2e/gal/yr	148	0.01514922	0.01	0.01	0.02	0.18	0	0.010526316	0.01	0.009789474	0
57	SV	YS	32	RIVER GARDEN FARMS COMPANY	37060 ROAD 6	KNIGHTS LAND	95645	723	27	2	723	30290005	CROP PREPARA	FOOD/AGRICUI	FUEL-FIRED EQPMNT	PROCESS HEATERS	LPG		1000 GALLONS BURNED	71.787	DRYING	71,787	gal/yr	0.01	MT CO2e/gal/yr	418	0.03029844	0.02	0.02	0.11	0.68	0	0.021052632	0.02	0.019578947	0
57	SV	YS	32	RIVER GARDEN FARMS COMPANY	37060 ROAD 6	KNIGHTS LAND	95645	723	1027	1	723	30200604	CROP PREPARA	FOOD/AGRICUI	GRAIN ELEVATORS	COUNTRY ELEVATOI	DRYING		TONS GRAIN PROCESSED	26080.75	CONVEYING						0	0	0	0	0	0	1.814814815	0.98	0.725925926	0
57	SV	YS	32	RIVER GARDEN FARMS COMPANY	37060 ROAD 6	KNIGHTS LAND	95645	723	1027	2	723	30290005	CROP PREPARA	FOOD/AGRICUI	FUEL-FIRED EQPMNT	PROCESS HEATERS	LPG		1000 GALLONS BURNED	44.623	DRYING	44,623	gal/yr	0.01	MT CO2e/gal/yr	260	0.01514922	0.01	0.01	0.04	0.31	0	0.010526316	0.01	0.009789474	0
57	SV	YS	1425	ROSETTA RESOURCES OPERATING L.P.	SECTION 33, TC	YOLO COUNTY		1311	42	1	1311	31000302	CRUDE PETRO /	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER BURNER STK		MILLION CUBIC FEET OF GAS	0.355	NATURAL GAS DEHYDRATION SYSTEM						0	0	0	0	0	0	0	0	0	0
57	SV	YS	1388	ROYALE ENERGY, INC.	SECTION 8, TO\	YOLO COUNTY		1311	42	1	1311	31000302	CRUDE PETRO /	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER BURNER STK		MILLION CUBIC FEET OF GAS	130.03	NATURAL GAS DEHYDRATION SYSTEM						0.032467532	0.01	0.01	0	0	0	0	0	0	0
57	SV	YS	90029	ROYALE ENERGY, INC.	SEC.8, T11N, R1	YOLO COUNTY		1311	49	1	1311	20200202	CRUDE PETRO /	INTERNLCOMB	INDUSTRIAL	NATURAL GAS	RECIPROCATING		MILLION CUBIC FEET	2.465	POWERING A COMPRESSOR	2,536	MMBTu/yr	0.05	MT CO2e/MMBtu/yr	135	4.157549234	0.38	0.38	5.26	0.93	0.02	0.010060362	0.01	0.009979879	0
57	SV	YS	1414	ROYALE ENERGY, INC.	SEC 2, T10N, R2	YOLO COUNTY	95697	1311	42	1	1311	31000228	CRUDE PETRO /	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER BURNER		MILLION CUBIC FEET OF GAS	509.6	NATURAL GAS DEHYDRATION SYSTEM						0.064935065	0.02	0.02	0	0	0	0	0	0	0
57	SV	YS	1518	RUMSEY RANCHERIA	18935 COUNTY	BROOKS	95606	4941	49	1	4941	20100102	WATER SUPPLY	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.125	BACK-UP POWER	125	gal/yr	0.01	MT CO2e/gal/yr	1	0	0	0	0	0.01	0	0	0	0	0
57	SV	YS	1232	SLAWSON, DONALD C. EXPLORATION (	SECTION 13, TC	YOLO COUNTY		1311	42	1	1311	31000302	CRUDE PETRO /	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER BURNER STK		MILLION CUBIC FEET OF GAS	65.972	NATURAL GAS DEHYDRATION SYSTEM						0	0	0	0	0	0	0	0	0	0
