Climate Action Plan

Tulare County

December 2018 Update

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Tulare County Climate Action Plan 2018 Update
Tulare County, California

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December 11, 2018

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BEFORE THE BOARD OF SUPERVISORS
COUNTY OF TULARE, STATE OF CALIFORNIA

IN THE MATTER OF ADOPTION OF THE)
CLIMATE ACTION PLAN 2018 UPDATE) Resolution No. 2018-1014

UPON MOTION OF SUPERVISOR ENNIS, SECONDED BY SUPERVISOR CROCKER, THE FOLLOWING WAS ADOPTED BY THE BOARD OF SUPERVISORS, AT AN OFFICIAL MEETING HELD DECEMBER 11, 2018, BY THE FOLLOWING VOTE:

AYES: SUPERVISORS CROCKER, VANDER POEL, SHUKLIAN, WORTHLEY AND ENNIS
NOES: NONE
ABSTAIN: NONE
ABSENT: NONE

ATTEST: JASON T. BRITT
COUNTY ADMINISTRATIVE OFFICER/
CLERK, BOARD OF SUPERVISORS

BY: _____
Deputy Clerk

* * * * * * * * * * * * * * * * * * * *

The Board of Supervisors:

1. Approved a Statutory Exemption consistent with the California Environmental Quality Act (CEQA) Title 14 California Code of Regulations (CCR), Section 15262 (Feasibility and Planning Studies) and Section 15061(b)3, the general rule exemption.
2. Adopted the Climate Action Plan 2018 Update Inclusive of a Comprehensive Inventory Update to satisfy the Sierra Club GPU settlement requirement for a Comprehensive Inventory Update, due by August 20, 2019.

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill.
AQ	Air Quality Element (in the Tulare County General Plan).
ARB	California Air Resources Board. ARB is used interchangeably with CARB by the agency.
BAU	Business as Usual
CAP	Climate Action Plan: A description of the policies and measures that a local government will take to reduce greenhouse gas emissions and achieve its emissions reduction targets. Most plans include a timeline, a description of financing mechanisms, and an assignment of responsibility to departments and staff. In addition to direct greenhouse gas reduction measures, most plans also incorporate public awareness and education efforts. Interchangeable with Greenhouse Gas Reduction Plan.
CARB	California Air Resources Board is a part of the California Environmental Protection Agency, an organization that reports directly to the Governor's Office in the Executive Branch of California State Government. The mission of CARB is to promote and protect public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants while recognizing and considering the effects on the economy of the State. Also referred to as ARB.
CEC	California Energy Commission
CEQA	The California Environmental Quality Act is a California statute passed in 1970 to institute a Statewide policy of environmental protection.
CEQA	California Environmental Quality Act
CFT	Clean Fuels and Technology
Climate Change	Climate change refers to a statistically significant variation (not due to chance) either in the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic (man caused) changes in the composition of the atmosphere or in land use.
CO_2	Carbon dioxide: A naturally occurring gas and a by-product of burning fossil fuels and biomass other industrial processes. It is the reference gas against which other greenhouse gases are measured and therefore has a global warming potential of 1.
CO_2e	Carbon dioxide equivalent: A carbon dioxide equivalent is the unit used to report greenhouse gas emissions or reductions. Greenhouse gases are converted to CO_2e by multiplying emissions by their respective global warming potential (GWP). The CO_2e allows for reporting of overall greenhouse gas emissions in one standardized value and aids in greenhouse gas emission comparisons.
DOF	California Department of Finance
EMFAC	EMission FACtors Model
EPA	United States Environmental Protection Agency. The mission of EPA is to protect human health and to safeguard the natural environment—air, water and land.

ERM	Environmental Resource Management Element (in the Tulare County General Plan.
GHG	Greenhouse gas
Greenhouse Gas	A gas that absorbs infrared radiation in the atmosphere. Greenhouse gases as defined by AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
Hamlet	An unincorporated area that shares many of the characteristics of a community but on a smaller scale.
HDB	Hamlet Development Boundary. This is an officially adopted and mapped County line around a hamlet that divides lands suitable for development from lands to be protected for agricultural, natural, or rural uses. Land inside a HDB is appropriate for development and is not subject to the criteria evaluation of development as established in the Rural Valley Lands Plan or Foothill Growth Management Plan [RVLP Policy 1-1].
HS	Health and Safety Element (in the Tulare County General Plan).
IPCC	United Nations Intergovernmental Panel on Climate Change
LU	Land Use (acronym in the Tulare County General Plan).
Metrics	Metrics are a set of measurements that quantify results. Performance metrics quantify the units of performance. Project metrics tell you whether the project is meeting its goals.
$MMTCO_2e$	Million metric tons of carbon dioxide equivalents: a measure of emissions of greenhouse gases.
MW	megawatts
NO_X	Nitrogen oxides (oxides of nitrogen). NO_X are compounds that include a variety of gases, such as nitric oxide and nitrogen dioxide. NO_X are primarily created from the combustion process and are a major contributor to smog and acid rain formation and secondary particulate formation.
PF	Planning Framework Element (in the Tulare County General Plan).
PFS	Public Facilities and Services Element (in the Tulare County General Plan).
PG&E	Pacific Gas and Electric Company.
RMA	Tulare County Resource Management Agency
ROG	Reactive organic gas. A photochemically reactive chemical gas composed of non-methane hydrocarbons that may contribute to the formation of smog. ROG is sometimes referred to as volatile organic compounds (VOCs).
SB	Senate Bill.
SCE	Southern California Edison.
Sector	A term used by the California Air Resources Board to describe emission inventory source categories for greenhouse gases based on broad economic sectors.
SJVAB	San Joaquin Valley Air Basin. An air basin is a geographic area that exhibits similar meteorological and geographic conditions. California is divided into 15 air basins to assist with the Statewide regional management of air quality issues. The SJVAB extends in the Central Valley from San Joaquin County in the north to the valley portion of Kern County in the south.

SJVAPCD	San Joaquin Valley Air Pollution Control District. The SJVAPCD is the regulatory agency responsible for developing air quality plans, monitoring air quality, and reporting air quality data for the SJVAB.
SL	Scenic Landscapes Element (in the Tulare County General Plan).
SLCP	Short-Lived Climate Pollutant
Statistical Significance	The likelihood that a finding or a result is caused by something other than chance.
TC	Transportation and Circulation Element (in the Tulare County General Plan).
TCAG	Tulare County Association of Governments is responsible for overseeing and planning projects with the county and each of its cities, helping to bring tax money back home to fund bus service, road improvements, projects that will improve our air quality, and more.
TCAT	Tulare County Area Transit
TCU	Transportation Communications and Utilities
UAB	This is an officially adopted and mapped County line around incorporated cities. The hierarchy is as follows: incorporated city limits, Urban Development Boundary (may be coterminous with the Sphere of Influence adopted by LAFCo), and the Urban Area Boundary of an incorporated city. The Urban Area Boundaries establish areas around incorporated cities where the County and cities coordinate plans, policies, and standards relating to street and highway construction, public utility systems, and other closely related infrastructure matters affecting the orderly development of urban fringe areas.
UDB	Urban Development Boundary. For cities, the UDB is an officially adopted and mapped county line delineating the area expected for urban growth over a 20-year period. Land within a city's UDB is assumed appropriate for development and not subject to the Rural Valley Lands Plan or Foothill Growth Management Plan. For communities, hamlets, and planned communities, the UDB is a County-adopted line dividing land to be developed from land to be protected for agricultural, natural, or rural uses. It serves as the official planning area for communities over a 20-year period. Land within a community UDB is assumed appropriate for development and is not subject to the Rural Valley Lands Plan or Foothill Growth Management Plan [RVLP Policy 1-1].
VMT	Vehicle miles traveled
WR	Water Resource Element (in the Tulare County General Plan).

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SECTION 1: EXECUTIVE SUMMARY

1.1—Introduction

The County of Tulare (County) adopted the Tulare County Climate Action Plan (CAP) in August 2012. The CAP includes provisions for an update when the State of California Air Resources Board (CARB) adopts a Scoping Plan Update that provides post-2020 targets for the State and an updated strategy for achieving a 2030 target. Governor Brown signed Senate Bill (SB) 32 on September 8, 2016 which contains the new 2030 target. The CARB 2017 Scoping Plan Update for the Senate Bill (SB) 32 2030 targets was adopted by the CARB on December 14, 2017 which provided new emission inventories and a comprehensive strategy for achieving the 2030 target (CARB 2017a). With the adoption of the 2017 Scoping Plan, the County proceeded with the 2018 CAP Update that is provided in this document.

The 2018 CAP Update incorporates new baseline and future year inventories to reflect the latest information and updates the County's strategy to address the SB 32 2030 target. The 2030 target requires the State to reduce emissions by 40 percent below 1990 levels from the 2017 Scoping Plan and County data. The CAP identifies the County's fair share of reductions required to maintain consistency with the State target.

The Executive Summary provides an overview of the Tulare County CAP. It includes brief discussions of the various CAP components to allow the reader to quickly understand the most important aspects of the CAP, including:

- The purpose of the CAP.
- The relationship to other State and regional regulatory and planning efforts.
- Using the CAP for CEQA compliance.
- Tulare County's greenhouse gas inventory.
- Emission reduction targets to demonstrate consistency with AB 32 and the CARB Scoping Plan.
- The Climate Action Plan strategy for achieving emission reduction targets.
- The plan for tracking and monitoring progress in implementing the CAP.

1.2—Climate Action Plan Purpose

The CAP serves as a guiding document for County of Tulare ("County") actions to reduce greenhouse gas emissions and adapt to the potential effects of climate change. The CAP is an implementation measure of the 2030 General Plan Update. The General Plan provides the supporting framework for development in the County to produce fewer greenhouse gas emissions during Plan buildout. The CAP builds on the General Plan's framework with more specific actions that will be applied to achieve emission reduction targets consistent with California legislation. The terms Climate Action Plan and Greenhouse Gas Reduction Plan are often used interchangeably. The County has chosen to use Climate Action Plan abbreviated as CAP for this document.

The CAP follows a series of guiding principles to ensure that it is consistent with the County's values, objectives, and economy.

- The CAP will focus on strategies that meet multiple County objectives and enhance the quality of life and well-being of Tulare County residents.
- CAP strategies that provide an economic return will receive a higher priority than strategies that increase costs for the County, or for businesses and residents.
- The CAP will not duplicate strategies and programs that are better handled by other agencies.
- The CAP will recognize that federal, state, and SJVAPCD requirements set for local government regarding greenhouse gas reductions and climate change are evolving, so strategies and targets must be adaptable to changing conditions.
- CAP implementation and monitoring will use existing data collection and reporting systems to the maximum extent possible.

2030 General Plan Update Principles

Fortunately, many of the County's most important objectives such as farmland protection, preserving open space and natural environments, and improving air quality are consistent with many of the actions needed to reduce greenhouse gases from new development. The Planning Framework Element of the 2030 General Plan Update includes the following principles:

- Principle 1: Provide opportunities for small unincorporated communities to grow or improve quality of life.
- Principle 2: Promote reinvestment in existing communities and hamlets in a way that enhances the quality of life in these locations.
- Principle 3: Protect the County's important agricultural resources and scenic natural lands from urban encroachment.
- Principle 4: Strictly limit rural residential development potential in important agricultural areas outside of communities, hamlets, and cities (i.e., avoid rural residential sprawl).
- Principle 5: Allow existing, outdated agricultural facilities in rural areas to be used for new businesses (including nonagricultural uses) if they provide employment.
- Principle 6: Enhance planning coordination and cooperation with the agencies and organizations with land management responsibilities in and adjacent to Tulare County.

Tulare County's Blueprint Vision

The Tulare County Association of Governments (TCAG) participated in the San Joaquin Valley Blueprint project that developed a vision for development in the San Joaquin Valley to year 2050. TCAG then developed a Regional Blueprint Vision for Tulare County. The vision statement is as follows:

To preserve and enhance the Tulare County region's unique features—its vibrant and culturally diverse communities, its rivers, farmland, mountains, recreational opportunities, natural areas, and national parks. To promote sustainability through a well-trained and educated workforce, and a healthy and diverse economy. To ensure that the urban and rural areas of the County are thriving and residents can enjoy a well-planned, well-designed, and maintained land use structure and transportation system that offers a variety of housing choices, mixed uses, and numerous ways to get from place to place (TCAG 2009).

Climate Action Plan Description

The 2018 CAP Update follows the format of the adopted CAP and includes much of the original content of the 2012 CAP. Major updates to the emissions inventories were prepared to reflect the latest information. The regulatory environment section has been updated to reflect new legislation and replace items that have been superseded by updated regulations.

This CAP follows a four-step process recommended by the Institute for Local Government. First, an inventory of greenhouse gas emission sources was developed for a base year (2015) to identify the most important categories and potential for emission reductions. Second, future year inventories for 2020 and 2030 were generated to illustrate what emissions would be in the future accounting for projected growth, but without controls on the sources. The future year inventory is referred to as a "business-as-usual scenario." The year 2020 projection was used to allow comparison to the State's target year in the 2008 CARB Scoping Plan. The year 2030 projection was used to identify the growth in emissions that would occur by the General Plan planning horizon year and the new 2017 CARB Scoping Plan 2030 target year. The 2020 and 2030 inventories were projected by interpolating emissions growth predicted between the 2015 base year and 2030. The third step was to identify and describe policies, regulations, and programs that apply to sources in the County's emission inventories and will achieve reductions by the target years. The policies, regulations, and programs considered in the CAP include those by federal, State, and local governments. These were then quantified to the extent possible using best available methodologies and data to determine the amount of reductions that are needed by the target years from Tulare County to achieve consistency with State targets. The last step was the development of a monitoring program that tracks implementation progress and emission reductions over time and identifies a process for taking corrective actions, if needed.

Tulare County's Role

One of the key issues to resolve in developing a CAP is defining the County's role in reducing emissions from the different source categories. The County's focus is on emission sources within its regulatory authority, which are mainly related to land use and the local transportation system. To

some extent, the County can influence activities that provide greenhouse gas reductions such as water conservation and solid waste diversion and recycling. The County also can require feasible mitigation measures for new projects as a Lead Agency under the California Environmental Quality Act (CEQA). The County has land use regulatory authority regarding designating areas in the General Plan Land Use Element as agriculture, but very limited authority over the vast majority of agricultural activities and cultural practices that are consistent with agricultural zoning and many agricultural related support activities. Most intensive agricultural activities such as confined animal facilities, including but not limited to, dairies, feedlots, poultry, swine, sheep, horses, rabbits, and other facilities require County land use approvals that are subject to CEQA. These and other new projects are required to address greenhouse gas and climate impacts under CEQA during the approval process. Please note that the County has prepared a separate Animal Confined Facilities Plan (ACFP) and Dairy and Feedlot Climate Action Plan to address GHG emissions from those facilities. The ACFP was adopted as General Plan Amendment (GPA) 10-002 on December 12, 2017 (Tulare County 2017).

Role of State and Regional Agencies

CARB has the primary responsibility for the State's climate programs and regulations that would apply to mobile and industrial sources of greenhouse gases. The California Energy Commission has primary responsibility for energy efficiency standards related to buildings and certain consumer products. The San Joaquin Valley Air Pollution Control District (SJVAPCD) regulates stationary, areawide, and indirect sources of emissions that impact health. Many SJVAPCD regulations on health-based pollutant emissions also reduce greenhouse gas emissions. The State Legislature provided the SJVAPCD with authority to require permits for agricultural sources of emissions with State Senate Bill 700 (2003 Stats, Ch. 479) in 2003. Since then, the SJVAPCD has implemented a permitting program for large agricultural sources and has implemented a rule requiring controls of reactive organic gases (ROG) that would apply to most dairies and other confined animal facilities in Tulare County. Controls effective for ROG often are also effective at reducing greenhouse gases.

Addressing Climate Change under CEQA

One of the most important uses for a CAP is to establish significance thresholds for reviewing projects under CEQA. Greenhouse gas emissions from an individual project will not result in a perceptible impact on global climate. Impacts to global climate are caused by the cumulative impacts of greenhouse gases emitted anywhere and everywhere on Earth. The Office of Planning and Research CEQA Guidelines encourages use of a plan consistency threshold for cumulative impacts on climate change. Projects that demonstrate consistency with the policies, implementation measures, and emission reduction targets contained in the CAP would have a less than significant impact on climate change.

One of the lessons learned since the CAP was first implemented in 2012 is that thresholds for GHG should be based on new development providing its fair share of reductions needed to demonstrate consistency with the State's targets and reduction strategy. Although applying a one size fits all threshold to all sectors or projects is simpler, it does not provide fair share in all cases. The wide variety of development types requires consideration of the role of each type in the community. Each threshold approach has its limitations.

The emission reduction targets are the critical factor in determining CAP consistency. The CAP target must be set at a level that demonstrates consistency with State targets but should be feasible for the vast majority of projects to achieve. If the reduction target percentage is set at a level that is infeasible, Environmental Impact Reports could be required for a large number of projects. A statement of overriding consideration would be required and no additional emission reductions would be achieved if feasible emission reductions were not available.

Although it is technologically possible to reduce greenhouse gases if cost is not considered, the potential exists that a locally implemented measure will only serve to relocate the emissions to another place that does not require the new technology—a phenomenon referred to as leakage. Therefore, even if emission rates are lower in one place, it could have no effect on global climate if the emission-producing activity is relocated out of State or to other countries.

Summary of CAP Actions:

- Identifies sources of greenhouse gas emissions caused by activities within the unincorporated areas of Tulare County and estimates how these emissions may change over time.
- Establishes a reduction target of reducing Tulare County's greenhouse gas emissions to demonstrate consistent with AB 32 (2006) and SB 32 (2016) and CARB Scoping Plan targets.
- Provides energy use, transportation, land use, water conservation, and solid waste strategies to bring Tulare County's greenhouse gas emissions levels to the reduction target.
- Mitigates the impacts of Tulare County activities on climate change (by reducing greenhouse gas emissions consistent with the direction of the State of California via AB 32, SB 32, Governor's Executive Order S-03-05, and the 2009 amendments to the CEQA Guidelines to comply with SB 97 (2008). The CEQA Guidelines encourage the adoption of policies or programs as a means of addressing comprehensively the cumulative impacts of projects. (See CEQA Guidelines, Sections 15064(h)(3) and 15130(c).)
- Allows the greenhouse gas emissions inventory and CAP to be updated every five years and to respond to changes in science, effectiveness of emission reduction measures and federal, State, regional, or local policies to further strengthen the County's response to the challenges of climate change.
- Provides substantial evidence that the emission reductions estimated in the CAP are feasible.
- Serves as the threshold of significance within the County of Tulare for climate change impacts, by which all applicable developments within the County will be reviewed.
- Proposed development projects that are consistent with the emission reduction and adaptation measures included in the CAP and the programs that are developed as a result of the CAP, would be considered to have a less than significant cumulative impact on climate change and emissions consistent with CEQA Guidelines Section 15064(h)(3) as amended to comply with SB 97.

1.3—Climate Change Legislation

The State of California is leading the Country in efforts to reduce greenhouse gases and the impacts on the global climate. The California legislature passed Assembly Bill (AB) 32—the California Global Warming Solutions Act of 2006 (2006 Stats, Ch. 488)—that provides a legislative mandate to reduce greenhouse gas emissions by 2020. Senate Bill (SB) 32, passed in 2016, is follow-up legislation that requires the State to further reduce emissions by 2030. In addition, a number of State Executive Orders have been issued on climate change. The legislation and Executive Orders described below provide the impetus needed to pursue an ambitious strategy for reducing California's GHG emissions.

State Executive Order S-3-05

In June of 2005, Governor Schwarzenegger issued a landmark Executive Order establishing progressive greenhouse gas emissions targets for the entire State. Executive Order S-3-05 makes the following goals:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020 reduce greenhouse gas emissions to 1990 levels;
- By 2050, reduce greenhouse gas emissions to 80% below 1990 levels.

Assembly Bill 32

To support these reduction targets, the California legislature adopted AB 32 (2006 Stats, Ch. 488, Health & Safety Code § 38500, et seq.). The law requires the CARB to develop regulatory and market mechanisms that will reduce greenhouse gas emissions to 1990 levels by 2020. In December 2008, CARB approved the AB 32 Scoping Plan outlining regulatory and market mechanisms to achieve the goal of AB 32. The plan cites local government action as an integral partner to achieving the State's goals.

The 2008 Scoping Plan provided the State's strategy for achieving the 2020 target accounting for projected growth. Originally, the Scoping Plan indicated that emissions in 2020 accounting for growth but with no controls referred to as the business as usual (BAU) inventory would be 496 million metric tons ($MMTCO_2e$/year) with a goal of reaching 427 $MMTCO_2e$ per year by 2020. Therefore, to achieve 1990 emission levels in 2020 was estimated to require a reduction of 169 $MMTCO_2e$/year. This equated to a 28.3 percent reduction from all sources compared to the 2020 BAU inventory. The 2014 Scoping Plan Update revised the BAU inventory to 545 $MMTCO_2e$ per year and reduced the required reduction to 21.7 percent. CARB indicates that the State is on track to achieving the 2020 target.

Senate Bill 32

The Governor signed SB 32 on September 8, 2016. SB 32 gives CARB the statutory responsibility to include the 2030 target previously contained in Executive Order B-30-15 in the next Scoping Plan update. SB 32 states that "In adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions authorized by this division, the state [air resources] board shall ensure that statewide greenhouse gas emissions are reduced to at least

40 percent below 1990 levels by December 31, 2030." The 2017 Climate Change Scoping Plan Update addressing the SB 32 targets was adopted on December 14, 2017.

Senate Bill 375

Senate Bill (SB) 375 (2008, Stats, Ch. 728)—Steinberg, was signed by the Governor on September 30, 2008. The legislation addresses implementation of AB 32. It requires CARB to set greenhouse gas emission reduction targets for passenger vehicles and light trucks for 2020 and 2035 by September 30, 2010. SB 375 provides relief from CEQA for residential projects that are consistent with the regional plan to achieve greenhouse gas reductions (Public Resources Code § 21159.28). It lays a solid foundation for a comprehensive approach to reducing greenhouse gas emissions from the land use and transportation sector. SB 375 harnesses funding and regulatory incentives, without mandates, to align transportation, housing, and land use planning.

CARB adopted targets for Tulare County on October 22, 2015. The target requires a reduction of 5 percent below 2005 per capita vehicle miles traveled (VMT) by 2020 and 10 percent by 2035. Tulare County is on track for achieving its 2020 target. CARB has proposed that Tulare County increase its 2035 target to a 16 percent reduction below 2005 levels. TCAG included a "Sustainable Communities Strategy" to reduce the amount of vehicle miles traveled in its 2014 Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) and provided an update in the 2018 RTP/SCS adopted on August 20, 2018 (TCAG 2018).

1.4—Tulare County's Greenhouse Gas Sources

Tulare County prepared a greenhouse gas inventory for year 2007 and 2030 as part of the 2030 General Plan Update and was included in the 2012 CAP. Tulare County updated the inventory in February 2016 to use the latest assumptions and models and to include additional emission source categories. The inventory used for the 2018 CAP update reflects the same source categories with adjustments to account for adopted regulations and new growth projections for future year inventories. The inventory categories include:

- Transportation
  - On Road Vehicles
  - Trains/Locomotives
  - Aviation
  - Off Road Equipment
- Energy
  - Electricity Use
  - Residential Natural Gas
  - Commercial Natural Gas
  - Propane Consumption
  - Residential Woodburning
- Solid Waste/Landfills
- Water Transport and Treatment

- Agricultural
  - Dairy
  - Agricultural Burning
  - Agricultural Fertilizer Use

Countywide data was allocated to the unincorporated areas of Tulare County based on California Department of Finance (DOF) population estimates and projections for the unincorporated areas. The inventory is divided into five source sectors. Electricity emissions are based on the electrical power generation emissions from power consumed in Tulare County from residential and commercial users based on the usage data from the two providers, Pacific Gas and Electric Company (PG&E) and Southern California Edison (SCE). Natural gas is from the Gas Company (formerly Southern California Gas) data for residential, commercial, and industrial uses. The mobile source sector includes off-road equipment and on-road vehicles trains, and aircraft. The off-road portion includes various types of off-road equipment, including agricultural, construction, lawn and garden, and off-road recreation, which includes equipment from hedge trimmers to cranes. On-road vehicles include passenger cars and light trucks, buses, motorcycles, and medium duty and heavy-duty trucks. Solid waste emissions are based on the greenhouse gas emissions from the landfills serving Tulare County. Wastewater emissions are based on volumes treated at County operated treatment facilities.

Confined Animal Facilities

Dairy Freestall Barn

On January 26, 2010, the Tulare County Board of Supervisors approved a General Plan Initiation (GPI10-001) for a general plan amendment to the Animal Confinement Facilities Plan and Program EIR. The County issued the Final Draft Animal Confinement Facilities Plan (ACFP) and Draft Dairy and Feedlot Climate Action Plan (Dairy CAP) on September 8, 2017 (Tulare County 2017). The ACFP and the Dairy CAP include a Final EIR. Dairy and feedlot emissions are from the cows themselves and from the decomposition of manure. The CAP 2018 Update includes dairy and feedlot emissions for accounting purposes only. Emissions in the CAP 2018 Update are divided into development related emissions and dairy and feedlot emissions. Dairy and feedlots will have their own reduction target and strategy set through the Dairy CAP process. Other emissions from agriculture are included in the 2018 CAP Update. For example, emissions related to open burning, fertilizer application, operating tractors and other mobile farm equipment are included in the 2018 CAP Update. Electricity used for water pumping and other agricultural purposes are included as its own line item in the electricity sector.

Emissions Inventory

The emission inventory provides totals for “development related” emissions and a grand total that includes emissions from dairies and feedlots and other agricultural sources. Development related

emissions refer to emissions from energy consumption from the use of electricity, heating and cooling, water use, and mobile sources. This includes construction activities, off-road equipment, buildings, residences, and motor vehicles. These are sources for which the County can influence greenhouse gas emissions through its land use authority and other governmental powers related to development. As stated earlier, dairies and feedlots are addressed as part of a separate CAP prepared as part of the Animal Confinement Facilities Plan and Dairy CAP process adopted in 2017.

Table 1 shows the Tulare County's development related inventories for the years 2015, 2020, and 2030 for each sector with 2020 and 2030 targets.

Table 1: Tulare County Emission Inventory 2015 to 2030

Source	Emissions ($MTCO_2e$ per year)		
	2015	2020	2030
Transportation			
On-Road Vehicles	514,666	384,496	276,134
Off-Road Mobile	32,368	38,797	47,618
Locomotives	9,079	10,243	11,073
Aviation	17,708	22,407	28,663
Total	*573,821*	*455,946*	*363,490*
Energy			
Electricity	146,127	131,497	110,723
Energy—Natural Gas	59,215	61,417	65,917
Energy—Propane	51,490	52,231	56,067
Residential Woodburning	6,912	7,069	7,835
Total	263,745	252,215	240,542
Solid Waste			
Solid Waste—Landfill	176,925	160,088	160,088
Water & Wastewater			
Water	105	83	95
Wastewater Treatment	1,838	1,891	2,096
Total	1,942	1,974	2,191
Development-Related Emissions Total	*1,016,432*	*870,223*	*766,311*
Per Capita Emissions (8.8 CAP Target for 2020)	**6.92**	**5.76**	**4.57**
Development Related Emissions for CAP 2030 Target			**700,364**
Per Capita Emissions Target for 2030			**4.18**

Table 1 (cont.): Tulare County Emission Inventory 2015 to 2030

Source	Emissions ($MTCO_2e$ per year)		
	2015	2020	2030
Industrial			
Industrial Natural Gas	124,775	125,811	139,443
Industrial Electricity	48,415	48,508	36,178
Total	173,190	174,319	175,621
Agriculture			
Agriculture Electricity	297,327	267,086	182,166
Agricultural Burning	152,878	152,878	152,878
Agricultural Fertilizer	193,277	193,277	193,277
Agricultural Offroad Equipment	241,999	239,662	237,728
Agriculture—Dairy	7,779,107	8,494,766	9,926,085
Total	8,437,327	9,122,753	10,469,155
Grand Total	**9,626,950**	**10,167,294**	**11,411,087**

Notes:
2023 dairy emissions are used as a placeholder for 2030 dairy emissions since 2030 emission projections are unavailable; see Section 4.2.
$MTCO_2e$ = metric tons of carbon dioxide equivalents
Source of emissions: Appendix A—GHG Emission Estimates.

The most important source of development related emissions is mobile sources. Emissions related to the generation of electricity are the next largest source followed by emissions from the combustion of natural gas. Solid waste emissions are the smallest sector in the inventory. Power consumption related to water pumping and sewage treatment is included in the electricity sector. Agricultural emissions are expected to remain flat for fertilizer use and agricultural burning. Agricultural equipment emissions show a decline due to use of more efficient equipment. Dairy emissions are assumed to grow proportionally with cow population. The inventory spreadsheets provided in Appendix A provides more detail for each source sector.

1.5—Strategy Overview

Tulare County has selected a CAP strategy that builds on the policies and implementation measures contained in the General Plan combined with existing and planned regulations and programs implementing AB 32 and SB 32. The CAP is consistent with the emission reduction goals as provided in the 2017 Scoping Plan. Projects implementing the General Plan that are subject to CEQA will be required to demonstrate consistency with the CAP and achieve emission reductions that will enable the County to meet its greenhouse gas reduction target. The policies focus on the following:

- Land Use and Transportation System Improvements
- Alternative, Non-automotive Travel Modes

- Building Energy Efficiency/Green Building Design
- Water Conservation
- Waste Reduction Program

A list of the General Plan policies with sustainability and greenhouse gas benefits is provided in Section 5, General Plan Policies. The complete policies are also provided in that section.

1.6—Greenhouse Gas Reduction Targets

The 2012 CAP included a GHG reduction target for 2020 of a 26.2 percent reduction in emissions that would occur by 2020 in the absence of regulations adopted by the State of California to reduce GHG emissions and accounting for population and economic growth. Population and economic growth in the State and in Tulare County were slower than projected at the time the Scoping Plan and Tulare CAP were prepared. This resulted in a decrease in the emissions projected for 2020 and the reductions needed to achieve the 2020 target. The State's population has grown at about 0.8 percent per year in the last decade. The unincorporated portions of Tulare County grew only 2.4 percent between 2010 and 2017 or 0.35 percent per year. Overall growth in population in Tulare County was 11.2 percent less than was projected in the CAP for 2017. These factors have helped Tulare County to be on track to achieving the 2020 target.

Of equal importance in reaching the 2020 target is the success of the State's GHG reduction strategy. The State implemented the regulations outlined in the 2008 Scoping Plan for nearly all sources of GHG emissions providing greater emission reductions than estimated in the CAP (CARB 2008). This has resulted in the State now predicting that it will achieve its 2020 target of reducing emissions to 1990 levels and in Tulare County being well ahead of its 2020 target. The First Update to the Climate Change Scoping Plan confirmed that the State is on track to achieve the 2020 target and to maintain and continue reductions beyond 2020 as required by AB 32 (CARB 2014).

2020 is two years away and growth rates could increase; however, State forecasts currently reflect continued slower than historic growth with exceptions in areas like the Bay Area that are experiencing more robust economic growth. In the event that rapid growth impacts Tulare County, a sufficient cushion remains to achieve consistency with State 2020 targets. Tulare County will continue to track progress on meeting this target and would adjust the CAP strategy if needed.

CAP 2020 Target

The reductions required by the 2012 CAP from State, Air District, and the County are shown in Table 2. The reductions achieved by State measures meet or exceed the 24.6 percent estimated in 2012 to achieve the 2020 target. With growth being much lower than predicted, the amount of reductions needed to compensate for new growth in the County is also much less. The combined effects of lower than predicted growth rates for the State and the County and full implementation of the State's GHG regulations since the adoption of the 2012 CAP mean that the 2020 target will be achieved ahead of schedule.

Table 2: Sources of Reductions to Achieve 2020 Target

Reduction Measures	Percentage Reduction
State Measures (vehicles, fuels, energy efficiency)	24.6
Air District Measures (employer trip reduction/indirect source)	0.5
Reductions required from Tulare County development	1.1 (6% at project level)
Total Reductions from all Sources	**26.2**
Source: CARB 2008.	

The project reductions from Tulare County development are achieved through land use related measures such as increased density, pedestrian and transit-oriented development, support for alternative transportation modes, and measures that reduce energy consumption through improved energy efficiency in buildings, water conservation, and waste reduction. Voluntary programs provide reductions from existing homes and businesses that install energy saving retrofits and solar photovoltaic systems. No reduction was claimed for voluntary measures. Although development has been limited since 2012, building construction that has taken place in the rural communities provides increased density and complies with increasingly stringent energy efficiency standards, water conservation requirements, and waste reduction goals.

Tulare County 2030 Target

The 2012 Tulare CAP included an emission forecast for 2030 but did not include a reduction target for that year pending adoption of a legislative target for the State. With the adoption of the 2017 Scoping Plan, a Tulare County 2030 reduction target based on consistency with the Scoping Plan may be set. The State's target can provide the basis for determining a fair share reduction for the CAP and for development projects. Under this standard, Tulare County must ensure that its growth does not hinder or interfere with the State achieving its targets. The County has no authority to directly regulate sources of GHG emission; however, other mechanisms to reduce emissions are available. The County can use its land use authority to mitigate the impacts of development projects and its budgetary authority to reduce the emissions from County operations and facilities. The County can invest transportation funds in ways that reduce motor vehicle trips and vehicle miles traveled and increase the use of alternative transportation modes.

Target Methodology

The 2018 CAP Update provides the County's emission reduction target for 2030 and the strategy needed to achieve the target. The 2012 CAP included a target based on achieving a percentage reduction in emissions from those projected to occur in the 2020 target year without considering regulations adopted to reduce GHG emissions after the 2007 base year. The future year inventory is referred to as a BAU inventory. The next step was to determine the effect of adopted regulations on emissions by the target year. This inventory is referred to as the Adjusted BAU Inventory. The difference between the County's target inventory and the Adjusted BAU inventory is the amount required by local measures to reduce GHG emissions to maintain consistency with the State targets and Scoping Plan. No target was set for agricultural emissions in the 2012 CAP or the 2018 CAP

Update because the major source of these emissions is being addressed by the Dairy CAP. The methodology for setting a 2030 target follows the same approach.

The California Supreme Court validated the use of a BAU threshold approach in its 2015 ruling on *Center for Biological Diversity (CBD) v. California Department of Fish and Wildlife (CDFW)* on the Newhall Ranch project. The Court concluded that whether the project was consistent with meeting statewide emission reduction goals is a legally permissible criterion of significance, but the significance finding for the project was not supported by a reasoned explanation based on substantial evidence. The Court provided several other GHG compliance options. A lead agency might assess consistency with AB 32's goal in whole or part by looking to compliance with regulatory programs designed to reduce greenhouse gas emissions from particular activities. A lead agency may utilize "geographically specific GHG emission reduction plans" such as climate action plans or greenhouse gas emission reduction plans to provide a basis for the tiering or streamlining of project-level CEQA analysis. A lead agency may rely on "existing numerical thresholds of significance for greenhouse gas emissions" adopted by, for example, local air districts. The County considered these options for use in the 2018 CAP Update and concluded a project threshold based on a qualitative CAP consistency for most projects and quantitative analysis of large projects is best suited for assessing the GHG impacts of new development proposed after 2020.

2017 Scoping Plan Update 2030 Target. SB 32 requires the State to reduce emissions to 40 percent below 1990 levels by 2030. This requires a reduction of about 5.2 percent per year from the statewide inventory after 2020 as shown in Figure 1. The 2017 Scoping Plan Update includes the State's strategy to achieve this target. The Scoping Plan provides a range of reductions expected from each strategy that in combination would achieve the 2030 target. The Scoping Plan Update relies on Cap-and-Trade to make up any shortfall from other strategies.

