



Appendix B

Technical Reports

Community Inventory

Community Baseline Activity Data

Activity data was obtained from utility providers, state agencies, and County staff to determine the extent to which each activity occurs annually. This activity data was used to calculate GHG emissions for 2008. **Table B-1** lists the activity data used in the 2008 baseline inventory analysis along with activity data, units, and sources. Data sources as presented in the PMC Memo dated June 27, 2014 include Pacific Gas and Electric (PG&E), the Local Government Operations Protocol (LGOP), the US Department of Housing and Urban Development (HUD), the California Department of Resources Recycling and Recovery (CalRecycle), and the California Energy Commission (CEC).

Table B-1: Community Baseline Inventory Activity Data

Sector	Activity Type	2008 Activity Data	Unit of Measure	Source
Residential Energy	Residential Electricity	172,672,340	kWh	PG&E, LGOP
	Residential Natural Gas	1,131,310	Therms	PG&E, LGOP
	Residential Propane	3,604,780	Gallons	US Census
	Residential wood use	35,380	Tons of wood	US Census
Commercial/Industrial Energy	Commercial/Industrial Electricity	89,568,140	kWh	PG&E, LGOP
	Commercial/Industrial Natural Gas	4,891,690	Therms	PG&E, LGOP
On-Road Transportation	On-Road Transportation	632,423,130	VMT	Caltrans
Waste-Solid Waste	Tons Disposed	28,690	Tons of Waste	CalRecycle
Off Road	Recreational	15,600	Households	PMC
	Construction	170	New Households	PMC
	Industrial	7,240	Jobs	PMC
	Lawn & Garden	15,600	Households	PMC
	Light Commercial	7,240	Jobs	PMC
	Logging	7,240	Jobs	PMC
	Orchard and Field Crops Acres	53,230	Acres	PMC

Table B-1: Community Baseline Inventory Activity Data Continued-

Sector	Activity Type	2008 Activity Data	Unit of Measure	Source
Off Road- Continued	Entertainment Equip.	15,600	Households	CARB OFFROAD Model
	Oil Drilling	7,240	Jobs	CARB OFFROAD Model
	Pleasure craft	5,600	Households	CARB OFFROAD Model
	Transportation refrigeration units	47,850	Service Population	CARB OFFROAD Model
Water	Indirect Water Emissions	103,667,980	Electricity (kWh)	CEC, LGOP
Wastewater	Direct Emissions	10	MG	Tehama County, LGOP
	Indirect Electricity	180,510	Electricity (kWh)	Tehama County, LGOP
	Septic Tanks	2,640	Population Served	US Census
Agriculture	Direct fertilizer emissions	53,230	Acres	Tehama County, California Department of Food and Agriculture
	Cattle	35,090	Average annual Head	Tehama County
	Crop Residue: Grasses	189	Acres Burned	Tehama County
	Crop Residue: Rice	50	Acres Burned	Tehama County
	Crop Residue: Walnuts	2,612	Acres Burned	Tehama County
	Crop Residue: Prunes	1,609	Acres Burned	Tehama County
	Crop Residue: Prescribed Burn	808	Acres Burned	Tehama County
	Crop Residue: Almonds	3,456	Acres Burned	Tehama County
	Crop Residue: Brush	167	Acres Burned	Tehama County
	Crop Residue: Corn	2	Acres Burned	Tehama County
	Crop Residue: Olive	982	Acres Burned	Tehama County
	Crop Residue: Other	62	Acres Burned	Tehama County
Stationary Sources		3,900	Annual Emissions	TCAPCD

Table B-2 identifies the emissions factors used to translate activity data into GHG emissions for the community baseline inventory as presented in the PMC Memo dated June 27, 2014. When a specific emissions coefficient is not applicable, the total emissions reported are given for reference.