57	SV	YS	1232	SLAWSON, DONALD C. EXPLORATION (	SECTION 13, TC	YOLO COUNTY		1311	49	1	1311	20200202	CRUDE PETRO /	INTERNLCOMB	INDUSTRIAL	NATURAL GAS	RECIPROCATING		MILLION CUBIC FEET	0	COMPRESSOR	-	MMBTu/yr	0.05	MT CO2e/MMBtu/yr	-	0	0	0	0	0	0	0	0	0	0
57	SV	YS	11	SYAR INDUSTRIES, INC.	16560 COUNTY	MADISON	95653	1442	43	1	1442	40600706	CONSTRUCTIOI	PETROLEUM M	CORP FLEET REFUELII	STAGE I	BALANCED SUB FILLING		1000 GALS TRANSFERRED	9.091	GASOLINE STORAGE & DISPENSING						0.100200401	0.07	0.07	0	0	0	0	0	0	0
57	SV	YS	1695	SYAR INDUSTRIES, INC.	16560 COUNTY	MADISON	95653	2951	6	2	2951	30500202	PAVING MIXTU	PETROLEUM IN	ASPHALT CONCRETE	HOT ELEVATORS	SCREENS,BINS,MIXR		TONS PRODUCED	64.042	FUEL OIL NO. 2						0	0	0	0.02	0.07	0.03	0.025	0.01	0.008325	0
57	SV	YS	11	SYAR INDUSTRIES, INC.	16560 COUNTY	MADISON	95653	1442	2	1	1442	30502511	CONSTRUCTIOI	MINING OPERA	NONMETALLIC MINR	SAND/GRAVEL	SCREENING		TONS PRODUCT PRODUCED	271824	AGGREGATE						0	0	0	0	0	0	2.72	1.36	0.204	0
57	SV	YS	11	SYAR INDUSTRIES, INC.	16560 COUNTY	MADISON	95653	1442	140	1	1442	30502032	CONSTRUCTIOI	MINING OPERA	NONMETALLIC MINR	STONE QUARRYING	TRUCK LOADING-CONVYR		TONS PRODUCT LOADED	152	OVERLAND CONVEYOR						0	0	0	0	0	0	0.066035659	0.03	0.004497028	0
57	SV	YS	1695	SYAR INDUSTRIES, INC.	16560 COUNTY	MADISON	95653	2951	6	1	2951	30500202	PAVING MIXTU	PETROLEUM IN	ASPHALT CONCRETE	HOT ELEVATORS	SCREENS,BINS,MIXR		TONS PRODUCED	21957.55	HOT MIX ASPHALT						0.09	0.09	0.09	4.39	1.32	0.97	0.475	0.19	0.158175	0
57	SV	YS	11	SYAR INDUSTRIES, INC.	16560 COUNTY	MADISON	95653	1442	2	2	1442	30502511	CONSTRUCTIOI	MINING OPERA	NONMETALLIC MINR	SAND/GRAVEL	SCREENING		TONS PRODUCT PRODUCED	0	PEA GRAVEL						0	0	0	0	0	0	0	0	0	0
57	SV	YS	11	SYAR INDUSTRIES, INC.	16560 COUNTY	MADISON	95653	1442	21	1	1442	30502510	CONSTRUCTIOI	MINING OPERA	NONMETALLIC MINR	SAND/GRAVEL	CRUSHING		TONS PRODUCT PRODUCED	73853	CRUSH RUN BASE AGGREGATE						0	0	0	0	0	0	0.3	0.15	0.0225	0
57	SV	YS	11	SYAR INDUSTRIES, INC.	16560 COUNTY	MADISON	95653	1442	2	3	1442	30502511	CONSTRUCTIOI	MINING OPERA	NONMETALLIC MINR	SAND/GRAVEL	SCREENING		TONS PRODUCT PRODUCED	916234	WASHED SAND						0	0	0	0	0	0	1.84	0.92	0.138	0
57	SV	YS	1048	TEICHERT AGGREGATES	27944 COUNTY	ESPARTO	95627	1442	6	2	2951	30590005	PAVING MIXTU	MINERAL PROD	FUEL-FIRED EQPMNT	LPG			1000 GALS BURNED	109.603	ASPHALT BATCH PLANT-PROPANE	109,603	gal/yr	0.01	MT CO2e/gal/yr	639	0	0	0	0	0	0	0	0	0	0
57	SV	YS	1048	TEICHERT AGGREGATES	27944 COUNTY	ESPARTO	95627	1442	81	1	1442	30502502	CONSTRUCTIOI	MINING OPERA	NONMETALLIC MINR	SAND/GRAVEL	AGGREGATE ST	Y	TONS PRODUCT	292585	AGGREGATE LOADING & SHIPPING						0	0	0	0	0	0	2.04	1.02	0.153	0