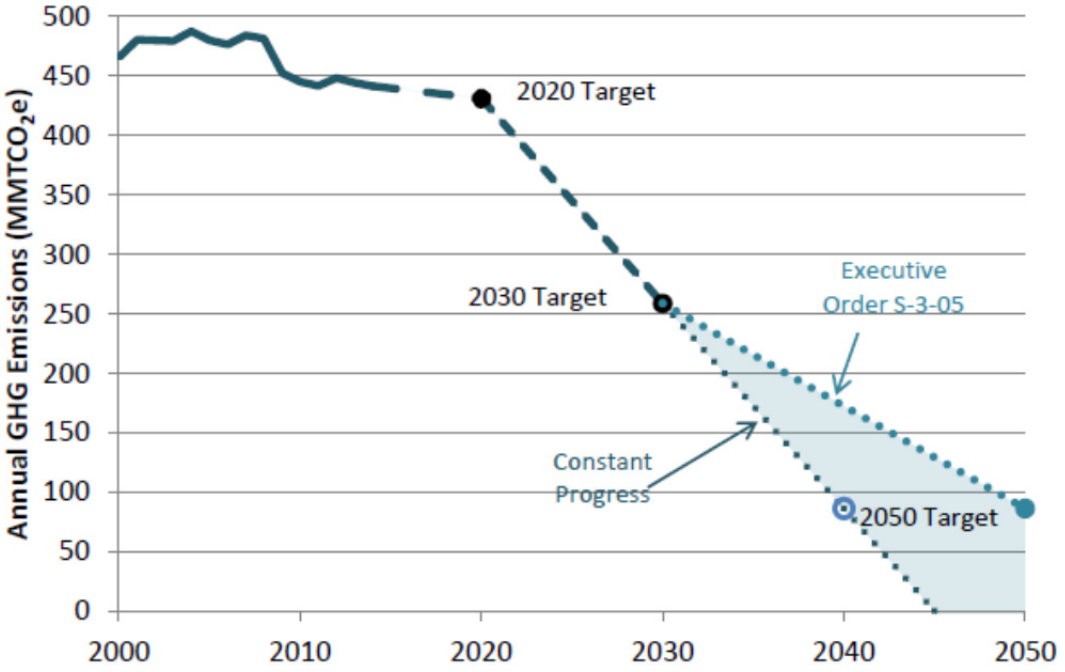
Local governments role in implementing the Scoping Plan fall into two areas.

1. Reductions from transportation emissions are achieved through the Regional Transportation Plan/Sustainable Communities Strategies (RTP/SCS) required by SB 375.
2. Additional reductions in energy use are encouraged from jurisdictions that choose to adopt voluntary building codes that exceed State standards and through water conservation and solid waste reductions.

The Scoping Plan includes no specific reduction amount for local governments except for amounts from SB 375 regional VMT targets implemented through the TCAG RTP/SCS.

The Tulare County 2030 BAU is based on the growth projected between 2015 and 2030 and the reductions applicable to Tulare County included in the 2017 Scoping Plan reference inventory (BAU). The next step in setting the target is to account for new State commitments included in the Scoping Plan Update. The 2017 Scoping Plan Update includes known commitments that are expected to provide a portion of the reductions needed. The Cap-and-Trade Program is expected to provide reductions to close the gap between reductions from source specific regulations and the amount needed to reach the 2030 target. The Scoping Plan also includes reductions attributable to the Short-Lived Climate Pollutant Reduction Strategy (SLCP), which are for non-CO_2 emission sources not in the State's official GHG inventory that uses IPCC methods.

Figure 1: California's Path to Achieving the 2050 Target



As with the 2012 CAP, achieving the CAP 2018 Update target for 2030 is also based on continued implementation of the General Plan policies and support for relevant strategies from the 2017 Scoping Plan. The 2017 Scoping Plan includes strategies that if implemented enable the State to achieve the 2030 target. The strategy calls for reductions from nearly all economic sectors and expects local governments to play a supporting role. It is possible for the State to achieve its goal with a regulatory only strategy but the Scoping Plan encourages local governments to go beyond building energy efficiency regulations where possible and to implement sustainable growth policies to reduce vehicle miles traveled.

CAP Consistency with the 2017 Scoping Plan

Compliance with the Tulare County RTP/SCS provides the mechanism for reducing VMT in the 2017 Scoping Plan. Building energy efficiency is regulated by Title 24, which is updated every 3 years with a goal of zero net energy residential projects by 2020 and non-residential projects by 2030. The 2019 Title 24 Building Energy Efficiency Standards, adopted on May 9, 2018 take effect on Jan. 1, 2020. With the limited growth and rural nature of expected Tulare County development, adopting voluntary Title 24 reach standards would require excessive staff resources and increased capital costs for development projects that could affect low income housing affordability. The County will encourage new development to exceed energy efficiency standards and to install solar panels and other alternative energy projects where feasible. The County has no regulatory authority over fuel use, and most agricultural operations and equipment. The County will provide a supporting role through its land use authority for alternative fuels projects, utility scale solar projects, and infrastructure. Dairies are addressed separately in the Dairy CAP. County landfills and solid waste collectors will be required to reduce organic waste and increase composting and methane capture at landfills. The County can also expand programs to encourage water conservation.

Accounting only for the benefits of adopted regulations and legislated mandates, the CAP target for 2030 is a 9-percent reduction from BAU or a 31 percent reduction from 2015 levels. The 2017 Scoping Plan strategy relies on Cap-and-Trade and the SCLP to achieve the reductions required by 2030. As the State implements the regulations from the Scoping Plan strategy, the gap between the target and the County's 2030 inventory will decrease as occurred during implementation of the 2008 Scoping Plan. The County will monitor State progress in implementing the 2017 Scoping Plan and will adjust the reductions required as the new regulations are adopted and the benefits of individual regulations on the County's emission sources can be determined.

Executive Order S-3-05 2050 Target

The CARB 2008 Scoping Plan states, "The 2020 goal was established to be an aggressive, but achievable, mid-term target, and the 2050 greenhouse gas emissions reduction goal represents the level scientists believe is necessary to reach levels that will stabilize climate" (CARB 2008, page 4). The year 2020 goal of AB 32 corresponds with the mid-term target established by S-3-05, which aims to reduce California's fair-share contribution of greenhouse gases in 2050 to levels that will stabilize the climate. The goal of reducing emissions by 80 percent by the year 2050 is not addressed in this analysis. To obtain the 2050 goal, substantial emission reductions would need to occur in California, such as a conversion to alternative energy generation, conversion to electric and/or zero emission motor vehicles, and substantial changes to land use patterns and transportation. The objective of this CAP is to provide Tulare County's contribution to achieving the 2020 and 2030 targets and to provide substantial progress toward achieving the 2050 target.

The 2018 CAP update addresses consistency with the SB 32 targets for the 2030 milestone year and the 2017 Scoping Plan Update that provides the strategy to achieve the 2030 target. Adopting a Tulare County target for 2050 would be premature and speculative prior to having the State's strategy that would provide most if not all of the reductions needed. In addition, the General Plan milestone year is 2030. A future General Plan update with a later buildout year would provide an appropriate occasion to address post 2030 targets. The State has the regulatory authority to control motor vehicle emissions, energy production, energy efficiency, and short-lived climate pollutants such as methane and refrigerants, but would still need additional legislation to require reductions beyond those needed to achieve the 2030 target or that are specifically authorized by other legislation such as SB 375 which includes a 2035 target for passenger vehicle emissions.

1.7—Cost of Implementing the Climate Action Plan

Implementation of the CAP reduction strategy will result in both costs and savings. Many of the building-related measures provide savings from reduced energy consumption. Many of the land use and transportation measures have lower infrastructure costs compared with "business-as-usual," which is due to more compact development and less need to expand transportation infrastructure because of the reduced trip generation rates. Some measures require investment in new technologies to achieve the reductions in energy and fuel use. The technology investments, in many cases, will pay for themselves over time with savings in energy costs. Some investments made by developers in energy efficiency and new technology may be difficult to recoup in the sale of the property due to market forces, but the person or business that ultimately pays for the energy use could experience savings.

The County will incur costs in administering the CAP. The County is responsible for implementing the measures included in the CAP and for tracking progress over time. Future updates to the CAP will also require County resources for staff and for technical assistance. To the extent possible, the County intends to incorporate CAP work into other related projects. For example, monitoring progress in implementing the CAP will be accomplished using existing data sources and the General Plan progress report process. Changes in travel characteristics are currently tracked as part of the Regional Transportation Plan maintained by the TCAG. This data can be used to determine the effectiveness of measures designed to reduce trips and vehicle miles traveled.

1.8—Monitoring and Tracking Progress

As part of the annual report to the Board of Supervisors on progress in implementing the General Plan, staff will report on benchmarks achieved that implement goals, objectives, and policies having air quality benefits. The County will use quantitative measures of progress, sometimes referred to as metrics, for goals, objectives, and policies with quantitative targets whenever possible. For example, increases in project level energy efficiency compared to Title 24 requirements may be obtained from Title 24 energy efficiency reports when those are prepared for projects. Not all Title 24 reports provide percent above standard and many only indicate overall compliance. In those cases, the percent reduction is the amount achieved through compliance with the regulations. The County will use its Geographic Information System to provide up to date land use and development data and tracking for other benchmarks or metrics. Transportation related measure data may be collected by the local transit agencies or the TCAG. An example of an item that is tracked is building permit data. For more details, see Section 7, Monitoring Program and Implementation Plan in this CAP, which identifies a number of benchmarks and metrics to verify progress. The CAP monitoring program will be adjusted over time to respond to changing conditions and lessons learned.

The County's success in achieving the targets set forth in the CAP is dependent on many factors that are subject to change. The type, mix, and scale of development that will occur by 2020 are dependent on the economy, changes in consumer preferences, and market trends. New technologies that have yet to be imagined may have dramatic effects on how we live and work. For these reasons, a long-range planning effort like the CAP requires monitoring and course corrections to keep up with the world as it is and not how it was predicted to be in 2018.

The County has issued two Progress Reports and an emission inventory update since the 2012 CAP was adopted. The inventory update was presented to the Board of Supervisors in February 2016 (Tulare County 2016a). The most recent Progress Report was presented to the Board of Supervisors in December 2017. The Progress Report indicated that growth was well below projections and that the County is on track to achieving the 2020 target.

SECTION 2: CLIMATE CHANGE

2.1—Climate Change Science

According to the Office of Environmental Health Hazard Assessment (OEHHA) in its Indicator of Climate Change Report (OEHHA 2017), California is already experiencing the effects of climate change, and projections show that these effects will continue to worsen over the coming centuries. The following changes are already occurring:

- A recorded increase in annual average temperatures, as well as increases in daily minimum and maximum temperatures.
- An increase in the occurrence of extreme events, including wildfire and heat waves.
- A reduction in spring runoff volumes, as a result of declining snowpack.
- A decrease in winter chill hours, necessary for the production of high-value fruit and nut crops.
- Changes in the timing and location of species sightings, including migration upslope of flora and fauna, and earlier appearance of Central Valley butterflies.

One study examined both precipitation and runoff in the Sacramento and San Joaquin River basins and found that 10 of the past 14 years between 2000 and 2014 have been below normal, and recent years have been the driest and hottest in the full instrumental record from 1895 through November 2014. In another study, the authors show that the increasing co-occurrence of dry years with warm years raises the risk of drought, highlighting the critical role of elevated temperatures in altering water availability and increasing overall drought intensity and impact. Generally, there is growing risk of unprecedented drought in the western United States driven primarily by rising temperatures, regardless of whether or not there is a clear precipitation trend.

Climate change is a change in the average weather of the earth that may be measured by alterations in wind patterns, storms, precipitation, and temperature. These changes are assessed using historical records of temperature changes occurring in the past, such as during previous ice ages. Many of the concerns regarding climate change use this data to extrapolate a level of statistical significance specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change constructed several emission trajectories of greenhouse gases needed to stabilize global temperatures and climate change impacts. The Intergovernmental Panel on Climate Change predicted that global mean temperature change from 1990 to 2100, given six scenarios, could range from 1.1 degrees Celsius (°C) to 6.4°C. Regardless of analytical methodology, global average temperatures and sea levels are expected to rise under all scenarios (IPCC 2007).

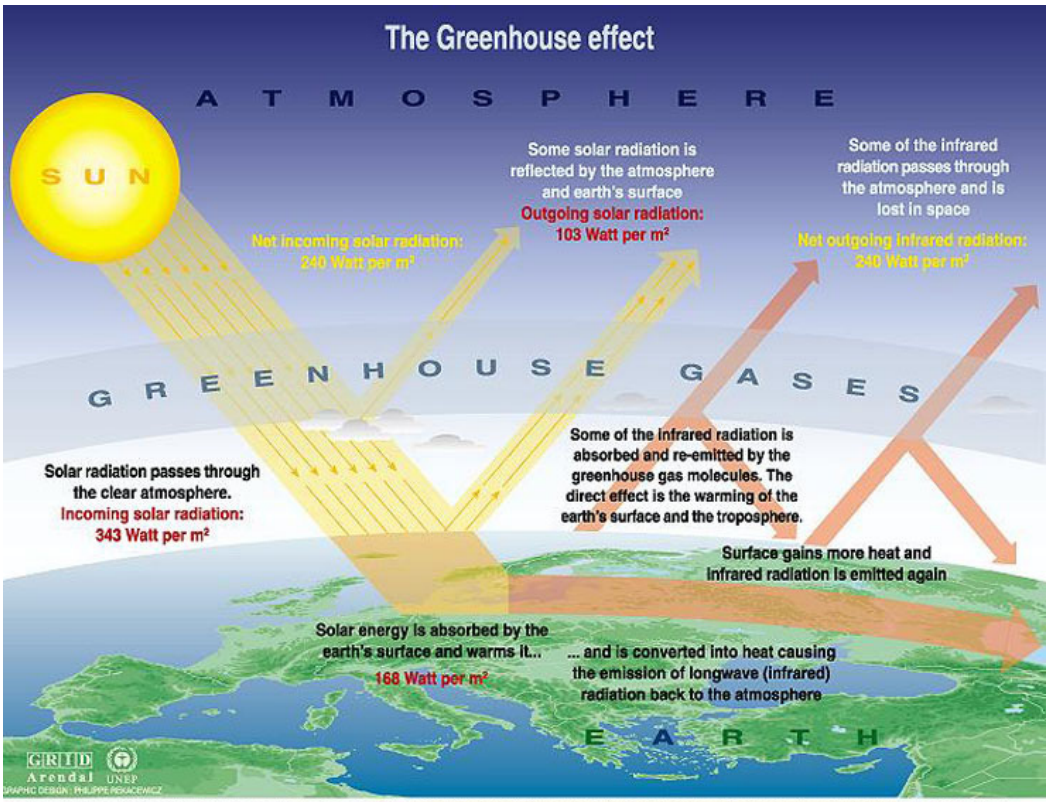
Gases that trap heat in the atmosphere are referred to as greenhouse gases. The effect is analogous to the way a greenhouse retains heat. Natural processes and human activities emit greenhouse gases. The presence of greenhouse gases in the atmosphere affects the earth's temperature. Without the natural heat trapping effect of greenhouse gas, the earth's surface would be about 34°C

cooler (CAT 2006). However, it is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

Climate change is driven by forcings and feedbacks. Radiative forcing is the difference between the incoming energy and outgoing energy in the climate system. Positive forcing tends to warm the surface while negative forcing tends to cool it. Radiative forcing values are typically expressed in watts per square meter. A feedback is a climate process that can strengthen or weaken a forcing. For example, when ice or snow melts, it reveals darker land underneath which absorbs more radiation and causes more warming. The global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere. The global warming potential of a gas is essentially a measurement of the radiative forcing of a greenhouse gas compared with the reference gas, carbon dioxide.

Figure 2 provides a visual representation of the greenhouse effect. As is shown in the illustration, solar radiation (energy) passes through the clear atmosphere. Some of the solar radiation is reflected back into space by the atmosphere and the earth's surface. Some solar radiation is absorbed by the earth's surface and is converted into heat causing the emission of infrared radiation back into the atmosphere. Some of the infrared radiation is absorbed and re-emitted by the greenhouse gas molecules and some exits the atmosphere to space.

Figure 2: The Greenhouse Effect



Sources: Okanagan university college in Canada, Department of geography, University of Oxford, school of geography; United States Environmental Protection Agency (EPA), Washington; Climate change 1995, The science of climate change, contribution of working group 1 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge university press, 1996.

Individual greenhouse gas compounds have varying global warming potentials and atmospheric lifetimes. Carbon dioxide, the reference gas for global warming potentials, has a global warming potential of 1. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing greenhouse gas emissions since it normalizes various greenhouse gas emissions to a consistent measure. Methane's warming potential of 25 indicates that methane has a 25 times greater warming affect than carbon dioxide on a molecule per molecule basis. A carbon dioxide equivalent is the mass emissions of an individual greenhouse gas multiplied by its global warming potential.

Greenhouse gases as defined by AB 32 include the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Greenhouse gases as defined by AB 32 and sources are summarized in Table 3. Greenhouse gases not defined by AB 32 include water vapor, ozone, and aerosols. Water vapor is an important component of our climate system and is not regulated. Ozone and aerosols are short-lived greenhouse gases; global warming potentials for short-lived greenhouse gases are not defined by the IPCC. Aerosols can remain suspended in the atmosphere for about a week and can warm the atmosphere by absorbing heat and cool the atmosphere by reflecting light. Black carbon is a type of aerosol that can also cause warming from deposition on snow.

Table 3: Greenhouse Gases

Greenhouse Gas	Description and Physical Properties	Sources
Nitrous oxide	Nitrous oxide (N_2O) is also known as laughing gas and is a colorless greenhouse gas. It has a lifetime of 114 years. The EPA reported that the concentration of nitrous oxide was 322 parts per billion (ppb) in 2008. Its global warming potential is 298.	Microbial processes in soil and water, fuel combustion, and industrial processes.
Methane	Methane (CH_4) is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. The EPA reported that the average methane concentration in 2008 was 2,000 parts per billion (ppb) based on data from a single site Its global warming potential is 25.	Methane is extracted from geological deposits (natural gas fields). Other sources are landfills, fermentation of manure, decay of organic matter, and cattle.
Carbon dioxide	Carbon dioxide (CO_2) is an odorless, colorless, natural greenhouse gas. Carbon dioxide's global warming potential is 1. The average global concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960. The lifetime of CO_2 is about 100 years but is variable because it depends on processes that may emit and remove CO_2 depending on the environmental conditions. Examples of these processes	Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused) sources are from burning coal, oil, natural gas, and wood.

Greenhouse Gas	Description and Physical Properties	Sources
	are atmosphere ocean gas transfer, chemical (e.g., weathering) and biological (e.g., photosynthesis). Carbon dioxide from fossil fuels contributed 81% of greenhouse gas emissions in 2004 in California.	
Chlorofluorocarbons	These are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. They are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). Chlorofluorocarbons have lifetimes ranging from 57 to 333 years. The concentrations of the individual CFCs range from 5 to over 100 parts per trillion (ppt). Global warming potentials range from 3,800 to 8,100.	Chlorofluorocarbons were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone. The Montreal Protocol on Substances that Deplete the Ozone Layer prohibited their worldwide production in 1987. These substances have been replaced primarily with hydrofluorocarbons.
Hydrofluorocarbons	Hydrofluorocarbons are a group of greenhouse gases containing carbon, chlorine, and at least one hydrogen atom. The lifetime these gases range from 1 year to 260 years. The concentrations of the various hydrofluorocarbons vary from 1 to 10 ppt. Global warming potentials range from 124 to 14,800.	Hydrofluorocarbons are synthetic manmade chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants.
Perfluorocarbons	Perfluorocarbons have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years. Measurements in 2000 estimate the perfluorocarbon CF4 global concentrations in the stratosphere at over 70 parts per trillion (ppt). Global warming potentials range from 7,390 to 12,200.	Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing.
Sulfur hexafluoride	Sulfur hexafluoride is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. The concentration of sulfur hexafluoride in the late 1990s was almost 4 ppt. It has a high global warming potential 22,800.	This gas is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.
Notes: Measure of concentrations in atmosphere: ppm = parts per million; ppt = parts per trillion Sources: Compiled from a variety of sources, including International Panel on Climate Change AR4 GWP 2007.		

2.2—Effects of Climate Change

Future climate change conditions have the potential to affect a number of different resources. From a Statewide perspective, climate change could affect California's environmental resources through potential, though uncertain, changes related to future air temperatures and precipitation and resulting impacts on water temperatures, reservoir operations, sea levels, and stream runoff. Such changes could threaten California's economy, public health, and environment.

Executive Order S-13-08 indicates that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in the order, in December 2009, the California Natural Resources Agency released its 2009 California Climate Adaptation Strategy (CNRA 2009). The Strategy is the ". . . first Statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

Impacts to California

The following is a summary of current scientific literature related to the effects of climate change in California. Much of the information contained below is from the 2009 California Climate Change Adaptation Strategy report (CNRA 2009) and Our Changing Climate 2012 (CEC 2012)

Taken collectively, the indicators help portray the interrelationships between climate and other physical and biological elements of the environment.

1. Average temperatures have increased by about 1.8 degrees Fahrenheit in California over the past century. Increases in minimum and maximum temperatures were 2.2°F and 1.3°F, respectively.
2. Over the past 120 years, California has become increasingly dry. The most recent drought from 2012 to 2016 was the most extreme since instrumental records began.
3. With increasing temperatures, the energy needed to cool buildings during warm weather—measured by "cooling degree days"—has increased.
4. Extreme heat days and especially nights have become more frequent since 1950. Heat waves have been highly variable each year, but nighttime heat waves have shown a marked increase since the mid-1970s.
5. Glaciers in the Sierra Nevada have decreased in area dramatically. By 2014, several of the largest glaciers were on average about half their size at the beginning of the twentieth century.
6. The amount of water stored in the state's snowpack has been highly variable from year to year, dropping to a record low in 2015, about 5 percent of the historical average. Snowmelt runoff during April through July has declined over the past century.

7. The area burned by wildfires across the state is increasing in tandem with rising temperatures. Large wildfires account for much of the acreage burned each year.
8. Over the past 80 years, California's forests have been changing in response to decreasing water availability, driven by warmer temperatures. Small trees and oaks have increased, while pines have decreased.
9. Sea levels along the California coast have risen overall, except at one location where uplift of the land surface has occurred due to the movement of the Earth's plates.

Water Supply

Section VII of the 2009 California Climate Adaptation Strategy report prepared by the California Natural Resource Agency (CNRA) provides a detailed discussion regarding potential impacts to California's water supply from climate change. Climate change is expected to impact California's water supply through a diminishing Sierra snowpack. The predicted change in rain and snowfall patterns over the 21st century varies by climate scenarios and models; however, most models suggest a 12- to 35-percent overall decrease in precipitation, with more precipitation occurring as rain rather than snow (CNRA 2009). This could lead to water shortages, as communities in California depend on runoff from established snowpack to provide water during the drier months. This problem is exacerbated by higher temperatures, which increase evaporation and snowmelt.

It is expected that increased amounts of winter runoff could be accompanied by increases in flood event severity and warrant additional dedication of wet season storage space for flood control instead of using the water for supply conservation, as is the standard practice. This change in water management could lead, in turn, to more frequent water shortages during periods of high water demand. Many regional studies have shown that only small changes in inflows into reservoirs could result in large changes in the reliability of water yields from those reservoirs (CNRA 2009).

A report prepared by the California Department of Water Resources in response to Executive Order S-3-05 represents the most current complete analysis of changes to State Water Project and Central Valley Project operations that would be likely to occur as a result of climate change. Contained in the report is an analysis of the potential impacts of climate change on State Water Project and Central Valley Project operations and deliveries and on Delta water quality and water levels. Results discussed in the report include projections from 2035 through 2064 under four potential climate change scenarios compared with a baseline scenario that does not assume climate change effects.

Four potential climate change scenarios were included, based upon modeling output from two separate global climate models. Three of these scenarios included decreased average annual precipitation, while one included increased average annual precipitation. Results from the investigation are considered preliminary, incorporate several assumptions regarding the effects of climate change on California water resources, and reflect a limited number of climate change scenarios. Results from the four modeled scenarios indicated effects to State Water Project and Central Valley Project operations. Because of projections of shifts in seasonal and annual average runoff, the amount of water delivered by the State Water Project and Central Valley Project was reduced considerably. The wetter scenario exhibited increased winter season runoff and decreased

April-July runoff, but it resulted in a 3-percent average annual increase in Central Valley Project South of Delta deliveries (CDWR 2006).

Most global climate models project that anthropogenic (human caused) climate change will be a continuous and fairly gradual process through the end of this century. California is expected to be able to adapt to the water supply challenges posed by climate change, even at warmer and dryer projections. Sudden and unexpected changes, however, could leave water managers unprepared, which, in extreme situations could have significant implications for California's water supplies (CDWR 2006).

Surface Water Quality

Water quality is affected by several variables, including runoff volume and timing, the physical characteristics of the watershed and water temperature. A combination of changes to these factors could affect several natural processes that serve to eliminate pollutants in water bodies. For example, an overall decrease in stream flows could concentrate pollutants and prevent contaminants from flushing from point sources.

Amount of Precipitation

Most precipitation events in California occur during the October through April rainy season with most of California's precipitation, in terms of amount of water, falling during November through March. An investigation completed by the Department of Water Resources indicated a statistically significant increasing trend in total precipitation in northern and central California since the late 1960s. A single investigation by Bardini and others showed a trend of potentially decreasing annual precipitation in California; however, this result is probably related to the specific subset of data that the Bardini study relied upon, wherein extremes at the beginning or end of time series data can substantially impact the identified trend. An investigation of rainfall during November through March from 1930 through 1997 indicated significant increases in California rainfall (CDWR 2006).

There is also evidence that the amount of precipitation that occurs on an annual basis is becoming more variable, that is, periods of both high and low rainfall are becoming more common. Specifically, a study performed by the Department of Water Resources indicates that present-day variability in annual precipitation is about 75 percent greater than that of the early 20th century (CDWR 2006).

Kaweah River Canyon

Changes in Runoff and Flooding

Annual runoff is measured during the annual water year (October 1 through September 30) and includes river flows derived from precipitation events, snowmelt, and river base flow. Peak runoff is typically measured for individual storm events. Like annual runoff, peak runoff results from precipitation events, snowmelt, and river base flow. Precipitation across California appears to have increased over the past century, and individual water years have

become more variable in terms of the amount of precipitation that occurs. It follows, then, that similar variable trends would be seen for runoff (CNRA 2009).

In relation to snowpack, winter storms provide snow to higher elevations that have historically melted from April through July. This process effectively stores water in California's snowpack until the spring snowmelt, when the water flows downstream and into major rivers and reservoirs, providing a significant portion of the water supply for the dry summer and autumn periods. April through July runoff in both the Sacramento and San Joaquin rivers shows a decreasing trend over the last century, indicating that in both watersheds, an increasing percentage of runoff is occurring earlier in the year, when many reservoirs are managed primarily for flood control and not for water supply (CDWR 2006).

Large annual variations in winter rainfall and runoff, which are normal in California, create uncertainty surrounding potential changes in flooding as a result of climate change. Independent climate modeling efforts are predicting that trends towards more variable river flows and more frequent flooding events will continue into the future, as a result of climate change (REIR 2010).

Wildland Fire Hazards

Warmer temperatures, longer dry seasons, reduced winter precipitation, and early snowmelt contribute to the increase in wildfires. Low- to moderate-intensity fires can be beneficial to ecosystems; however, there are no benefits from high-intensity fires (CNRA 2009).

Results of fire modeling conducted for the California Energy Commission found that within California, increases in fire risk in Northern California ranged from 15 to 90 percent, increasing with temperature. In Southern California, the change in fire risks ranged from a decrease of 29 percent to an increase of 28 percent. Temperature increases and lower precipitation in northern California and southern Oregon produced larger fire-risk increases in the western slopes and foothills of the Sierra Nevada and in the Coast and Cascade ranges of northern California and southern Oregon, where forests and woodlands provide a ready source of fuel (CEC 2006).

Negative Impacts to Agriculture and Forestry

Impacts to agricultural and forest resources from wildfires, pests, increased temperatures, water reductions, and flooding may be caused by climate change. Development on productive farmland or forestry reduces land available for adaptation. There could be reductions in the quality and quantity of certain agricultural products such as grapes, fruit, nuts, and milk.

Some temperature warming may be beneficial for agriculture and forestry, but at a certain level, these benefits will deteriorate basic plant functioning. Earlier flowering can be a problem if plants become desynchronized with life cycles of pollinators. A reduction in chill hours can be a problem for fruits and nuts. Warmer temperatures increase the growth rate of pests, weeds, and pathogens. Increased temperatures may reduce the range of forests (KRH 2008).

Extreme events such as heat waves and floods pose significant challenges to this sector, including early flowering, reduced effectiveness of pollination, decreased ability for photosynthesis, decreased yield, and demise of plants requiring long periods of growth. Higher temperatures can reduce cow milk production. A lower temperature-warming scenario shows a 7- to 10-percent reduction in dairy production and 11 to 22 percent reduction for the highest warming scenario (KRH 2008).

Climate change poses a serious threat to agriculture for the State of California and Tulare County. Temperature increases observed statewide and globally have been partially masked in the past few decades by cooling from irrigation. But the aerial extent of irrigation is expected to stabilize, thus unable to mask further increases. Thus, temperature increases and other climatic changes pose serious threats to the leading economic sector of the county, including:

- Higher temperatures, including extreme temperatures, can negatively affect crop growth during various stages of their development, as well as cattle and poultry health and reproduction;
- Higher temperatures, especially in the main harvesting months, are also dangerous to agricultural workers;
- Reduced water availability as a result of (a) the projected decrease in snowpack as more precipitation falls as rain than as snow and (b) higher temperatures leading to higher evaporation from reservoirs and soils resulting in reduced reservoir storage and generally drier conditions; any decrease in total precipitation as projected by the latest climate change projections for the state would only exacerbate these declines in water supplies;
- More intense downpours can lead to fruit, vegetable and flower damage and more soil erosion;
- Water demand by plants and animals (for drinking and cooling) will increase as temperatures increase;
- Reduced number of chill hours (with relevant temperature thresholds varying by fruit crop);
- Less-well understood effects of changing climate on crop pollination;
- Lower productivity of rangelands for cattle; and
- Increased risk of pest infestations and spread of invasive plant species. (CEC 2012).

One of the potential benefits of a warmer climate is that cold extremes and late winter and spring frosts—which can pose serious threats to sensitive crops—will continue to become less frequent (Figure 32). Many crops also respond positively to elevated carbon dioxide under lower levels of warming, but this beneficial effect on growth and yields is limited quickly by higher levels of warming and water or other nutrient shortage (CEC 2012).

Sea Level Rise

A rise in sea levels could result in the displacement of coastal businesses and residences. During the past century, sea levels along California's coast have risen about 7 inches. If heat-trapping emissions continue unabated and temperatures rise into the higher warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century (Moser et al. 2009). Elevations of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

Negative Impacts to Public Health

Climate change could cause an increase in infections, disease, asthma, and other health-related problems (CCCC 2006). Heat waves are expected to have a major impact on public health as well as decreasing air quality and an increase in mosquito breeding and mosquito-borne diseases. Vector control districts throughout the State are already evaluating how they will address the expected changes to California's climate.

If temperatures rise to the medium warming range, there could be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions. This is more than twice the increase expected if rising temperatures remain in the lower warming range.

Negative Impacts to Wildlife

Increased global temperatures and resource depletion exacerbated by climate change are causing disruptions in animal migration and plant pollination. As temperatures rise, species are moving north in California or to higher elevations. This change in migration disrupts the food chain and prevents some plant species from being pollinated. Water and food supplies are expected to be more variable and to shift as the seasons change on different timeframes. With vegetation, reduction in soil moisture will result in early die-back of many plants, potentially leading to conflicts with animal breeding seasons and other natural processes. Many of the potential effects on wildlife are still being studied, but because of the inability of wildlife to adapt to new climates, the potential for severe species loss is highly probable (CNRA 2009).

Implications for Tulare County

Increased Flooding

Increasing snowmelt from rising temperatures coupled with increasing precipitation in the form of rain and less falling as snow in the mountains could result in greater flows in mountain streams and rivers. Additionally, increasing variability in storm events could affect flood control measures such as levees and reservoirs (CDWR 2006).

Tulare County contains a number of rivers and waterways. The Kern River flows north to south through the Sierra Nevada Mountains in eastern Tulare County. The headwaters for the Kaweah and Tule Rivers are located in the Sierra Nevada Mountains. These rivers flow west into the Tulare Lake Basin. A number of mountain streams flow into the Kaweah and Tule rivers and their respective reservoirs, Lake Kaweah and Lake Success. Lake Kaweah and Lake Success both serve as flood control structures. The Kaweah and Tule rivers, their tributaries, and Lake Kaweah and Lake Success could be

subject to increased frequency or severity of flooding from upstream areas as a result of increased snowmelt and runoff. A number of communities are located near these water bodies, including Three Rivers, Woodlake, Lemoncove, Springville, and Porterville, and could be exposed to increased flooding associated with the effects of climate change (REIR 2010).

Water Supplies

Tulare County receives some of its water supplies from the State Water Project and Central Valley Project. Surface water supplies in Tulare County from the State Water Project and Central Valley Project could potentially be reduced as a result of climate change effects (CDWR 2006).

Few scientific studies have been performed on the effects of climate change on specific groundwater basins, groundwater quality, or groundwater recharge characteristics. Warmer temperatures could lead to higher evaporation or shorter rainfall seasons, which would mean that soil deficits would persist for longer time periods. Reductions in spring runoff and higher evapotranspiration would likely reduce the amount of water available for recharge and can lead to greater pumping of groundwater to make up for losses in surface water (CNRA 2009). Groundwater serves as a major source of water supply in Tulare County, which could result in serious implications for water supply in the County.

Agriculture

Agriculture is important to Tulare County. Climate change may cause negative effects to agriculture. Some crop yields may increase with warming, while others may decrease. Compared with 2005 levels, the following yield changes in 2030 are estimated for Tulare County: almond yield increase by 5 percent; grape yield decrease by 5 percent; berry yield decrease by 5 percent; and cherry yield decrease by more than 15 percent (CNRA 2009). No values were provided in the report for citrus. Changes in precipitation can result in drought, which can have serious impacts on agriculture in the County.

Public Health

The elderly and young, and those vulnerable populations that do not have the resources to deal with the costs and adapt to the changes that are expected to impact the community will need assistance. More days with higher temperatures could increase heat related illnesses, especially in the elderly that may not be able to afford to run their air conditioning system. Increased temperatures may also result in higher ozone concentrations with more violations of the health-based standard. Some vectors such as mosquitoes may expand their range to new areas resulting in increased vector-related illnesses. Warming may also cause increases in allergens. Social equity issues related to the unequal distribution of resources and increased costs to address community-wide health risks will need to be addressed proactively to reduce the potential for financial strain on the County (CNRA 2009).

Climate Change Adaptation

There are adaptation strategies Tulare County can use that would minimize impacts from climate change to the County. These strategies are incorporated in a variety of policies within the 2030 Tulare County General Plan. The policies will help the County adapt to impacts from climate change.

Water Supply

Water conservation policies in the Tulare County General Plan will help to conserve water for future uses. These water conservation policies are summarized in Section 5.1.3, Water Conservation Energy Savings, of this CAP and include the following:

- WR-1.5 Expand Use of Reclaimed Wastewater
- WR-1.6 Expand Use of Reclaimed Water
- WR-3.5 Use of Native and Drought Tolerant Landscaping
- ERM-1.7 Planting of Native Vegetation

In addition, the County is considering a Water Conservation Program in the Community of Traver as part of a wastewater treatment plant upgrade project that will reduce water consumption with the benefit of reduction of influent to the wastewater facility by allowing the income-qualified residents to replace inefficient water devices with new low-flow or low-consumption water conserving devices.

AB 1881 (2006) required the State Department of Water Resources to update the Model Water Efficient Landscape Ordinance and required all cities and counties to adopt and implement a water efficient landscape ordinance by January 1, 2010. The ordinance is intended to reduce water consumption for landscape watering and so will help Tulare County adapt to potential lower water availability. The County enforces water conservation requirements of the CalGreen Building Code and the Model Water Efficient Landscape Ordinance. During the recent drought, the County adopted the Ordinance Establishing the Staged Water Conservation Program at All County-Operated Water Systems in County Service Area No. 1 on May 17, 2016, which was designed to meet the Governor's Executive Order B-29-15 that requires a 25 percent reduction in potable urban water use compared with a 2013 baseline (Tulare County 2016b).

Flooding

The General Plan policies that would help to prevent flooding include the following:

- FGMP-8.3 Development in the Floodplain
- HS-1.4 Building and Codes
- HS-1.5 Hazard Awareness and Public Education
- HS-1.11 Site Investigations
- HS-5.1 Development Compliance with Federal, State, and Local Regulations
- HS-5.2 Development in Floodplain Zones
- HS-5.3 Participation in Federal Flood Insurance Program
- HS-5.4 Multi-Purpose Flood Control Measures
- HS-5.5 Development in Dam and Seiche Inundation Zones
- HS-5.6 Impacts to Downstream Properties
- HS-5.7 Mapping of Flood Hazard Areas
- HS-5.8 Road Location
- HS-5.9 Floodplain Development Restrictions
- HS-5.10 Flood Control Design
- HS-5.11 Natural Design

- PFS-4.1 Stormwater Management Plans
- PFS-4.3 Development Requirements
- PFS-4.6 Agency Coordination

Agriculture and Forest

There are several adaptation strategies for the agricultural sector (KRH 2008). These include crop switching, breeding, and improved management practices. As chill hours decline, varieties of fruits and nuts that require less chill time could increase survival rates. Better monitoring of pests, weeds, and diseases could lead to improved control and reduced damages. More efficient water use could reduce farmers' exposure to drought.