Table B-2: Community Baseline Inventory Emissions Coefficients

Activity Type		2008		Sources
Residential Electricity		0.000292	MTCO ₂ e per kWh	PG&E, LGOP/PMC Memo
Residential Natural Gas		0.0053	MTCO ₂ e per therm	LGOP/PMC Memo
Residential Propane		0.0060	MTCO ₂ e per gallon	LGOP/PMC Memo
Commercial/Industrial Electricity		0.000292	MTCO ₂ e per kWh	PG&E, LGOP
Commercial/Industrial Natural Gas		0.0053	MTCO ₂ e per therm	LGOP
Direct Access Electricity		0.00041	MTCO ₂ e per kWh	LGOP
On-Road Transportation		0.00072	MTCO ₂ e per VMT	EMFAC 2011
Waste – Solid Waste Disposed		0.25	MTCO ₂ e per ton of waste	CARB Landfill Tool
Off-Road-Construction		24.41	MTCO ₂ e per House Equiv.	CARB Off-Road Model/PMC
Off-Road-Farm Equipment		0.836	MTCO ₂ e per Ag. Acre Equiv.	CARB Off-Road Model/PMC
Water		0.000292	MTCO ₂ e per kWh	CEC, LGOP
Waste Water Indirect elect.		0.000277	MTCO ₂ e per kWh	Tehama County, LGOP
Agriculture	Direct fertilizer emissions	8,130	MTCO ₂ e	Tehama County
	Cattle	56,880	MTCO ₂ e	Tehama County
	Crop Residue: Grasses	1.857	MTCO ₂ e per Acres Burned	Tehama County
	Crop Residue: Rice	3.411	MTCO ₂ e per Acres Burned	Tehama County
	Crop Residue: Walnuts	1.026	MTCO ₂ e per Acres Burned	Tehama County
	Crop Residue: Prunes	1.466	MTCO ₂ e per Acres Burned	Tehama County
	Crop Residue: Prescribed Burn	1.857	MTCO ₂ e per Acres Burned	Tehama County
	Crop Residue: Almonds	1.467	MTCO ₂ e per Acres Burned	Tehama County
	Crop Residue: Brush	1.857	MTCO ₂ e per Acres Burned	Tehama County
	Crop Residue: Corn	5.000	MTCO ₂ e per Acres Burned	Tehama County
	Crop Residue: Olive	1.465	MTCO ₂ e per Acres Burned	Tehama County
	Crop Residue: Other	1.444	MTCO ₂ e per Acres Burned	Tehama County

Government Operations Inventory

Government Operations Baseline Activity Data

Baseline activity data used in the government operations baseline inventory is provided in **Table B-3** as presented in the PMC Memo dated June 27, 2014.

Table B-3: 2008 Government Operations Baseline Activity Data

Sector	Subsector	Activity Data	Unit	Source
Buildings	Electricity	4,959,010	kWh	PG&E, County Records, PMC
	Natural Gas	154,600	Therms	PG&E, County Records, PMC
Fleet	2008 Gasoline/Diesel	251,560	Gallons (10.5 mpg)	LGOP, County Records, PMC
Fleet	2020 Gasoline/Diesel	217,796	Gallons (12 mpg)	LGOP, County Records, PMC
	2028 Gasoline/Diesel	174,237	Gallons (15 mpg)	LGOP, County Records, PMC
Landfill	Tons of Waste in place	1,260,990	Tons	CalRecycle, County Records
25% of Landfill Methane not captured	2008 Baseline Year	7,780	MTCO _{2e}	PMC Memo Pg. 32
25% of Landfill Methane not captured	2020 Forecast Year	8,720	MTCO _{2e} Gallons	PMC Memo Pg. 32
	2028 Forecast Year	9,380	MTCO _{2e}	PMC Memo Pg. 32
Lighting	PG&E Streetlights	58,830	kWh	PG&E, County Records
	Traffic Lights	1,860	kWh	PG&E, County Records
	Other Public Lighting	21,910	kWh	PG&E, County Records
Employee Commute & Travel	Employee Travel	1,971,150	Miles Traveled	Travel Survey
	Employee Commute	5,260,590	VMT	Travel Survey
Government- Solid Waste (Generated)	Tons Disposed	1,220	Tons	Tehama County Sustainability Report

Table B-4 identifies the emissions factors used to translate activity data into GHG emissions for the government operations baseline inventory as presented in the PMC Memo dated June 27, 2014. When a specific emissions coefficient is not applicable, the total emissions reported are given for reference.