57	SV	YS	1048	TEICHERT AGGREGATES	27944 COUNTY	ESPARTO	95627	1442	6	1	2951	30500240	PAVING MIXTU	PETROLEUM IN	ASPHALT CONCRETE	MIXERS	BATCH PROCES	Y	TONS PRODUCED	27322	ASHPALT BATCH PLANT						0.11	0.11	0.11	4.97	0.51	0.07	0.22	0.15202	0.08712	0
57	SV	YS	1048	TEICHERT AGGREGATES	27944 COUNTY	ESPARTO	95627	1442	1006	1	3273	30501101	READY-MIXED (	MINERAL PROD	CONCRETE BATCHIN(	GENERAL		Y	CUBIC YARDS CONCRETE PR(	4086	CONCRETE BATCH PLANT						0	0	0	0	0	0	0.130434783	0.12	0.080869565	0
57	SV	YS	1048	TEICHERT AGGREGATES	27944 COUNTY	ESPARTO	95627	1442	140	1	1442	30502006	CONSTRUCTIOI	MINING OPERA	NONMETALLIC MINR	STONE QUARRYING	SCREEN/CONVI	Y	TONS RAW MATERIAL	292585	PRIMARY RECEIVING AND DIVERTING						0	0	0	0	0	0	0.3	0.15	0.0225	0
57	SV	YS	1048	TEICHERT AGGREGATES	27944 COUNTY	ESPARTO	95627	1442	2	1	1442	30502510	CONSTRUCTIOI	MINING OPERA	NONMETALLIC MINR	SAND/GRAVEL	CRUSHING		TONS PRODUCT PRODUCED	224278	WET AGGREGATE PROCESSING						0	0	0	0	0	0	0.9	0.45	0.0675	0
57	SV	YS	1048	TEICHERT AGGREGATES	27944 COUNTY	ESPARTO	95627	1442	1021	1	1442	30502510	CONSTRUCTIOI	MINING OPERA	NONMETALLIC MINR	SAND/GRAVEL	CRUSHING	Y	TONS PRODUCT PRODUCED	71055	ROAD BASE CRUSHER PLANT						0	0	0	0	0	0	0.42	0.21	0.0315	0
57	SV	YS	1542	TEICHERT READY MIX	27944 COUNTY	ESPARTO	95627	3273	6	1	3273	30501112	READY-MIXED (	MINERAL PROD	CONCRETE BATCHIN(	MIXING WET			CUBIC YARDS CONCRETE PR(	1402	CONCRETE BATCH PLANT						0	0	0	0	0	0	0.043478261	0.04	0.026956522	0
57	SV	YS	1580	TOWNE EXPLORATION	SECTION 5, TO\	YOLO COUNTY		1311	42	1	1311	31000302	CRUDE PETRO /	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER BURNER STK		MILLION CUBIC FEET OF GAS	60.828	NATURAL GAS DEHYDRATION SYSTEM						0	0	0	0	0	0	0	0	0	0
57	SV	YS	317	UNITED TRAVEL PLAZA	29770 COUNTY	DUNNIGAN	95937	5541	43	1	5541	40600403	GASOLINE SER\	PETROLEUM M	SERVICE STATIONS	STAGE II	VAPOR-CONTROLLED		1000 GALLONS TRANSFERRE	271.494	GASOLINE STORAGE/DISPENSING						0.240891298	0.24	0.24	0	0	0	0	0	0	0
57	SV	YS	1321	VERIZON CALIFORNIA	42360 3RD STR	KNIGHTS LAND	95645	4812	49	1	4812	20100102	RADIOTELEPHC	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.162	BACK-UP POWER	162	gal/yr	0.01	MT CO2e/gal/yr	2	0	0	0	0	0.01	0	0	0	0	0
57	SV	YS	1614	VERIZON WIRELESS	54080 SOUTH F	CLARKSBURG		4812	49	1	4812	20100102	RADIOTELEPHC	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.102	BACK-UP POWER	102	gal/yr	0.01	MT CO2e/gal/yr	1	0	0	0	0	0.01	0	0	0	0	0