Methods to provide greater heat tolerance for cows include introducing shade, "showering," cool drinking water, changing feeding schedules, and adjusting livestock diets to reduce meat. The effectiveness of these methods, however, may decrease at higher temperatures. Additionally, breeding for more heat-resistant livestock may be a longer-term strategy; historically, heat resistance has been sacrificed for greater milk production. Other livestock such as poultry and sheep are also impacted by excessive heat.

Agricultural and forest land preservation and conservation would allow greater room for adaptation. Smart growth policies and urban growth boundaries would help to reduce encroachment onto agricultural and forest lands.

The General Plan policies that would help the County adapt to impacts from climate change on agriculture include the following, as described in Section 5.1, Tulare County General Plan Policies and Measures:

- AQ-3.2 Infill near Employment
- LU-1.4 Compact Development
- LU-1.8 Encourage Infill Development
- LU-3.3 High Density Residential Locations
- LU-2.1 Agricultural Lands
- AG-1.8 Agriculture within Urban Boundaries
- ERM-5.15 Open Space Preservation
- LU IM 3 Encourage Smart Growth Incentives

2.3—California Regulatory Context

California leads the nation in adopting broad reaching legislation and implementing comprehensive regulations to reduce greenhouse gas emissions. This leadership role is expected to continue in the coming years in order to reach the challenging mid-term and long-term reduction targets set by the State.

Statewide Greenhouse Gas Emissions Strategy

Executive Order S-3-05.

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S 3-05, the following reduction targets for greenhouse gas emissions:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020, reduce greenhouse gas emissions to 1990 levels; and
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be an aggressive, but achievable, mid-term target. The State achieved the 2010 target is expected to achieve the 2020 target.

Assembly Bill (AB) 32

The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006 (2006 Stats. Ch. 488 and Health & Safety Code § 38500, et seq.). This landmark legislation was California's first comprehensive bill to require the reduction of greenhouse gas emissions. Greenhouse gases, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. AB 32 requires that greenhouse gases emitted in California be reduced to 1990 levels by the year 2020. CARB is the primary State agency charged with developing plans to meet AB 32 targets, developing emission inventories, and regulating certain sources of greenhouse gases that cause global warming. The California Energy Commission (CEC), the California Department of Water Resources (CDWR), and CalRecycle also have significant roles in implementing AB 32.

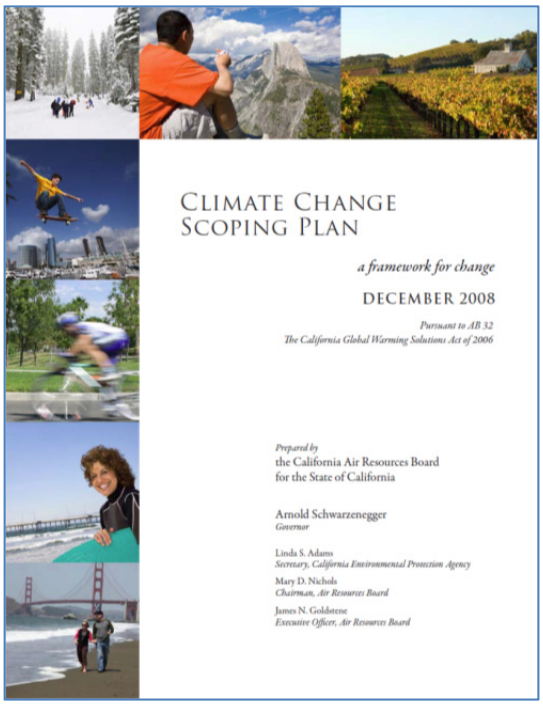
AB 32 states the problem as follows:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the State from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

CARB approved the 1990 greenhouse gas emissions level of 427 $MMTCO_2e$ on December 6, 2007 (CARB 2007). The First Update to 2014 Scoping Plan Update revised the 1990 inventory to 431 $MMTCO_2e$, therefore, emissions generated in California in 2020 are required to be equal to or less than 431 $MMTCO_2e$.

2008 Scoping Plan

CARB approved the Climate Change Scoping Plan in December 2008. The Plan "proposes a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health" (CARB 2008).



The 2008 Scoping Plan identifies recommended measures for multiple greenhouse gas emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 greenhouse gas target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards (The CEC completed 2013 and 2016 updates to Title 24 Building Energy Efficiency and CalGreen and is currently working on the 2019 update);
- Achieving a Statewide renewables energy mix of 33 percent (Utilities are on track to achieve the 33 percent renewable target);
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system (The CAP and Trade program is in place and recent auctions have been successful);
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets (SB 375) (Regional targets have been adopted by CARB);
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard (All in place); and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation (Considered infeasible at this time).

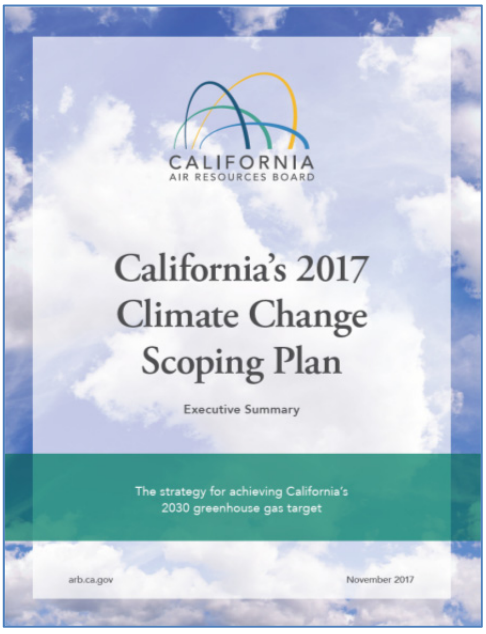
An important feature of the Scoping Plan is that it differentiates between "capped" and "uncapped" strategies. Capped strategies are subject to the proposed cap-and-trade program which comprise 85 percent of the State's GHG emissions. The Scoping Plan states that the inclusion of these emissions within the cap-and trade program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure.

Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. Uncapped strategies that will not be subject to the cap-and-trade emissions caps and requirements are provided as a margin of safety by accounting for additional greenhouse gas emission reductions. Examples of uncapped strategies are high global warming potential measures, sustainable forests, oil and gas extraction and transmission, and landfill methane capture. The CARB reports that the State is on track to meet or exceed the 2020 target.

The First Update to the Climate Change Scoping Plan adopted in May 2014 provided revised inventory projections to reflect slower growth in emissions during the recession and lower future year projections. The State's 2020 BAU inventory was reduced from 596 $MMTCO_2e$ to 545 $MMTCO_2e$ (CARB 2014). The GHG reduction level for the State to reach 1990 emission levels by 2020 was lowered to 21.7 percent from BAU in 2020. The 2014 Scoping Plan Update also confirmed that the State is on track to achieve the 2020 target and to maintain and continue reductions beyond 2020 as required by AB 32 (CARB 2014).

The 2014 Scoping Plan Update incorporated a list of key recommended actions for the agriculture sector, including the following "In 2014, convene an interagency workgroup that includes the California Department of Food and Agriculture, CARB, CEC, the California Public Utilities Commission (CPUC), and other appropriate state and local agencies and agriculture stakeholders to:

- Establish agriculture sector GHG emission reduction planning targets for the mid-term time frame and 2050.
- Expand existing calculators and tools to develop a California-specific agricultural GHG tool for agriculture facility operators to use to estimate GHG emissions and sequestration potential from all on-farm sources. The tool would include a suite of agricultural GHG emission reduction and carbon sequestration practices and would allow users to run different scenarios to determine the best approach for achieving on-farm reductions.
- Make recommendations on strategies to reduce GHG emissions associated with the energy needed to deliver water used in agriculture based on the evaluation of existing reporting requirements and data.
- Conduct research that identifies and quantifies the GHG emission reduction benefits of highly efficient farming practices and provide incentives for farmers and ranchers to employ those practices."



Senate Bill (SB) 32

SB 32 is follow-up legislation to address the 2030 target previously contained in Executive Order B-30-15. SB 32 continues the State's leadership in reducing GHG emissions. The Governor signed SB 32 on September 8, 2016. SB 32 gives CARB the statutory responsibility needed to pursue this goal. SB 32 states that "In

adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions authorized by this division, the state [air resources] board shall ensure that statewide greenhouse gas emissions are reduced to at least 40 percent below 1990 levels by December 31, 2030." The 2017 Climate Change Scoping Plan Update addressing the SB 32 targets was adopted on December 14, 2017.

2017 Scoping Plan

Unlike the 2008 Scoping Plan, which provided emission reduction estimates for each strategy, the 2017 Scoping Plan assigns a range of reductions to each measure to account for the uncertainty in effectiveness of the regulations ultimately adopted to implement the measures. The 2017 Scoping Plan indicates that potential shortfalls from the strategies, if any, would be made up through the CAP and Trade Program (CARB 2017a). The Governor signed AB 398 on July 25, 2017 to extend the Cap-and-Trade Program to 2030. The legislation includes provisions to ensure that offsets used by sources are limited to 4 percent of their compliance obligation from 2021 through 2025 and 6 percent from 2026 through 2030. AB 398 also prevents Air Districts from adopting or implementing emission reduction rules on stationary sources that are also subject to the Cap-and-Trade Program (CAR 2017).

Status of the State Regulatory Program

Transportation

The State's transportation regulatory program requires increased fuel efficiency in motor vehicles and increased use of fuels with lower carbon content than gasoline and diesel. Programs to reduce the vehicle miles traveled also play a role in the State's strategy.

AB 1493 Pavley Regulations and Fuel Efficiency Standards. California AB 1493, enacted on July 22, 2002, required the CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the United States Environmental Protection Agency's (EPA's) denial of an implementation waiver. The EPA subsequently granted the requested waiver in 2009, which was upheld by the by the U.S. District Court for the District of Columbia in 2011 (CARB 2013a).

The standards were phased in during the 2009 through 2016 model years. The near-term (2009–2012) standards resulted in an approximately 22 percent reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards resulted in about a 30 percent reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation, rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant (CARB 2013b).

The second phase of the implementation for the Pavley bill was incorporated into Amendments to the Low-Emission Vehicle Program referred to as LEV III or the Advanced Clean Cars program. The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation will reduce GHGs from new cars by 34 percent from 2016 levels by 2025. The new rules

will reduce pollutants from gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles, and hydrogen fuel cell cars. The regulations will also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California (CARB 2013b).

Executive Order S-01-07—Low Carbon Fuel Standards. The Governor signed Executive Order S-01-07 on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It also requires that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California. The LCFS is measured on a lifecycle basis to include emissions from fuel consumption and production. The LCFS requires that the fuel sold in California meet, on average, a declining standard for greenhouse gas emissions measured in a carbon dioxide equivalent gram per unit of fuel energy sold. After a legal challenge, the final LCFS regulation was approved on November 16, 2015. CARB is nearing completion of Proposed Amendments to the Low Carbon Fuel Standard and Regulation on Commercialization of Alternative Diesel Fuels. The proposed amendments target a 20 percent reduction in fuel carbon intensity from a 2010 baseline by 2030 to meet the commitment from the 2017 Scoping Plan (CARB 2018).

Senate Bill (SB) 375. As discussed in more detail in the Executive Summary, SB 375 was signed by the Governor on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of greenhouse gas emissions, which emits over 40 percent of the total greenhouse gas emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: (1) it requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing greenhouse gas emissions, (2) it aligns planning for transportation and housing, and (3) it creates specified incentives for the implementation of the strategies. Regional targets for Tulare County are a reduction of 5 percent for 2020 and a 10 percent reduction for 2035. The 2014 Tulare County RTP/SCS indicates that implementing the preferred strategy would exceed these percentages. CARB revised TCAG's GHG reduction target to 13 percent in 2020 and 16 percent in 2035 in March 2018 to provide additional reductions to achieve the 2030 SB 32 target (CARB 2015). The 2018 RTP/SCS was adopted on August 20, 2018. The 2018 RTP/SCS continues to rely on the Tulare County Regional Blueprint as the preferred land use scenario and is expected to achieve the new CARB reduction targets (TCAG 2018).

Energy

SB 1368—Emission Performance Standards. In 2006, the State Legislature adopted SB 1368, which was subsequently signed into law by the governor. SB 1368 directs the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than 5 years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant. Because of the carbon content of its fuel source, a coal-fired plant cannot meet this standard because such plants emit roughly twice as much carbon as natural gas, combined cycle plants. Accordingly, the new law effectively prevents California's utilities from investing in, otherwise

financially supporting, or purchasing power from new coal plants located in or out of the State. The California Public Utilities Commission adopted the regulations required by SB 1368 on August 29, 2007. The regulations implementing SB 1368 establish a standard for baseload generation owned by, or under long-term contract to publicly owned utilities, of 1,100 lbs. CO_2 per megawatt-hour (MWh).

SB 1078, SB 107, and Executive Order S-14-08 Renewables Portfolio Standard (RPS). On September 12, 2002, Governor Gray Davis signed a bill (SB 1078) requiring California to generate 20 percent of its electricity from renewable energy by 2017. SB 107, signed by the Governor on September 26, 2006 changed the due date to 2010 instead of 2017. On November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08, which established a Renewable Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. Senate Bill X1-2 was signed by Governor Edmund G. Brown, Jr. in April 2011, setting the RPS target at 33 percent by 2020. This new RPS applied to all electricity retailers in the state including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. The utilities are on track to achieve this standard.

SB 350—Clean Energy and Pollution Reduction Act of 2015. Governor Edmund G. Brown, Jr. signed into legislation Senate Bill 350 in October 2015, which requires retail sellers and publicly owned utilities to procure 50 percent of their electricity from eligible renewable energy resources by 2030. The legislation also seeks to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

Cap-and-Trade

AB 398 California Global Warming Solutions Act of 2006: market-based compliance mechanisms: fire prevention fees: sales and use tax manufacturing exemption. AB 398 was signed by Governor Brown on July 25, 2017. This bill would, until January 1, 2031, extend the applicability of the Cap-and-Trade regulation that establishes a system of market-based declining annual aggregate emissions limits for sources or categories of sources that emit greenhouse gases to December 31, 2030. The existing CAP and Trade Program was authorized by AB 32. Recent Cap-and-Trade offset credit auctions have sold all credits offered.

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SECTION 3: EMISSION INVENTORY SUMMARY

3.1—Emission Inventory Overview

Greenhouse gas inventories consider a wide range of human activities. Estimating the amount of greenhouse gases generated by these activities requires using a multiplicity of data sources and a diverse set of methodologies. Emission inventories are, by nature, the reflection of the best available data and the most applicable methods at the time of their compilation. As data grows and understanding develops, the inventory can be updated and improved.

Emissions inventories are organized by source categories or sectors. The State of California organizes its emission inventory by the following sectors: transportation, electricity, commercial and residential, industry, recycling and waste, high global warming potential gases, and agriculture. The inventory is based on the emissions of a number of greenhouse gases. Although carbon dioxide is the largest contributor to climate change, AB 32 also defines methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons as "greenhouse gases." The emissions of each gas are standardized by the global warming potential compared with CO_2 and is referred to as CO_2 equivalent or CO_2e.

California Emission Inventory

A comparison of major sources of greenhouse gas emissions at the state and county levels illustrates the scale of emissions. The most current year available was used for each inventory summary. A summary of California's greenhouse gas inventory for 2015 is provided in Table 4.

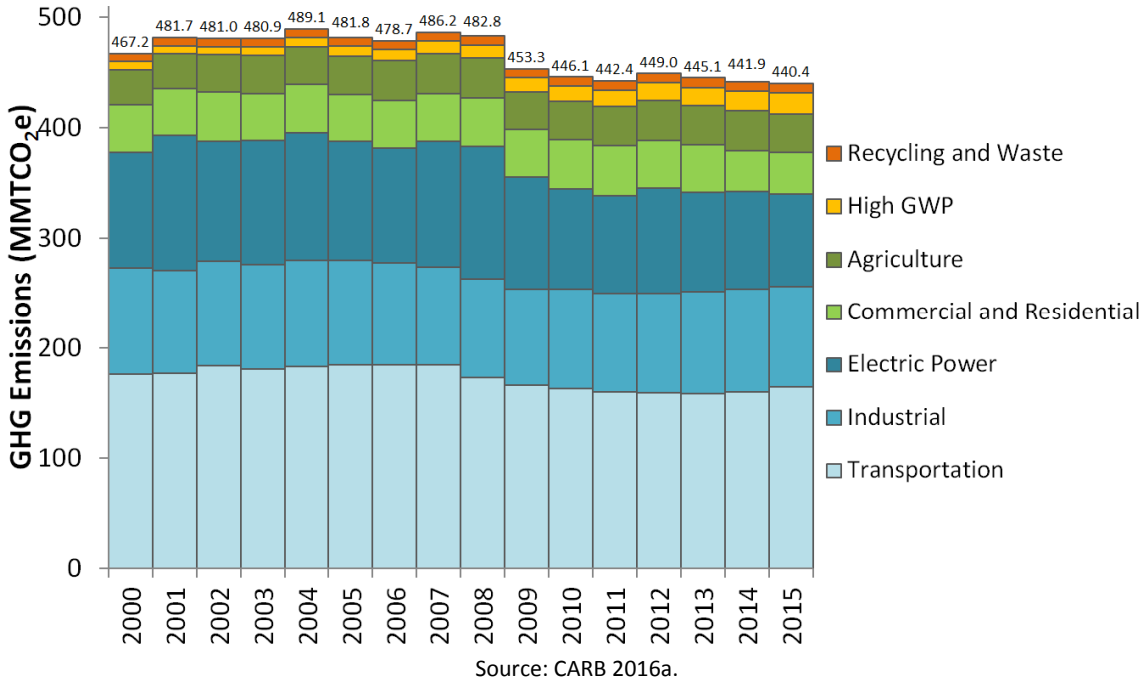
Table 4: California Greenhouse Gas Emissions Inventory in 2015 by Sector

Scoping Plan Sector	2015 Emission (Millions of Metric Tons of CO_2 Equivalent/Year)	Percentage of Inventory
Transportation	164.63	37.4
Industrial Fuel Use	91.71	20.8
Electric Power	83.67	19.0
Commercial and Residential Fuel Use	37.92	8.6
Agriculture	34.65	7.9
High Global Warming Potential Gases	8.73	4.3
Recycling and Waste	19.05	2.0
Total Emissions	**440.36**	**100.0**

Notes:
Sequestration of emissions from forestry activities is not included. Emission categories are as defined in the CARB Scoping Plan.
Source: California Greenhouse Gas Inventory for 2000–2015 by Category as Defined in the Scoping Plan (CARB 2017a)

Open burning of agricultural biomass is a common practice in California and a source of nitrogen oxide (N_2O) and methane (CH_4) emissions. CO_2 emissions from agricultural biomass burning is not considered a net source of emissions because the carbon released to the atmosphere as CO_2 from the combustion of agricultural biomass is assumed to have been absorbed during the previous (or a recent) growing season. Therefore, emissions from CO_2 are estimated but not included in California's GHG inventory total. Emission trends in California's GHG inventory are provided in Figure 3.

Figure 3: Greenhouse Gas Emission Trends by Scoping Plan Category in California



Source: CARB 2016a.

Tulare County Inventory

This assessment presents the estimated greenhouse gas emissions generated in the unincorporated areas of Tulare County for calendar year 2015, as well as the projected unincorporated Tulare County emissions for 2020 and 2030. The base year in the 2017 Scoping Plan Update is 2015. The year 2020 corresponds with the AB 32 target year and 2030 corresponds with the Tulare County General Plan 2030 Update buildout year and the SB 32 target year. The 2012 CAP inventory used a 2007 base year that is obsolete and is no longer used in the 2018 CAP Update. See Appendix A for a detailed discussion of the Tulare County inventory and supporting documentation.

Summary of Emissions

The greenhouse gas emissions inventory is divided into development related, industrial, and agricultural sectors. The development related emissions are sources related to commercial and residential development. The industrial emission sources include natural gas and electricity consumed in industrial production activities. Agricultural emissions include sources related to growing crops and dairy. Dairy emissions are addressed separately in the Dairy CAP but are included here to provide a more complete picture of Tulare County emissions.

Greenhouse gas emissions produced within Tulare County in 2015 were estimated at 9.4 million metric tons of CO_2 equivalent. Projected emissions for 2030 are 11.2 million metric tons of CO_2e. The 2015 emissions are considered the baseline inventory year. The 2030 emissions are considered a future year BAU inventory that accounts for growth and adopted regulations but not planned regulations and mitigation measures that may be applied in the future. In both 2015 and 2030, dairies/feedlots accounted for the largest portion of total emissions, making up 82 percent and 88 percent of total emissions, respectively. Mobile sources (on- and off-road) accounted for the second largest portion of emissions, contributing 6 percent in 2015 and 3 percent in 2030. The inventory also identifies separate totals for development related emissions not including industry, agriculture, dairies and feedlots. The per capita development related emissions in 2015 were 6.9 metric tons per year and decline to 5.8 metric tons per year in 2020, and 4.6 metric tons per year in 2030 prior to considering new regulations included in the SB 32 Scoping Plan.

Methods

This assessment includes emissions attributable to all unincorporated land within Tulare County. It does not include emissions associated with incorporated cities within Tulare County. Therefore, unincorporated Tulare County is considered to be the organizational boundary for the assessment. The assessment includes emission inventories for seven sectors of emission sources: electricity, natural gas, solid waste, water and wastewater, mobile sources, industrial, and agriculture including dairy/feedlot. Therefore, these sectors are considered to be the operational boundary for the assessment.

The emission inventory for the CAP includes agricultural emissions. Dairy and feedlot emissions comprise approximately 95 percent of agricultural GHG emissions. Other agricultural categories for farming operations such as fuel consumption, fertilizer application, and soil management were added to the last inventory update prepared in 2016. Tulare County has limited regulatory authority over most aspects of farming operations on lands designated for agriculture by the General Plan. Tulare County has no discretionary authority over field crops and tree crops. New and expanding dairies are considered a discretionary approval subject to CEQA.

Emissions in the 2015 base year were calculated using data from calendar year 2015, when available. When data from 2015 was unavailable, data from the most recent year were used as a proxy. Year 2030 projections assume that overall build-out would occur at rates projected by the California DOF population projections for Tulare County (DOF 2016). Year 2030 projections also assume a “business-as-usual” trajectory for generation of greenhouse gases in the County that include regulations included in the 2017 Scoping Plan Update reference scenario. Dairy emissions are from projections in the Tulare County Dairy CAP (Tulare County 2017).

General Procedure

This greenhouse gas inventory used protocols established by the California Climate Action Registry (CCAR 2008), and by the Greenhouse Gas Protocol Initiative (WRI 2008). In addition, the inventory was updated to add new emission categories in 2017 that were not included in the 2007 inventory. Using protocol guidelines, the process used to perform this greenhouse gas inventory is as follows:

1. Set organizational boundaries
2. Set operational boundaries
3. Identify sources of emissions
4. Collect data on emissions for a representative period of time
5. Calculate greenhouse gas emissions from data using data-specific emission factors
6. Create an inventory of CO_2e emissions that is complete and transparent

The organizational boundary for the emission inventory is the unincorporated portions of Tulare County. The emissions from the cities of Tulare County, tribal lands, and federal lands are excluded since they are considered the responsibility of those jurisdictions. Figure 4 displays the regional location and Tulare County boundary. Figure 5 shows the location of the cities, tribal lands and federal lands in greater detail.

The emissions by sector for the years 2015, 2020, and 2030 are presented in Table 5. Inventories in the 2012 CAP are no longer valid for comparison purposes due to changes in source categories included and new methodologies for mobile sources. The inventory for 2020 and 2030 represents emissions with projected growth and compliance with adopted regulations.

Table 5: Tulare County Emission Inventory 2015 to 2030

Source	Emissions ($MTCO_2e$ per year)		
	2015	2020	2030
Transportation			
On-Road Vehicles	514,666	384,496	276,134
Off-Road Mobile	32,368	38,797	47,618
Locomotives	9,079	10,243	11,073
Aviation	17,708	22,407	28,663
Total	*573,821*	*455,946*	*363,490*
Energy			
Electricity	146,127	131,497	110,723
Energy—Natural Gas	59,215	61,417	65,917
Energy—Propane	51,490	52,231	56,067
Residential Woodburning	6,912	7,069	7,835
Total	*263,745*	*252,215*	*240,542*
Solid Waste			
Solid Waste—Landfill	176,925	160,088	160,088
Water & Wastewater			
Water	105	83	95
Wastewater Treatment	1,838	1,891	2,096
Total	*1,942*	*1,974*	*2,191*

Table 5 (cont.): Tulare County Emission Inventory 2015 to 2030

Source	Emissions ($MTCO_2e$ per year)		
	2015	2020	2030
Development-Related Emissions Total	1,016,432	870,223	766,311
Per Capita Emissions (8.8 CAP Target for 2020)	**6.92**	**5.76**	**4.57**
Development Related Emissions for CAP2030 Target			**700,364**
Per Capita Emissions CAP Target for 2030			**4.18**
Industrial			
Industrial Natural Gas	124,775	125,811	139,443
Industrial Electricity	48,415	48,508	36,178
Total	173,190	174,319	175,621
Agriculture			
Agriculture Electricity	297,327	267,086	182,166
Agricultural Burning	152,878	152,878	152,878
Agricultural Fertilizer	193,277	193,277	193,277
Agricultural Offroad Equipment	241,999	239,662	237,728
Agriculture—Dairy	7,779,107	8,494,766	9,926,085
Total	8,437,327	9,122,753	10,469,155
Grand Total	9,626,950	10,167,294	11,411,087

Notes:
2023 dairy emissions are used as a placeholder for 2030 dairy emissions since 2030 emission projections are unavailable; see Section 4.2.
$MTCO_2e$ = metric tons of carbon dioxide equivalents
Source of emissions: Appendix A—GHG Emission Estimates.

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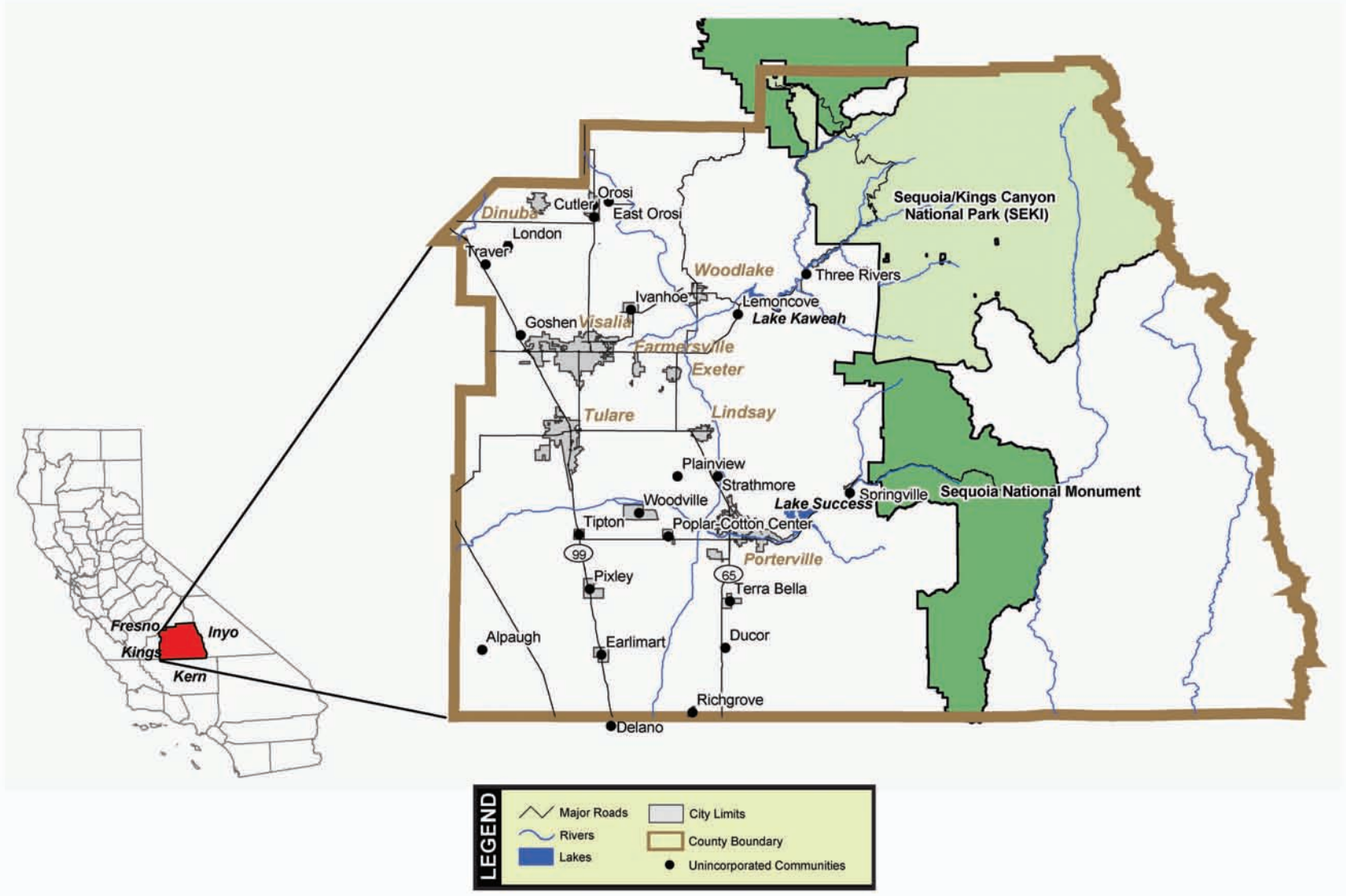

Source: Tulare County General Plan 2030 Update Background Report (2007).

NORTH

28 14 0 28 Miles

Figure 4

Regional Location

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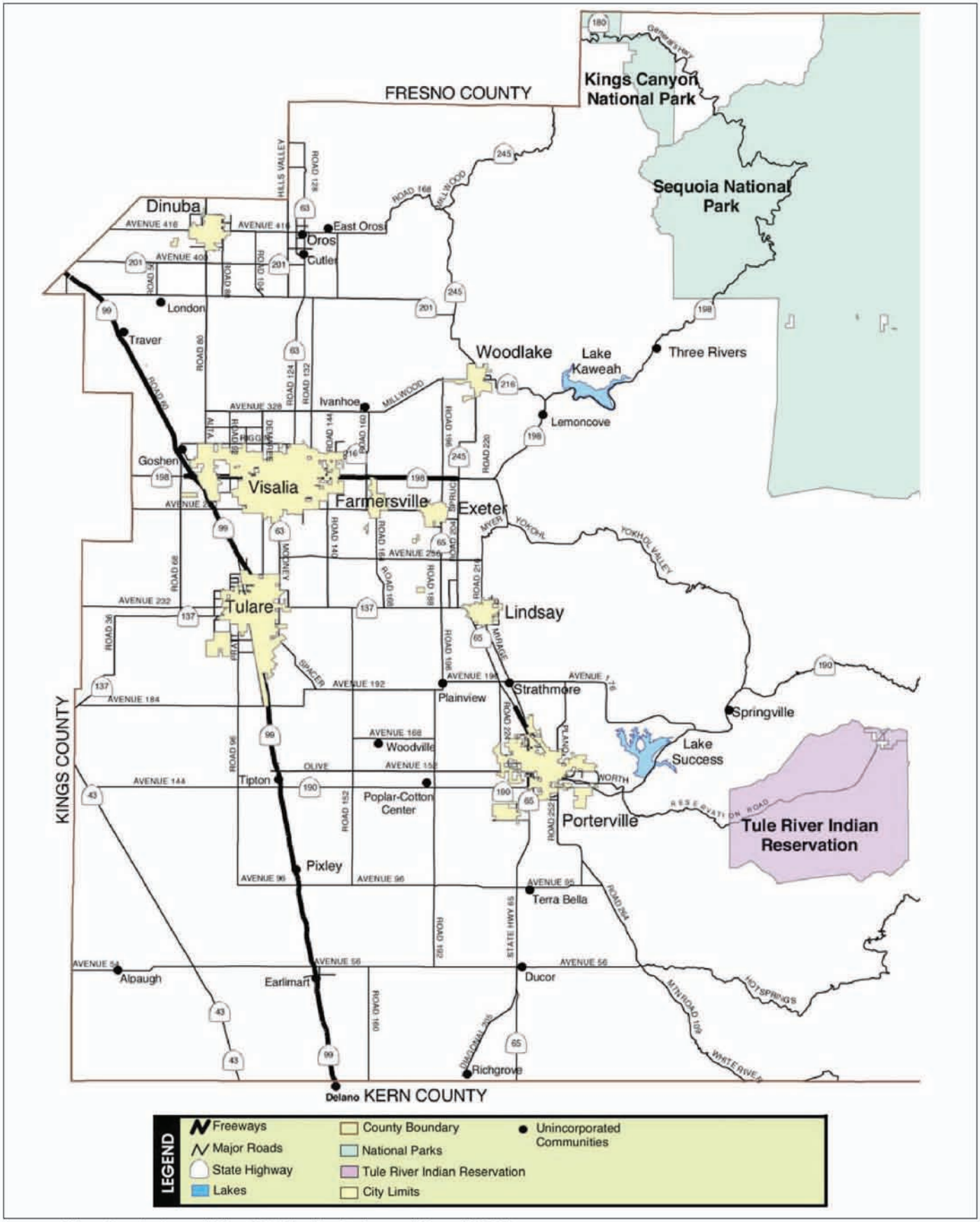

Source: Tulare County General Plan 2030 Update Background Report (2007).

NORTH

8 4 0 8 Miles

Figure 5
Tulare County
Organizational Boundary

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Figure 6 shows the percentage of each major emission sector for the 2015 baseline inventory for development related sources. Transportation is the largest sector, comprising 57 percent of development related inventory. Energy is the second most important component with 26 percent of the inventory. The development related inventory is expected to decrease by 34 percent between 2015 and 2030 from adopted regulations and programs. Industrial emissions are reported in its own category. The County has no authority to regulate the fuel used for industrial production and large industrial sources are subject to Cap-and-Trade. Dairy emissions comprise the vast majority of agricultural sources and are the subject of the Dairy CAP. The County does not have authority over the fuels used in offroad equipment, electricity consumed, fertilizer use, and agricultural burning. The County supports voluntary efforts to improve the efficiency of agricultural operations and fertilizer application. Although growth in these sources is assumed to be flat, farms are highly motivated to operate as efficiently as possible so reductions in the coming years are likely to occur.