Table B-4: Government Operations Baseline Inventory Emissions Coefficients

Activity Type	Applicable Indicator	2008 Coefficient		Source
Building Electricity (kWh)	Building Area	0.00200	MTCO _{2e} per Sq. ft.	Based on PMC Memo
Building Natural Gas (therms)	Building Area	0.00132	MTCO _{2e} per Sq. ft.	Based on PMC Memo
Gasoline/Diesel Combined	County Employment	0.00936	MTCO _{2e} per gallon	Based on PMC Memo
Tons of Waste in Place	Service Population	0.00617	MTCO _{2e} per ton	CARB Landfill Tool

Table B-4: Government Operations Baseline Inventory Emissions Coefficients Continued-

Activity Type	Applicable Indicator	2008 Coefficient		Source
Streetlights*	Employment	0.00028	MTCO _{2e} per kWh	LGOP, PG&E
Traffic Lights*	Employment	0.00029	MTCO _{2e} per kWh	LGOP, PG&E
PG&E-Owned Streetlights*	Employment	0.00045	MTCO _{2e} per kWh	LGOP, PG&E
Employee Commute	Employment	0.00040	MTCO _{2e} per miles traveled	EMFAC 2011, LGOP
Travel	Employment	0.00039	MTCO _{2e} per VMT	EMFAC 2011, LGOP
Tons Disposed	Employment	0.2131	MTCO _{2e} per ton	CARB Landfill Tool

**Note that emissions coefficients vary for County electricity use because of multiple utility providers. County facilities are located within the incorporated cities of Red Bluff and Coming, resulting in accounts serviced by these municipal utilities. PG&E provides service to most of the County's accounts.*

Forecast Indicators

Emissions are forecast to 2020 and 2028 using indicators as presented in the PMC Memo dated June 27, 2014. For example, the projected increase in households identified in the Department of Finance is used to estimate residential energy and off road emissions for 2020 and 2028. **Table B-5** identifies the various growth indicators used to forecast Tehama County's community and government operations to 2020 and 2028.

Table B-5: 2020 and 2028 Emissions Forecast Indicators

Indicator	Source	Emissions Forecast Sector	2008	2020	2028	Percent Change, 2008–2028
Community Inventory						
Households	California Department of Finance	Residential Energy, Off-Road (Recreational, Lawn and Garden, Entertainment and Pleasure craft)	15,600	22,640	26,970	+73%
Jobs	US Census Bureau, n.d; Caltrans	Nonresidential energy, Off-road (Industrial and Light Commercial)	7,240	8,150	8,970	+24%
New Houses	California Department of Finance	Off-road (Construction)	170	590	540	+24%

Table B-5: 2020 and 2028 Emissions Forecast Indicators Continued-

Indicator	Source	Emissions Forecast Sector	2008	2020	2028	Percent Change, 2008–2028
Service Population	California Department of Finance	Transportation; Solid waste, water, wastewater	47,850	61,370	72,360	+51%
Agriculture Acres (Orchards/ Field Crops)	Tehama County Department of Agriculture; Compton 2014	Farm Equipment	53,230	63,073	66,802	+25%
Government Operations Inventory						
County Government Building Area (sq ft)	Tehama County Administration	Buildings	621,584	656,684	656,684	+6%
Forecast waste in place	Tehama County Landfill	Landfill	1,260,990	1,835,630	2,254,380	+79%
County Employment	County of Tehama Administration	All other subsectors	840	830	830	-1%

Note. Agricultural Orchard Forecast Indicators are in Appendix C

State Reduction Methods Summary

Assembly Bill 1493 (Pavley) and Low Carbon Fuel Standard (LCFS)

GHG Quantification Assumptions:

CARB anticipates that the Pavley standards and the LCFS will collectively reduce GHG emissions from new California passenger vehicles, while improving fuel efficiency and reducing motorists' costs.

The Pavley rules establish GHG emissions standards for two different groups of passenger vehicles:

(1) passenger cars and light-duty trucks with test weights under 3,751 pounds loaded vehicle weight (LDT1); and (2) light-duty trucks with test weights between 3,751 pounds loaded vehicle weight and 8,500 pounds gross vehicle weight (LDT2). Medium-duty passenger vehicles (LDT3) between 8,500 and 10,000 pounds gross vehicle weight are included with manufacturers' LDT2 vehicles when determining compliance with California's GHG standards. For the purposes of this analysis, only vehicles up to 8,500 pounds were considered, since most LDT3 vehicles are commercial and therefore do not fall under the scope of the Pavley rules.

The LCFS calls for at least a 10% reduction in carbon intensity (the amount of carbon released during production and use) within California's transportation fuels by 2020. This analysis assumes that carbon intensities will be reduced by 10%.