Stationary Sources - Permitted Sources

Yolo County Greenhouse Gas Emissions Inventory - 2008

CO	AB	DIS	FACID	FNAME	FSTREET	FCITY	FZIP	FSIC	DEV	PROID	SIC	SCC	SICN	SCC1N	SCC3N	SCC6N	SCC8N	CONF	SCCUN	PR	PRDESC	Consumption	Units	Emission Factor	Units	GHG Emissions (MT/CO2e/yr)	TOGT	ROGT	VOCT	COT	NOXT	SOXT	PMT	PM10T	PM2_5T	NH3T
57	SV	YS	1661	VERIZON WIRELESS	31020 SOUTH F	CLARKSBURG	95612	4812	49	1	4812	20100102	RADIOTELEPHO	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.029	BACK-UP POWER	29	*gal/yr*	0.01	*MT CO2e/gal/yr*	0	0	0	0	0	0	0	0	0	0	0	0
57	SV	YS	1534	VERIZON WIRELESS	SECTION 19 & 2	ESPARTO	95627	4812	49	1	4812	20100102	RADIOTELEPHO	INTERNLCOMB	ELECTRIC GENERATN	DIST.OIL/DIESEL	RECIPROCATING		1000 GALLONS BURNED	0.105	IC ENGINE	105	*gal/yr*	0.01	*MT CO2e/gal/yr*	1	0	0	0	0.01	0.01	0	0	0	0	0	0
57	SV	YS	1424	WELCH & SILVEIRA, INC	1/4 MILE EAST	CLARKSBURG	95612	2048	1183	1	2048	30299999	PREPARED FEE	FOOD/AGRICUI	MISCELLANEOUS	NOT CLASSIFIED	OTHER		TONS PRODUCED (FINISHED	48.44	STRAW WATTLE MANUFACTURING						0	0	0	0	0	0	0.344827586	0.1	0.003448276	0
57	SV	YS	1424	WELCH & SILVEIRA, INC	1/4 MILE EAST	CLARKSBURG	95612	2048	183	1	2048	30299999	PREPARED FEE	FOOD/AGRICUI	MISCELLANEOUS	NOT CLASSIFIED	OTHER		TONS PRODUCED (FINISHED	174	STRAW WATTLE MANUFACTURING						0	0	0	0	0	0	1.206896552	0.35	0.012068966	0
57	SV	YS	1364	WHITING OIL AND GAS CORPORATION	TM HESS UNIT 1	YOLO COUNTY		1311	42	1	1311	31000227	CRUDE PETRO /	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER STILL STACK		MILLION CUBIC FEET OF GAS	0	NATURAL GAS DEHYDRATION						0	0	0	0	0	0	0	0	0	0
57	SV	YS	1368	WHITING OIL AND GAS CORPORATION	CALPINE MAST	YOLO COUNTY		1311	1042	1	1311	31000227	CRUDE PETRO /	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER STILL STACK		MILLION CUBIC FEET OF GAS	140.432	NATURAL GAS DEHYDRATION						0	0	0	0	0	0	0	0	0	0
57	SV	YS	1368	WHITING OIL AND GAS CORPORATION	CALPINE MAST	YOLO COUNTY		1311	42	1	1311	31000227	CRUDE PETRO /	OIL & GAS PRO	NATURAL GAS PRODI	GLYCOL DEHYDRAT(	REBOILER STILL STACK		MILLION CUBIC FEET OF GAS	116.411	NATURAL GAS PRODUCTION						0	0	0	0	0	0	0	0	0	0
57	SV	YS	1013	ZAMORA MINI MART	9920 COUNTY I	ZAMORA	95698	5541	1	1	5541	40600403	GASOLINE SER	PETROLEUM M	SERVICE STATIONS	STAGE II	VAPOR-CONTROLLED		1000 GALLONS TRANSFERRE	392.866	GASOLINE STORAGE & DISPENSING						0.341262672	0.34	0.34	0	0	0	0	0	0	0
																					TOTAL					**8,220**									