Figure 6: Development Related Emissions—Percentage by Sector in 2015

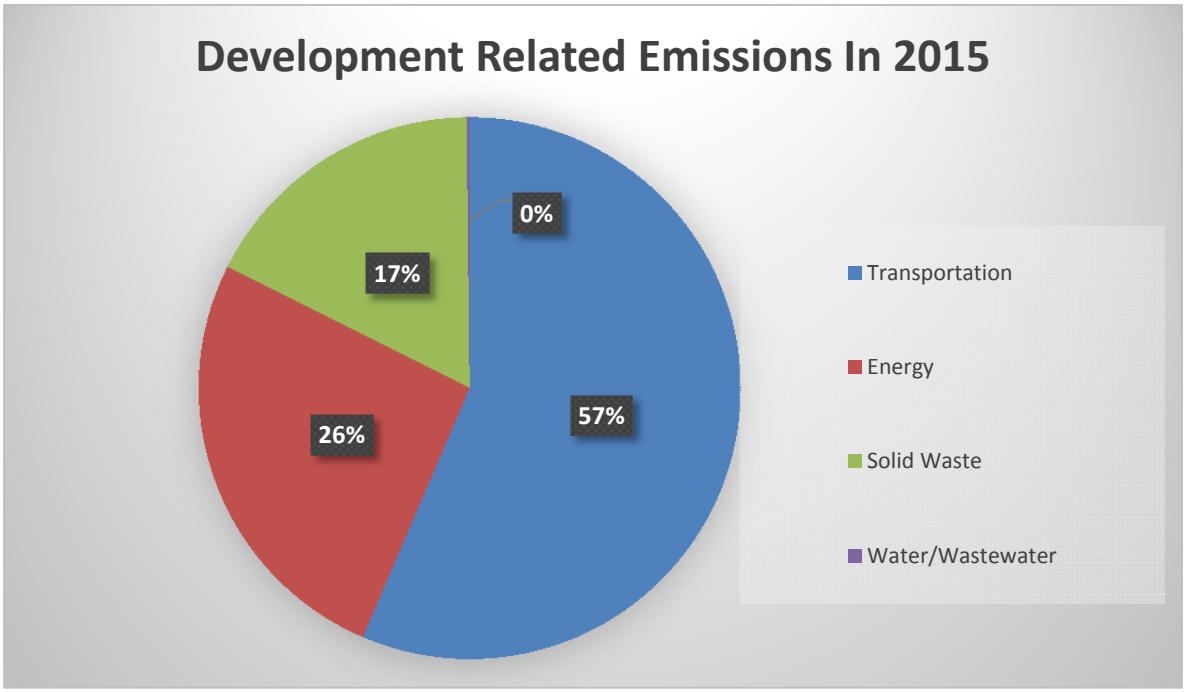
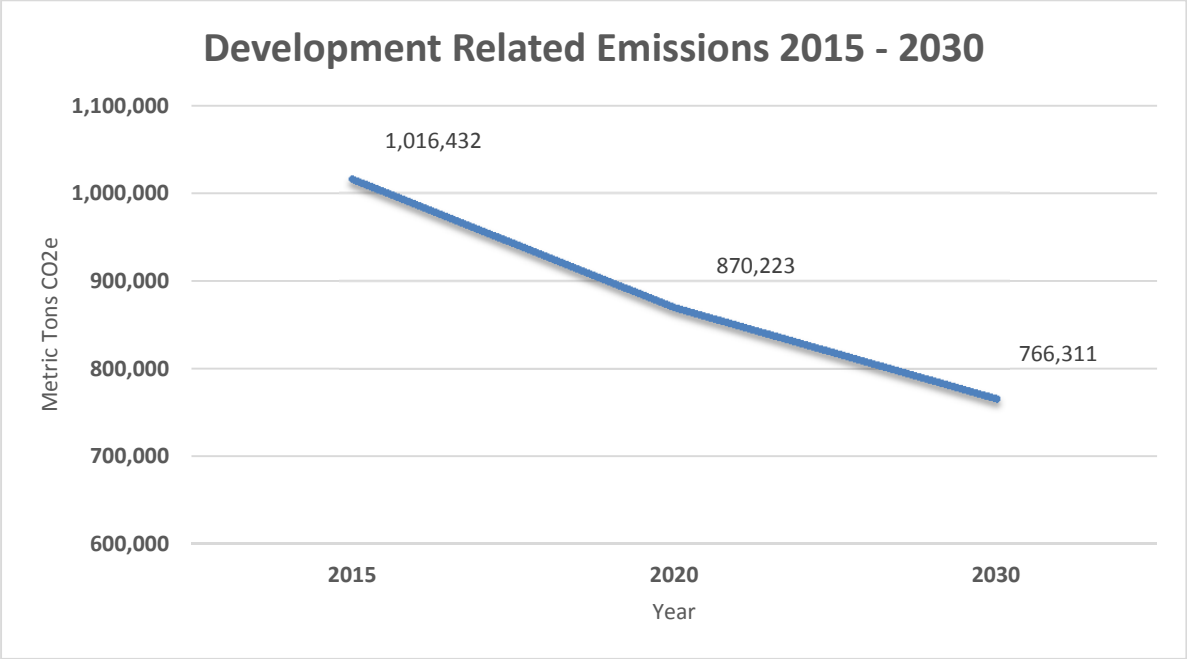


Figure 7 displays the emission trend accounting for projected growth and regulations currently in place. Emissions are predicted to decline steadily during the 15-year period. Additional measures and strategies included in the 2017 Scoping Plan Update are required to reach the 2030 target. Reductions in the Tulare County 2030 BAU inventory totaling 75,876 $MTCO_2e$ are required from transportation, energy, and commercial and residential fuel use to reach levels consistent with the development related emission reductions in the 2017 Scoping Plan. The 2030 emission target is 700,364 $MTCO_2e$ or 4.18 $MTCO_2e$ per capita as shown in Table 5.

Figure 7: Development Related Emissions with Adopted Regulation 2015–2030



SECTION 4: CAP EMISSION REDUCTION TARGET

4.1—Approach to Greenhouse Gas Target Setting

CAP targets are important because they provide a quantitative means of demonstrating that development within a community is consistent with California's GHG targets. Targets provide a way to measure whether a community is doing its fair share in reducing GHG emissions.

A CAP that is to be used as the basis for tiered GHG emissions analysis under CEQA must meet the requirements of CEQA Guidelines Section 15183.5, as summarized below. This authorizes significance for individual projects to be determined through evaluation of consistency with the enforceable GHG reduction measures in the CAP:

- Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
- Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
- Establish a mechanism to monitor the plan's progress toward achieving the emissions level, and to require amendment if the plan is not achieving specified levels;
- Be adopted in a public process following environmental review.

The 2012 CAP followed these steps in developing the 2020 target and included a strategy to achieve the target. The County has prepared progress reports and an inventory update that found that the County is on track to achieving the 2020 target.

The 2018 CAP Update follows the same basic approach used in the 2012 CAP to address the SB 32 2030 target and for monitoring and reporting progress. The 2018 CAP Update provides a new level of GHG emissions for 2030 based on substantial evidence that demonstrates that the growth consistent with the CAP would not be cumulatively considerable. This is accomplished by first determining the County's emissions under a 2030 BAU analysis, then determining the reductions that would be achieved with the application of existing regulations and new legislated reductions described in the 2017 Scoping Plan. The emissions remaining after application of mandated regulations to reach the target, if any, are then identified.

The only Scoping Plan strategy that applies directly to local government is per capita emissions from passenger cars and light trucks mandated by SB 375 and included in the Regional Transportation Plan Sustainable Community Strategy. The County has no authority to regulate motor vehicles or fuel use, so it must rely on the State or federal government to regulate these sources. The State has authority

to regulate criteria pollutants from motor vehicles to attain federal ambient air quality standards and will require increasing numbers zero emission vehicles to achieve ozone standards. The regulations that reduce ozone precursor emissions with zero emission vehicles will also increase fuel efficiency and reduce GHG emissions. Therefore, it is likely that the State has sufficient authority to achieve its reduction goal for motor vehicles without additional legislation but new GHG specific motor vehicle standards could provide additional certainty.

The 2017 Scoping Plan encourages but does not require local governments to achieve additional reductions beyond those expected from regulations. The 2017 Scoping Plan envisions local government playing a supporting role with local actions that help to make the State's regulatory strategy more effective. However, the Cap-and-Trade Program is explicitly designed to make up any shortfalls from other regulatory measures. This means that local measures beyond regulations are essentially voluntary.

The Scoping Plan presents the expected reductions as a range to reflect the uncertainty in the effectiveness of the regulatory strategy. The Cap-and-Trade Program is relied on to fill the gap should other strategies under-perform. The mobile source strategy provides an example. The LEV III motor vehicle standards apply to model years 2016 to 2025. If the new regulations required for post-2025 vehicles are less stringent than anticipated in the Scoping Plan, the deficiency would be made up by the Cap-and-Trade Program. This structure provides a reasonable basis for concluding that the State has adequate authority and resources to achieve the 2030 target.

The 2030 target for the 2018 CAP update is based on consistency with the percentage reduction needed by the State from development related sources to achieve the State 2030 target. The County can fulfill its share of these reductions by continuing its focus on protecting important farmland from development, developing in rural communities at higher densities envisioned by the Blueprint and SCS, improvements in transportation infrastructure that encourage alternative modes of transportation, and voluntary measures to improve energy efficiency in existing buildings and new development. Implementation of General Plan policies that are consistent with the Tulare County Regional Blueprint are expected to fulfill the requirements of SB 375 regional targets. The reductions in per capita emissions from passenger cars and light trucks required by the most recent SB 375 targets for Tulare County are 13 percent in 2020 and 16 percent in 2035.

New and Existing Sources

For the 2018 CAP update purposes, new sources are those that are constructed after the 2015 baseline inventory. Existing sources are those included in the 2015 baseline. New development projects can incorporate the latest energy efficiency and sustainability measures into the design of the project whereas existing development comprises buildings that were constructed in compliance with the building standards in effect at the time they were built. Homes and businesses constructed prior to Title 24's enactment in 1978, which comprise most of the building stock, are much less energy efficient than those constructed to today's more stringent standards. The DOF predicts Tulare County's population will grow by 14 percent between 2015 and 2030 or 0.93 percent per year. This means that in 2030, 86 percent of the emissions would come from sources that already existed in 2015. Therefore, the CAP reductions from new development comprise a small portion of the reductions needed to achieve the 2030 target. For example, a 6 percent reduction from new

development would reduce emissions in Tulare County by 0.8 percent by 2030, whereas emissions reductions that apply to existing sources would reduce all emissions subject to control.

Most reductions will be achieved through measures that apply to all sources existing and new. Emissions from all sources will be reduced by actions that increase the use renewable and zero emission electricity from the grid from sources such as wind, solar, and hydroelectric. The LCFS applies to all transportation fuels, so reductions apply to the entire vehicle population. New vehicle standards apply to all vehicles purchased and will incrementally reduce emissions from the vehicle fleet. Cap-and-Trade applies to sources responsible for 85 percent of California's emission inventory and provide reductions from new and existing industrial sources that ultimately affect the purchasers of products and services subject to the regulation. To summarize, new development plays an important role in reducing GHG emissions because it can build efficiency and renewable energy production into the project; however, achieving the State's target must necessarily obtain the bulk of reductions from existing sources because that is where the bulk of emissions occur.

CAP 2020 Reduction Target

The 2012 CAP identified the County's fair share of emissions and reductions. At the time of adoption of the 2012 CAP adoption a gap existed between the reductions achieved by regulations by the State and the reductions needed to achieve the 2020 target. This led to an apparent need to provide additional local reductions to provide a fair share of the amount needed to achieve the target.

Tulare County Emission Reduction 2020 Target from the 2012 CAP is as follows:

- 26.2 percent reduction in County development related emissions
- 6 percent average project reduction required from new development beyond that required by regulation.

Since the CAP was adopted in 2012, the amount required from County development emission sources has declined due to slower than projected growth and the adoption and amendment of statewide regulations that reduce GHG emissions. Compliance with adopted regulations is more than sufficient for the County to reach the 2020 target. This is confirmed by the State, which expects to achieve the 2020 target on time or ahead of schedule and past progress reports prepared for the Tulare CAP.

Integrating the 2020 and 2030 Targets

The 2018 CAP update includes emission reduction targets for the years 2020 and 2030 to match AB 32 and SB 32 targets and General Plan buildout. The CAP addresses sources under the jurisdiction and influence of Tulare County. The target is based on forecasts of development activity from California DOF population projections. The mobile source reductions are based on the development being consistent with the goals, policies, and implementation measures in the General Plan, and the TCAG Blueprint Vision.

The 2030 target uses the same approach as was used for the 2020 target. The analysis is based on the following general assumptions:

- New development will be targeted to occur in existing cities and rural communities.
- New large lot rural estate subdivisions and ranchettes on important farmlands will be discouraged.
- New residential development in rural communities will increase development density by 25 percent compared with current averages.
- A significant amount of development in the unincorporated County areas will occur on existing lots that are not subject to any additional County discretionary approvals.
- Any new town, planned community area, or large corridor developments in Tulare County will be environmental showcases for technology and innovation that go well beyond standards for energy efficiency, water conservation, and alternative transportation.

A critical issue in identifying a workable reduction target is differences in effectiveness of transportation measures based on project type and setting. Rural communities would not be expected to have the population needed to support frequent transit service in the year 2020 and 2030 planning timeframes. However, rural communities are very amenable to improved pedestrian and bicycle access and to programs such as ridesharing and vanpools. A substantial portion of County residents live and work on farms. Farms and food processing operations may also be dependent on seasonal labor that may only reside temporarily in Tulare County or that work on multiple farms and packing houses throughout the year. Farmworker transportation is an important concern in Tulare County.

The emission reductions presented in this section were compiled from several sources. Emission reductions from State sources are from CARB estimates of the reductions anticipated from implementing the Scoping Plan measures and adjusted to show their effect on Tulare County source categories. Reductions from SJVAPCD regulations, programs, and measures that provide post-2020 reductions are from SJVAPCD staff reports prepared for adoption of the regulations and programs. The amount of reduction required is based whether the 2017 Scoping Plan requires additional reductions beyond those anticipated from state and regional measures for land-use-related sectors. The gap in reductions, if any, would be filled with reductions from local measures and programs to achieve consistency with the state targets.

The 2017 Scoping Plan strategy is designed to achieve the 2030 target with a comprehensive set of measures that apply to each emission sector. CARB adopted a strategy that includes command and control regulations on many sources combined with the Cap-and-Trade Program as the preferred alternative strategy. Measures that apply to local government primarily focus on implementation of SB 375 regional transportation targets to provide reductions in passenger car and light truck emissions. The Scoping Plan encourages but does not require local government to adopt voluntary "reach" energy efficiency standards more stringent than state standards and to support voluntary energy retrofit programs for existing development. The 2017 Scoping Plan includes an extensive list of potential local measures that are considered in the 2018 CAP Update. The list was reviewed to identify measures appropriate for Tulare County and is provided as a CAP Appendix B. Dairy and feedlot emission reductions are addressed by the Tulare County Animal Confinement Facilities Plan and the Dairy CAP.

4.2—California's Strategy for Achieving the 2020 Target

Key elements of California's strategy for reducing its greenhouse gas emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a Statewide renewable energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets (SB 375);
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

The CARB 2008 Scoping Plan (CARB 2008) identifies measures designed to reach the State's 2020 target and provides emission reduction estimates for each measure. The following describes the primary statewide measures that apply to development related emissions in Tulare County:

Motor Vehicles—Pavley Standards: The EPA granted a waiver for California for its greenhouse gas emission standards for motor vehicles. The Pavley I (AB 1493) regulation required GHG emission reductions from passenger cars and light trucks up to the 2016 model year. This regulation is expected to provide 27.7 $MMTCO_2e$ of emission reductions in 2020. The Pavley I standards are expected to reduce total emissions for automobiles and light trucks by 17.2 percent relative to the scenario without Pavley or corporate average fuel economy by the year 2020. CARB then developed standards for passenger vehicles model year 2017 through 2025 referred to as Pavley II that have been incorporated into CARB's LEV III or Advanced Clean Vehicle Program. The Pavley II standards will achieve additional 3 percent emission reduction by 2020 and 25 percent by 2030. The Pavley I and II standards are expected to reduce total emissions for automobiles and light trucks by 19.7 percent relative to the scenario without Pavley or corporate average fuel economy by the year 2020.

Motor Vehicles—Low Carbon Fuel Standard (LCFS): CARB adopted a new regulation in December 2009 to implement the California Low Carbon Fuel Standard (LCFS). The regulation is a discrete early action measure under AB 32 and implements Governor Schwarzenegger's Executive Order S-01-07. The regulation will reduce greenhouse gas) emissions by reducing the carbon intensity of transportation fuels used in California by an average of 10 percent by the year 2020. CARB Scoping Plan estimates this regulation will provide 15 $MMTCO_2e$ of emission reductions in 2020. The LCFS is expected to reduce total emissions from passenger vehicles and heavy-duty trucks by 10 percent. A

10 percent reduction from BAU emissions for passenger vehicles and heavy-duty trucks is taken for this regulation.

Motor Vehicles—Passenger Vehicle Efficiency: CARB identified several measures that would further reduce tailpipe greenhouse gas emissions from passenger vehicles by increasing vehicle efficiency. These measures include ensuring proper tire inflation and using solar-reflective automotive paint and window glazing (cool car standards). The CARB Scoping Plan estimates these regulations will provide 1.44 $MMTCO_2e$ of emission reductions in 2020. These measures are expected to reduce total emissions from passenger vehicles by 2.8 percent. Details regarding the current status of these initiatives are provided below:

- CARB approved a regulation that requires California's automotive maintenance industry to check the tire pressure of every vehicle they service in March 2009. Properly inflated tires help to reduce fuel greenhouse gas emissions by reducing tire-rolling resistance.
- In June 2009, CARB approved the cool car standards, which cut greenhouse gases by reducing heat gain in automobile interiors. The cool car standards begin phasing in with the 2012 model year. The regulation requires that passenger cars, pickup trucks and sport utility vehicles be equipped with windows that reduce the amount of heat that enters the vehicle from solar radiation. Less heat inside the vehicle will allow air conditioning units to be downsized or used less, thereby increasing fuel economy and reducing the amount of greenhouse gases emitted by the vehicle when it is in use.
- Additional measures that would further reduce tailpipe greenhouse gas emissions from passenger vehicles by increasing vehicle efficiency include low friction oil and a tire tread program. The CARB Scoping Plan estimates these regulations will provide 3.1 $MMTCO_2e$ of emission reductions in 2020. The combined benefit of these measures is expected to reduce total emissions from passenger vehicles by 2.8 percent.

Motor Vehicles, Heavy Duty Truck Vehicle Efficiency (Aerodynamic Efficiency): CARB approved this regulation in December 2008. This measure requires existing trucks/trailers to be retrofitted with the best available technology and/or CARB approved technology. Technologies that reduce GHG emissions and improve the fuel efficiency of trucks may include devices that reduce aerodynamic drag and rolling resistance. The requirements apply to California and out-of-state registered trucks that travel to California. The 2020 estimated greenhouse gas emission reductions could be up to 6.4 $MMTCO_2e$ nationwide, of which about 0.93 $MMTCO_2e$ would occur within California. This regulation is expected to reduce total emissions from heavy-duty trucks by 2.9 percent.

Natural Gas Energy Efficiency: The CARB Scoping Plan Energy Efficiency measure includes a number of actions that reduce energy consumption of both natural gas and electricity through improvements in building and appliance efficiency and through efficiency in combustion of the natural gas. Example efficiency improvements include the use of condensing heaters, tankless gas-fired on-demand heaters and other super-efficient gas-fired heating appliances that will replace less efficient water and space heaters by attrition as they fail. The 2020 emission reductions from this measure are 4.3 $MMTCO_2e$ or 9.4 percent of the inventory for this source category.

Renewable Energy Portfolio Standard: Renewable energy includes (but is not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas. California's current RPS was intended to increase that share to 20 percent by 2010. Increased use of renewables will decrease California's reliance on fossil fuels, thus reducing emissions of greenhouse gases from the Electricity sector. Based on Governor Schwarzenegger's call for a statewide 33 percent RPS, the 2008 Scoping Plan anticipates that California will have 33 percent of its electricity provided by renewable resources by 2020 and includes the reduction of greenhouse gas emissions based on this level. Tulare County is served by SCE and Pacific Gas and Electric (PG&E). Based on the 2007 renewables portfolio for the two utilities, reaching the 33 percent target would result in an 18.4 percent reduction by 2020 in Tulare County. The CPUC reports that in 2016 SCE had achieved 28 percent RPS procurement and PG&E had achieved 33 percent renewable procurement (CPUC 2017).

With the passage of SB 350, the RPS program requires investor-owned utilities (IOUs), publicly owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 50 percent of total procurement by 2030.

Electrical Efficiency: The 2008 Scoping Plan includes twelve strategies listed below to maximize energy efficiency that are expected to achieve up to 40,000 gigawatt-hours of electricity savings by 2020. The Scoping Plan estimates reductions from electrical efficiency measures would reduce emissions from this source category by 15.2 $MMTCO_2e$ by 2020. With the implementation of the strategies, emission reductions of 15.7 percent would be achieved from this source category.

- Cross Cutting Strategy for Buildings:
  - "Zero Net Energy" buildings
- Standards Strategies
  - More stringent building codes and appliance standards
  - Broader standards for new types of appliances and for water efficiency
  - Improved compliance and enforcement for existing standards
- Voluntary efficiency and green building targets beyond mandatory codes for Existing Buildings
  - Voluntary and mandatory whole-building retrofits for existing buildings
  - Innovative financing to overcome first-cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation
- Improved Utility Program Strategies
  - More aggressive utility programs to achieve long-term savings
- Other Needed Strategies
  - Water system and water use efficiency and conservation measures
  - Local government programs that lead by example and tap local authority planning, development, and code compliance
  - Additional industrial and agricultural efficiency efforts
  - Providing real time energy information to help consumers conserve and optimize energy performance

Million Solar Roofs: As part of Governor Arnold Schwarzenegger's Million Solar Roofs Program, California set a goal to install 3,000 megawatts of new, solar capacity by 2017—moving the state

toward a cleaner energy future and helping lower the cost of solar systems for consumers. The Million Solar Roofs Program is a ratepayer-financed incentive program aimed at transforming the market for rooftop solar systems by driving down costs over time. Created under Senate Bill 1 (Murray, Chapter 132, Statutes of 2006), Million Solar Roofs builds on previous ratepayer-funded programs and provides up to $3.3 billion in financial incentives that decline over time. The State is expected to exceed the 3,000 MW goal by a substantial margin. In addition, the CEC reported that the State had installed nearly 20,000 MW of utility scale photovoltaic and thermal solar generation capacity by 2016 (CEC 2017).

Waste—Landfill Methane/Recycling: The CARB Regulation to Reduce Methane Emissions from Municipal Solid Waste Landfills, which became effective in June 2010, requires landfills to enhance capture and control of methane from municipal waste landfills. CARB estimates that the regulation will reduce methane emissions at existing landfills with methane capture systems and combustion by an additional 14.2 percent. The Legislature and Governor Brown set an ambitious goal of 75 percent recycling, composting or source reduction of solid waste by 2020 calling for the state and the Department of Resources Recycling and Recovery (CalRecycle) to take a statewide approach to decreasing California's reliance on landfills (CalRecycle 2016).

4.3—California's Strategy for Achieving the 2030 Target

The State's strategy to achieve the SB 32 2030 target is described in the 2017 Scoping Plan Update. The plan builds on the state's successes to date, proposing to strengthen major programs that have been a hallmark of success, while further integrating efforts to reduce both GHGs and air pollution. The major elements of the framework proposed to achieve the 2030 target are as follows:

1. SB 350
   - Achieve 50 percent Renewables Portfolio Standard (RPS) by 2030.
   - Doubling of energy efficiency savings by 2030.
2. Low Carbon Fuel Standard (LCFS)
   - Increased stringency (reducing carbon intensity 18 percent by 2030, up from 10 percent in 2020).
3. Mobile Source Strategy (Cleaner Technology and Fuels Scenario)
   - Maintaining existing GHG standards for light- and heavy-duty vehicles.
   - Put 4.2 million zero-emission vehicles (ZEVs) on the roads.
   - Increase ZEV buses, delivery and other trucks.
4. Sustainable Freight Action Plan
   - Improve freight system efficiency.
   - Maximize use of near-zero emission vehicles and equipment powered by renewable energy.
   - Deploy over 100,000 zero-emission trucks and equipment by 2030.
5. Short-Lived Climate Pollutant (SLCP) Reduction Strategy
   - Reduce emissions of methane and hydrofluorocarbons 40 percent below 2013 levels by 2030.
   - Reduce emissions of black carbon 50 percent below 2013 levels by 2030.

6. SB 375 Sustainable Communities Strategies
   - Increased stringency of 2035 targets.
7. Post-2020 Cap-and-Trade Program
   - Declining caps, continued linkage with Québec, and linkage to Ontario, Canada.
   - CARB will look for opportunities to strengthen the program to support more air quality co-benefits, including specific program design elements. In Fall 2016, CARB staff described potential future amendments including reducing the offset usage limit, redesigning the allocation strategy to reduce free allocation to support increased technology and energy investment at covered entities and reducing allocation if the covered entity increases criteria or toxics emissions over some baseline.
8. By 2018, develop Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink (CARB 2017a).

The State's GHG limit or target for 2020 is 431 $MMTCO_2e$ per year, which equates to GHG emissions that occurred in California in 1990. The State expects to achieve this goal by 2020 or earlier. The 2030 GHG limit is 260 $MMTCO_2e$ per year, which requires a 40 percent reduction below 1990 levels. Emission reductions of 171 $MMTCO_2e$ per year from 1990 levels will be needed to reach this goal. The 2017 Scoping Plan Update recognizes that there is no single solution but rather a balanced mix of strategies to achieve the GHG target. The emission reduction ranges and percentage reductions from each emission sector are shown in Table 6.

Table 6: 2017 Scoping Plan Estimated Change in Emissions by Sector $MMTCO_2e$

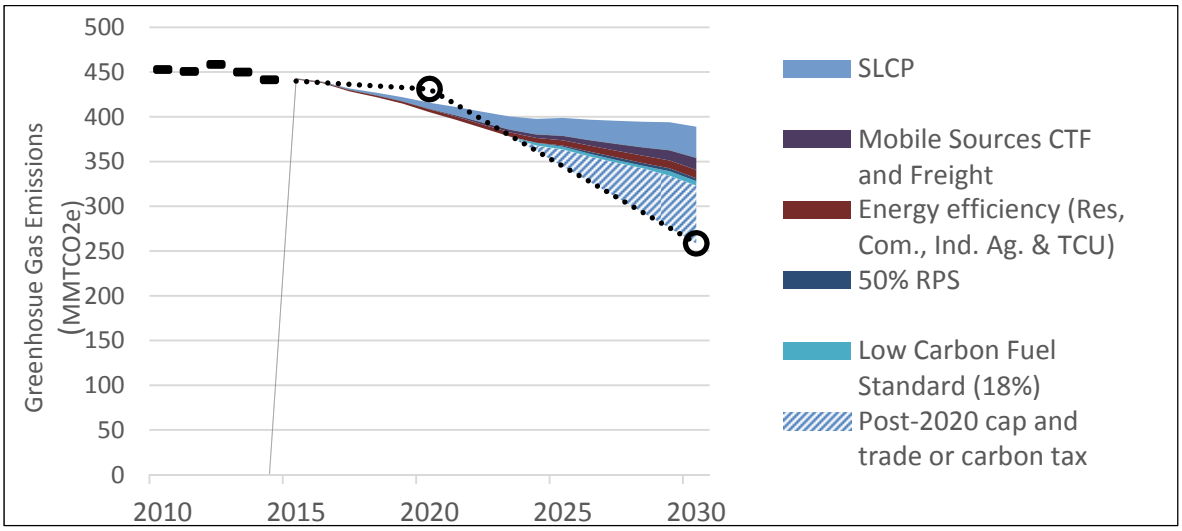
Sector	1990 ($MMTCO_2e$)	2030 Scoping Plan Ranges ($MMTCO_2e$)	% Change from 1990
Agriculture	26	24–25	-8 to -4
Residential and Commercial	44	38–40	-14 to -9
Electric Power	108	30–53	-72 to -51
High GWP	3	8–11	267 to 367
Industrial	98	83–90	-15 to -8
Recycling and Waste	7	8–9	14 to 29*
Transportation (Including TCU)	152	103–111	-32 to -27
Natural Working Lands Net Sink	-7	TBD	TBD
Subtotal	431	294–339	-32 to -21
Cap-and-Trade Program	N/A	34–79	N/A
Total	431	260	-40
	Per Capita	**5.9**	**—**

Note:
* The SLCP will reduce emissions in this sector by 40 percent from 2013 levels. However, the 2030 levels are still higher than the 1990 levels as emissions in this sector have grown between 1990 and 2013.
Source: 2017 Scoping Plan Update.

The Scoping Plan uses a Reference Scenario (BAU) to determine the starting point for developing new measures contained in the State strategy. The Reference Scenario is the forecasted statewide GHG emissions through 2030 with existing policies and programs, but without any further action to reduce GHGs. The 2030 BAU inventory is 389 $MMTCO_2e$ per year. Use of a BAU inventory ensures that growth in population and the economy is accounted for in the plan. The Reference Scenario accounts for continued benefits from regulations adopted to achieve the 2020 target that continue to accrue reductions after 2020.

Figure 8 displays the relative contribution of each strategy toward achieving the 2030 goal. The reduction from each category will be achieved through a combination of existing and new regulations. It should be noted that in any year, GHG emissions may be higher or lower than the straight-line projection. That is to be expected as periods of economic recession or increased economic activity, annual variations in hydropower, and many other factors may influence a single or several years of GHG emissions in the State. Most of the measures are identified as "known commitments," meaning that they are modifications to existing programs or required by statute. These commitments are not part of the Reference Scenario (BAU). This is similar to the BAU scenario for the 2020 target, which only included regulations in effect prior to 2006 in the BAU projection.

Figure 8: Scoping Plan Scenario: Estimated Greenhouse Gas Emissions Savings by Measure Relative to Reference Scenario



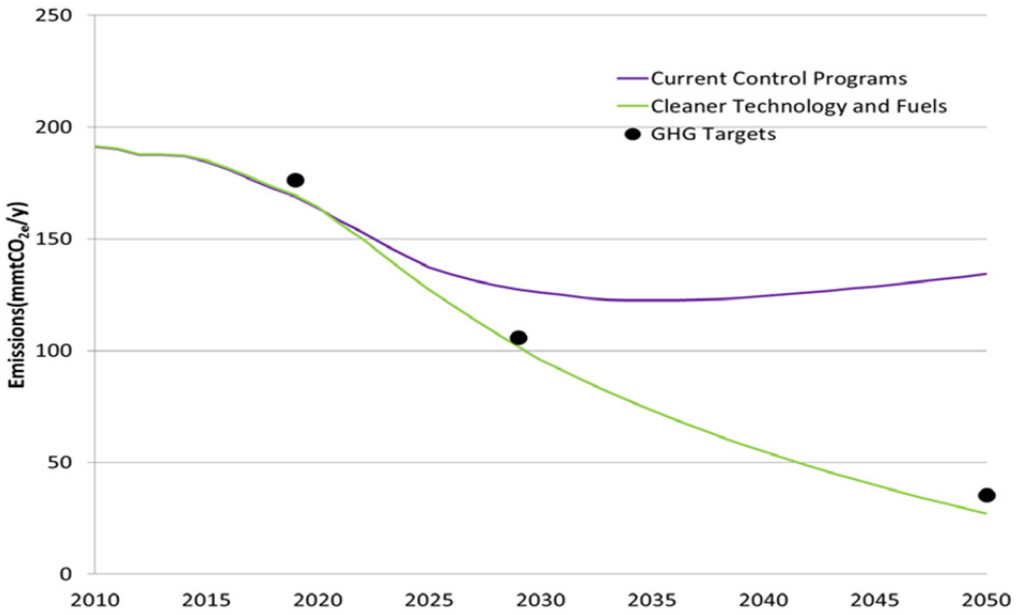
Source: CARB 2017 Scoping Plan

Most of the additional reductions needed to achieve the 2030 target will be obtained from the Cap-and-Trade Program, which covers 85 percent of the State's emission inventory, and the SLCP, which is expected to reduce methane and black carbon emissions by 40 percent from 2013 levels. The Cap-and-Trade program is expected to provide between 20 and 46 percent of the needed reductions by 2030. The Cap-and-Trade reductions vary depending on the effectiveness of direct regulations on source sectors. Fewer reductions are needed from Cap-and-Trade if more reductions are obtained from other strategies.

Mobile sources comprise the largest sector of California's emission inventory. Figure 9 shows the emissions reductions from the on road mobile source sector comparing current control programs

and implementation of the State's Cleaner Technology and Fuels Program from the CARB Mobile Source Strategy. The figure illustrates the need for new regulations on cleaner technology and fuels after the LEV III program reaches its final year of implementation in 2025 to achieve 2030 and 2050 targets.

Figure 9: On-Road Statewide GHG Emission Trends



Source: CARB Mobile Source Strategy 2016.

The 2017 Scoping Plan contains a detailed implementation schedule for the plan measures that is shown in Table 7. The measures include both state and federal regulatory actions on off-road and on-road vehicles over the next decade.

Table 7: 2017 Scoping Plan Measures and Implementation Schedule

Measures	Agency	Action	Implementation Begins
On-Road Light-Duty			
Advanced Clean Cars 2	ARB	2020	2026
Lower In-Use Performance Assessment	ARB/BAR	N/A	Ongoing
Further Deployment of Cleaner Technologies	ARB/SCAQMD/EPA	ongoing	2016
On-Road Heavy-Duty			
Lower In-Use Emission Performance Level	ARB	2016	2017
Low-NO_X Engine Standard—California Action	ARB	2017–2019	2023
Low-NO_X Engine Standard—Federal Action	EPA	2017–2019	2024
Medium and Heavy-Duty GHG Phase 2	ARB/EPA	2017–2019	2018

Table 7 (cont.): 2017 Scoping Plan Measures and Implementation Schedule

Measures	Agency	Action	Implementation Begins
Advanced Clean Transit	ARB	2017	2018
Last Mile Delivery	ARB	2018	2020
Innovative Technology Certification Flexibility	ARB	2016	2016
Zero-Emission Airport Shuttle Buses	ARB	2016	2023
Incentive Funding to Achieve Further Emission Reductions from On-Road Heavy-Duty Vehicles	ARB/SCAQMD	ongoing	2016
Further Deployment of Cleaner Technologies	ARB/SCAQMD/EPA	ongoing	2016
Off-Road Federal and International Sources			
More Stringent National Locomotive Emission Standards	EPA	2016	2023
Tier 4 Vessel Standards	ARB/IMO	2015-2018	2025
Incentivize Low-Emission Efficient Ship Visits	ARB	2017-2018	2018
At-Berth Regulation Amendments	ARB	2017-2018	2022
Further Deployment of Cleaner Technologies	ARB/SCAQMD/EPA	ongoing	2016
Off-Road Equipment Sources			
Zero-Emission Off-Road Forklift Regulation Phase 1	ARB	2020	2023
Zero-Emission Off-Road Emission Reduction Assessment	ARB	2025	—
Zero-Emission Off-Road Worksite Emission Reduction Assessment	ARB	TBD	—
Zero-Emission Airport Ground Support Equipment	ARB	2018	2023
Small Off-Road Engines	ARB	2018	2022
Transport Refrigeration Units Used for Cold Storage	ARB	2017–2018	2020
Low-Emission Diesel Requirement	ARB	By 2020	2023
Further Deployment of Cleaner Technologies	ARB/SCAQMD/EPA	ongoing	2016
Source: CARB 2017 Scoping Plan			

CARB's 2016 Mobile Source Strategy provides details regarding individual measures and the basis for estimating the expected emission reductions. Major components of the strategy are shown in Table 8.

Table 8: Statewide On-Road Fleet Strategy

Vehicles	Today	Description	2030
Passenger Fleet	200k	ZEV/PHEV population[1]	4.2 Million
	27%	Renewable Energy Generation	50%
	24 mpg	Fuel Efficiency	49 mpg
	11%	Improved system to reduce VMT growth (change in projected growth between today and 2030)	5%
Truck Fleet[2]	Demos[3]	Low-NO_X truck population	900,000
	300	ZEV last mile delivery truck population	23,000
	8%	Renewable Fuels	50%
	6.5 mpg	Fuel Efficiency	8.9 mpg

Notes:
[1] ZEV/PHEV—Zero Emission Vehicles/Plug-in Hybrid Electric Vehicles
[2] Class 8 Trucks
[3] Demos—Demonstration prototypes
Source: CARB Mobile Source Strategy 2016 (CARB 2016a)

The 2017 Scoping Plan seeks reductions from all sectors with multiple strategies on most sources; however, one strategy stands as critical for success. The Post-2020 Cap-and-Trade Program was authorized by AB 398 in 2017. The program could provide nearly half of the reductions required by 2030. The SLCP Program (CARB 2017b) provides reductions in non-carbon GHGs such as methane from organic waste, black carbon, and HFCs used as refrigerants. The mobile source strategy includes fuel efficiency, increases in electric vehicles and plug in hybrid vehicles, and reductions in vehicle miles traveled (VMT) through continued implementation of SB 375. The energy efficiency strategy moves to zero net energy residential and commercial buildings, more efficient appliances, and energy retrofits on existing buildings. The reductions expected from each measure are presented in Table 9.

Table 9: 2017 Scoping Plan Reduction Measures

Scoping Plan Measure	Measure Description	2030 GHG Savings ($MMTCO_2e$)
50% RPS (vs. Reference ~40% RPS)	50% renewable portfolio standard by 2030 (vs. Historical Procurement in Reference scenario, ~40% RPS by 2020) [1]	3.1
Energy efficiency (Res., Com. Ind., Ag. & TCU)	2x additional achievable energy efficiency in the 2015 Integrated Energy Policy Report (IEPR)	9.3
Low-carbon fuel standard (biofuels)	18% reduction in carbon intensity of transportation fuels from the Low Carbon Fuel Standard[2]	5.0

Table 9 (cont.): 2017 Scoping Plan Reduction Measures

Scoping Plan Measure	Measure Description	2030 GHG Savings ($MMTCO_2e$)
Transportation measures	All transportation measures: cleaner technologies and fuels scenario from the mobile source strategy, sustainable freight and reductions in off-road transportation[3]	13.5
SLCP measures (non-energy GHGs)	Mitigation scenario in the short-lived climate pollutant strategy plus additional reductions in nitrogen oxides and CO_2 from cement production	34.9
Total change in Scoping Plan vs. Ref. scenario (reflecting interactive effects)		68.5

Notes:
1. This case was updated in August 2017 to reflect banking of Renewable Energy Credits (RECs), PPC3 out-of-state RECs and other model fixes including to reflect loads that are excluded from the RPS regulation (i.e., pumping loads).
2. GHG savings isolated are from biofuels only; note there are interactive effects with transportation measure.
3. Does not include biofuels; note there are interactive effects with the LCFS

Source: CARB 2017 Scoping Plan Pathways GHGs by Measure.

The SLCP measures are critical for the State to achieve the 2030 target. The SLCP targets black carbon, methane, and hydrofluorocarbons. They are powerful climate forcers and harmful air pollutants that have a major impact on climate change in the near term, compared with longer-lived GHGs, such as CO_2. SLCPs are estimated to be responsible for about 40 percent of current net climate forcing. Reductions expected from the SLCP by pollutant are provided in Table 10.