GHG reductions from the Pavley and LCFS standards were calculated using EMFAC 2011 data for Tehama County. EMFAC 2011 data includes the breakdown of vehicles by vehicle class and emissions factors per mile for each vehicle class. Emissions reductions per model year and vehicle class are applied to the County's transportation emissions and would result in a 22% decrease in transportation-related GHG emissions below baseline levels by 2020 (Community and Government), (Please see Table B-6 for an Pavley and LCFS equivalent emissions factor derived from the PMC Memo dated June 27, 2014).

Community and Government Operation Combine

Total GHG Reductions:	2020	2028
Emissions Reduced (MTCO _{2e})	-111,190	-144,060

GHG Quantification Sources:

California Air Resources Board. 2010. Clean Car Standards—Pavley, Assembly Bill 1493.
<http://www.arb.ca.gov/cc/ccms/ccms.htm>.

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

———. 2010. Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0.
<http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>.

———. 2011. Emissions Factor 2011 Model Software. <http://www.arb.ca.gov/msei/modeling.htm>.

Renewables Portfolio Standard

GHG Quantification Assumptions:

California's RPS mandates that utility providers procure 33% of their energy from renewable sources by 2020. PG&E provides electricity in the unincorporated areas of Tehama County, and approximately 11.7% of the utility's electricity came from qualified renewable sources in 2008. While PG&E has made significant strides to reach the 33% goal by 2020, the California Public Utilities Commission (CPUC) has indicated that energy providers are not likely to meet this target due to transmission and permitting issues that have proven to be significant barriers to the development of renewable energy. Considering these barriers, the calculation included in this plan rely on PMC's analyses as included in the June 27, 2014 Memo, which indicates a 22,820 MTCO_{2e} reduction from the 2020 Community Inventory Forecast BAU kWh cumulative number of 141,730 MTCO_{2e} or about a 16% reduction in the kWh emissions factor of 0.000292 (Please see Table B-6 for the RPS equivalent emissions factor).

Community and Government Operation Combine

Total GHG Reductions:	2020	2028
Emissions Reduced (MTCO _{2e})	-24,020	-39,740

GHG Quantification Sources:

California Public Utilities Commission. 2009. 33% Renewable Portfolios Standard Implementation Analysis Report. <http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf>.

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

———. 2011. California Renewables Portfolio Standard. Sacramento.
<http://www.cpuc.ca.gov/PUC/energy/Renewables/index.htm>.

California Building Code, Title 24

GHG Quantification Assumptions:

Title 24 of the California Code of Regulations provides building standards regulating how each new home and business is built in California. It includes requirements for the structural, plumbing, electrical, and mechanical systems of buildings, and for fire and life safety, energy conservation, green design, and accessibility in and around buildings. The 2010 triennial edition of Title 24 applies to all occupancies that applied for a building permit on or after January 1, 2011, and remains in effect until the effective date of the 2013 triennial edition. This CAP focuses on two sections of Title 24: Part 6, the California Energy Code; and Part 11, the California Green Building Standards Code, or CALGreen. These two sections require direct electricity, natural gas, and water savings for every new home or business built in California. Title 24 is a statewide standard applied at the local level by local agencies through project review.

The GHG emissions forecast incorporates the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on CEC studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for ongoing updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. As such, the GHG emissions forecast also includes a conservative estimate of the energy reductions resulting from future updates of Title 24 based on historic growth. Past updates to Title 24 have resulted in equal, if not higher, increases in efficiency. The energy reductions quantified in the forecast from Part 6 Energy Code updates are based on the assumption that the updates to the code would yield regular decreases in the maximum allowable amount of energy used from new construction. The energy effects of 2008 Title 24 Standards for nonresidential alterations are modeled. Future updates to Title 24 standards for nonresidential alterations are not taken into consideration for lack of data and certainty.

Community and Government Operation Combine

Total Measured GHG Reduction:	2020	2028
Emissions Reduced (MTCO ₂ e)	-8,860	-17,460

GHG Quantification Sources:

California Energy Commission. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings.

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

———. 2010. 2009 California Residential Appliance Saturation Study. Sacramento. <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PD>.

GHG Reduction Strategies Quantification: Sources and Assumptions

This section summarizes data sources, assumptions, and performance metrics used to calculate the GHG emissions reductions strategy for the Tehama County CAP. The sources and metrics are organized by strategy and rely on four primary types of data and research: (1) the County’s GHG emissions inventory and forecast, (1) government agency tools and reports, (3) case studies in similar jurisdictions, and (4) scholarly research.