Emission Factors

Fuel	CO_2	GWP	N_2O	GWP	CH_4	GWP	units	CO2e Emission Factor (MT/unit/yr)		Source:
electricity	724.1	1	0.0081	296	0.0302	23	lb/MWh delivered	0.33	MT CO2e/MWH/yr	CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
natural gas	53.06	1	0.0001	296	0.005	23	kg/MMBtu	0.05	MT CO2e/MMBtu/yr	CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
propane	5.74	1	0.0001	296	0.001	23	kg/gal	0.01	MT CO2e/gal/yr	CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
LPG	5.79	1	0.0001	296	0.0003	23	kg/gal	0.01	MT CO2e/gal/yr	CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
distillate fuel oil/diesel fuel	10.15	1	0.0001	296	0.0004	23	kg/gal	0.01	MT CO2e/gal/yr	CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
biogas	502.50	1					Btu/scf		MT CO2e/gal/yr	CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
crude oil	10.29	1					kg/gal	0.01	MT CO2e/gal/yr	CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf
jet fuel	**9.57**	**1**					**kg/gal**	**0.01**	**CO2e/gal/yr**	
wood	1,591.53	1					kg/MT	1.59	MT CO2e/MT/yr	CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Conversion Factors

1,029	Btu	1	scf natural gas				
1	MMBtu	1,000,000	Btu				
2,204.62	lb	1	MT	1,000	kg	1.102	tons

Stationary Source Emissions - Agricultural Processing

Yolo County Greenhouse Gas Emissions Inventory - 2008

Commodity Fumigation

Year	Pesticide (Chemical Name)	Countywide Application lbs/yr	lbs/MT Conversion Factor	GWP of 1 MT SO_2F_2 compared to 1 MT CO_2	MT CO2e/yr
2008	SULFURYL FLUORIDE	7,191.46	0.000454	4,800	15,658
Facility Emissions					826
TOTAL					**16,483**

Source: California Department of Pesticide Regulation: Pesticide Use Reporting

http://www.cdpr.ca.gov/docs/pur/pur90rep/p90menu.htm

Source: YSAQMD facility permit data 2008.

Transportation - On-Road Mobile Sources

Yolo County Greenhouse Gas Emissions Inventory - 2008

	MT CO2e/yr
Unincorporated County	**105,253**

VMT Distribution and EMFAC 2007 Output by Speed Bin

VMT Speed Bins (MPH)	Unincorporated (VMT/day)	%	Weighted Emission Factor (g/mile)
0 - 5	14	0.0%	0.015
5 - 10	26	0.0%	0.060
10 - 15	187	0.0%	0.331
15 - 20	51,786	9.2%	73.212
20 - 25	7,802	1.4%	9.152
25 - 30	25,597	4.5%	26.159
30 - 35	23,149	4.1%	21.287
35 - 40	27,507	4.9%	23.460
40 - 45	52,894	9.4%	43.069
45 - 50	72,477	12.9%	57.955
50 - 55	110,291	19.6%	89.077
55 - 60	57,388	10.2%	48.168
60 - 65	133,864	23.8%	120.265
65 - 70	0	0.0%	0.000
70 - 75	0	0.0%	0.000
>75	0	0.0%	0.000
Total	**562,982**		**512.209**