Table 10: California SLCP Emissions and Emission Reduction Target Levels ($MMTCO_2e$)

Pollutant	2013	2030 BAU	2030 Emission Reduction Target (% from 2013)
Black carbon (anthropogenic)	38	26	19 (50%)
Methane	118	117	71 (40%)
Hydrofluorocarbons (HFCs)	40	65	24 (40%)

Notes:
* Using 20-year GWPs from the 4th Assessment report of the IPCC for methane and HFCs, and 5th Assessment report for black carbon (the first report to define a GWP for black carbon)

** Business as Usual (BAU) forecasted inventory includes reductions from implementation of current regulations.

Source: CARB 2017 Scoping Plan.

The SLCP relies on continued implementation of existing regulations that have already substantially reduced these emissions and new measures to reach the 40 percent reduction goal of SB 1383 and the SLCP Strategy. Reductions in black carbon would be achieved by reductions in residential wood combustion and implementation of measures required to reach air quality standards for criteria pollutants. Measures included in the SLCP Strategy for methane include adopting regulations to reduce and recover methane from landfills, wastewater treatment facilities, and manure at dairies; using the methane as a source of renewable gas to fuel vehicles and generate electricity; and

establishing infrastructure development and procurement policies to deliver renewable gas to the market. Reductions in HFCs would be achieved by requiring the use of lower GWP refrigerants and equipment. A summary of SLCP measures and reductions is provided in Table 11.

Table 11: Summary of Proposed New SLCP Measures and Estimated Emission Reductions

Measure	2030 Annual Emission Reductions ($MMTCO_2e$)	2030 Annual Emissions ($MMTCO_2e$)
Black Carbon (Anthropogenic)		
2030 BAU	—	26
Residential Fireplace and Woodstove Conversion	3	—
State Implementation Plan Measures and Clean Energy Goals[3]	4	—
2030 BAU with new measures	—	19
Methane		
2030 BAU	—	117
Dairy and Other Livestock (Manure and Enteric Fermentation)	26	—
Landfill	4	—
Wastewater, industrial and Other Miscellaneous Sources	7	—
Oil and Gas Sector	8	—
2030 BAU with new measures	—	71
Hydrofluorocarbons		
2030 BAU		65
Financial Incentive for Low-GWP Refrigeration Early Adoption	2	—
HFC Supply Phasedown (to be achieved through the global HFC phasedown)[5]	19	—
Prohibition on sales of very-high GWP refrigerants	5	—
Prohibition on new equipment with high-GWP Refrigerants	15	—
2030 BAU with new measures		**24**

Note:
[1] Using 20-year GWPs from the 4th Assessment report of the IPCC for methane and HFCs, and 5th Assessment report for black carbon (the first report to define a GWP for black carbon)
[2] Business as Usual (BAU) forecasted inventory includes reductions from implementation of current regulations.
[3] Future emission reduction measures that will be developed to help the State meet its air quality and climate change goals are also expected to help the State meet the black carbon target by 2030.
[4] The specific annual reduction values shown above do not sum exactly to the total shown due to rounding.
[5] A global HFC production and consumption phasedown was agreed to on October 15, 2016, in Kigali, Rwanda. CARB is currently evaluating the impact upon HFC emission reductions in California and plans to utilize the results from the assessment to inform future updates to BAU projections for HFC emissions.
Source: CARB 2017 Scoping Plan.

Reductions from California BAU and Baseline Inventories

As shown in Table 12, the 2017 Scoping Plan strategy requires a 33.2 percent reduction from BAU from to achieve the 2030 target. This equates to a reduction of 40.9 percent from the 2015 baseline inventory. The reductions are from continued implementation of existing regulations, adoption of new regulations, and from Cap-and-Trade. About 53 percent of the required reductions from BAU come from new regulations and 47 percent come from Cap-and-Trade.

Table 12: California Emission Inventory Targets and Percentage Reductions

Inventory Type and Year	GHG Emissions $MMTCO_2e$	Percent Reduction from BAU	Percent Reduction from 2015 Baseline
2015 Inventory	440	—	—
2030 Reference Inventory—BAU (with current regulations)	389	—	11.6%
2030 Target Inventory	260	33.2%	40.9%
Reductions Needed to Reach Target from BAU	129	—	—
Reductions from Regulations in Scoping Plan	68	17.5%	—
Reductions needed from Cap-and-Trade	61	15.7%	—
Source: CARB 2017 Scoping Plan.			

Tulare County will achieve reductions that are proportional to the percentage of the statewide inventory subject to specific regulations that apply to sources located within county jurisdiction. For example, reductions from the LCFS are proportional to the amount of fuel used for transportation in unincorporated Tulare County. Energy efficiency improvements and utility RPS requirements are proportional to the amount of new construction that occurs and electricity consumed in the County. Reductions from Cap-and-Trade are more difficult to allocate geographically because the reductions could occur anywhere. Industries subject to Cap-and-Trade can reduce emissions at their facilities or purchase reductions in the marketplace. Therefore, some reductions would be local while other reductions are not. Measures that increase the purchase of electric vehicles (EVs) will not likely have uniform market penetration. For example, wealthy urban areas with a better charging network would be likely to purchase more EVs than less wealthy rural areas with a sparse charger network. The State could still achieve its EV goal if this area purchases limited numbers of EVs. On the other hand, rural areas like Tulare County are leaders in installing solar panels and in siting alternative fuels projects and would be expected to provide more reductions from these sources than crowded urban areas of California.

Local government's role in achieving the targets through its land use authority is important but limited. Changing the land use pattern in a community is a slow and gradual process. However, there is an ongoing trend in California to build at higher densities. The trend of increased land use density may be rooted in market trends responding to higher land costs, but it still relies on local government land use decisions that allow projects to proceed within the context of development standards that encourage walkable, bike-friendly, and transit-oriented designs. The Tulare County General Plan provides the policy framework to fulfill this function.

Tulare County 2030 Target

As shown in Table 13, the 2030 target for Tulare County is to reduce development related emissions by 31.1 percent from 2015 levels or 8.6 percent from 2030 BAU. This equates to per capita emissions of 4.12 $MTCO_2e$ per year in 2030. Emission reductions of this magnitude are consistent with the reductions required by the State to achieve the 2030 target.

Table 13: Tulare County 2030 GHG Target

Inventory	$MTCO_2e$/Percent Reduction
2015 Baseline Development Related Inventory	1,016,432
2030 BAU Inventory	766,311
2030 Target Inventory	700,364
Percent Reduction from BAU	**8.6%**
Percent Reduction from 2015	**31.1%**
Per Capita Emissions Target ($MTCO_2e$/Population	**4.18**
Source: Appendix A—CAP Inventory and Emission Reduction Estimates.	

Local Government's Role

Tulare County's primary role is to take actions that support the State's strategy such as ensuring that new development is consistent with the County's Sustainable Communities Strategy implementing SB 375 and facilitating new renewable energy projects. Tulare County's strategy is consistent with General Plan policies that encourage new development in existing communities and commercial corridors at higher than historic densities.

Tulare County will comply with regulations requiring methane capture at County operated landfills and wastewater treatment plants if any apply to these facilities. The three landfills under County control already have methane capture systems in place. Several rural communities in Tulare County have wastewater treatment plants. These facilities are relatively small and would not produce quantities of methane that can be captured in a cost-effective manner. If the State develops new regulations for wastewater treatment plants or requires additional controls at landfills beyond the currently installed systems, the County would comply with these regulations.

The Scoping Plan states that local governments are essential partners in achieving California's goals to reduce GHG emissions. Local governments can implement GHG emissions reduction strategies to address local conditions and issues and can effectively engage citizens at the local level. Local governments also have broad jurisdiction, and sometimes unique authorities, through their community-scale planning and permitting processes, discretionary actions, local codes and ordinances, outreach and education efforts, and municipal operations.

What does this mean for a rural agricultural County? The County can ensure that its land use plans and transportation plans help to reduce GHG emissions by protecting farmland and focusing development in rural communities and designated corridors and increasing average development

densities. The County can encourage residents and businesses to take actions to reduce their greenhouse gas emissions through education and outreach. For new development projects, the County can encourage new development to make their projects walkable, support alternative modes of transportation and exceed energy and water efficiency standards when feasible. Capital investments in clean transit fleets, green buildings, and public infrastructure that reduces energy consumption and water use and captures natural gas in landfills are possibilities. The 2012 CAP addressed these local actions and the 2018 CAP Update continues the existing strategy. No additional measures are required for the County to remain consistent with the 2017 Scoping Plan and SB 32 2030 targets.

Local Regulatory Requirements

The pathway to achieve the 40 percent reduction from 1990 levels laid out in the Scoping Plan Update has only one quantified commitment that is responsibility of local government. The Tulare County SB 375 RTP/SCS regional targets call for a reduction in per capita VMT of 5 percent by 2020 and 10 percent by 2035. New higher regional targets are proposed for 2020 and 2035. The proposed target for 2020 is 13 percent and for 2035 is 16 percent. TCAG has included these targets in the 2018 RTP/SCS. Other Scoping Plan measures envision local governments playing mainly a supporting role; for example, helping renewable energy projects through the permitting process, pursuing grant money for local energy efficiency projects, providing charging infrastructure for electric vehicles, implementing water conservation measures, and increasing recycling and composting of solid waste. The Scoping Plan also indicates that new development subject to CEQA should implement feasible mitigation measures to reduce project impacts.

The Scoping Plan strategy requires adoption of new and amended regulations to implement already approved legislation and federal mandates stemming from the Clean Air Act. CARB included ranges of reductions for each strategy to reflect the uncertainty of the ultimate effectiveness of regulations that have yet to go through a public process and detailed technological assessments. The Scoping Plan relies on the Cap-and-Trade Program to fill in gaps in the regulatory strategy. If the regulatory strategy achieves a high level of reductions, less reductions from the Cap-and-Trade Program will be required. If the regulatory strategy falls short, the reductions from Cap-and-Trade are increased to fill the gap. Local government has no regulatory authority on existing sources of GHG emissions and can only make a small contribution through its budget priorities and in mitigating the growth of emissions through the CEQA process for new projects. The Scoping Plan suggests that local governments could adopt building energy efficiency standards exceeding Title 24 and energy upgrades at the time of sale of existing homes and buildings among others. The County assessed potential local government actions for feasibility in Tulare County and included only those that are feasible in the CAP strategy.

Scoping Plan Suggestions for Local Government

The Scoping Plan includes a statement that indicates that it cannot achieve the 2030 target without the assistance of local government; however, no quantitative amount of reduction is assigned to local government beyond implementation of SB 375 regional targets for passenger cars and light duty trucks. The Title 24 reach standards are not practical to implement when the standards are revised every 3 years and will be near net zero for residential in the near term and near net zero for non-residential by 2030. The County supports and encourages new projects to exceed standards

where feasible but cannot require mitigation of the impact unless a potentially significant impact has been identified. The threshold of significance for GHG emissions is based on a project's consistency with state targets mandated by AB 32 and SB 32. Since the Scoping Plan strategy would achieve the target without additional reductions from development projects and the Scoping Plan strategy accounts for statewide growth, a constitutional nexus between the project's impact and a requirement for additional mitigation beyond regulation would be difficult to justify.

As a point of clarification, items that were formerly considered mitigation measures are often incorporated into regulations and standards when the regulations are updated. For example, Title 24 incorporates building features and designs in each new update to the regulation that were once suggested as mitigation measures. The burden of complying with the regulation has replaced the burden of complying with a mitigation measure. The advantage of the regulatory compliance approach is that implementation becomes uniform and universal with all projects required to comply.

The State has laid out a feasible regulatory strategy to achieve the 260 $MMTCO_2e$ 2030 target, which includes Cap-and-Trade as the contingency measure to ensure that the State achieves its goal. The Scoping Plan 2030 BAU inventory is 389 $MMTCO_2e$. As shown in Table 12, the Scoping Plan estimates that the regulatory strategy will achieve reductions of 68 $MMTCO_2e$ by 2030. Under this scenario, the State would need reductions of 61 $MMTCO_2e$ from Cap-and-Trade to reach the 2030 260 $MMTCO_2e$ target.

CAP Course Corrections

Growth predicted for the State and for Tulare County is accommodated by the Scoping Plan, which uses population and VMT forecasts similar to those of the CAP. If growth exceeds projections, additional reductions may be needed. However, if development projects are at or near net zero energy consumption as required by future updates to Title 24, growth above forecast would have little effect on those emissions. If VMT growth is higher than projected, but the per capita VMT targets of the SCS are still met, the impact of the excess growth would not result in inconsistency with the Scoping Plan. If growth is well above projections (e.g., 5 percent over a 3-year period), the CAP would be revisited to determine if Cap-and-Trade is adequate to cover the additional emissions or if additional local measures are needed. If Cap-and-Trade proves inadequate to make up shortfalls because of excess growth over projections or underperforming regulations, the State has the responsibility for revising the Scoping Plan strategy to strengthen regulations, which could include, among other things, more requirements for local government or for new development.

The statement in the Scoping Plan that long-term targets "cannot be achieved" without land use decisions that allow more efficient use and management of land and infrastructure is not supported by substantial evidence in the Scoping Plan or elsewhere. Changing land use and transportation systems to reduce VMT is supported by General Plan policies but is only one possible measure in one possible path to reaching the targets. More reliance on zero emission vehicles and renewable or zero carbon energy sources could make up reductions from VMT strategies. Greater reductions from Cap-and-Trade could also make up for any shortfalls from land use and energy efficiency strategies. The goal of more efficient land use and developing livable walkable sustainable communities is a

worthwhile pursuit on its own merit but should be seen for what it is—an alternative or supplement to reduce reliance on technological solutions.

The long-range land use planning and permitting goals contained in the General Plan are consistent with the 2017 Scoping Plan. Tulare County has no surplus funds to provide incentives of reduced permit fees or to pay for additional staff required for permit streamlining of energy projects. Reducing fees for certain projects requires increasing fees from other projects to subsidize the energy projects and could slow needed economic growth in the County.

Emission Reductions from Implementing the Tulare County RTP/SCS

The TCAG RTP/SCS assessed the performance of three different development scenarios considered in the SCS to demonstrate compliance with the SB 375 regional targets assigned to Tulare County. The regional targets require Tulare County to achieve a 5 percent reduction in CO_2 emissions from automobiles and light duty trucks from 2005 levels by 2020 and 10 percent by 2030 (ARB 2015).

An assessment prepared for the 2018 RTP/SCS found that the Preferred Scenario—Blueprint (Blueprint) would achieve a reduction of 13.1 percent by 2020 and 17.9 percent by 2035 which would more than meet the SB 375 targets. CARB has proposed updated targets as part of the 2017 Scoping Plan. The new targets for Tulare County are 13 percent for 2020 and 16 percent for 2035, which are in line with the current Tulare County RTP/SCS reduction amounts.

The SCS examined the no project scenario and three other land use scenarios and identified a preferred scenario. The "Trend Scenario" described the effect of continued development at current average densities and mix of housing types. The Trend Scenario can also be considered the "Business as Usual Scenario" used to calculate greenhouse gas reduction targets. The preferred scenario identified during the process was the "25% Density Increase Scenario." This scenario increased residential density by 25 percent and shifted the housing types to medium and high densities (TCAG 2008). The two scenarios are compared in Table 14.

Table 14: Blueprint Scenario Comparison

Item	Trend Scenario	Preferred Scenario—Blueprint
Definition	Future development same as today Single-family homes the norm No new transit	Status quo densities are increased by 25% Increase in medium and high-density housing Light rail between cities Highway 65 extended throughout the entire eastern portion of the County
Density	4.3 dwelling units per acre	5.3 dwelling units per acre
Housing Mix	12.6% low density 61.1% medium density 25.3% high density	8.7% low density 49.8% medium density 41.5% high density
Residential Footprint	43,811 acres	35,421 acres

Note:
Density estimates for Tulare County from San Joaquin Valley Blueprint April 2009 Update.
Source: San Joaquin Valley Blueprint Planning Process Summary Report September 2010 and TCAG 2018

Importantly for the unincorporated County, the Blueprint would consume about 800 fewer acres of important farmland and 16 fewer acres of critical habitat by 2042 than the Trend Scenario (TCAG 2018). The General Plan supports farmland conservation and focusing development in existing communities and transportation corridors that support the Blueprint. SB 375 provides CEQA streamlining incentives for certain infill projects that will help to ensure that the County implements the Blueprint scenario.

Air District Reductions

The SJVAPCD adopted Rule 9410—Employer Based Trip Reduction in 2009. The rule requires employers with over 100 employees to implement trip reduction programs. The rule targets employee commute trips and requires large employers to implement measures that reduce vehicle miles traveled by increasing transit use, carpooling, vanpooling, bicycling, or other measures to reduce trips. The SJVAPCD estimates that the rule will reduce mobile source criteria pollutants by approximately 1.6 percent by 2023 (SJVAPCD 2009). Since the rule reduces trips and vehicle miles traveled, it would produce similar reductions in greenhouse gases. Light-duty passenger cars and truck trips that would be affected by the rule comprise 26 percent of development-related emissions in Tulare County in 2020 and 19.4 percent in 2030. Therefore, this measure will reduce overall development related greenhouse gas emissions by approximately 0.4 percent by 2020 and would achieve 0.3 percent in 2030.

Another SJVAPCD rule that will provide greenhouse gas emission reductions from new development is Rule 9510—Indirect Source Review. The rule requires development projects subject to the rule to reduce operational NO_X emissions by 33 percent and operational PM_{10} emissions by 50 percent. The rule allows credits for land use and transportation measures that provide an air quality benefit to the site and requires payment of a mitigation fee that is used to fund off-site emission reduction projects if the reduction target is not achieved with on-site measures. The on-site measures and off-site projects funded may provide greenhouse gas reductions in excess of those required by other regulations.

Projects subject to Rule 9510 accomplish on-site reductions primarily with measures that reduce vehicle travel, provide clean fleet vehicles, and improve energy efficiency. Off-site reductions are achieved with projects in the SJVAPCD's Heavy-Duty Engine Program, and other grant and incentive programs that reduce mobile source emissions. Engines replaced by the Heavy-Duty Engine Program are typically more fuel-efficient that the current engine. Replacing diesel engines with electric motors is an option that produces substantial greenhouse gas reductions. The exact mix of projects funded by Rule 9510 cannot be predetermined since the SJVAPCD operates the program on a first come, first served basis.

Based on these factors, it is reasonable to conclude that Rule 9510 will provide greenhouse gas reductions in Tulare County. Approximately 85 percent of discretionary development projects in the San Joaquin Valley are subject to Rule 9510 (SJVAPCD 2005). Assuming 65 percent of development projects in Tulare County will require a discretionary approval, 55 percent (0.65 x 0.85) of development would generate reductions from this rule. Of the 33-percent reduction in mobile and area sources of NO_X required by the rule, it is reasonable to assume that at least 0.5 percent will be reductions in greenhouse gases not accounted for elsewhere. For the purpose of developing a

target, the reduction was conservatively estimated as 0.5 percent of the mobile and area source inventory-related inventory. When Rule 9410 and Rule 9510 reductions are combined, they result in a reduction of 0.9 percent in mobile sources.

4.4—Process for Determining CEQA Project Level Consistency with the CAP

One of the primary purposes of the CAP is to provide a solid approach for determining significance for project cumulative impacts on climate change. The following section describes the approach selected for Tulare County.

2020 Targets

On average, all Tulare County existing and new development will produce 14.4 percent fewer emissions by 2020 compared to 2015 levels due to the benefits of State regulations described in the CARB Scoping Plan. This is expected to provide more than adequate reductions to achieve the 2020 target from the 2012 CAP. Reductions from new development compliance with Title 24 and CalGreen code are included in the energy inventory projections. Reductions in trips and VMT from new development are accounted for in reductions due to SB 375 regional targets. Projects that are built out prior to 2020 can continue to demonstrate consistency with the 2020 target with an analysis that shows the project would reduce emissions by at least 26.2 percent compared to BAU in 2020. Projects with buildout after 2020 must demonstrate consistency with the 2030 target.

Quantifying Project Emissions and Mitigation Measures

The primary tool for estimating project level emission reductions is the land use air quality model CalEEMod that was developed by the South Coast Air Quality Management District in cooperation with local and regional air pollution control districts throughout the State. CalEEMod includes a mitigation component that quantifies emission reductions from a wide variety of land use and transportation measures. The reductions in the mitigation component are based on the California Air Pollution Control Officers Association (CAPCOA) 2010 document Quantifying Greenhouse Gas Mitigation Measures (CAPCOA 2010). The effectiveness of individual measures accounts for differences in rural and urban environments, the type and frequency of transit service, the climate of the area, walkability, and development density among others. The CalEEMod model is well accepted as the standard for assessing air quality and greenhouse gas impacts of development projects undergoing CEQA review.

The CAPCOA quantification document provides ranges of effectiveness for transportation strategies based on four land use categories. The categories are urban, compact infill, suburban center, and suburban. Highly urban areas like downtown San Francisco are classified as “urban.” “Compact infill” projects are generally high-density development within an existing moderately dense community. A “suburban center” is represented by portions of Walnut Creek that have BART access or Fresno that have bus rapid transit, and relatively high concentrations of employment and housing near transit stops. Suburban development describes most development found in Tulare County cities and rural communities. Housing in suburban development areas includes single family home most often constructed at 3 to 10 dwelling units per acre, low rise apartments, shopping centers, and office complexes. Projects that include only large lot rural development would not achieve any reductions using the CAPCOA methodology. Energy efficiency in excess of Title 24 requirements would result in reductions from suburban and rural projects.

The CAPCOA document further subdivides the transportation measures into five subcategories shown in Table 15. The methodology used by CAPCOA accounts for differences in transportation choices in urban and suburban areas and provide a global maximum and subcategory maximum for each measure. This prevents double counting reductions from multiple measures and caps the reductions based on studies performed in areas having different land use characteristics. Dense urban areas with quality transit can build on their existing development patterns and transit systems to achieve greater reductions than suburban areas with fewer people and jobs located near quality transit or in walkable mixed-use areas. The measures are not mandatory and are provided to illustrate the types of measures that may apply to projects proposed in unincorporated Tulare County and can be selected when using the CalEEMod mitigation component if quantification is required.

Table 15: CAPCOA Transportation Measures

Land Use/Location	Neighborhood/ Site Enhancement	Parking Policy/ Pricing	Transit System Improvements	Commute Trip Reduction
Maximum Global Reduction for Suburban Development Projects—15%				
Max Reduction: 5%	**Max Reduction 5%**	**Max Reduction 10%**	**Max Reduction 10%**	**Max Reduction 15%**
Increase Density	Pedestrian Network	Parking Supply Limits	Transit Network Expansion	Commute Trip Reduction (CTR) Program
Site Design	Traffic Calming	Unbundled Parking Costs	Service Frequency Increase	Transit Fare Subsidy
Location Efficiency	NEV Network	On Street Market Parking	Bus Rapid Transit	Employee Parking Cash Out
Development Diversity (mixed Use)	Car Share Program	Residential Parking Permits	Access to Transit Improvements	Workplace Parking Pricing
Destination Accessibility	Bicycle Lanes/Trails and Parking		Station Bike Parking	Alternative Work Schedules & Telecommute
Transit Accessibility	Urban Non-Motorized Zones		Local Shuttles	CTR Marketing
Below Market Rate Housing			Park and Ride Lots	Employer Sponsored Van Pool/Shuttle
Pedestrian Orientation				Ride Share Program
Proximity to Bike Path				Bike Share Program
				End of Trip Facilities
				Preferential Parking Permit
				School Carpools
				School Bus

Note:
Measures shaded blue have a higher likelihood of feasibility in Tulare County development projects compared with non-shaded measures. The small size and rural nature of the communities does not support frequent transit service and paid parking strategies. Larger-scale new developments and major employers may have opportunities for the other non-shaded measures.
Source: CAPCOA 2010.

The following example project is provided to illustrate the feasibility of achieving a project-level reduction that would meet the County's emission reduction target. Table 16 provides an emission reduction scenario for a 100-unit residential project in a rural community. The emission reduction estimates are from the CalEEMod Mitigation Component using some of the measures listed in Table 16. Most of the measures have a range of effectiveness that could result in greater or lesser reductions for different projects. The results represent the reductions from business as usual in 2030 to meet the 9.0 percent reduction required from the 2030 CAP adjusted business as usual inventory with regulations applied. Project applicants could choose other measures if these particular measures are not feasible for their project. This method is consistent with the BAU analysis approach recommended by the SJVAPCD and used on project analyses in Tulare County for the 2012 CAP.

Table 16: Rural Community Project Reduction Example

Measure	
Improve Walkability Design—Intersections per Square Mile (CAPCOA LUT-9)	250/Sq. MI.
Improve Destination Accessibility Distance to Downtown (CAPCOA LUT-4)	1 Mile
Integrate Below Market Rate (BMR) Housing % BMR (CAPCOA LUT 6)	25%
Improve Pedestrian Network Onsite and Connecting Offsite (CAPCOA SDT-1	All
Provide Traffic Calming Measures (Pedestrian signals, narrow crossings (CAPCOA SDT-2)	25%
Total Reductions from Land Use Measures (Percent)	**6.2%**
Comply with 2019 Title 24 Building Energy Efficiency Standards (5% more stringent than 2016 standard)	0.4%
County achieves the 75 percent CalRecycle diversion mandate	2.1%
Additional energy savings from water conservation required by CalGreen and Landscape Ordinance (20% better than average)	0.3%
Reductions from Rule 9510 Indirect Source Review (33% NOx reduction)	0.5%
Total Reductions from Land Use Measures and Regulations not Accounted for in CalEEMod	**9.5%**
Percentage Reduction Required from Adjusted Business as Usual Inventory Required in 2030	**9.0%**
Note: Project is 5 du/ac = dwelling units per acre. Source: CalEEMod 2016.2.3.	

New Development CAP Consistency Checklist

The 2018 CAP Update includes an additional method of determining project consistency with the CAP and 2030 targets. Projects subject to CEQA review could use a checklist containing design features and measures that are needed to determine consistency. Large projects (500-unit subdivisions and 100,000 square feet of retail or equivalent intensity for other uses) and new specific plans should provide a greenhouse gas analysis report quantifying GHG emissions to demonstrate that the project emissions are at least 31 percent below 2015 levels by 2030 or 9 percent below BAU emissions in 2030. These are the amounts currently required from development related sources to demonstrate consistency with SB 32 2030 targets. Smaller projects may also prepare a GHG analysis report if the checklist is not appropriate for a particular project or is deemed necessary by the project proponent or County staff. The GHG analysis should incorporate as many measures as possible from the CalEEMod mitigation component as described in Table 15 and can take credit for 2017 Scoping Plan measures that have not been incorporated into CalEEMod but that will be adopted prior to 2030 such as 50 percent RPS.

Table 17 lists the overarching consistency requirements for all projects based on consistency with County land use plans that apply to the project location. Reviews for consistency with land use plans require planning staff to review projects to determine if they comply with applicable plan policies and implementation measures.

Table 17: CEQA Project Requirements for Consistency with CAP

Item	Required
Project helps to meet the density goals from the Tulare Blueprint	Yes
Consistency with General Plan policies	Yes
Consistency with Rural Valley Land Plans or Foothill Growth Management Plan development criteria	Yes
Consistency with Urban Growth Boundary expansion criteria	Yes
Consistency for development within Rural Community Urban Development Boundaries (UDB) and Hamlet Development Boundaries HDB, and Legacy Development Boundaries (LDB)	Yes
Note: Criteria as identified in the General Plan Planning Framework	

A more detailed review for compliance with CAP measures is required to ensure that a project is doing its part in reducing emissions. Table 18 provides a checklist containing measures that will provide reductions necessary to achieve CAP consistency. A project checklist that can be used by staff is provided as Appendix C.

Table 18: CAP Consistency Checklist

CAP Measure	Compliance
Land Use: Project is consistent with the Tulare County General Plan policies listed in the CAP applicable to GHG emissions and sustainability.	Review for compliance during project review process.

Table 18 (cont.): CAP Consistency Checklist

CAP Measure	Compliance
Land Use—Residential: Subdivisions and multifamily projects propose densities consistent with County commitments for the Tulare Blueprint. Densities in subdivisions within the boundaries of Valley rural communities must be at least 5.0 units per acre. (County R-1 zoning has a 6,000 square foot minimum lot size or 7.26 units per gross acre). Overall residential density is 5.3 units per acre for the entire County including the cities. Mountain subdivisions over 50 lots require review to determine if they are consistent with the Blueprint.	Review development plans during project review to determine if densities are consistent with Blueprint.
Land Use—Non-Residential: Retail and office projects should be constructed within the boundaries of Rural Communities, HDB, UDB, LDB, and in designated transportation corridors to provide needed local goods services to residents and the traveling public. Agricultural industrial projects may be constructed in rural locations as long as consistent with the General Plan.	Review development plans to ensure locations are appropriate for type of project that is proposed and consistent with County plans.
Land Use Design—Projects that require construction of new roads or major intersection improvements provide a fair share of improvements such as sidewalks and pedestrian friendly crossings, and bike lanes/paths connecting to schools, shopping, and other uses consistent with County development standards.	Include roadway improvements as conditions of approval of subdivision or commercial site plan
Energy Efficiency: Project complies with current version of Title 24. (Current version is 2016 Title 24)	Provide copy of the Title 24 Report demonstrating compliance with the applicable standards with Building Permit application.
Renewable Energy: Project includes solar panels or other alternative energy source meeting County Solar Ordinance or new Title 24 standards whichever is more stringent.	Include solar on building plans and provide Title 24 compliance reports with Building Permit applications.
EV Charging: Project meets charging installation/charging ready requirements of the CalGreen Code.	Include charging in building plans
CalGreen Building Code Water: Project complies with indoor and outdoor water conservation measures.	Provide copy of report showing code compliance.
Water Conservation Landscaping:	Project complies with County water conservation ordinance requirements for landscaping.
Solid Waste: Project has access to recycling service for homes and businesses meeting CalRecycle requirements.	County verify that providers are in compliance with CalRecycle regulations regarding recycling and diversion of solid waste.
Large Employment Projects: Projects that will have large numbers of employees (over 100) are required to comply with Rule 9410 Employee Trip Reduction Plans (ETRIP). Provide a copy of the ETRIP plan to the County after approval of the plan by the SJVAPCD.	Employer is responsible for compliance with Rule 9410
Industrial Projects: Industrial projects that are large employers will comply with Rule 9410. Industrial process related GHG emissions are not under the County's regulatory authority but will require permits from the SJVAPCD and may be subject to Cap-and-Trade.	Employer is responsible for compliance with Rule 9410

Pathway to Consistency

A typical residential subdivision in a community could include sidewalks to connect the neighborhood to schools or shopping areas, have a street pattern that enhances walkability, connect to community or regional bicycle paths and trails, incorporate traffic calming measures at busy intersections, and be within walking distance of a transit stop. Not all subdivisions would be able to utilize all of these design features due to existing community characteristics and location of the subdivision within the community. However, each project should incorporate as many features as possible. Implementing the preferred Blueprint development scenario as supported by the General Plan will help to maximize the effectiveness of the measures. Based on experience in using CalEEMod for Rule 9510 ISR analysis, reductions of 5 to 10 percent are possible in single-family residential subdivisions in suburban locations. Communities that build a mix of single family homes and low-rise apartments would meet the 25 percent increase in density Blueprint scenario.

The measures are intended for development within or contiguous with existing communities and not for large lot rural development. The Blueprint assumed that 8.7 percent of County residences could still be constructed at low densities and achieve the density goal. The Blueprint goal applies to the cities and the unincorporated areas of Tulare County. Since most of the rural land is within the unincorporated County, most of the low density residential would be built in these areas. Therefore, progress toward achieving the density goal must be tracked for the entire County with each City and the unincorporated County playing a role. Larger cities such as Visalia and Tulare can be expected to absorb a larger portion of the new multifamily and small lot single family development and overall growth compared to the unincorporated County. General Plan policies to protect important farmlands will help minimize the amount of low density development that occurs in the unincorporated County.

A typical commercial office or retail building could incorporate pedestrian amenities and street patterns of the town center if built in areas served by the traditional gridded street system. In more modern suburban settings, connections with sidewalks, bike lanes, with nearby residences and other businesses could help increase walking and bicycling. The commercial projects may also be close to transit stop in some cases. Large employers are required to comply with commute trip reduction measures from SJVAPCD Rule 9410. Small employers will be encouraged to provide these measures for their projects. Industrial projects often require separation from residential development to prevent land use conflicts and do not substantially benefit from measures for walking and bicycling. However, large industrial employers can implement commute trip reduction measures. Reductions from non-residential projects typically range from 2 to 8 percent, but projects with large numbers of employees can achieve greater reductions.

Energy efficiency regulations will continue to increase in stringency as the State pursues it zero net energy goal for new residential and non-residential buildings. The CEC recently mandated installation of solar panels at all residential projects. With these mandates in place there is limited value in requiring projects to exceed Title 24 energy efficiency standards. Therefore, no measure is included in the CAP that requires new buildings to exceed the standards by a certain percentage.

Water conservation measures required by the CalGreen code, Tulare County Ordinances, and the Model Water Efficiency Landscape Ordinance will provide significant indoor and outdoor water

savings. Use of drought tolerant landscaping in new development will be encouraged to obtain additional water savings. No additional mandatory reductions from water conservation are included in the CAP.

Emission Reduction Potential from New Development

Establishing an emission reduction target requires consideration of the potential sources subject to control during the planning timeframes and the mix of measures most likely to be implemented for the various project types. The DOF forecasts a population increase in the unincorporated area of the County of 20,678 people between 2015 and 2030 or 14.1 percent. Based on the average household size in Tulare County of 3.38 persons per dwelling unit, this increase would require the construction of 6,115 dwelling units or an average of 408 units per year. The number of dwelling units required by 2020 was estimated by assuming a steady annual growth rate through 2030 and interpolating the 2020 amount. A net increase of approximately 2,038 dwelling units will be required by 2020 at the average rate of 408 units per year. This means that 14.1 percent of the housing in Tulare County will be subject to actions that reduce emissions during the development process between 2015 and 2030. (DOF 2017) No statistics on the square feet of commercial space that will be constructed were available; however, it would be expected to grow at rates that would support the increase in population. The General Plan uses a forecast of 10.5 percent employment growth by 2030 in unincorporated areas of Tulare County. The employment growth reflects Blueprint and General Plan policies to focus development in cities and existing rural communities.

Development in Existing and New Subdivisions

The County has already approved a substantial number of lots for development. Development of some of these lots will be limited by various factors such as water supply, sewer/septic capability, road capacity, etc. that cannot be addressed during the planning horizon due to lack of resources. This means that the County expects that new development proposals will be received that are more likely to develop before existing lots are developed because the rural community, landowner, or developer has the resources to provide all improvements and services required for the site. As a rough estimate, this analysis assumes that 40 percent of the development will occur on existing lots and 60 percent will occur in new developments. Development occurring on existing lots will be subject to existing conditions of the approved subdivision and zoning standards. Development occurring in new subdivisions and projects would be subject to additional measures required to mitigate significant impacts. The County will encourage developers of existing lots to implement measures that reduce greenhouse gas emissions, but it has no authority to require additional reductions beyond those required by State regulation, the building code, and local ordinance.

Commercial and Industrial Projects

Commercial and industrial development in Tulare County during the 2020 and 2030 planning timeframes will comply with increasingly stringent State energy efficiency regulations in most projects. For industrial projects where the SJVAPCD is a Responsible Agency, the project will be expected to implement Best Performance Standards included in the SJVAPCD Guidelines for Addressing Greenhouse Gas Emissions on the processes and stationary equipment that emit greenhouse gases to levels that meet or exceed State targets and may be subject to Cap-and-Trade Program requirements.

Energy Efficiency

Projects that are constructed between 2015 and 2030 will produce substantially less emissions than those built prior to 2015 because they comply with more stringent Title 24 energy efficiency standards and Green Building Code requirements than existing development. For example, the 2016 Title 24 update improved energy efficiency in residential projects by 28 percent compared to the 2013 Title 24. The reductions from the 2016 Title 24 and the CalGreen Building Code are incorporated into the 2030 emission inventory. The 2019 Title 24 update and future updates would move towards zero net energy for residential in 2020 and for non-residential by 2030. The reductions from new buildings meeting net zero or equivalent levels with on-site renewable generation would reduce emissions in a stair step fashion with each new update to the standards that results in more buildings closer to net zero energy consumption. After 2030, building energy from new development new development would be fully mitigated (CEC 2016).

The 2017 Scoping Plan includes a measure to double the energy efficiency of existing buildings by 2030. That would require home and business owners to invest in energy efficiency or to install solar to reduce their net energy consumption. Many people in Tulare County have found it worthwhile to make these investments with the help of incentives provided by the State and energy utilities. The cost of solar has declined substantially over the years while energy prices have increased making the need for incentives less important in the future. Financing programs like the PACE program and lease programs can allow people to make the investment even when they have limited capital. Some have suggested requiring energy retrofits at the time of sale; however, this would affect housing affordability and potentially reduce the number of people who can qualify for a home. The cost-effectiveness of energy retrofits varies for each retrofit project due to differences in currently installed equipment, current energy use, and the cost of the replacement technology.