The quantification approaches are consistent with guidance provided for development of a Qualified GHG Reduction Strategy. The baseline GHG inventory and forecast serve as the foundation for the quantification of the County’s GHG reduction strategies. Activity data from the inventory forms the basis of strategy quantification, including VMT, kWh of electricity or therms of natural gas consumed, and tons of waste disposed. Activity data was combined with the performance targets and indicators identified by the County. The activity data and performance targets and indicators were used throughout the quantification process to calculate the emissions reduction benefit of each strategy. This approach ensures that Tehama County’s GHG reductions are tied to the baseline and to future activities occurring within the county.

Common Emissions Factors

Table B-6 lists common emissions factors used to quantify emissions reductions in the CAP. Coefficients are for 2020 and 2028 after existing state and local programs have been implemented. For example, the on-road transportation factor represents the emissions from vehicles in 2020 through 2028 after the Pavley standards are implemented.

Table B-6: Common Post 2020 Emissions Factors

Applicability	Value	Unit	Source
On-Road Transportation with Pavley and LCFS implemented	0.0006	MTCO ₂ e per mile driven	EMFAC 2011/June 27, 2014 PMC Memo
Electricity with RPS implemented	0.00025	MTCO ₂ e/kWh	PMC Memo
Natural Gas	0.0053	MTCO ₂ e/therm	LGOP v1.1/PMC Memo
Propane	0.0060	MTCO ₂ e/ gallon of propane	LGOP v1.1/PMC Memo
Tons of Waste in Place	0.00617	MTCO ₂ e per ton (Government)	CARB Landfill Emissions Tool
Building Area Electricity (kWh)	0.00200	MTCO ₂ e per Sq. ft. (Government)	Based on PMC Memo
Building Area Natural Gas (therms)	0.00132	MTCO ₂ e per Sq. ft. (Government)	Based on PMC Memo
Gasoline/Diesel Combined	0.006	MTCO ₂ e per gallon (Government)	Based on PMC Memo

Technical Data for Quantified GHG Reduction Strategies

E1. Connect low-income homeowners to financing and resources for retrofits.

Actions:

- Work with nonprofits to identify highest opportunities for a successful low-income program.
- Encourage workforce training programs to provide free weatherization services to qualified households.

- Partner with workforce training programs such as Living Elements and Valley Contractors Exchange.
- Leverage federal funding for home improvements, such as Community Development Block Grants (CDBG), to improve the energy efficiency and livability of Tehama County's lowest-income households.

GHG Assumptions:

	2020	2028
Low-income weatherization participation rate	10%	35%

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-441	-1,543

Performance Indicators:

	2020	2028
Number of participants	559	1,956
Electricity reduction (kWh, averaged across all homes)	-120	-120
Natural gas reduction (therms, averaged across all homes)	-30	-30
Propane reduction (gallons, averaged across all homes)	-100	-100

GHG Sources:

Bay Area Economics. 2009. County of Tehama Housing Element Update, Housing Needs Assessment

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

KEMA, Inc. 2010. 2009 California Residential Appliance Saturation Study, Volume 2: Results.
<http://www.energy.ca.gov/appliances/rass/>.

US Census Bureau. 2010. 2008–2010 American Community Survey, Data Table B25040: House Heating Fuel.

E2. Support retrofits in existing nonresidential uses with an emphasis on manufacturing facilities.

Actions:

- Develop a voluntary educational program and business inventory to identify energy- and cost-saving opportunities.
- Promote Property Assessed Clean Energy (PACE) financing in partnership with the local chambers of commerce, utilities, and local businesses.
- Partner with utilities and local business leaders to connect local businesses with advanced rebates and assistance for energy retrofits. For example, the County may collaborate with PG&E to map local high energy users and guide County outreach in collaboration with PG&E.

GHG Assumptions:

	2020	2028
Participation rate for retrocommissioning	25%	55%
Participation rate for retrofits	15%	25%

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-2,585	-5,036

Performance Indicators:

	2020	2028
Number of retrocommissioning and/or retrofit participants	72	154
Average electricity reduction (kWh)	-117,460	-107,850
Average natural gas reduction (therms)	-1,220	-1,100

GHG Sources:

Pacific Northwest National Laboratory. 2011. Advanced Energy Retrofit Guide: Office Buildings.

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

US Census Bureau. 2007. 2007 Economic Census, Data Table EC0700A1: All Sectors: Geographic Area Series: Economy-Wide Key Statistics.