Source: Fehr & Peers 2010; Yolo County General Plan Travel Demand Forecast Model 2005

Conversion factor 0.000001 g/MT

Title : Yolo County 2008
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/06/18 16:22:47
Scen Year: 2008 -- All model years in the range 1965 to 2008 selected
Season : Annual
Area : Yolo
****

Transportation - On-Road Mobile Sources

Yolo County Greenhouse Gas Emissions Inventory - 2030

	MT CO2e/yr	
Unincorporated County	**465,731**	Assumes 75% of general plan buildout would occur by 2030

VMT Distribution and EMFAC 2007 Output by Speed Bin

VMT Speed Bins (MPH)	Unincorporated (VMT/day)	%	Weighted Emission Factor (g/mile)
0 - 5	706	0.0%	0.106
5 - 10	3104	0.1%	1.125
10 - 15	831	0.0%	0.230
15 - 20	157597	4.5%	34.695
20 - 25	414016	11.9%	75.244
25 - 30	58571	1.7%	9.214
30 - 35	108167	3.1%	15.235
35 - 40	131685	3.8%	17.143
40 - 45	161807	4.6%	20.075
45 - 50	660217	19.0%	80.443
50 - 55	564810	16.2%	69.630
55 - 60	640716	18.4%	82.366
60 - 65	578883	16.6%	80.046
65 - 70	0	0.0%	0.000
70 - 75	0	0.0%	0.000
>75	0	0.0%	0.000
Total	**3,481,110**		**485.551**

Source: Fehr & Peers 2010; Yolo County General Plan Travel Demand Forecast Model 2005

Conversion factor 0.000001 g/MT

Title : Yolo County 2030
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/06/25 11:38:46
Scen Year: 2030 -- All model years in the range 1986 to 2030 selected
Season : Annual
Area : Yolo
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Wastewater Treatment

Yolo County Greenhouse Gas Emissions Inventory - 2008

= Input

Facility	First Year of Operation	Year of Data	Type of Treatment	Facility-Specific Data: Capacity (MGD)	Capacity (G/yr)	Influent (MGD)	Influent (G/yr)	Influent BOD (mg/L)	BOD (Kg/Gal)	BOD (kg/yr)	Adjusted Emission Factor (kg CH4/kg BOD)	kg CH4/yr	MT CO2e/yr	Default Emission Factor (kg CH4/kg BOD)	CH4 Correction Factor	Adjusted Emission Factor (kg CH4/kg BOD)
Yolo County (Unincorporated) Facilities														0.6	0.2	0.12
Esparto	**1963**	2001, 2002	primary/secondary	3.00	1,095,000,000	3.00	1,095,000,000	62	0.0002	256,912	0.12	30,829	**709**			
Source: Esparto CSD Waste Discharge Requirements 2001 (influent data); Esparto CSD Wastewater Pond Monitoring Report 2002 (BOD data)																
Madison	**1966**	1998, 2001	primary/secondary	0.14		0.14	51,100,000	330	0.0012	63,833	0.12	7,660	**176**			
Source: Madison Service District Cease and Desist Order 1994 (influent data); Madison Service District Pond Monitoring Report 2000-2001 (BOD data)																
Knights Landing	**?**	2000, 2007	primary/secondary	0.08		0.08	29,200,000	292	0.0011	32,276	0.12	3,873	**89**			
Source: Knights Landing CSD Waste Discharge Requirements 2007 (influent data, BOD data)																
Unincorporated											**Total 2008**		**974**			

Notes:
Methane CF of 0.2 is the EF representing the lowest end of the "poorly managed centralized aerobic treatment plant" range.