Projects that occur in new towns or in large, multi-use developments in existing communities would be able to achieve reductions greater than those achieved for typical suburban development in Tulare County's rural communities. Large projects offer opportunities to better design land use patterns and transportation infrastructure to support walking, bicycling, and transit use. Larger structures and office developments have more opportunity for employee commute programs, carpooling, and transit service. New developments in low-income communities with affordable housing receive credits for generating fewer vehicle trips. Although not required, projects that exceed the energy efficiency standards or achieve net zero energy consumption before required will provide additional reductions that can be used as a contingency amount available in the event that other measures are less effective than predicted. The measures required can be adjusted in the future, if needed to meet the County's emission target or to address changes in regulatory measures.

Voluntary measures implemented by residents and businesses for projects not subject to a discretionary approval and voluntary retrofits of existing structures with energy saving features may provide additional reductions. The potential success of voluntary actions has not been estimated.

As stated earlier, the feasibility of achieving emission reductions related to travel varies by project type, location, and surrounding development. Projects in some of the smaller rural communities and hamlets may have a more difficult time demonstrating reductions than projects in the larger rural communities and new towns but are in great need of new development to help with infrastructure,

jobs, and commercial opportunities. As the County reviews development proposals, it can determine if a separate reduction target for small rural communities and hamlets is warranted.

The County wants to encourage development that is consistent with the Blueprint and General Plan Policies that promote greenhouse gas reductions and protects agricultural and natural resources. The CAP targets for development provide an incentive for developers to propose projects that meet or exceed the targets. Projects will continue to be required to meet the checklist criteria for development within the Rural Valley Lands Plan Area.

Dairy and Feedlot Emissions

Dairy and feedlot emissions are the largest source of greenhouse gas emission in the Tulare County emissions inventory. Other types of livestock produce insignificant amounts of greenhouse gases due to their limited numbers and lower manure production. Dairies and feedlots are responsible for over 95 percent the State livestock greenhouse gas inventory. The primary avenue of reducing emissions from this source is through SJVAPCD regulations. The SJVAPCD Rule 4570, Confined Animal Facilities, requires dairies to implement practices that reduce reactive organic gases (ROG) from manure handling and disposal. Measures that reduce ROG also tend to reduce the formation of the greenhouse gas, methane. The CARB 2008 Scoping Plan measure for livestock emphasizes voluntary incentive programs to install anaerobic digesters at dairies to capture the methane and use it as a carbon neutral biofuel. These regulations and programs will reduce emissions from existing and new facilities. Several dairies have installed anaerobic digesters in recent years, but they have required subsidies to make them feasible. Facilities that use engines to generate electricity must install expensive controls to reduce hydrogen sulfide from the fuel and controls on the engines to reduce oxides of nitrogen (NO_X). New technologies like microturbines and fuel cells have not been proven technologically feasible for biogas or are too costly to install. This could change if the cost of these technologies is reduced or other new technologies are introduced.

The County requires new and expanding dairies and feedlots to go through the CEQA process, at which time greenhouse gas reduction measures can be identified that are appropriate for the circumstances of the individual facility. The SJVAPCD is a Responsible Agency for these projects and will recommend mitigation measures to reduce air quality impacts. The SJVAPCD adopted CEQA Guidelines in 2009 for addressing greenhouse gases at development projects and proposes that projects implement Best Performance Standards to reduce impacts. For dairies, the SJVAPCD identified the use of feed supplements, frequent manure removal, and anaerobic digesters as measures to reduce greenhouse gas emissions. The feed supplements are believed to reduce greenhouse gases by at least 12 percent. Frequent manure removal is estimated to reduce emissions by about 7 percent. Anaerobic digesters reduce methane emissions by 63.5 percent. The SJVAPCD is commencing a process to finalize the Best Performance Standards. Until that occurs, the measures

should only be considered informational. Most dairies are required to perform frequent manure removal to comply with Rule 4570. It remains to be seen if the feed supplement measure will prove feasible for some or all dairies, due to potential costs and unknown quality impacts. However, if these new supplements prove effective and replace feed supplements of similar cost, it could produce large reductions not only in Tulare County but with all dairies. The County believes that anaerobic digesters have not been demonstrated as a feasible mitigation measure, but it will track this technology as more are installed around the San Joaquin Valley.

The County 2017 Dairy CAP includes a voluntary emission reduction target for dairies and feedlots through a separate process as part of the update of the ACFP. In the interim, compliance with SJVAPCD regulations and project-by-project CEQA compliance will be used to mitigate impacts of this source on climate change.

4.5—Targets After 2030

The State has set emission reduction targets for 2020 and 2030 and a long-term goal of reducing emissions to 80 percent below 1990 emissions by 2050. Reaching the 2050 goal will require the implementation of technologies and measures that have yet to be identified. For the CAP, Tulare County assumes that the percentage reduction required from new projects will remain constant through 2030. The State can be expected to prepare another Scoping Plan Update prior to 2030 that sets goals to 2040 or 2050. Tulare County will revise the CAP to clarify the County's role in achieving the later targets when the State sets updated targets.

4.6—Control Costs

Implementation of the CAP reduction strategy will result in both costs and savings. Many of the building related measures provide savings from reduced energy consumption. Many of the land use and transportation measures have lower infrastructure costs compared with BAU, resulting in more compact development and less need to expand transportation infrastructure because of the reduced trip generation rates. Some measures require investment in new technologies to achieve the reductions in energy and fuel use. The technology investments, in many cases, will pay for themselves over time with savings in energy costs. Some investments made by developers in energy efficiency and new technology may be difficult to recoup in the sale of the property because of market forces, but the person or business that ultimately pays for the energy use could experience savings.

The County will incur costs in administering the CAP. The County is responsible for implementing the measures included in the CAP and for tracking progress over time. Future updates to the CAP will also require County resources for staff and for technical assistance. To the extent possible, the County intends to incorporate CAP work into other related projects. For example, progress in implementing the CAP will be reviewed using existing data sources and the General Plan progress report process. Changes in travel characteristics are currently tracked as part of the Regional Transportation Plan maintained by the TCAG. This data can be used to determine the effectiveness of measures designed to reduce trips and vehicle miles traveled.

Emission control costs are usually calculated in dollars per metric ton of CO_2e reduced to allow for the comparison of relative costs of different controls. This is referred to as cost-effectiveness. Cost

per metric ton is also used in exchanges that facilitate buying and selling carbon credits on the open market such as the Chicago Climate Exchange.

A number of studies have been prepared that estimate the control costs and savings for different measures. The California Air Pollution Control Officers Association report, CEQA & Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act, published in January 2008, includes percentage reductions and cost estimates for many measures (CAPCOA 2008). The report does not calculate cost-effectiveness for each measure, since that would vary by the amount of emissions at the source being controlled. The report is useful for identifying the capital costs of the measures, but it would require a project specific emission reduction estimate to calculate cost-effectiveness.

A 2007 report in the McKinsey Quarterly (Enkvist et al. 2007) presented the cost-effectiveness for a large number of measures. The cost savings for the most effective measure exceeded $200 per metric ton of CO_2e. Other measures provided emission reductions at a cost of less than $60 per metric ton of CO_2e. Measures that provide cost savings include the following in order of cost savings:

- Building insulation
- Fuel efficiency in commercial vehicles
- Lighting systems
- Air Conditioning
- Water Heating
- Fuel efficiency in vehicles

Table 19 lists the estimated cost or the range in cost per metric ton of CO_2e for a variety of measures. The measures are not specific to Tulare County and are provided for illustrative purposes only. The cost-effectiveness can be part of a decision process for identifying appropriate measures for the County or for individual projects.

Table 19: Cost-Effectiveness Estimates

No.	Measures	Cost per Metric Ton (CO_2e)
1	Expand energy saving opportunities to businesses	$0.18–$0.38
2	Improve residential energy efficiency	Negligible
3	Encourage development that is mixed-use, infill, and higher density	$0.81–$1.62
4	Increase housing density near transit	$4.54–$9.08
5	Actively promote walking and biking as safe modes of local travel, particularly for children attending local schools	$923.52
6	Create travel routes that ensure that destinations may be reached conveniently by public transit, bicycling and walking	Negligible
7	Convert more vehicles to hybrid, electric, alternative fuel, or smaller vehicles	$6,537–$7,027

Table 19 (cont.): Cost-Effectiveness Estimates

No.	Measures	Cost per Metric Ton (CO_2e)
9	Adopt a green building standard for all new development and major remodels	Negligible
10	Create water and waste efficient landscapes.	$24.74–$28.87
11	Identify opportunities for on-site renewable energy generation on County and privately owned property	$1,282–$1,320
12	Implement reduction strategies included in the energy audit of County facilities and continue to monitor County facility performance	N/A
13	Provide for increased albedo (reflectivity) of all urban surfaces including roads, driveways, sidewalks, and roofs in order to minimize the urban heat island effect	Negligible
14	Encourage tree planting	$35.96–$71.91
15	Address and minimize vegetation that degrades access along public rights of way	N/A
16	Increase bike parking	$6–$12
17	Price on-street parking in high-traffic areas in order to alleviate congestion, increase motorist convenience, reduce vehicle miles traveled, and create a new revenue stream for the County	$50.26
18	Support zero waste	Negligible
19	Increase recycling and composting at public events	Negligible
20	Establish an environmentally preferable purchasing program (EPP) for government operations	$17.42
21	Provide for a shuttle service in order to increase transit ridership	$1.15–$2.30
22	Promote car sharing programs	$1.55–$3.11
23	Increase accommodation and promotion of fueled vehicles and hybrid vehicles alternatively	$200
Source: City of San Carlos 2009.		

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SECTION 5: GENERAL PLAN POLICIES

5.1—Tulare County General Plan Policies and Measures

The Tulare County General Plan 2030 Update fulfills many sustainability and greenhouse gas reduction objectives at the program level. Individual projects that will implement the General Plan will comply with these policies resulting in long-term benefits to air quality and greenhouse gas reductions that will help Tulare County achieve the CAP reduction targets. Table 20 lists the policies from the various General Plan elements that promote more efficient development and reduce travel and energy consumption.

Table 20: General Plan Policies Having Greenhouse Gas Emission Reductions

Sustainability and Greenhouse Gas Emissions	
PF-1.1 Maintain Urban Edges	ERM-1.2 Development in Environmentally Sensitive Areas
PF-1.2 Location of Urban Development	ERM-1.3 Encourage Cluster Development
PF-1.3 Land Uses in UDBs/HDBs	ERM-1.4 Protect Riparian Management Plans and Mining Reclamation Plans
PF-1.4 Available Infrastructure	ERM-1.6 Management of Wetlands
AG-1.7 Conservation Easements	ERM-1.7 Planting of Native Vegetation
AG-1.8 Agriculture Within Urban Boundaries	ERM-1.8 Open Space Buffers
AG-1.11 Agricultural Buffers	ERM-1.14 Mitigation and Conservation Banking Program
AG-1.14 Right to Farm Noticing	ERM-4.1 Energy Conservation and Efficiency Measures
AG-2.11 Energy Production	ERM-4.2 Streetscape and Parking Area Improvements for Energy Conservation
AG-2.6 Biotechnology and Biofuels	ERM-4.3 Local and State Programs
AQ-1.6 Purchase of Low Emission/Alternative Fuel Vehicles,	ERM-4.4 Promote Energy Conservation Awareness
AQ-1.7 Support Statewide Global Warming Solutions,	ERM-4.6 Renewable Energy
AQ-1.8 Greenhouse Gas Emissions Reduction Plan	ERM-4.7 Reduce Energy Use in County Facilities
AQ-1.9 Off-Site Measures to Reduce Greenhouse Gas Emissions	ERM-4.8 Energy Efficiency Standards
AQ-1.10 Alternative Fuel Vehicle Infrastructure	ERM-5.1 Parks as Community Focal Points
AQ-2.1 Transportation Demand Management Programs,	ERM-5.6 Location and Size Criteria for Parks
AQ-2.3 Transportation and Air Quality	ERM-5.15 Open Space Preservation
AQ-2.4 Transportation Management Associations,	HS-1.4 Building and Codes
AQ-2.5 Ridesharing,	Chapter 11: Water Resources
AQ-3.1 Location of Support Services	TC-2.1 Rail Service
AQ-3.2 Infill Near Employment	TC-2.4 High Speed Rail (HSR)
AQ-3.3 Street Design	TC-2.7 Rail Facilities and Existing Development
AQ-3.5 Alternative Energy Design	TC-4.4 Nodal Land Use Patterns that Support Public Transit
AQ-3.6 Mixed Use Development	TC-5.1 Bicycle/Pedestrian Trail System
LU-1.1 Smart Growth and Healthy Communities	TC-5.2 Consider Non-Motorized Modes in Planning and Development
LU-1.2 Innovative Development	TC-5.3 Provisions for Bicycle Use
LU-1.3 Prevent Incompatible Uses	TC-5.4 Design Standards for Bicycle Routes
LU-1.4 Compact Development	TC-5.5 Facilities
LU-1.8 Encourage Infill Development	
LU-2.1 Agricultural Lands	
LU-3.2 Cluster Development	
LU-3.3 High-Density Residential Locations	

Table 20 (cont.): General Plan Policies Having Greenhouse Gas Emission Reductions

Sustainability and Greenhouse Gas Emissions	
LU-4.1 Neighborhood Commercial Uses LU-7.1 Distinctive Neighborhoods LU-7.2 Integrate Natural Features LU-7.3 Friendly Streets LU-7.15 Energy Conservation ED-2.3 New Industries ED-2.8 Jobs/Housing Ratio ED-5.9 Bikeways ED-6.1 Revitalization of Community Centers ED-6.2 Comprehensive Redevelopment Plan ED-6.3 Entertainment Venues ED-6.4 Culturally Diverse Business ED-6.5 Intermodal Hubs for Community and Hamlet Core Areas ED-6.7 Existing Commercial Centers SL-3.1 Community Centers and Neighborhoods ERM-1.1 Protection of Rare and Endangered Species	TC-5.6 Regional Bicycle Plan TC-5.7 Designated Bike Paths TC-5.8 Multi-Use Trails PFS-1.3 Impact Mitigation PFS-1.15 Efficient Expansion PFS-2.1 Water Supply PFS-2.2 Adequate Systems PFS-3.3 New Development Requirements PFS-5.3 Solid Waste Reduction PFS-5.4 County Usage of Recycled Materials and Products PFS-5.5 Private Use of Recycled Products PFS-8.3 Location of School Sites PFS-8.5 Government Facilities and Services Part II, Chapter 1: Rural Valley Lands Plan WR-1.5 Expand Use of Reclaimed Wastewater WR-1.6 Expand Use of Reclaimed Water WR-3.5 Use of Native and Drought Tolerant Landscaping
Source: Tulare County General Plan 2030 Update.	

The complete policies listed in Table 15 have been organized into several sections that help to identify common themes: Land Use and Transportation Strategies; Building Energy Efficiency; Water Conservation Energy Savings; Solid Waste Reduction and Recycling; and, Agricultural Programs and Initiatives.

Land Use and Transportation Strategies

The County's authority over land use provides its most important contribution to efforts to reduce greenhouse gas emissions related to new development. In addition, as new development is constructed consistent with the General Plan and the Blueprint, even existing development will see benefits from infill and better transportation options.

- **PF-1.1 Maintain Urban Edges**. The County shall strive to maintain distinct urban edges for all unincorporated communities within the valley region, while creating a transition between urban uses and agriculture and open space.
- **PF-1.2 Location of Urban Development**. The County shall ensure that urban development only takes place in the following areas:
  1. Within incorporated cities and Urban Development Boundaries (UDBs);
  2. Within the UDBs of adjacent cities in other counties, unincorporated communities, planned community areas, and HDBs of hamlets;
  3. Within foothill development corridors as determined by procedures set forth in Foothill Growth Management Plan;

4. Within areas set aside for urban use in the Mountain Framework Plan and the mountain sub-area plans; and
5. Within other areas suited for non-agricultural development, as determined by the procedures set forth in the Rural Valley Lands Plan.

- **PF-1.3 Land Uses in Urban Development Boundaries (UDBs)/Hamlet Development Boundaries (HDBs)**. The County shall encourage those types of urban land uses that benefit from urban services to develop within UDBs, urban area boundaries, and HDBs. Permanent uses which do not benefit from urban services shall be discouraged within these areas. This shall not apply to agricultural or agricultural support uses, provided that such accessory uses are time-limited through special use permit.
- **AQ-1.9 Support Off-Site Measures to Reduce Greenhouse Gas Emissions**. The County will support and encourage the use of off-site measures or the purchase of carbon offsets to reduce greenhouse gas emissions.
- **AQ-3.2 Infill Near Employment**. The County shall identify opportunities for infill development projects near employment areas within all unincorporated communities to reduce vehicle trips.
- **LU-1.4 Compact Development**. The County shall actively support the development of compact mixed use projects that reduce travel distances.
- **LU-1.8 Encourage Infill Development**. The County shall encourage and provide incentives for infill development to occur in communities, and hamlets within or adjacent to existing development in order to maximize the use of land within existing urban areas, minimize the conversion of existing agricultural land, and minimize environmental concerns associated with new development.
- **LU-3.2 Cluster Development**. The County shall encourage proposed residential development to be clustered onto portions of the site that are more suitable to accommodating the development, and shall require access either directly onto a public road or via a privately maintained road designed to meet County road standards.
- **LU-3.3 High-Density Residential Locations**. The County shall encourage high-density residential development (greater than 14 dwelling units per gross acre) to locate along collector roadways and transit routes, and near public facilities (e.g., schools, parks), shopping, recreation, and entertainment.
- **ERM-1.3 Encourage Cluster Development**. When reviewing development proposals, the County shall encourage cluster development in areas with moderate to high potential for sensitive habitat.
- **PFS-1.15 Efficient Expansion**. The County shall provide incentives for infill projects where an efficient expansion of the infrastructure delivery system is fully funded.
- **LU-2.1 Agricultural Lands**. The County shall maintain agriculturally designated areas for agriculture use and by directing urban development away from valuable agricultural lands to cities, unincorporated communities, and hamlets where public facilities and infrastructure are available.
- **AG-1.8 Agriculture Within Urban Boundaries**. The County shall not approve applications for preserves or regular Williamson Act contracts on lands located within a UDB unless it is demonstrated that the restriction of such land will not detrimentally affect the growth of the community involved for the succeeding 10 years, or that the property in question has special

public values for open space, conservation, etc., or that the contract is consistent with the publicly desirable future use and control of the land in question. If proposed within a UDB of an incorporated city, the County shall give written notice to the affected city pursuant Government Code §51233.

- **AG-1.11 Agricultural Buffers**. The County shall examine the feasibility of employing agricultural buffers between agricultural and non-agricultural uses, and along the edges of UDBs, HDBs considering factors including the type of operation and chemicals used for spraying, building orientation, planting of trees for screening, location of existing and future rights-of-way (roads, railroads, canals, powerlines, etc.), and unique site conditions.
- **ERM-1.8 Open Space Buffers**. The County shall require buffer areas between development projects and significant watercourses, riparian vegetation, wetlands, and other sensitive habitats and natural communities. These buffers should be sufficient to assure the continued existence of the waterways and riparian habitat in their natural state.
- **ERM-5.15 Open Space Preservation**. The County shall preserve natural open space resources through the concentration of development in existing communities, use of cluster development techniques, maintaining large lot sizes in agricultural areas, avoiding conversion of lands currently used for agricultural production, limiting development in areas constrained by natural hazards, and encouraging agricultural and ranching interests to maintain natural habitat in open space areas where the terrain or soil is not conducive to agricultural production.
- **LU IM 3**. During preparation of the Zoning Ordinance and Land Development Regulations, the County shall consider appropriate incentives to encourage smart growth implementation, including but not limited to such factors as infill, densification, transportation alternatives, provision of public amenities, and commercial standards.
- **LU IM 4**. During the review of all discretionary permit applications, the County shall ensure that smart growth and other urban design principles set forth in this Land Use Element are incorporated as conditions of project approval, as appropriate.
- **LU IM 7**. The County shall develop a set of criteria to determine whether proposed projects are infill developments and develop a set of incentive programs for infill projects located within UDBs.
- **LU IM 8**. The County shall develop and maintain a Geographic Information System based database of infill sites and encourage new development to occur on the identified sites.
- **LU IM 9**. The County shall create a program to consolidate infill sites when permits are sought for development and shall require access to public roads be present prior to development. [New Program]
- **LU IM 10**. The County shall require identification of infill sites in all new community plan updates, hamlet plans and redevelopment project area plans as they are prepared over time.
- **LU IM 19**. The County shall prepare a cluster development ordinance, defining the process, incentives and standards. The means of consultation and contents will be developed later, after further research.
- **LU IM 24**. The County shall review LEED and LEED-ND certification requirements and develop an implementation program.

Transit and Pedestrian Oriented and Traditional Neighborhood Design Summary (AQ-3.1–PFS-8.3)

- Locate high-density development close to commercial and service destinations that are within walking distance
- Provide direct pedestrian connections between uses to minimize walking distances
- Locate transit stops and infrastructure near to high-density development to maximize the number of people within walking distance
- Provide transit infrastructure such as benches and shelters at locations that maximize accessibility
- Construct narrow streets to slow traffic and allow room for pedestrian infrastructure
- Traffic calming measures such as roundabouts, and pedestrian bulb outs to improve flow and enhance pedestrian safety
- Use a grid street system to provide direct routes to many destinations
- Require tree-lined streets with drought tolerant trees to shade pedestrian routes
- Storefronts near the street to create an interesting pedestrian orientation
- Provide parking lots in the back or in public lots to minimize separation of compatible uses
- Allow second story residential mixed use in downtown commercial areas and large mixed-use projects to create a more active pedestrian environment after normal business hours

- **AQ-3.1 Location of Support Services**. The County shall encourage the location of ancillary employee services (including, but not limited to, child care, restaurants, banking facilities, convenience markets) near major employment centers for the purpose of reducing midday vehicle trips
- **AQ-3.2 Infill Near Employment**. The County shall identify opportunities for infill development projects near employment areas within all unincorporated communities to reduce vehicle trips
- **AQ-3.3 Street Design**. The County shall promote street design that provides an environment which encourages transit use, biking, and pedestrian movements.
- **AQ-3.6 Mixed Use Development**. The County shall encourage the mixing of land uses that generate high trip volumes, especially when such uses can be mixed with support services and where they can be served by public transportation.
- **LU-1.1 Smart Growth and Healthy Communities**. The County shall promote the principles of smart growth and healthy communities UDBs and HDBs, including:
- Creating walkable neighborhoods,
  - Providing a mix of residential densities,
  - Creating a strong sense of place
  - Mixing land uses,
  - Directing growth toward existing communities,
  - Building compactly,
  - Discouraging sprawl,
  - Encouraging infill,
  - Preserving open space,
  - Creating a range of housing opportunities and choices,

  - Utilizing planned community zoning to provide for the orderly pre-planning and long-term development of large tracks of land which may contain a variety of land uses, but are under unified ownership or development control, and
  - Encouraging connectivity between new and existing development

- **LU-1.2 Innovative Development**. The County shall promote flexibility and innovation through the use of planned unit developments, development agreements, specific plans, mixed-use projects, and other innovative development and planning techniques.
- **LU-3.2 Cluster Development**. The County shall encourage proposed residential development to be clustered onto portions of the site that are more suitable to accommodating the development, and shall require access either directly onto a public road or via a privately maintained road designed to meet County road standards.
- **LU-4.1 Neighborhood Commercial Uses**. The County shall encourage the development of small neighborhood convenience and grocery facilities to meet the everyday shopping and personal needs of immediately surrounding residential land uses in communities and hamlets.
- **LU-7.1 Distinctive Neighborhoods**. The County shall encourage development of diverse and distinctive neighborhoods that build on the patterns of the natural landscape and are responsive in their location and context and to the lifecycle needs of the residents.
- **LU-7.3 Friendly Streets**. The County shall encourage new streets within UDBs to be designed and constructed to not only accommodate traffic, but also serve as comfortable pedestrian and cyclist environments. These should include, but not be limited to:
  - Street tree planting adjacent to curbs and between the street and sidewalk to provide a buffer between pedestrians and automobiles, where appropriate,
  - Minimize curb cuts along streets,
  - Sidewalks on both sides of streets, where feasible,
  - Bike lanes and walking paths, where feasible on collectors and arterials, and
  - Traffic calming devices such as roundabouts, bulb-outs at intersections, traffic tables, etc.

- **ED-6.1 Revitalization of Community Centers**. The County, through public and private collaboration, shall strive to strengthen the core areas of communities to serve as the center for public, financial, entertainment, and commercial activities.
- **ED-6.3 Entertainment Venues**. The County shall encourage the establishment of community and regional entertainment venues within community core areas.
- **ED-6.5 Intermodal Hubs for Community and Hamlet Core Areas**. The County shall work with communities and transit providers to develop intermodal hubs that focus on both local and regional bus service.
- **ED-6.7 Existing Commercial Centers**. The County shall help protect the viability of community retail centers by promoting a business mix that responds to changing economic conditions and provides needed services to surrounding neighborhoods.
- **SL-3.1 Community Centers and Neighborhoods**. The County shall support investments in unincorporated communities and hamlets to improve the image, quality of urban infrastructure, amenities, and visual character by:
  - Encouraging restoration of existing historic buildings and developing new buildings that reflect the local culture and climate,
  - Creating or enhancing overall community design frameworks with a hierarchy of connected block and street patterns, open spaces, town centers, neighborhoods, and civic facilities,

- Reducing the need for sound-walls and gated neighborhoods by having residential and nonresidential uses interface along streets and open spaces (not adjoining property lines) and locating residential uses on local-serving streets,
- Planning residential development as interconnected neighborhoods with definable social and physical centers that incorporate parks, schools and commercial services,
- Enhancing the comfort and scenic experience of transit riders, cyclists, and pedestrians, and
- Developing open spaces, streets and pedestrian facilities that include landscaping and streetscaping that improve the image of the community and make it a more comfortable pedestrian environment.

- **ERM-5.1 Parks as Community Focal Points**. The County shall strengthen the role of County parks as community focal points by providing community center/recreation buildings to new and existing parks, where feasible.
- **TC-4.4 Nodal Land Use Patterns that Support Public Transit**. The County shall encourage land uses that generate higher ridership including; high density residential, employment centers, schools, personal services, administrative and professional offices, and social/recreational centers, to be clustered within a convenient walking distance of one another.
- **PFS-8.3 Location of School Sites**. The County shall work with school districts and land developers to locate school sites consistent with current and future land uses. The County shall also encourage siting new schools near the residential areas that they serve and with access to safe pedestrian paths to school.

Pedestrian and Bicycle Infrastructure Summary

- Provide sidewalks and pedestrian paths that connect uses that would attract walkers
- Provide safe, well-connected bicycle paths and lanes that encourage bicycle travel
- Secure bicycle parking for employment sites to increase convenience for cyclists
- Bike racks for commercial development to provide security for bikes during shopping trips.

- **ED-5.9 Bikeways**. The County shall support the enhancement of the County's recreational bikeways and promote the bikeway network a component of the County's tourism program.
- **TC-5.1 Bicycle/Pedestrian Trail System**. The County shall coordinate with TCAG and other agencies to develop a Countywide integrated multi-purpose trail system that provides a linked network with access to recreational, cultural, and employment facilities, as well as offering a recreational experience apart from that available at neighborhood and community parks.
- **TC-5.2 Consider Non-Motorized Modes in Planning and Development**. The County shall consider incorporating facilities for non-motorized users, such as bike routes, sidewalks, and trails when constructing or improving transportation facilities and when reviewing new development proposals. For developments with 50 or more dwelling units or non-residential projects with an equivalent travel demand, the feasibility of such facilities shall be evaluated
- **TC-5.3 Provisions for Bicycle Use**. The County shall work with TCAG to encourage local government agencies and businesses to consider including bicycle access and provide safe bicycle parking facilities at office buildings, schools, shopping centers, and parks.
- **TC-5.4 Design Standards for Bicycle Routes**. The County shall utilize the design standards adopted by Caltrans and as required by the Streets and Highway Code for the development, maintenance, and improvement of bicycle routes

- **TC-5.5 Facilities**. The County shall require the inclusion of bicycle support facilities, such as bike racks, for new major commercial or employment locations.
- **TC-5.6 Regional Bicycle Plan**. The County shall identify Countywide recreational and commuter bicycle routes and update the Tulare County Regional Bicycle Plan as appropriate.
- **TC-5.7 Designated Bike Paths**. The County shall support the creation and development of designated bike paths adjacent to or separate from commute corridors.
- **TC-5.8 Multi-Use Trails**. The County shall encourage the development of multi-use corridors (such as hiking, equestrian, and mountain biking) in open space areas, along power line transmission corridors, utility easements, rivers, creeks, abandoned railways, and irrigation canals
- **TC-5.9 Existing Facilities**. The County shall support the maintenance of existing bicycle and pedestrian facilities.

Transit Infrastructure and Support Policies and Measures Summary

- Provide a wide variety public transportation options that reduce vehicle trips and miles traveled such as transit and rail service
- Coordinate transit service provided by various transit agencies in the County to make service as convenient as possible for potential riders
- Provide quality transit and rail facilities and equipment that will provide system users with reasonable travel times and comfort
- Support a variety of rail options including existing Amtrak services and potential high-speed rail that will provide competitive travel times and costs compared to flying and driving
- Preserve rail corridors for future use as light rail or trail corridors

- **TC-4.1 Transportation Programs**. The County shall support the continued coordination of transportation programs provided by social service agencies, particularly those serving elderly and/or handicapped
- **TC-4.2 Determine Transit Needs**. The County will continue to work with TCAG, cities, and communities in the County to evaluate and respond to public transportation needs.
- **TC-4.3 Support Tulare County Area Transit**. The County shall request the support of TCAG for development of transit services outlined in the County's Transit Development Plan. Efforts to expand Tulare County Area Transit should be directed toward:
  - Encouraging new and improving existing transportation services for the elderly and disabled,
  - Providing intercommunity services between unincorporated communities and cities.
- **TC 4.5 Transit Coordination**. The County shall encourage regional coordination to facilitate improved connectivity between County and city operated transit systems and other transportation modes.
- **TC-2.1 Rail Service**. The County shall support improvements to freight and expanding passenger rail service throughout the County.
- **TC 2.2 Rail Improvements**. The County shall work with cities to support improvement, development, and expansion of passenger rail service in Tulare County.
- **TC-2.3 Amtrak Service**. The County shall encourage Amtrak to add passenger service to the Union Pacific corridor in the County.

- **TC-2.4 High Speed Rail**. The County shall coordinate with TCAG and the California High Speed Rail Authority in efforts to locate the HSR corridor with a passenger stop and maintenance facility in Tulare County.
- **TC-2.5 Railroad Corridor Preservation**. The County shall work with other agencies to plan railroad corridors to facilitate the preservation of important railroad rights-of-way for future rail expansion or other appropriate transportation facilities.
- **TC-2.6 Rail Abandonment**. The County shall coordinate with the Public Utilities Commission and TCAG to evaluate possible impacts of rail line abandonment proposals and consider alternatives uses for abandoned facilities, such as light rail, bike trails, utility corridors, or transit facilities.
- **AQ-2.3 Transportation and Air Quality**. When developing the regional transportation system, the County shall work with TCAG to comprehensively study methods of transportation, which may contribute to a reduction in air pollution in Tulare County. Some possible alternatives that should be studied are:
  - Commuter trains (Light Rail, Amtrak, or High-Speed Rail) connecting with Sacramento, Los Angeles, and San Francisco, with attractive services scheduled up and down the Valley,
  - Public transportation such as buses and light rail, to serve between communities of the Valley, publicly subsidized if feasible,
  - Intermodal public transit such as buses provided with bicycle racks, bicycle parking at bus stations, bus service to train stations and airports, and park and ride facilities, and
  - Community transportation systems supportive of alternative transportation modes, such as cycling or walking trails, with particular attention to high-density areas.
- **ED IM 3**. The County shall commit staff resources to engage in regional transportation initiatives, such as the Regional Blueprint and San Joaquin Partnership that encourage regional planning and economic development.

Transportation Management Programs Summary

- Transportation Demand Management programs encourage employees to use alternative modes of transportation for commute trips through incentives and information exchange regarding available options.
- Transportation Management Associations provide transportation services and expertise to multiple employers that may be too small individually to provide effective services.
- Ridesharing and matching programs help increase carpool participation by identifying and coordinating potential participants.

- **AQ-2.1 Transportation Demand Management Programs**. The County shall coordinate and provide support for County Transportation Demand Management programs with other public and private agencies, including programs developed by the TCAG and the SJVAPCD [New Policy].
- **AQ-2.4 Transportation Management Associations**. The County shall encourage commercial, retail, and residential developments to participate in or create Transportation Management Associations that can assist in the reduction of pollutants through provisions to support carpooling, alternative transportation, etc.
- **AQ-2.5 Ridesharing**. The County shall continue to encourage ridesharing programs such as employer-based rideshare programs.

- **AQ IM 10**. The County shall continue to evaluate and implement flextime programs (non-traditional work hour programs) for County employees to limit County staff commuting during peak hours.
- **AQ IM 17**. The County may inspect County facilities to evaluate energy use, the effectiveness of water conservation measures, production of GHGs, use of recycled and renewable products and indoor air quality to develop recommendations for performance improvement or mitigation. The County shall update the audit periodically and review progress towards implementation of its recommendations.

Building Energy Efficiency

Energy consumption from buildings through electricity and natural gas usage is one of the largest sources of greenhouse gases. Policies that encourage the installation of the most energy efficient technologies can substantially reduce energy use and related emissions.

Building Energy Efficiency Measures Summary

- New buildings to provide energy conserving features such as increased insulation in walls and roofs, cool light-colored roofs, high efficiency window
- Use high efficiency heating, ventilation, and cooling equipment in buildings
- Use passive solar designs and day-lighting to reduce heating and lighting demands
- Landscaping the shades buildings or parking lots to reduce ambient temperatures around buildings
- Provide solar ready roofs that provide adequate area to install photovoltaic panels and avoid shading of panels with roof structures and landscaping
- Install solar water heating systems
- Promote retrofits of older less efficient buildings with energy conserving devices

- **AQ-3.5 Alternative Energy Design**. The County shall encourage all new development, including rehabilitation, renovation, and redevelopment, to incorporate energy conservation and green building practices to maximum extent feasible. Such practices include, but are not limited to: building orientation and shading, landscaping, and the use of active and passive solar heating and water systems.
- **LU-7.15 Energy Conservation**. The County shall encourage the use of solar power and energy conservation building techniques in all new development.
- **ERM-4.1 Energy Conservation and Efficiency Measures**. The County shall encourage the use of solar energy, solar hot water panels, and other energy conservation and efficiency features in new construction and renovation of existing structures in accordance with State law.
- **ERM-4.2 Streetscape and Parking Area Improvements for Energy Conservation**. The County shall promote the planting and maintenance of shade trees along streets and within parking areas of new urban development to reduce radiation heating.
- **ERM-4.3 Local and State Programs**. The County shall participate, to the extent feasible, in local and State programs that strive to reduce the consumption of natural or man-made energy sources.
- **ERM-4.4 Promote Energy Conservation Awareness**. The County should coordinate with local utility providers to provide public education on energy conservation programs.

- **HS-1.4 Building and Codes**. Except as otherwise allowed by State law, the County shall ensure that all new buildings intended for human habitation are designed in compliance with the latest edition of the California Building Code, California Fire Code, and other adopted standards based on risk (e.g., seismic hazards, flooding), type of occupancy, and location (e.g., floodplain, fault).
- **ERM-4.6 Renewable Energy**. The County shall support efforts, when appropriately sited, for the development and use of alternative energy resources, including renewable energy such as wind and solar, biofuels and co-generation.
- **ERM-4.7 Reduce Energy Use in County Facilities**. Continue to integrate energy efficiency and conservation into all County functions.
- **ERM-4.8 Energy Efficiency Standards**. The County shall encourage renovations and new development to incorporate energy efficiency and conservation measures that exceed State Title 24 standards. When feasible, the County shall offer incentives for use of energy reduction measures such as expedited permit processing, reduced fees, and technical assistance

Water Conservation Energy Savings

Water conservation saves energy required to pump and treat water for use and reduces energy required for wastewater treatment. Specific measures to conserve water include:

Water Conservation Measures Summary

- Expand groundwater recharge to capture runoff and water available during wet years.
- Use reclaimed water from tertiary plants for irrigation in appropriate locations.
- Use native and drought tolerant landscaping.
- Require the installation of low-flow fixtures.
- Smart irrigation technologies that apply water based on plant requirements and that direct water flow only where needed.