E3. Work with utility providers to encourage nonresidential appliance upgrades.**Actions:**

- Track the number of energy-efficient or smart-grid-integrated appliances installed in new development and major nonresidential remodels through the County's permit tracking system.
- Work with third-party providers and utility companies to provide low- to no-cost rebates and incentives for nonresidential appliances and equipment.

GHG Assumptions:

	2020	2028
Participation rate	20%	35%
Utilization rate	40%	60%

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-680	-1,960

Performance Indicators:

	2020	2028
Participating businesses	28	54
Average electricity reduction per business (kWh)	-81,120	-121,690
Average natural gas reduction per business (therms)	-750	-1,120

GHG Sources:

Brown, Rich, S. Borgeson, J. Koomey, and P. Biermayer. 2008. U.S. Building-Sector Energy Efficiency Potential. PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary Report. Itron, Inc. 2007. California Commercial End-use Survey - Results Page. <http://capabilities.itron.com/CeusWeb/Chart.aspx>.

E5. Expand distributed generation, renewable energy systems for new residential development.**Actions:**

- Encourage all new discretionary development projects consisting of more than 500 residential units to achieve zero net energy using solar PV and high-efficiency construction.
- Offer expedited processing for developers providing on-site solar, such as participants in the state's Homebuyer Solar Program.
- Encourage all new discretionary multi-family developments to offer solar options or provide off-site power purchase agreements, following the Homebuyer Solar Program.
- Encourage all new discretionary projects to include solar prewiring for PV.

GHG Assumptions:

	2020	2028
Average kWh eliminated through zero net energy house	5,618	3,979
Average therms eliminated through zero net energy house	149	149

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-1,005	-2,836

Performance Indicators:

	2020	2028
Number of new households in participating areas	459	1,593
Percent of all new households	13%	23%

GHG Sources:

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

E6. Support distributed generation in new nonresidential development to reduce on-site energy use.**Actions:**

- Adopt incentives to encourage distributed generation systems, targeting large projects most likely to benefit from on-site energy, including large nonresidential development greater than 10,000 square feet.
- Streamline administrative review process to determine exemptions.
- Offer expedited processing for developers providing on-site solar.

- Encourage new nonresidential development, subject to discretionary review, to prewire for solar PV systems and to maximize roof space to accommodate future rooftop solar installations.

GHG Assumptions:

	2020	2028
Percent of new nonresidential developments with on-site renewables	5%	10%
Average amount of demand to be met by on-site renewables	80%	80%

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-136	-272

Performance Indicators:

	2020	2028
Total Installed kW of completed solar PV for new nonresidential development; Number of participating businesses in parentheses	400 (9)	800 (18)
Tehama County (Regional) annual kWh per kW	1,362	1,362
Average annual kWh savings	544,800	1,089,600

GHG Sources:

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

E7. Encourage the voluntary installation of distributed generation, renewable energy systems throughout the county.

Actions:

- Revise the permit fee to reflect size of PV installation.
- Streamline the review and approval of solar PV panels through online permitting and easily accessible educational materials.

GHG Assumptions:

	2020	2028
Percent of existing (pre-2008) homes with solar panels to be installed after 2008	4%	10%
kW potential of PV systems at existing (pre-2008) nonresidential development	13,770	22,680

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-6,391	-12,227

Performance Indicators:

	2020	2028
Number of pre-2008 homes with solar panels	714	1,890
Size of average residential PV array (kW)	7	7
Total Installed kW of completed solar PV for existing residential development; Number of participating residences in parentheses	4,998 (714)	13,230 (1,890)
Total size of PV arrays installed on pre-2008 nonresidential buildings (kW)	13,770	22,680
Tehama County (Regional) annual kWh per kW	1,362	1,362
Average annual kWh savings	25,562,016	48,909,420

GHG Sources:

Go Solar California, California Solar Initiative. May 21, 2013. Current CSI Working Dataset.
http://www.californiasolarstatistics.ca.gov/current_data_files/.

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

Renewable Resource Data Center, National Renewable Energy Laboratory. 2013. PVWatts Grid Data Calculator Version 2. <http://www.nrel.gov/rredc/pvwatts/grid.html>.

E8. Promote energy-efficiency programs and streamline on-site solar PV installations for agricultural and food processing facilities to improve operations and profitability.