Source:
Intergovernmental Panel on Climate Change 2006. IPCC Guidelines for National Greenhouse Gas Inventories; Chapter 6: Wastewater Treatment and Discharge

Conversion Factors:

Liter	Gallon
1	0.264

Year	Days
1	365

Kg	mg	lb	MT
1	1000000	2.204	
1000			1

MG	G
1	1000000

GWP

Methane (CH4)	23

Esparto Data
Year 2002

	BOD (mg/L) pond						
	1	2	3	4	5	6	7
Month							
Apr	38	43	49	23	13	14	
May	90	100	66	52	24	44	14
Jun	24	28	34	32	29	53	12
July	65	90	60	35		50	21
Aug	58	72	160	57	140	60	98
Sep	70	70	63	62		41	43
Oct	61	64	47	57		58	50
Nov	78	84	170	170	170	66	51
Average	**62**						

Wastewater Treatment

Yolo County Greenhouse Gas Emissions Inventory - Projections = Input

Facility	First Year of Operation	Year of Data	Type of Treatment	Facility-Specific Data: Capacity (MGD)	Capacity (G/yr)	Influent (MGD)	Influent (G/yr)	Effluent (MGD)	Influent BOD (mg/L)	BOD (Kg/Gal)	BOD (kg/yr)	COD (kg/yr)	Emission Factor (kg CH4/kg	kg CH4/yr	MT CO2e/yr	Emission Factor (kg CH4/kg	CH4 Correction Factor	Adjusted Emission Factor (kg CH4/kg BOD)
Yolo County (Unincorporated) Facilities																0.6	0.2	0.12
Esparto	**1963**	2001, 2002, 2009	primary/ secondary	-		3.00	1,095,000,000		62	0.0002	256,912		0.12	30,829	**709**			

Source: Esparto CSD Waste Discharge Requirements 2001 (influent data); Esparto CSD Wastewater Pond Monitoring Report 2002 (BOD data)

Unincorporated

Total 2030	**709**

Notes:

Assumes Madison and Knights Landing plants are transitioned to tertiary facilites by 2030, for which GHG emissions are embedded in the energy sector.

Methane CF of 0.2 is the EF representing the lowest end of the "poorly managed centralized aerobic treatment plant" range.

Sources:

Intergovernmental Panel on Climate Change 2006. IPCC Guidelines for National Greenhouse Gas Inventories; Chapter 6: Wastewater Treatment and Discharge

Yolo County 2030 General Plan Update EIR. 2009 (April). Utilities Chapter. Prepared by LSA.

Conversion Factors:

Liter	Gallon
1	0.264

Year	Days
1	365

Kg	mg	lb	MT
1	1000000	2.204	
1000			1

MG	G
1	1000000

GWP

Methane (CH4)	23

Water Consumption

Yolo County GHG Emissions Inventory - 2008

= input

Domestic Water Supply from Groundwater Pumping

KWh/million gallons	KWh/acre-ft	acre-ft/year	Total KWh	MWh	Region	Emission Factor (lb CO2/MWh)	GWP	Emission Factor (lb CH4/MWh)	GWP	Emission Factor (lb N2O/MWh)	GWP	Total CO2e (MT/year)
	145	1,056	153,082	153	CALI	724.12	1	0.0302	23	0.0081	296	**50**

Source: California Agricultural Water Electrical Energy Requirements. 2003 (December). Prepared by Irrigation Training and Research Center for CEC. http://www.itrc.org/reports/energyreq/energyreq.pdf

Source: CCAR GRP. 2009. v 3.1 Appendix C. http://www.climateregistry.org/resources/docs/protocols/grp/GRP_3.1_January2009.pdf

Unincorporated Water Consumption Data (2008)

Wild Wings CSD:	248	MG/yr	Source: Regina Espinoza, Yolo County
North Davis Meadows:	96	MG/yr	Source: Dianna Jensen, City of Davis Public Works Department
El Macero & Royal Oaks:	230,674	ccf	Source: Dianna Jensen, City of Davis Public Works Department

Conversion Factors

3.069	acre-ft	1	MG
2204.62	lb	1	MT
0.134	gallon	1	cubic foot
100	cubic feet	1	ccf

Water Consumption

Yolo County GHG Emissions Inventory - Projections

CO2e (MT/yr)			
2020	**2030**	**2040**	**2050**
100	181	198	216