- **WR-1.5 Expand Use of Reclaimed Wastewater**. To augment groundwater supplies and to conserve potable water for domestic purposes, the County shall seek opportunities to expand groundwater recharge efforts.
- **WR-1.6 Expand Use of Reclaimed Water**. The County shall encourage the use of tertiary treated wastewater and household gray water for irrigation of agricultural lands, recreation and open space areas, and large landscaped areas as a means of reducing demand for groundwater resources.
- **WR-3.5 Use of Native and Drought Tolerant Landscaping**. The County shall encourage the use of low water consuming, drought-tolerant and native landscaping and emphasize the importance of utilizing water conserving techniques, such as night watering, mulching, and drip irrigation.
- **ERM-1.7 Planting of Native Vegetation**. The County shall encourage the planting of native trees, shrubs, and grasslands in order to preserve the visual integrity of the landscape, provide habitat conditions suitable for native vegetation and wildlife, and ensure that a maximum number and variety of well-adapted plants are maintained.

Solid Waste Reduction and Recycling

Recycled materials typically require a fraction of the energy to produce compared to those using virgin materials. Programs to avoid use of excessive packaging reduce energy used in production and eliminate the transfer of material to a landfill. Landfills produce methane gas from the decomposition of the organic matter in the waste stream. Programs to encourage composting and use of the biomass for energy production provide renewable energy and reduce greenhouse gas emissions.

Solid Waste Reduction and Recycling Measures Summary

- Encourage the use of recycled materials in its own operations and purchases.
- Provide sites and publicity for recycling events.
- Work with recycling contractors on innovative programs to encourage residents and businesses to take advantage of recycling services.

- **PFS-5.3 Solid Waste Reduction**. The County shall provide notification to proposed development within one-mile of a solid waste facility of the existence of the solid waste facility and any proposed changes to the facility.
- **PFS-5.4 County Usage of Recycled Materials and Products**. The County shall encourage all industries and government agencies in the County to use recycled materials and products where economically feasible.
- **PFS-5.5 Private Use of Recycled Products**. The County shall work with recycling contractors to encourage businesses to use recycled products and encourage consumers to purchase recycled products.

Agricultural Programs and Initiatives

Agriculture offers opportunities for projects that generate greenhouse gas credits related to biofuels and other alternative energy sources and that may provide additional income to farming operations.

Agricultural Measures Summary

- Encourage energy production and alternative energy projects with assistance in identifying appropriate sites and with the permit process.
- Build on its advanced agricultural technology base to provide conditions supportive for developing a strong biotech and biofuels industry.

- **AG-2.11 Energy Production**. The County shall encourage and support the development of new agricultural related industries featuring alternative energy (e.g., ethanol), utilization of agricultural waste, and solar or wind farms.
- **AG-2.6 Biotechnology and Biofuels**. The County shall encourage the location of industrial and research oriented businesses specializing in biotechnologies and biofuels that can enhance agricultural productivity, enhance food processing activities in the County, provide for new agriculturally related products and markets, or otherwise enhance the agricultural sector in the County.

SECTION 6: OTHER VOLUNTARY PROGRAMS

The following voluntary programs help to achieve the CAP targets through knowledge sharing of practices that save energy and reduce greenhouse gases and with financial assistance and services that are available to assist in implementing energy saving measures.

6.1—Agriculture

Agriculture is Tulare County's number one industry and plays an important role in improving our air quality. Farming competes in a global marketplace and must constantly improve efficiency and reduce costs in order to remain competitive. Fortunately, measures that improve efficiency also often have air quality benefits through reduced fuel use, power consumption, and dust generation. Protecting farmland provides air quality benefits by focusing development in cities and rural communities where transportation options such as walking, bicycling, and transit are more feasible and travel distances are less. Farmland can be protected from premature development by focusing development in the existing urban areas at higher densities than were constructed in the past, and as identified in the TCAG Blueprint Preferred Growth Scenario. Improved efficiency and farmland conservation go hand in hand to keep farmland in production and economically viable.

The agricultural industry, in cooperation with government agencies and universities, is producing many advances in agricultural practices that provide energy and air quality benefits. Example projects and initiatives include:

- Water well efficiency upgrades.
- Conversion from diesel engines to electric motors for water pumping.
- Precision irrigation.
- Drip and micro sprinkler systems.
- Precision pesticide and fertilizer application.
- Chemigation (application of fertilizers and pesticides with irrigation water).
- Conservation tillage—low till and no till.
- Reduce passes by using larger equipment.
- Install dairy digesters to produce biogas.
- Cogeneration projects at food processing plants.
- Reduced agricultural burning through cogeneration and composting.

6.2—Water Conservation

The County is considering a Water Conservation Program for the Community of Traver as part of a wastewater treatment facility upgrade that will reduce water consumption with the benefit of reduction of influent to the wastewater facility by allowing the income-qualified residents to replace inefficient water devices with new low flow or low consumption water conserving devices. This can provide a model for other Tulare County communities to follow.

6.3—Energy Conservation

State and Federal Tax Credits

Solar consumers are eligible for federal tax incentives for the purchase and installation of eligible solar systems, including both solar photovoltaics (PV) and solar hot water (solar thermal) systems, as well as other renewable energy investments. The federal tax credit is currently 30 percent of the total system cost with no upper limit. The credit drops incrementally to zero by the end of 2021.

Southern California Edison Programs

SCE offers programs and rebates to its residential and commercial customers. The following rebates are available in 2018 (SCE 2018):

- Smart Thermostat rebate of up to $150.
- Variable Speed Pool Pump rebates up to $200.
- Evaporative Cooler rebates up to $400.
- Hybrid Electric Heat Pump Water Heater rebates up to $200.
- Window Evaporative Cooler rebates up to $200.
- Whole House Fans rebates up to $125

The following describes SCE's self-generation program.

SCE customers can generate their own power to supplement the electricity purchased from SCE. "Self-generation," also called "distributed generation," can serve various purposes that include:

- "Back-up" or emergency generation designed to be used during utility power outages.
- "Cogeneration," or combined heat and power applications, used by customers that have consistently high need for steam or another form of thermal energy.
- Generation to be used during "peak demand," when it may be less costly to operate a generator than to buy power from Southern California Edison. "Environmentally friendly" generation is used by customers who want to reduce pollution.
- Generation to be used to improve reliability or power quality when operational needs exceed the level of service that Southern California Edison can provide. *Note: Self-generation does not include "merchant generation" intended for sale in California's wholesale electricity market.*
- Net Energy Metering (NEM) pays for excess solar generation from home solar generation systems.
- Self-Generation Incentive Program. Qualifying projects receive incentives ranging from $0.44 per watt for non-renewable combined heat and power to $1.07 per watt for renewable and waste energy recovery projects, and $1.46 per watt for emerging technology projects such as advanced energy storage and fuel cells.

PG&E Rebate Programs

Pacific Gas and Electric Company (PG&E) offers a variety of rebates for residential customers who install energy efficient equipment in eligible homes. Prescriptive rebates are available for eligible energy efficiency improvements such as HVAC, appliance, water heating, ventilation and pool pump upgrades. The following rebates are available in 2018 (PGE 2018a)

- Smart Thermostat replacing manually operated or programmable thermostat: $50 per household.
- High Efficiency Gas Storage Water Heater: $125 per unit
- High Efficiency Electric Heat Pump Storage Water Heater: $300 per unit.
- Energy Upgrade California provides up to $5,500 in rebates for home heating, cooling and water heating systems.

PG&E's Self Generation Incentive Program provides financial incentives for the installation of new, qualifying wind or fuel cell self-generation equipment. Solar rebates are currently administered under PG&E's California Solar Initiative. While residential customers are not excluded from the program, the minimum 30-kilowatt system size for renewable technologies generally limits most applications to non-residential energy consumers (PG&E 2018b).

PG&E's Schedule NEM—Net Energy Metering Service provides solar customers with the option to offset the cost of their electricity usage with energy that their solar generating system exports to the grid. A "net meter" is installed to measure the difference between electricity supplied to the customer by PG&E and electricity the customer exports to the grid, over a billing month. The corresponding charges and credits are reconciled after 12-monthly billing periods of the system's interconnection. Typically, solar systems export more energy during the summer months, generating credits for customers to use during the winter months when the system does not meet their energy needs.

SoCal Gas Non-Residential Programs

Zero Percent Interest On-Bill Financing. SoCal Gas offers to finance the purchase and installation of eligible energy-efficiency upgrades at zero percent for qualified customers. Loans range from $5,000 to $1,000,000.

Natural gas equipment rebates are available to large commercial, small commercial, industrial, and institutional customers for a wide variety of efficiency projects. Qualifying equipment includes boilers, pipe and tank insulation, steam traps, water and pool heaters, energy management systems, furnaces and food service equipment.

The Energy Efficiency Calculated Incentive Program provides incentives of up to $1 million per project ($2 million per location) per year for large gas efficiency projects not covered by the basic rebate program (including new or replacement equipment, as well as for process improvements or new processes). The payment is $1.00 per annualized therm savings or 50 percent of project cost, whichever is less. Eligible projects are required to undergo an energy analysis, but projects saving less than an estimated 200,000 therms/year may qualify to receive a no-cost analysis.

The Energy Assessments for Business Customers program offers free energy assessments to customers that use 250,000 therms or more per year to in order to help identify energy efficiency projects that may qualify for rebates (maximum $1 million per project or $2 million per site per year).

6.4—Other Programs and Incentives

California Climate Investments (CCI) & Greenhouse Gas Reduction Fund (GGRF)

Revenue for the CCI Fund comes from the proceeds of The California Cap-and-Trade Program Auctions. To date, nearly $3.4 billion has been appropriated by the Legislature to state agencies implementing GHG emission reduction programs and projects. The Governor proposed $2.2 billion in funding for the GGRF for FY 2017/2018. The fund supports a number of local assistance programs, including the following (CCI 2017):

- Affordable Housing and Sustainable Communities (AHSC)
- Active Transportation
- High Speed Rail
- Low Carbon Transit Options
- Low Carbon Transportation
- Sustainable Agricultural Lands Conservation (SALC)
- Transit and Intercity Rail Capital
- Transformative Climate Communities

Vehicle Incentive Programs

New Plug-in Car Purchases. Buyers of plug-in hybrids and electric cars benefit from a federal tax credit of $2,500 to $7,500, depending on the size of the battery in the car. On the low end of the spectrum, cars with 4 kWh battery packs will qualify for a $2,500 tax credit. The credit has a maximum value of $7,500 for cars with a 16-kWh battery pack (e.g., the Chevrolet Volt). The credits were provided as part of the American Recovery and Reinvestment Act, otherwise known as the "Stimulus Bill." The incentive begins phasing out after an automaker sells 200,000 vehicles that are eligible for the credit.

The Clean Vehicle Rebate Project (CVRP) offers state rebates for the purchase or lease of qualified vehicles. Since program inception in 2009, the program administrator—the Center for Sustainable Energy (CSE)—has issued over $440 million to fund rebates for individuals, nonprofits, government entities and business owners. The rebates offer up to $2,500 for light-duty zero emission and plug-in hybrid vehicles that the CARB has approved or certified and $5,000 for hydrogen fuel cell vehicles. The rebates are available on a first-come, first-served basis to individuals, business owners, and government entities in California that purchase or lease new eligible vehicles. The Legislature approved $140 million in Cap-and-Trade auction proceeds in September 2017. In periods when funding exceeds current budgets, waiting lists can form. Households earning more than $300,000 and individuals reporting more than $150,000 per year are no longer eligible.

The "REMOVE II Program" is administered by the SJVAPCD and provides incentives for the purchase of low emission passenger vehicles, light duty trucks, small buses, and trucks with Gross Vehicle Weight Ratings of 14,000 pounds or less. The SJVAPCD's Drive Clean Rebate Program offers between

$1,000 and $3,000 per vehicle and varies according to the emission certification level and size of the vehicle. Vehicles must be powered by alternative fuel, electric, or hybrid electric motors. The SJVAPCD is made up of eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the San Joaquin Valley Air Basin portion of Kern. Rebate vouchers are available for the purchase of electric vehicles in qualifying counties for up to $3,000 (Plug-In Cars 2016).

California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) is a program to help speed the early market introduction of clean, low-carbon hybrid and electric trucks and buses. HVIP accomplishes this by addressing the biggest barrier to the purchase of medium- and heavy-duty advanced trucks: the high incremental cost of these vehicles in the early market years when production volumes are still low. All fleets are eligible, whether they are public or private, large or small (SJVAPCD 2017).

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SECTION 7: MONITORING PROGRAM AND IMPLEMENTATION PLAN

7.1—Monitoring Program

As part of the annual report to the Board of Supervisors on progress in implementing the General Plan, staff will report on benchmarks achieved that implement goals, objectives, and policies having air quality, climate change, and sustainability benefits. The County will use its Geographic Information System to provide up-to-date land use and development data and tracking for other metrics or quantitative measures of success. Appropriate benchmarks and the means to track them were developed and used for two progress reports presented to the Board of Supervisors. Table 21 presents the progress metrics and benchmarks for the latest Progress Report.

Table 21: CAP Progress Report 2017/2018 Summary

Metric	CAP Comparison	Progress On Track?
Overall growth in population and housing compared to amount projected in CAP	CAP 2018 Population: 166,797 Actual 2018 Population: 144,375	Yes
	CAP 2010-2018 Housing Unit Increase: 8,072 Actual 2010-2018 Housing Units: -248	Yes
	Change in Occupied Housing 2010-2018: -0.6%	Yes
Average Development Density in Community Plans	CAP Goal from Blueprint Strategy: 5.3 units/acre Approved TSMs in 2017/2018: 6.5 units/acre	Yes[1]
VMT Comparison	CAP 2015-2018 Growth Estimate: 12.4% Actual 2015-2018 Growth Rate: -1.7% Under CAP by 14.1%	Yes
Per Capita Emissions	CAP 2020 Target: 8.8 $MTCO_2e$/person Updated 2020 Estimate: 5.8 $MTCO_2e$/person 2015 Per Capita Emissions: 6.9 $MTCO_2e$/person	Yes[3]
Solar Projects FY 2016/2017	Residential: 498 projects—4.8 MW Commercial: 13 projects—1.37 MW Ag/Dairy: 34 projects—22.90 MW	Yes
Amount Title 24 Exceeded (compared to 2008 Title 24)	CAP Goal: 20% Residential: 46% Commercial: 33%	Yes
Progress from water conservation measures	New development would achieve the 20 percent reductions in landscape water use and indoor water use through compliance with regulations. Insufficient data were available to quantify benefits beyond regulations and from existing development in the unincorporated area.	Yes[2]
Solid Waste	The County reports that it is on track to achieving the State's 75 percent solid waste goal.	Yes

Table 21 (cont.): CAP Progress Report 2017/2018 Summary

Metric	CAP Comparison	Progress On Track?
Status of State regulations	Sufficient regulations adopted for the State to achieve AB 32 2020 target.	Yes

Notes:
[1] The 5.3 units per acre density goal applies to all residential development within unincorporated areas where zoning allows residential units (not including existing large lots zoned for agricultural purposes which allows a maximum number of residences to maintain its agricultural nature). For FY 2017/2018 one TSM was in a rural community and had density exceeding the goal at 6.5 units per acre. A second TSM for a project was an extension of the City of Kingsburg and not a rural community. Ninety-four percent of new lots were created in rural communities or adjacent to a city. It is noted that including multi-family units in incorporated and unincorporated Tulare County would increase the average density within unincorporated areas where zoning allows residential units.
[2] Many residences and businesses in unincorporated Tulare County use private wells or are serviced by small water services with limited reporting requirements that would allow better tracking.
[3] Updates to per capita emission rates from Draft CAP update.

Land Use Benchmarks

- Summary of building permits for new construction issued during the previous year.
- The amount of residential development approved in new subdivisions and parcel maps in Rural Interface areas and Rural Communities.
- The average density of new development approved during the previous year.
- Progress in improving the jobs/housing balance in Rural Communities and Cities within Tulare County, and neighboring counties.
- Acres of farmland classified as prime, or of Statewide importance, approved for development in Tulare County.
- Inventory of vacant land in Tulare County cities, Rural Communities, and Hamlets by designation including change from previous year.

Conservation Benchmarks

- Compile results of Title 24 Compliance Reports to show amount achieved over standards.
- Status report on achieving landfill recycling and diversion targets.
- Progress achieved on landfill methane capture projects.
- Progress achieved on water conservation programs and projects.
- Progress achieved on water reuse projects.
- Progress achieved on wastewater treatment plant methane capture projects.
- Progress achieved on dairy digester methane projects.

Transportation and Circulation Benchmarks

- TCAG Tulare County RTP/SCS implementation status report.
- Transit ridership statistics.
- Transit route expansions and changes to service frequency.

- New lane miles of roads built by functional classification.
- Progress in implementing congestion relief projects.
- Updates in vehicle miles traveled used by TCAG in making Transportation Conformity findings for transportation plans.
- VMT Comparison
- Complete Streets Projects

7.2—Climate Action Plan Implementation

The 2012 CAP required County staff to take a series of actions to ensure that the policies and implementation measures are accomplished in a timely manner. The following lists the actions and (*current status since after adoption of the CAP*):

First Year Actions:

- Assign a CAP Coordinator. *(RMA Special Project Chief assigned)*
- Set up a CAP Implementation Committee to assign Department responsibilities for providing specific information under their purview:
  - -Building Department—building statistics, energy reports.
  - -Planning Department—subdivision data.
  - -Fleet Manager—low emission vehicle purchases.
  - -Administration—capital improvements/energy retrofits/budget.
  - -Geographic Information Systems—tracking and mapping land use changes/prepare new reports as needed.
  - -Solid Waste—recycling and waste diversion statistics.
  - Grants Division—Low-income energy conservation program.
  - -Other—to be determined.
  - *(Departments participated in two progress reports, an inventory update, and the current 2018 CAP Update.)*
- Participate in SB 375 Regional Targets process with TCAG *(ongoing—participating in 2018 RTP/SCS, including membership on the RTP Roundtable Committee).*
- Develop a LEED/LEED ND Implementation Program *(RMA Staff available to review LEED projects).*
- Coordinate with transit agencies on transit issues *(ongoing—through RMA TCAG participation).*
- Compile first progress report as a section/chapter of the Annual General Plan Implementation Report *(Completed two progress reports).*
- Identify program improvements and new programs that the County can pursue *(implementing solar and water conservation programs)*.
- Obtain technical assistance from the Air District to assist Tulare County in developing uniform monitoring and reporting procedures. *(Air District has become less active in greenhouse gas programs. Using consulting services for technical assistance.)*

- Development of a fee/cost recovery program to implement the monitoring and reporting *(currently using existing RMA budgets to cover climate change work).*

Long-term Actions:

Long-term milestones (approximately every 5 years) include the following actions:

- Review land use and transportation data collected from the previous 5 years for comparison to goals for TCAG Blueprint (multiple years of data is needed to account for market fluctuations). *(Reviewed land use data for Inventory Update and 2018 CAP Update. Growth in unincorporated County has been substantially below projections.)*
- Analyze completed projects to determine if the CAP targets are being achieved and propose revisions or additional programs if needed. *(Progress reports and inventory update showed that 2020 target will be achieved.)*
- Update the CAP to reflect changes in State regulations and CAP programs. *(2018 CAP Update fulfills this action.)*

The following actions are required to implement the 2018 CAP Update strategy.

New and Continuing Actions from 2018 CAP Update

- Continue to participate in SB 375 process with TCAG through the RTP/SCS updates.
- Continue to coordinate with transit agencies on transit issues
- Compile annual progress reports beginning the first full year following adoption of the 2018 CAP Update. (late 2019 or early 2020).
- Prepare a CAP update at 5-year point that includes an updated inventory and projections. Update the CAP strategy if needed to stay on track to meet the 2030 target.
- Monitor CARB implementation of the 2017 Scoping Plan. This information will be incorporated into the progress reports and updates.

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Appendix A:
Climate Action Plan Inventory and Emission Reduction Estimates

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Tulare County Emission Inventory Summary

Table 1: Tulare County Emission Inventory 2010 to 2030

Source	Emissions ($MTCO_2e$ per year)				Red from 2015	Red from BAU	Red. Fraction 2015 to 2020
	2015	2020	2030	2030 Target			
TRANSPORTATION							
On-Road Vehicles	514,666	384,499	276,136				
Off-Road Vehicles and Equipment	32,368	38,797	47,618				
Locomotives	9,079	10,243	11,073				
Aviation	17,708	22,407	28,663				
Total	**573,821**	**455,946**	**363,490**	**322,643**			
ENERGY							
Electricity	146,127	131,497	110,723	94,314			
Energy – Natural Gas	59,215	61,417	65,917	57,225			
Energy - Propane	51,490	52,231	56,067	56,067			
Residential Woodburning	6,912	7,069	7,835	7,835			
Total	**263,745**	**252,215**	**240,542**	**215,441**			
SOLID WASTE							
Solid Waste - Landfill	**176,925**	**160,088**	**160,088**	**160,088**			
WATER & WASTEWATER							
Water	105	83	95	95			
Wastewater Treatment	1,838	1,891	2,096	2096			
Total	**1,942**	**1,974**	**2,191**	2191			
Development-Related Emissions Total	**1,016,432**	**870,223**	**766,311**	**700,364**	**0.311**	**0.086**	**0.144**
Population	146,908	151,202	167,586	167586			
Per Capita Emissions	**6.92**	**5.76**	**4.57**	**4.18**			
INDUSTRIAL							
Industrial Natural Gas	124,775	125,811	139,443				
Industrial Electricity	48,415	48,508	36,178				
Total	**173,190**	**174,319**	**175,621**				

AGRICULTURE							
Agriculture Electricity	297,327	267,086	182,166				
Agricultural Burning	152,878	152,878	152,878				
Agricultural Fertilizer	193,277	193,277	193,277				
Agricultural Offroad Equipment	14,738	14,746	14,749				
Agriculture - Dairy	7,779,107	8,494,766	9,926,085				
Total	**8,437,327**	**9,122,753**	**10,469,155**		0.8081	0.8699	
Grand Total	9,626,950	10,167,294	11,411,087		0.0596	0.0319	

Note:

$MTCO_2e$ = metric tons of carbon dioxide equivalents

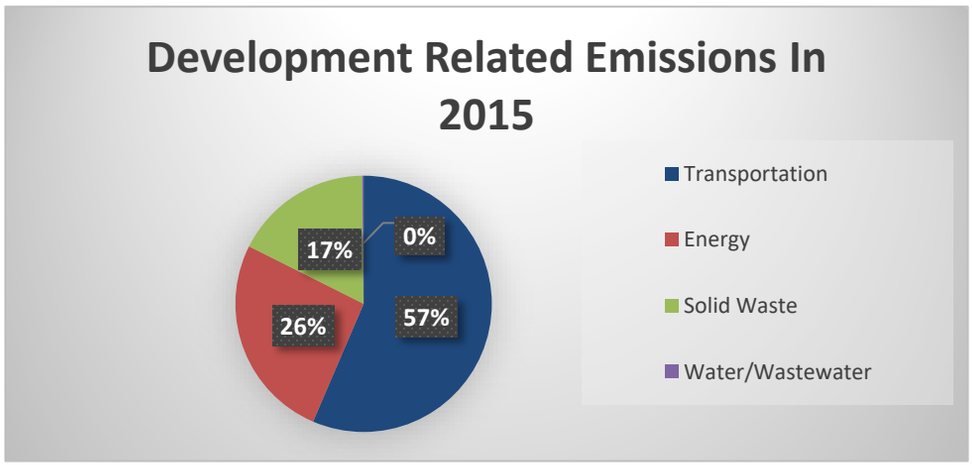
Dairy emission estimates from the Confined Animal Inventory

Source of emissions: Appendix A – GHG Emission Estimates.

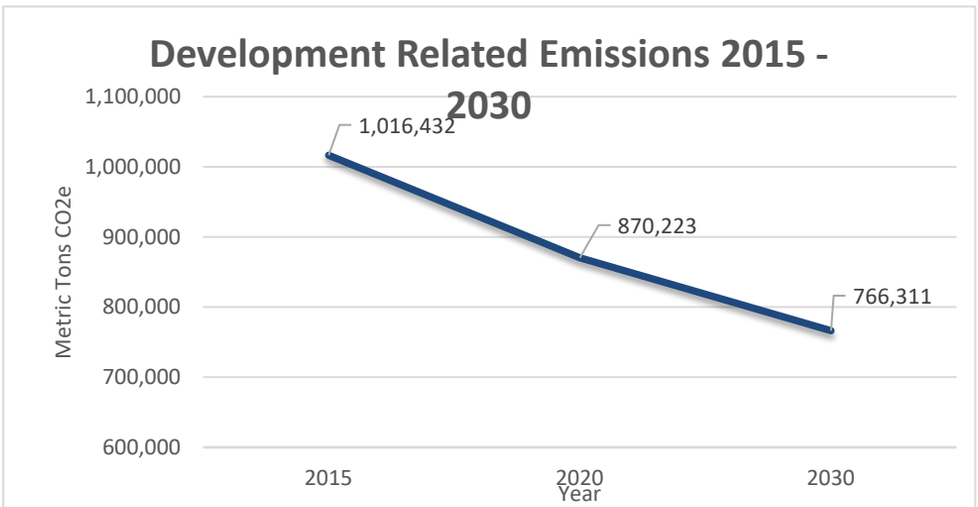
Tulare County Population Projections	**Population**	**Increase**
2010	142,800	0.031
2015	147,395	baseline
2020	168,447	0.143
2030	198,299	0.345
2035	215,155	0.460

Development Related Emission Inventory

	Emissions (MTCO2e per year)
Transportation	573,821
Energy	263,745
Solid Waste	176,925
Water/Wastewater	1,942
Total	**1,016,432**



	2015	2020	2030
Development Related Emissions	1,016,432	870,223	766,311
Reduction from 2015		146,210	250,121
Percent Reduction from 2015		0.144	0.246



2017 Scoping Plan Emission Reductions

Scoping Plan Sector	1990	2030	Low Range % Reduction	High Range % Reduction
Agriculture	26	24–25	4	8
Residential and Commercial	44	38–40	9	14
Electric Power	108	30–53	51	72
High GWP	3	8–11	increase	
Industrial	98	83–90	8	15
Recycling and Waste	7	8–9	increase	
Transportation (Including TCU)	152	103–111	27	32
Natural Working Lands	-7			
Subtotal	431	294-339	21	32
Cap and Trade		34-79		
		260		

California Emission Inventory Target

	GHG Emissions MMTCO2e	Percent Reduction	Percent Reduction
2015 Inventory	440		
2030 Reference Inventory	389		0.116
2030 Target Inventory	260		0.409
Reductions Needed	129	0.332	
Reductions from Regulations in SP	**68**	0.175	
Reductions needed from Cap and Trade	**61**	0.157	

Reductions Required from Development Related Sources

	Scoping Plan Reductions MMTCO2e	Fraction of Total Inventory Reduction
50 percent RPS	3.1	0.047
Energy Efficiency	9.3	0.141
LCFS	5	0.076
Transportation	13.5	0.205
SLCP	34.9	0.530
	65.8	

Reductions by Source Sector	2015 Inventory	Scoping Plan Reductions MMTCO2e	Reduction Fraction by Sector
Energy Electric	83.67	12.4	0.148
Commercial and Res Fuel	37.92	5	0.132
Transportation	164.63	18.5	0.112

Transportation includes reductions from LCFS and Vehicle Standards
Res and comm fuel estimate is the average of the range in the Scoping Plan
Energy includes RPS and Energy Efficiency

Tulare County Emission Reductions with Scoping Plan Regs

	2030 BAU Inventory	Emission Reduction from New Regs	Target Inventory
Transportation	363,490	40,846	322,643
Energy - Electric	110,723	16,409	94,314
Comm and Res Fuel	65,917	8,692	57,225
	540,130	65,947	474,182

Tulare County Population Allocation

Tulare County Populaton Estimates and Projections

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2025	2030	2035
Tulare County Population	442,330	447,350	452,000	455,891	459,910	464,337	467,960	472,748	477,679	482,697	487,733	513,541	540,580	567,626
Unicorporated Tulare County	142,872	143,326	144,529	145,537	146,370	146,908	145,252	146,276	148,086	149,641	151,202	159,203	167,586	175,970
											0.310	**0.310**	**0.310**	**0.310**

Report P-1 Total Estimated and Projected Pop for Cal Counties 2010 to 2060. Applied 2017 unincorporated fraction from Report E-1 to all future years.

Tulare County Population Estimates from DOF Report E-1

	4/1/2010	1/1/2011	1/1/2012	1/1/2013	1/1/2014	1/1/2015	1/1/2016	1/1/2017
Unincorporated County	142,872	143,326	144,529	145,537	146,370	146,908	145,252	146,276
Incorporated	299,307	302,336	306,143	309,554	312,470	315,153	321,311	325,566
County Total	442,179	445,662	450,672	455,091	458,840	462,061	466,563	471,842
Unincorporated Fraction	**0.32310897**	**0.322**	**0.321**	**0.320**	**0.319**	**0.318**	**0.311**	**0.310**

Report E-1 2017 Population Estimates with Annual Percent Change 2016 and 2017

Population Fraction In Unincorporated Tulare County and Rate of Increase

	2015	2017	2020	2030	2035
Unincorporated Population	146,908	146,276	151,202	167,586	175,970
Unincorp. Fraction	0.318	0.310	0.310	0.310	0.310
Percent Increase from 2015		**-0.004302**	**0.0292317**	**0.1407514**	**0.1978248**
Increase - Cumulative			**4,294**	**20,678**	**29,062**
Average Annual Increase	1453.1025				
Total Unincorp Increase 15-35	29,062				

Population Fraction In Tulare County and Rate of Increase

	2015	2017	2020	2030	2035
County Population	462,061	466,563	487,733	540,580	567,626
Increase		4,502	25,672	78,519	105,565
Percent Increase 15-35		**0.0097433**	**0.0555598**	**0.1699321**	**0.2284655**

State of California Population 2010-2050

	2010	2015	2020	2025	2030	2035
California	37,333,583	39,059,809	40,719,999	42,407,005	44,019,846	45,521,334
Tulare County	442,179	462,061	487,733	513,541	540,580	567,626
County Fraction of State Pop.	0.0118	0.0118	0.0120	0.0121	0.0123	0.0125
Growth 2015 to 2030					4,960,037	
Percent Increase 2015 to 2030					12.7%	
Avg Annual Increase					0.85%	

State DOF Report P-1 and E-1

Occupied Housing Units Unincorporated Tulare County

	2015	2017	2020	2030	2035
Occupied Housing Units	39,419	39,002	40,316	44,684	46,919
Population Unincorp.	146,908	146,276	151,202	167,586	175,970
Increase from 2015		-417	897	5,265	7,500
Annual Average Increase			179	351	375

Housing projections based on population per occupied unit in 2017.

TCAG VMT

	Vehicle Miles Traveled per Day					
Year	**2005**	**2015**	**2017**	**2020**	**2030**	**2035**
VMT/Day	7,720,078	7,924,758	7,965,694	8,086,247	8,826,464	9,196,572
Increase from 2005		204,680	245,616	366,169	1,106,386	1,476,495

Avg Inc 2005-2035	49,216
Avg Inc 2020-2030	74,022
Avg Inc. 2017-2020	40,185

2015 and 2030 are interpolated from adjacent year VMT
VMT includes all II, no XX, and 50% IX and XI

Vehicle Miles Traveled Estimates

	Vehicle Miles Traveled per Day				
	2015	**2017**	**2020**	**2030**	**2035**
Tulare County	7,922,261	7,962,823	8,082,668	8,820,838	9,193,524
Unincorp Tulare County	2,518,809	2,468,559	2,505,712	2,734,553	2,850,090
VMT Growth from 2015		-50,250	-13,097	215,743	331,280
VMT Growth Rate Fraction		-0.01995	-0.0052	0.085653	0.131523
Uninc Population Fraction	0.318	0.310	0.310	0.310	0.310

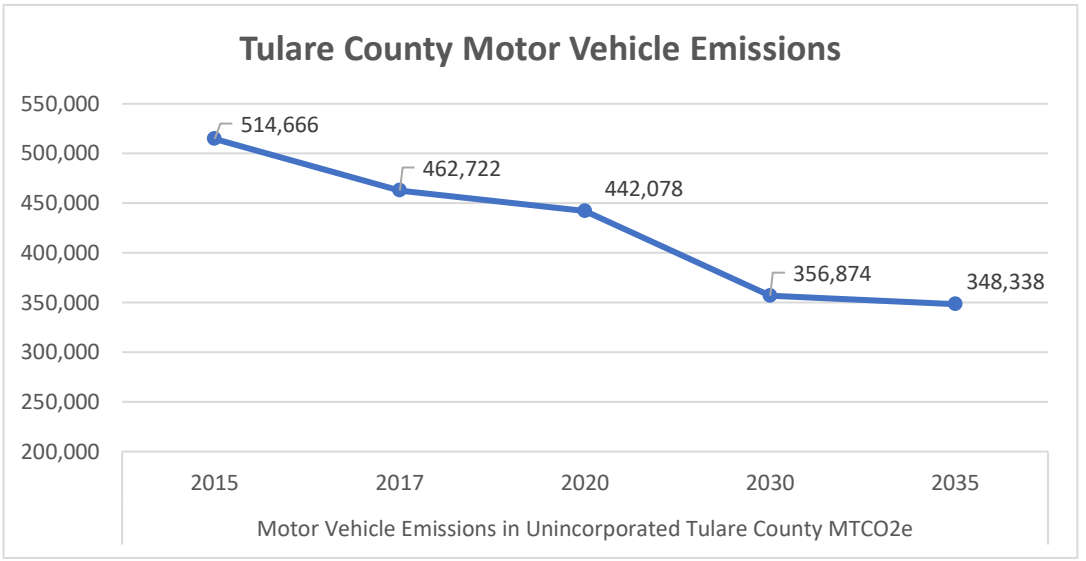
VMT from TCAG 2017 Conformity Estimate including II, half of XI and IX, and no XX trips
Population fraction from DOF Report E-1 for 2017

Mobile Source Emission Summary

Emissions for Tulare Counties and Cities

	Running Emissions	Idling Emissions	Start Emissions	Total MTCO2e All Tulare County w/Cities	Unincorporated Fraction	Total MTCO2e Unincorporated Tulare County	Decrease 2015 to 2030	Percent Decrease
2015	1,561,371.47	37,187.35	19,887.38	1,618,446.20	0.318	514,665.9		
2017	1,435,758.59	36,577.30	20,316.92	1,492,652.81	0.310	462,722.4		
2020	1,356,487.54	48,223.87	21,346.19	1,426,057.59	0.310	442,077.9		
2030	1,090,133.57	33,151.35	27,921.93	1,151,206.86	0.310	356,874.1	157,791.8	30.65907
2035	1,055,389.50	32,739.46	35,540.55	1,123,669.51	0.310	348,337.5		

	Motor Vehicle Emissions in Unincorporated Tulare County MTCO2e				
	2015	2017	2020	2030	2035
Motor Vehicle Emissions	514,666	462,722	442,078	356,874	348,338



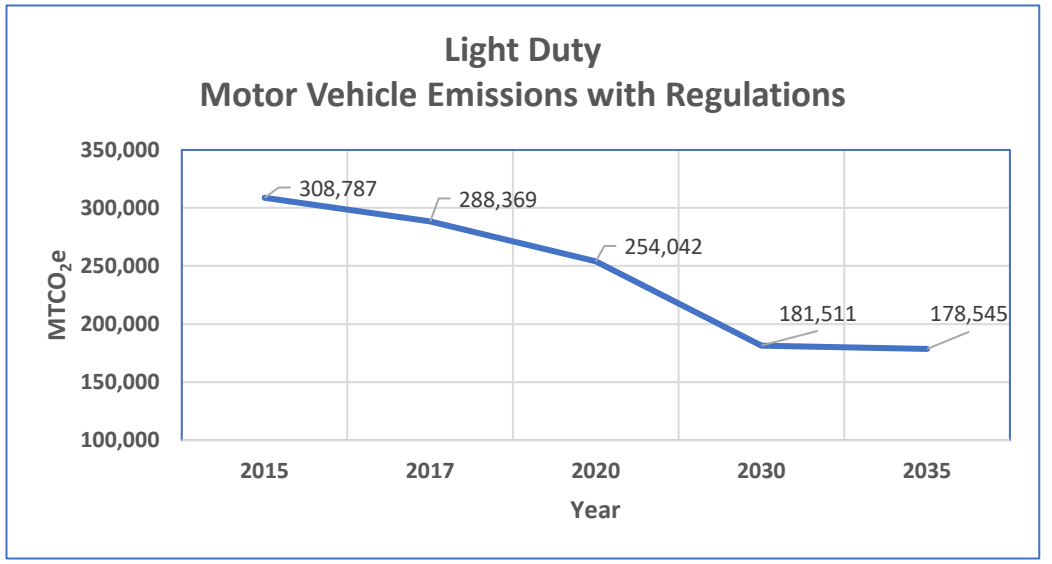
Includes Pavley/LEV III Reductions

	Motor Vehicle Emissions in Unincorporated Tulare County MTCO2e				
	2015	**2017**	**2020**	**2030**	**2035**
Motor Vehicle Emissions	514,666	462,722	442,078	356,874	348,338
LCFS 10% 2020 18% 2030	514,666	462,722	397,870	292,637	285,637
Percent Reduction from 2015			0.227	0.431	0.445
Emissions with SB 375 Reductions	514,666	462,722	384,499	276,136	265,798
% Reduction with SB 375			0.253	0.463	0.484