Actions:

- Partner with PG&E to develop a localized, energy-efficiency outreach effort for agricultural processing industries reflecting characteristics of local operations and available financing.
- Provide resources on rebates and financing for appliances and equipment upgrades through stakeholder outreach, including collaboration with utility companies such as PG&E.
- Connect third-party energy-efficiency providers to provide free to low-cost equipment to eligible businesses and large energy users.
- Adopt a solar energy zoning ordinance to simplify the installation of solar PV in prime and non-prime farmland that would serve on-site agricultural and manufacturing uses. The zoning specification will streamline and expedite the development of solar PV in high opportunity areas while protecting prime farmland and other environmental resource.

GHG Assumptions:

	2020	2028
Percent of food processors participating in demand response	30%	50%
Percent of food processors participating in steam system efficiencies	65%	80%
Percent of food processors participating in electricity efficiency	75%	90%

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-78,630	-117,672

Performance Indicators:

	2020	2028
Number of food processors participating in an efficiency program	28	43
Average electricity reduction per efficiency participant (kWh)	-28,990	-38,750
Average natural gas reduction per efficiency participant (therms)	-4,216	-3,532
kW potential of solar panels on agricultural land	228,350	342,000
Tehama County (Regional) annual kWh per kW	1,362	1,362
Average annual kWh savings from potential solar panels on ag. land	311,012,700	465,804,000

GHG Sources:

California Energy Commission. Project Fact Sheet: Infra-Red Drying of Rice to Improve Energy Efficiency and Disinfestations. http://www.energy.ca.gov/process/agriculture/ag_pubs/INFRA_RED_DRYING_RICE.PDF.

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County of Tehama. 2010. Tehama County General Plan Draft Environmental Impact Report.

Glen Lewis Group, Environmental Energy Technologies Division and Lawrence Berkeley National Laboratory, University of California. 2007. Strategies to Increase California Food Processing Industry Demand Response Participation: A Scoping Study.

Kazama, Donald, Joseph Wang, and Tony Wong. 2004. Energy Efficiency Opportunities in California Food Processing Facilities. <http://repository.tamu.edu/bitstream/handle/1969.1/87972/ESL-IE-08-05-04.pdf?sequence=1>.

Pacific Gas and Electric Company. 2012. Unincorporated Tehama County Non-Residential Energy Overview.

Renewable Resource Data Center, National Renewable Energy Laboratory. 2013. PVWatts Grid Data Calculator Version 2. <http://www.nrel.gov/rredc/pvwatts/grid.html>.

AF1. Expand the use of alternative and clean-fuel vehicles.**Actions:**

- Support use of neighborhood electric vehicles, such as low-speed golf carts or other personal neighborhood electrical vehicles.
- Encourage new nonresidential buildings, subject to discretionary review, to provide electric vehicle prewiring or conduit.
- Update zoning provisions to encourage alternative fuel stations.

GHG Assumptions:

	2020	2028
Number of public EV charging stations	7	21
Percent of households with NEVs	2%	5%

GHG Reduction:

	2020	2028
Emissions Reduction (MTCO ₂ e)	-224	-753

Performance Indicators:

	2020	2028
Number of households with NEV (1 EV per Household)	443	1,344
Reduction in car Emissions per household with NEV (VMT Equivalent)	-841	-934
Number of public EV charging stations	7	21

GHG Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures.

California Energy Commission. 2002. Demonstration of Neighborhood Electric Vehicles (NEVs).
http://www.energy.ca.gov/reports/2002-08-28_600-02-020F.PDF.

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ICLEI USA. 2010. Climate and Air Pollution Planning Assistant (CAPPA) 1.5.

US Department of Energy, Vehicle Technologies Office. Comparing Energy Costs per Mile for Electric and Gasoline Vehicles.
https://www1.eere.energy.gov/vehiclesandfuels/avta/light_duty/fsev/fsev_gas_elec2.html

AF2. Coordinate with Tehama County Air Quality Management District to adopt construction mitigation requirements for all construction projects.**Actions:**

- Applicants for projects subject to discretionary review shall be encouraged to choose one of the following:
- Reduce construction equipment idling to 3 minutes.
- As practical, use clean or alternative fuel equipment.

GHG Assumptions:

	2020	2028
Reduction in construction equipment idling time (Percent of House Equivalent Emissions Coefficient)	10%	10%

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-720	-659

Performance Indicators:

	2020	2028
Participation rate of construction equipment	50%	50%

GHG Sources:

California Air Resources Board. 2013. Heavy-Duty Vehicle Idling Emission Reduction Program.
<http://www.arb.ca.gov/msprog/truck-idling/truck-idling.htm>.

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

US Environmental Protection Agency and North Central Texas Council of Governments. Idle Reduction.
<http://www.nctcog.org/trans/air/vehicles/tech/idle/>.

TR1. Create a transportation demand management program for businesses throughout Tehama County composed of requirements for employers with more than 50 employees (large employers) and voluntary actions for smaller employers.

Actions:

- Work in collaboration with Stakeholders and local chambers of commerce to promote TDM strategies.
- Develop guidelines for Tehama County that recommend appropriate TDM strategies for local businesses.
- Develop an informational brochure highlighting employer-based TDM strategies with available programs and provide as outreach to local businesses.
- Encourage existing employers and small employers to participate in TDM.
- Create an annual survey to track employee commute trends for all participating businesses.
- Connect employers with regional transit resources and partners, working with partners such as Tehama Regional Transit.
- Provide facilities for carpooling and park and ride programs and facilities such as the park and ride lot adjacent to Rio Street.

GHG Assumptions:

	2020	2028
Average reduction in annual VMT per participant	-13,350	-13,850

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-2,400	-2,864

Performance Indicators:

	2020	2028
Number of employees participating in TDM program	300	345

GHG Sources:

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A2. Improve maintenance of agricultural vehicles to reduce fuel use.

Actions:

- Promote best practices in agricultural equipment maintenance.
- Collaborate with the Tehama County Air Quality Management District to publicize rebates for improvements.
- Provide materials promoting the transition to consolidated farm equipment.

GHG Assumptions:

	2020	2028
Reductions from best management practices	5%	5%

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	1,318	1,396

Performance Indicators:

	2020	2028
Percent of agricultural equipment participating	50%	50%

GHG Sources:

California Air Resources Board. OFFROAD 2007.

http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles.

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

SW1. Sustain a maximum practical methane capture rate at the Plymire Road Recycling and Waste Facility.

Actions:

- Continue to monitor landfill gas emissions.
- Expand the collection system as needed to comply with provisions of the Landfill Methane Rule (AB32).
- Extend the long-term landfill gas purchase agreement as appropriate at the conclusion of the current agreement.
- Research and develop conversion technology that results in increased capture of methane associated with organic waste.

GHG Assumptions:

	2020	2028
Target methane capture rate of decomposing waste in place	90%	90%

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-5,232	-5,628

Performance Indicators:

	2020	2028
Methane capture rate	90%	90%

GHG Sources:

PMC: Products/formulas and Tehama County Greenhouse Gas Inventory and Forecast Summary

California Air Resources Board. 2011. ARB Landfill Emissions Tool.

<http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm>.

GO2. Improve operations with energy-efficient equipment.**Actions:**

- Adopt a revised procurement manual with a policy that requires consideration of energy-efficient options such as ENERGY STAR products when purchasing new equipment.
- Reduce the number of computer network servers by upgrading to virtual servers.
- Install automatic thermostat controls on facilities to help regulate building temperatures for diverse users.
- Install other automatic sensors to eliminate unnecessary energy use in energy and lighting, using technologies such as plug loads, occupancy sensors, and timers.

GHG Assumptions:

	2020	2028
Percent of facilities to be retrofitted	30%	50%
Therm Implementation rate	15%	25%
kWh Implementation rate	35%	55%

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-177	-469

Performance Indicators:

	2020	2028
Retrofitted square feet	197,000	328,000

GHG Sources:

Brown, Rich, Sam Borgeson, Jon Koomey, and Peter Biermayer. 2008. U.S. Building-Sector Energy Efficiency Potential.

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Itron, Inc. 2007. California Commercial End-use Survey - Results Page.

<http://capabilities.itron.com/CeusWeb/Chart.aspx>.

GO4. Reduce fuel use in the County fleet.

Actions:

- Track options for alternative fuel vehicles and equipment.
- Continue to review options through the Fleet Committee.
- Implement CARB standards with replacement of the County's heavy-duty diesel vehicles (>14,000 lb).

GHG Assumptions:

	2020	2028
Fleet average mpg (Gasoline and Diesel Combined)	10.5	10.5
Fleet MTCO ₂ e prior to Target fleet mpg average implementation	1,730	1,590

GHG Reduction:

	2020	2028
Emissions reduction (MTCO ₂ e)	-423	-545

Performance Indicators:

	2020	2028
Target fleet mpg average	12	15

GHG Sources:

Tehama County Records.

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Local Government Operations Protocol v1.1.