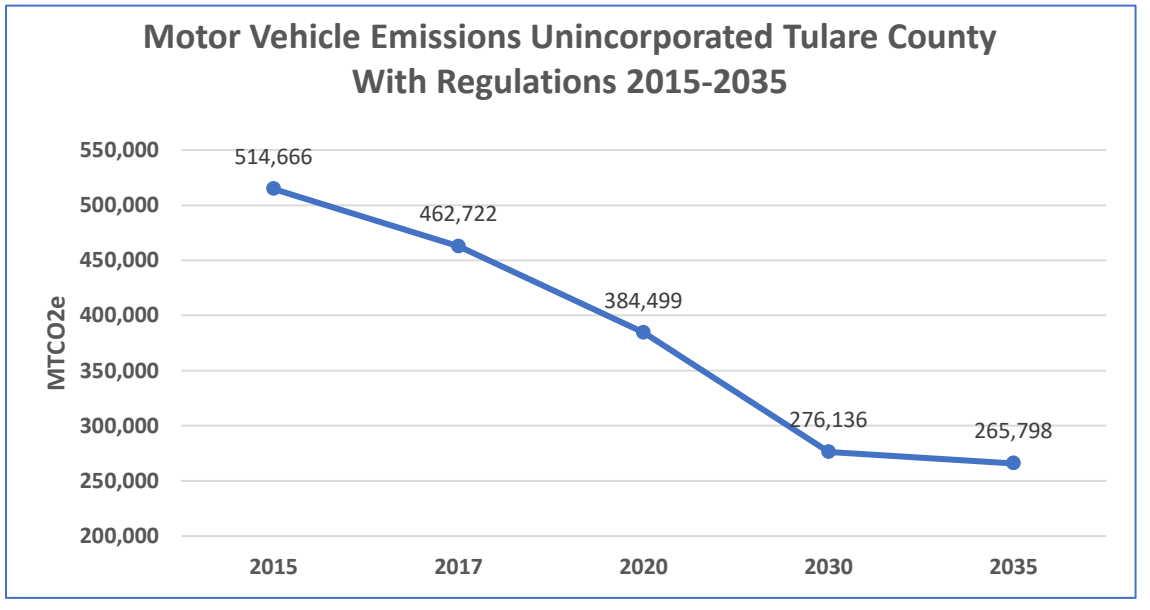
Car and Light Truck Emission Summary

	Light Duty Vehicle Emissions in Entire County and Unincorporated Tulare County MTCO2e				
	2015	**2017**	**2020**	**2030**	**2035**
Running Emissions	951,547	910,060	841,384	610,850	605,579
Start Emissions	19,662	20,131	21,209	27,876	34,344
Total Entire County	**971,209**	**930,191**	**862,594**	**638,725**	**639,923**
Uninc Population Fraction	0.318	0.310	0.310	0.310	0.310
Total Unincorp County	**308,787**	**288,369**	**267,413**	**198,012**	**198,383**
SB 375 Reduction 2015 Target			5%	8.3%	10%
SB 375 Reductions			13,371	16,501	19,838
Emissions with SB 375 Reductions	**308,787**	**288,369**	**254,042**	**181,511**	**178,545**
LCFS Reduction Rate (percent)			10%	18%	18%
LCFS Reductions MTCO2e			25,404	32,672	32,138
Light Duty Emissions w/LCSF and	**308,787**	**288,369**	**228,638**	**148,839**	**146,407**
% Reductions with Regulations			0.260	0.518	0.526

	Light Duty Motor Vehicle Emissions in Unincorporated Tulare County MTCO2e				
	2015	**2017**	**2020**	**2030**	**2035**
Emissions with Regulations	308,787	288,369	254,042	181,511	178,545



Motor Vehicle Emissions in Unincorporated Tulare County MTCO2e w/all Regulations					
	2015	2017	2020	2030	2035
Motor Vehicle Emissions	514,666	462,722	384,499	276,136	265,798



Tulare County Energy Use 2015 to 2017 PG&E & SCE

PG&E	2015	2016	2017	2015 Including City Customers	2015 Prior Report	
	Total kWh	Total kWh	Total kWh	Total kWh	Total kWh	Fraction in Unicorp County
Residential	77,398,801	83,205,810	63,380,469	115,772,155	77,398,801	0.668544188
Commericial	32,799,100	35,288,995	35,318,738	55,778,057	32,799,100	0.588028721
Agriculture	43,071,680	40,170,444	40,183,775			
Total	**214,621,892**	**224,641,016**	**195,050,432**			

SCE	2015	2016	2017 6 Mo
Agricultural	1,072,333,892	993,570,699	284,777,076
Commercial	165,879,418	164,036,805	73,650,324
Industrial	179,240,727	179,044,951	90,519,418
Residential	302,373,412	298,721,518	131,200,761
	1,719,827,449	**1,635,373,973**	**580,147,579**

Energy Consumption from PG&E and SCE			
Agriculture	**1,115,405,572**	**1,033,741,143**	**324,960,851**
Commercial	198,678,518	199,325,800	108,969,062
Industrial	179,240,727	179,044,951	90,519,418
Comm and Ind	**377,919,245**	**378,370,751**	**199,488,480**
Residential	379,772,213	381,927,328	194,581,230
Total Non Ag	**757,691,458**	**760,298,079**	**394,069,710**

PG&E Emission Factors	2015	2016	2017	2020	2030
Lbs/MWhr CO2	391	370	349	290	290
MTCO2/MWh	0.177	0.168	0.158	0.131	0.131

SCE Emission Factors	2015	2016	2017	2020	2030
RPS percentage	26.7	28		36.9	50
Lbs/MWhr	592.92	582.40		510.41	404.45
RPS Increase Percentage from 2015				0.38	0.87

SCE forecast for 2020 RPS compliance is 36.9%

	CO2	CH4	N2O
SCE Default Intensity Factor 2012	702	0.029	0.00617
2020 Lbs/MWhr	510.41	0.023	0.005
2030 Lbs/MWhr	404.45	0.0167	0.0036

2014 RPS Percentage	23.2
2012 RPS Percentage	20.6
Zero RPS lbs/MWh	808.89

PG&E Electricity Emissions

2015	Electricity Used (kWh)	Electricity Used (mWh)	Emissions (CO2 lbs)	Emission (CH4) lbs	Emissions (N20) lbs	Emissions (MTCO2e)
Residential	77,398,801	77,399	30,262,931	44,504	115,324	13,800
Commercial	32,799,100	32,799	12,824,448	18,859	48,871	5,848
Agricultural	43,071,680	43,072	16,841,027	24,766	64,177	7,679
Total	**153,269,581**	153,270	59,928,406	88,130	228,372	**27,327**

2016	Electricity Used (kWh)	Electricity Used (mWh)	Emissions (CO2 lbs)	Emission (CH4) lbs	Emissions (N20) lbs	Emissions (MTCO2e)
Residential	83,205,810	83,206	30,786,150	47,843	123,977	14,043
Commercial	35,288,995	35,289	13,056,928	20,291	52,581	5,956
Agricultural	40,170,444	40,170	14,863,064	23,098	59,854	6,780
Total	**158,665,249**	158,665	58,706,142	91,233	236,411	**26,778**

	2017	Electricity Used (kWh)	Electricity Used (mWh)	Emissions (CO2 lbs)	Emission (CH4) lbs	Emissions (N20) lbs	Emissions (MTCO2e)
Residential		63,380,469	63,380	32,349,999	36,444	94,437	14,733
Commercial		35,318,738	35,319	18,027,023	20,308	52,625	8,210
Agricultural		40,183,775	40,184	20,510,184	23,106	59,874	9,341
Total		**138,882,982**	138,883	70,887,206	79,858	206,936	**32,285**

	2020	Electricity Used (kWh)	Electricity Used (mWh)	Emissions (CO2 lbs)	Emission (CH4) lbs	Emissions (N20) lbs	Emissions (MTCO2e)
Residential		79,119,992	79,120	22,944,798	45,494	117,889	10,482
Commercial		33,528,484	33,528	9,723,260	19,279	49,957	4,442
Agricultural		44,029,506	44,030	12,768,557	25,317	65,604	5,833
Total		156,677,981	156,678	45,436,615	90,090	233,450	**20,757**

	2030	Electricity Used (kWh)	Electricity Used (mWh)	Emissions (CO2 lbs)	Emission (CH4) lbs	Emissions (N20) lbs	Emissions (MTCO2e)
Residential		86,518,221	86,518	25,090,284	36,138	91,650	11,439
Commercial		36,663,613	36,664	10,632,448	15,314	38,838	4,847
Agricultural		48,146,548	48,147	13,962,499	20,111	51,002	6,366
Total		171,328,382	171,328	49,685,231	71,563	181,490	**22,652**

Occupied Housing Units Unincorporated Tulare County

	2015	2017	2020	2030	2035
Occupied Housing Units	39,419	39,002	40,316	44,684	46,919
		-417	897	5,265	7,500
Fraction of Housing Subject to 2016 Title 24			0.022237943	0.11782378	0.159857334

	Residential	Commericial
Title 24 Reduction Fraction	0.28	0.05

PGE Electricity Emissions w/RPS					
	2015	**2016**	**2017**	**2020**	**2030**
Residential	13,800	14,043	14,733	10,482	11,439
Commercial	5,848	5,956	8,210	4,442	4,847
Agricultural	7,679	6,780	9,341	5,833	6,366
Total	**27,327**	**26,778**	**32,285**	**20,757**	**22,652**

PGE Electricity Emissions w/2016 Title 24					
	2015	**2016**	**2017**	**2020**	**2030**
Residential	13,800	14,043	14,733	10,417	11,368
Commercial	5,848	5,956	8,210	4,437	4,842
Agricultural	7,679	6,780	9,341	5,833	6,366
Total	**27,327**	**26,778**	**32,285**	**20,687**	**22,575**

	2015	**2016**	**2017**	**2020**	**2030**
Residential	13,800	14,043	14,733	10,417	11,368
Commercial	5,848	5,956	8,210	4,437	4,842
Total Residential and Commercial	**19,648**	**19,998**	**22,943**	**14,854**	**16,210**
Agricultural	**7,679**	**6,780**	**9,341**	**5,833**	**6,366**
SCE Residential and Comm	126,480	122,788		116,644	94,514
PGE Residential and Comm	19,648	19,998	22,943	14,854	16,210
Total Res and Comm Elec	**146,127**	**142,786**	**22,943**	**131,497**	**110,723**
SCE Industrial	**48,415**	**47,508**		**48,508**	**36,178**
SCE Ag	289,648	263,634		261,253	175,801
PGE Ag	7,679	6,780	9,341	5,833	6,366
Total Ag	**297,327**	**270,413**	**9,341**	**267,086**	**182,166**

SCE Data for 2017 only covers the first two quarters

Southern California Edison Electricity Usage for Tulare County

Total Usage (KWH)

		Date Range: 01/01/2015 - 12/31/2015				
County	**Rate Category**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Totals**
TULARE, COUNTY OF	Agricultural	167,538,998	309,867,302	424,129,807	170,797,785	1,072,333,892
TULARE, COUNTY OF	Commercial	33,687,407	41,365,584	54,630,463	36,195,964	165,879,418
TULARE, COUNTY OF	Industrial	44,948,301	45,655,284	47,180,518	41,456,624	179,240,727
TULARE, COUNTY OF	Residential	65,063,138	63,138,433	105,078,025	69,093,816	302,373,412
						1,719,827,449

Total Usage (KWH)

		Date Range: 01/01/2016 - 12/31/2016				
County	**Rate Category**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Totals**
TULARE, COUNTY OF	Agricultural	122,130,739	284,604,724	391,843,566	194,991,670	993,570,699
TULARE, COUNTY OF	Commercial	31,241,326	41,365,267	53,674,329	37,755,883	164,036,805
TULARE, COUNTY OF	Industrial	42,922,818	46,635,047	45,550,978	43,936,108	179,044,951
TULARE, COUNTY OF	Residential	64,868,521	65,310,110	104,022,136	64,520,751	298,721,518
						1,635,373,973

Total Usage (KWH)

		Date Range: 01/01/2017 - 06/30/2017				
County	**Rate Category**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Totals**
TULARE, COUNTY OF	Agricultural	88,319,259	196,457,817			284,777,076
TULARE, COUNTY OF	Commercial	32,354,397	41,295,927			73,650,324
TULARE, COUNTY OF	Industrial	44,656,771	45,862,647			90,519,418
TULARE, COUNTY OF	Residential	66,554,570	64,646,191			131,200,761

COUNTY OF TULARE 2017

Category	# of Customers	Annual Therms
Commercial	1,228	17,071,532
Industrial	108	22,933,662
Single-Family Residential	25,726	10,096,738
Multi-Family Residential	3,849	1,205,381
Total Therms		51,307,313

Southern California Gas Natural Gas Usage for Tulare County

COUNTY OF TULARE 2016			COUNTY OF TULARE 2017		
Category	**# of Customers**	**Annual Therms**	**Category**	**# of Customers**	**Annual Therms**
Commercial	1,248	23,995,632	Commercial	1,228	17,071,532
Industrial	108	23,136,963	Industrial	108	22,933,662
Single-Family Residential	25,809	9,788,336	Single-Family Residentia	25,726	10,096,738
Multi-Family Residential	3,853	1,191,868	Multi-Family Residentia	3,849	1,205,381
Total Therms Residential	29,662	**58,112,799**	Total Therms	29,575	**51,307,313**

392.47
4,591.92

SCG Gas Emission Totals (2016)

	TotalCustomers	**TotalTherms/Year**	**Emissions (lbs)**	**Emissions (MTCO2)**
Commercial	1,248	23,995,632	280,748,894	127,348
Industrial	108	23,136,963	270,702,467	122,791
Single-Family Residential	25,809	9,788,336	114,523,531	51,948
Multi-Family Residential	3,853	1,191,868	13,944,856	6,325
Total Therms	**31,018**	**58,112,799**	**679,919,748**	**308,412**

Emission factor for natural gas is 11.70 lbs per therm
11.7

SCG Gas Emission Totals (2017)

	TotalCustomers	**TotalTherms/Year**	**Emissions (lbs)**	**Emissions (MTCO2)**
Commercial	1,228	17,071,532	199,736,924	90,601
Industrial	108	22,933,662	268,323,845	121,712
Single-Family Residential	25,726	10,096,738	118,131,835	53,585
Multi-Family Residential	3,849	1,205,381	14,102,958	6,397
Total Therms	**30,911**	**51,307,313**	**600,295,562**	**272,294**

Natural Gas Emissions Without Regulations

	2015	2016	2017	2020	2030
Residential	59,215	58,273	59,982	62,002	68,720
Commercial	129,406	127,348	90,601	93,652	103,799
Total Res and Comm.	**188,621**	**185,621**	**150,582**	**155,654**	**172,519**
Industrial	124,775	122,791	121,712	125,811	139,443

	2015	2016	2017	2020	2030
Customers	31,519	31,018	30,911	31,952	35,414
Housing Units	39419	38792	39,002	40,316	44,684
Increase	0.016163126	0	0	0.033678647	0.145680122

Used 2016 and 2017 SCG data and DOF housing projections to estimate emissions for other years.

Residential Energy Savings 2016 Title 24 is 28 percent
Non-Residential Energy Savings 2016 Title 24 is 5 percent but zero for Natural Gas

Natural Gas Emissions With Title 24

	2015	2016	2017	2020	2030
Residential	59,215	58,273	59,982	61,417	65,917

Tulare County Dairy Emissions

	2010	2013	2015	2020	2023	2030
Dairy and Feedlots (MTCO2e)	7,063,447	7,492,843	7,779,107	8,494,766	8,924,162	9,926,085

Increase per year 2013 to 2023 143,132

Source: Tulare County Dairy CAP Table 3, August 2017.
Emissions from Dairy and Feedlot CAP inventory for 2013 and 2023. Other years interpolated or projected.
Growth Rate from CAP is 1.5 percent per year.

Agriculture Emissions Totals

	2010	2015	2017	2020	2030
Ag ricultural Burning	142,985	142,985	142,985	142,985	142,985
Agricultural Fertilizer	177,335	177,335	177,335	177,335	177,335
Agricultural Offroad Equip.	245,622	241,999	241,064	239,662	237,728
Agriculture - Dairy	7,063,447	7,779,107	8,065,371	8,494,766	9,926,085
Agriculture Emission Total	**7,629,389**	**8,341,426**	**8,626,755**	**9,054,748**	**10,484,133**

142,985 MTCO2e/year is the annual average based on data from 2013 & 2014.
Data for Ag Fertilizer tincludes 2013 & 2014. The average was also calculated.
177,335 MTCO2e/Year is the average.

Tulare County Agricultural Fertilzer Emissions

Field Crops **Harvested Acres**

	2013	2014	2015	2016	UC Nitrogen Rate (Lbs/Acre/yr)	Rosenstock, etal Nitrogen Rate (Lbs/Acre/yr)	Source of Rate	Nitrogen Rate (Lbs/Acre)	2013 N (lbs/year)	2014 N (Lbs/year)	2015 N (lbs/year)	2016 N (Lbs/Year)
Alfalfa Hay	82,200	60,000	60,500	56,800	0	50		50	4,110,000	3,000,000	3,025,000	2,840,000
Barley - Grain	6,470	1,450	6,820	6,500	177	240	Wheat	177	1,145,190	256,650	1,207,140	1,150,500
Beans - Dry	8,180	8,680	8,500	11,400		116		116	948,880	1,006,880	986,000	1,322,400
Corn - Grain	9,340	947	5,610	5,300	213			213	1,989,420	201,711	1,194,930	1,128,900
Corn - Silage	166,000	117,000	158,000	158,000	150	275		150	24,900,000	17,550,000	23,700,000	23,700,000
Cotton - Lint	16,700	14,000	9,860	13,600	174			174	2,905,800	2,436,000	1,715,640	2,366,400
Hay - Other	19,900	14,000	28,000	22,000		50		50	995,000	700,000	1,400,000	1,100,000
Silage Small Grains	186,000	75,100	287,000	239,000		50	Hay	50	9,300,000	3,755,000	14,350,000	11,950,000
Sudan Grass	12,800	168	15,200	11,400		50	Hay	50	640,000	8,400	760,000	570,000
Wheat - Grain	23,300	5,810	37,100	23,000	177	240		177	4,124,100	1,028,370	6,566,700	4,071,000
Total Field Crops									**51,058,390**	**29,943,011**	**54,905,410**	**50,199,200**
Total N Applied to Field Crops												

Source of Nitrogen application rate: UC California Agriculture Nitrogen Fertilizer Use in California Volume 67, No. 1
Rosenstock, Todd S. etal. Nitrogen Fertilizer use in California: Assessing data trends and a way forward.
Crop data from the Tulare County 2014 Crop Report

Tree Crops **Harvested Acres**

	2013	2014	2015	2016	UC Nitrogen Rate (Lbs/Acre/yr)	USDA Nitrogen Rate (Lbs/Acre/yr)		Nitrogen Rate (Lbs/Acre)	2013 N (lbs/year)	2014 N (Lbs/year)	2015 N (lbs/year)	2016 N (Lbs/Year)
Almonds	38,100	46,400	45,300	60,900	179			179	6,819,900	8,305,600	8,108,700	10,901,100
Apricots	767	587	758	613		85		85	65,195	49,895	64,430	52,105
Blueberries	1,330	1,410	1,410	1,450		85	rate for apricots	85	113,050	119,850	119,850	123,250
Cherries	2,520	2,260	2,220	2,480		75		75	189,000	169,500	166,500	186,000
Grapes	62,200	60,500	51,160	56,840		45		45	2,799,000	2,722,500	2,302,200	2,557,800
Raisins	16,600	15,200	12,300	11,300	44	45		44	730,400	668,800	541,200	497,200
Table Grapes	34,700	34,100	30,000	35,600	43	53		43	1,492,100	1,466,300	1,290,000	1,530,800
Wine Grapes	10,900	11,200	8,860	9,940	27	44		27	294,300	302,400	239,220	268,380
Grapefruit	2,180	2,240	2,300	1,740		102		102	222,360	228,480	234,600	177,480
Kiwifruit	2,450	2,380	1,880	1,850		74		74	181,300	176,120	139,120	136,900
Lemons	6,930	7,210	7,850	7,190	123	67		123	852,390	886,830	965,550	884,370
Nectarines	11,400	9,240	9,170	9,260	104	50		104	1,185,600	960,960	953,680	963,040
Olives	12,300	11,700	9,040	10,700		85		85	1,045,500	994,500	768,400	909,500
Orange - Navel	76,700	79,500	72,700	78,800	95			95	7,286,500	7,552,500	6,906,500	7,486,000
Orange - Valencia	16,600	16,300	14,300	14,900	95			95	1,577,000	1,548,500	1,358,500	1,415,500
Peaches - Cling	1,310	1,200	1,180	1,220	102	103		102	133,620	122,400	120,360	124,440
Peaches - Freestone	12,200	11,300	10,900	11,300	113			113	1,378,600	1,276,900	1,231,700	1,276,900
Pears	199	148	294	205		77		77	15,323	11,396	22,638	15,785
Pecans	856	1,060	997	884	138		rate for walnuts	138	118,128	146,280	137,586	121,992
Persimmons	2,430	810	936	892	113		rate for peaches	113	274,590	91,530	105,768	100,796
Pistachio Nuts	41,300	45,400	51,700	60,800	159			159	6,566,700	7,218,600	8,220,300	9,667,200
Plums and Pluots	10,400	9,260	8,830	8,540	104	65		104	1,081,600	963,040	918,320	888,160

Pomegranates	4,220	5,650	4,850	2,960			plums	65	274,300	367,250	315,250	192,400
Prunes	3,450	3,440	3,270	3,100	130	112		130	448,500	447,200	425,100	403,000
Quinee	128	86	98	110		112	plums	112	14,336	9,632	10,976	12,320
Tangerines	13,800	21,700	24,700	22,100		97		97	1,338,600	2,104,900	2,395,900	2,143,700
Walnuts	36,500	40,300	36,500	42,000	138			138	5,037,000	5,561,400	5,037,000	5,796,000
Total N Applied to Tree Crops									**41,534,892**	**44,473,263**	**43,099,348**	**48,832,118**
Total N Applied to All Crops									**92,593,282**	**74,416,274**	**98,004,758**	**99,031,318**

California Agriculture, Volume 67, number 1. Jan-Mar 2013. Rosenstock, etal. Nitrogen fertilizer use in California: Assessing the data, trends and a way forward

USDA 2009. California Agricultural Chemical Use: Fruit Crops 2009.

Emission Calculations for N2O

Year and Source	Nitrogen Applied (lbs/year)	Nitrogen Applied (kg/yr)	Direct N2O Factor	Molecular Weight N2O	N2O Emissions (kg/year)	N2O Emission MT/year	GWP	MTCO2e/Year
2013 Field Crops	51,058,390	23,159,575	0.01	1.5711	363,860	364	298	**108,430**
2014 Field Crops	29,943,011	13,581,850	0.01	1.5711	213,384	213	298	**63,589**
2015 Field Crops	54,905,410	24,904,545	0.01	1.5711	391,275	391	298	**116,600**
2016 Field Crops	50,199,200	22,769,855	0.01	1.5711	357,737	358	298	**106,606**
2013 Tree Crops	41,534,892	18,839,812	0.01	1.5711	295,992	296	298	**88,206**
2014 Tree Crops	44,473,263	20,172,627	0.01	1.5711	316,932	317	298	**94,446**
2015 Tree Crops	43,099,348	19,549,433	0.01	1.5711	307,141	307	298	**91,528**
2016 Tree Crops	48,832,118	22,149,760	0.01	1.5711	347,995	348	298	**103,702**
Combined Average 2013-2016								**193,277**

GWP = Global Warming Potential. Using Fourth Assessment Report (AR4) values.

EF1 Proportion of N applied emitted as N2O	0.01
	MMTCO2e
State of California Emission Inventory	2.443
Tulare County	0.177335
Fraction of the State EI	0.07258903

Tulare County Agricultural Burn Emissions

Tree Crops	Harvested Acres											
	2013	2014	2015	2016	Average Acres 2013-2016	Average Annual Burn Tons	Burn (MT)	CO2 Emisions grams	CO2 Emissions MTCO2	Emission Factor (CH4)	CH4 Emissions (MTCO2e)	Emission Factor N2O
Almonds	38,100	46,400	45,300	60,900	47,675	47,675	43,251	73,612,793,520	73,613	0.00117	50603.3892	0.00020
Apricots	767	587	758	613	681	1,568	1,423	2,421,223,412	2,421			
Cherries	2,520	2,260	2,220	2,480	2,370	5,455	4,949	8,423,191,906	8,423			
Grapefruit	2,180	2,240	2,300	1,740	2,115	4,868	4,417	7,516,899,106	7,517			
Kiwifruit	2,450	2,380	1,880	1,850	2,140	4,868	4,417	7,516,899,106	7,517			
Lemons	6,930	7,210	7,850	7,190	7,295	8,179	7,420	12,629,352,074	12,629			
Nectarines	11,400	9,240	9,170	9,260	9,768	22,483	20,396	34,714,568,329	34,715			
Orange - Navel	76,700	79,500	72,700	78,800	76,925	177,065	160,634	273,398,328,000	273,398			
Orange - Valencia	16,600	16,300	14,300	14,900	15,525	35,735	32,419	55,177,238,118	55,177			
Peaches - Cling	1,310	1,200	1,180	1,220	1,228	2,825	2,563	4,362,644,753	4,363			
Peaches - Freestone	12,200	11,300	10,900	11,300	11,425	26,298	23,858	40,605,471,529	40,605			
Pears	199	148	294	205	212	550	499	849,075,515	849			
Pecans	856	1,060	997	884	949	1,612	1,463	2,489,194,960	2,489			
Persimmons	2,430	810	936	892	1,267	3,294	2,988	5,086,424,004	5,086			
Pistachio Nuts	41,300	45,400	51,700	60,800	49,800	49,800	45,179	76,893,909,120	76,894			
Plums and Pluots	10,400	9,260	8,830	8,540	9,258	24,070	21,836	37,164,617,381	37,165			
Pomegranates	4,220	5,650	4,850	2,960	4,420	10,174	9,230	15,709,075,200	15,709			
Prunes	3,450	3,440	3,270	3,100	3,315	8,619	7,819	13,308,204,874	13,308	0.00164	1.64	
Tangerines	13,800	21,700	24,700	22,100	20,575	47,359	42,964	73,125,389,647	73,125			
Walnuts	36,500	40,300	36,500	42,000	38,825	43,532	39,492	67,215,160,282	67,215			
	284,312	**306,385**	**300,635**	**331,734**	**305,767**	**526,030**	**477,215**	**812,219,660,836**	**812,220**			

Biomass Emission Factor 1702 gCO2/kg of biomass. Calculation assumes Burn Tons = Biomass Tonnage

Burn Acres and Burn Tons Estimate

	Burn Tons	Burn Acres	Burn Tons/Acre
Almond Pruning	51718	51718	1.00
Apple Pruning	900	391	2.30
Pear Pruning	286	110	2.60
Pecan Pruning	501	295	1.70
Quince	47	28	1.68
Walnut Pruning	17083	15236	1.12
Apple Removal	691	23	30.04
Citrus Removal	54035	1891	28.57
Fig Removal	2392	80	29.90
Pear Removal	490	16	30.63
Quince Removal	10	0.4	25.00

Source: SJVAPCD 2010. Emissions from Agricultural Burning and Alternatives to Burning and Health Considerations Final Staff Report and Recommendations on Agricultural Burning.

895 g of CH4 per acre of Almond
22,372 g (i.e. 22.37 kg) of CO2eq. per acre of Almond

Tree Crops **Harvested Acres**

	2013	2014	2015	2016	Average Acres	Emission Factor MTCO2e /Acre	Average Emissions (MTCO2e)	2013 Emissions (MTCO2e)	2014 Emissions (MTCO2e)
Almonds	38,100	46,400	45,300	60,900	47,675	1.49	71,036	56,769	69,136
Cherries	2,520	2,260	2,220	2,480	2,370	0.34	807	858	770
Grapefruit	2,180	2,240	2,300	1,740	2,115	0.34	720	742	763
Kiwifruit	2,450	2,380	1,880	1,850	2,140	0.34	729	834	810
Orange - Navel	76,700	79,500	72,700	78,800	76,925	0.34	26,194	26,118	27,071
Orange - Valencia	16,600	16,300	14,300	14,900	15,525	0.34	5,287	5,653	5,550
Peaches - Cling	1,310	1,200	1,180	1,220	1,228	0.34	418	446	409
Peaches - Freestone	12,200	11,300	10,900	11,300	11,425	0.34	3,890	4,154	3,848
Pears	199	148	294	205	212	0.34	72	68	50
Pecans	856	1,060	997	884	949	0.34	323	291	361
Persimmons	2,430	810	936	892	1,267	0.34	431	827	276
Pistachio Nuts	41,300	45,400	51,700	60,800	49,800	0.34	16,958	14,063	15,459
Plums and Pluots	10,400	9,260	8,830	8,540	9,258	0.34	3,152	3,541	3,153
Pomegranates	4,220	5,650	4,850	2,960	4,420	0.34	1,505	1,437	1,924
Prunes	3,450	3,440	3,270	3,100	3,315	0.34	1,129	1,175	1,171
Tangerines	13,800	21,700	24,700	22,100	20,575	0.34	7,006	4,699	7,389
Walnuts	36,500	40,300	36,500	42,000	38,825	0.34	13,221	12,429	13,723
	265,215	289,348	282,857	314,671	288,023		**152,878**	**134,106**	**151,864**

ARB California GHG Emission Inventory for 2012

	Acres	Emissions	Emissions/Acre
Almonds	663,600	989,000	1.49035564
Walnuts	232,000	79,000	0.34051724

Tulare County Residential Woodburning Emissions

Fireplaces and Woodstoves

Wood Burned Per Year

County	Occupied Homes	Percent with woodburning Devices	Percent Using Devices	Percent of homes w/devices that are in use	Homes with fireplaces in use	Fireplaces per Home	Fireplaces in Use	Wood Burned (tons/year)	Manufactured Logs (tons/year)	total (tons/year)	Tons/Residence/year
Tulare County (all 2015)	114,640	0.330	0.570	0.188	21,564	1.1	23,720	11,162	423	11,585	0.48840641
2010 Unincorporated	39,093	0.330	0.570	0.188	7,353	1.1	8,089			3,951	
2015 Unincorporated	39,419	0.330	0.570	0.188	7,415	1.1	8,156			3,984	
2016 Unincorporated	38,883	0.330	0.570	0.188	7,314	1.1	8,045			3,929	
2017 Unincorporated	39,002	0.330	0.570	0.188	7,336	1.1	8,070			3,941	
2020 Unincorporated	40,316	0.330	0.570	0.188	7,583	1.1	8,342			4,074	
2030 Unincorporated	44,684	0.330	0.570	0.188	8,405	1.1	9,246			4,516	
2035 Unincorporated	46,919										

ARB 2009 Section 7.1 Appendix B Residential Wood Combustion San Joaquin Valley Methodology for Fireplaces

Emission Factors for Fireplaces and Woodstoves

	CO2 (lbs/ton of fuel)
Fireplaces	3,400

	CO2 (lbs/ton)	CH4/ (lbs/ton)	N2O (lbs/ton)
Woodstoves	3,400	16	0.3

CalEEMod based on EPA AP 42

Emission Estimates for Woodburning Fireplaces and Woodstoves

Year	Fireplaces and Woodstoves in Use	Wood Burned (Tons)	CO2 (lbs/ton)	CO2 lbs	CO2 (MT)	CH4 (lbs)	CH4 (MT)	CH4 MTCO2e	N2O lbs	N2O (MT)	N2O MTCO2e)	Total MTCO2e
2010	8,089	3,951	3,400	13,432,002.1	6,092.6	63,209.4	28.7	602.1	1,185.2	0.5	160.2	6,854.9
2015	8,156	3,984	3,400	13,544,012.7	6,143.5	63,736.5	28.9	607.1	1,195.1	0.5	161.5	6,912.1
2016	8,045	3,929	3,400	13,359,848.0	6,059.9	62,869.9	28.5	598.9	1,178.8	0.5	159.3	6,818.1
2017	8,070	3,941	3,400	13,400,735.3	6,078.5	63,062.3	28.6	600.7	1,182.4	0.5	159.8	6,839.0
2020	8,342	4,074	3,400	13,852,213.9	6,283.3	65,186.9	29.6	620.9	1,222.3	0.6	165.2	7,069.4
2030	9,246	4,516	3,400	15,353,019.2	6,964.0	72,249.5	32.8	688.2	1,354.7	0.6	183.1	7,835.3

Residential Woodburning Emission Summary

	2010	2015	2016	2017	2020	2030
Emissions (MTCO2e)	6,855	6,912	6,818	6,839.0	7,069	7,835

Tulare County Propane Inventory

Housing Statistics

	2015 Total	Vacant	% Vacant	2015 Occupied Housing
Single Family Attached	34,783	4,070		
SF Detached	826	97		
2-4 Unit	1715	201		
5 or more	1187	139		
MH	6538	765		
Total	45,049	5,271	11.70	39,774
County Total Occupied				134612
Unincorporated Fraction				0.295471429

Rural Communities with Natural Gas Service

	Community	Housing Units with Natural Gas
93277	Goshen	773
93256	Pixley	798
93201	Alpaugh	226
93235	Ivanhoe	1142
93244	Lemon Cove	120
93270	Terra Bella	787
93286	Woodlake	1966
93647	Orosi	1985
93673	Traver	184
93267	Strathmore	751
Total		**8732**

Houses with Propane	31,042
Fraction of Total County	0.231
Fraction of Unincorporated	0.780

Propane Emission Estimate

County Residential Propane Use from ARB EI Methodology

	1991 Gal/Year	Gallons/Home	CO2 Emissions kg/Gallon	CO2 Emissions kg CO2	MTCO2/yr	Emissions/Home MTCO2/yr
Tulare County Propane	6,614,000	288.85	5.7942	38,322,574	38,323	1.67367113
State of California Propane	38,962,000		5.7942	225,752,062	225,752	
Tulare Fraction of State	0.16975515					

Propane emission factor from ARB Mandatory GHG Reporting Regulation GHG Calculator
http://www.locustec.com/co2_calc.html
Propane Usage from ARB Emission Inventory Methodology Section 7.3 Residential Fuel Combustion

Year	Occupied Homes	Homes Using Propane	Gallons/Home/Year	CO2 Emissions kg/yr	CO2 Emissions MT/yr	CO2 Emissions w/T24
Tulare County (all 2015)	114,640	31,042	288.9	51,954,099	51,954	
2010 Unincorporated	39,093	30,511	288.9	51,064,555	51,065	51,065
2015 Unincorporated	39,419	30,765	288.9	51,490,387	51,490	51,490
2020 Unincorporated	40,316	31,465	288.9	52,662,077	52,662	52,231
2030 Unincorporated	44,684	34,874	288.9	58,367,702	58,368	56,067

Assumes all propane use for home heating is in the County areas.
Housing from DOF Report E-5

Propane Use per Home

	Occupied Homes	Fraction Using Propane	Homes Using Propane	Propane Use Tulare County (gal)	Propane gal/Home/Yr
County Occupied Housing 1991	99,293	0.231	22,897	6,614,000	288.9

Housing from DOF Report E-8 1990-2000

Tulare County Population Projections	Population	Increase/ Decrease	Percent Reduction 2016 T24	Reduction from New Buildings
2010	142,872	0.027		
2015	146,908	baseline		
2020	151,202	0.029	0.28	0.008
2030	167,586	0.141	0.28	0.039
2035	175,970	0.198	0.28	0.055

Title 24 Reduction in Natural Gas Usage compared to 2015 Baseline 0.28

		Occupied Housing Units
2014	146,370	39295
2015	146,908	39419
2016	145,252	38883
2017	146,276	39002

Occupied Housing Units Unincorporated Tulare County

	2015	2017	2020	2030	2035
Occupied Housing Units	39,419	39,002	40,316	44,684	46,919

Locomotive Emissions

	2010 MTCO2e Tons/Year	Nox Tons/Day	Tulare Pop. Fraction
California Locomotive Emissions	2,030,000	102.17	
Tulare Locomotive Emissions	23,954	2.87	0.0118

	2010 MTCO2e/ Year	2013 MTCO2e/ Year	2015 MTCO2e/ Year	2017 MTCO2e/ Year	2020 MTCO2e/ Year	2030 MTCO2e/ Year
California Locomotive Emissions	2,030,000	2,396,000	2,420,000	2,610,000	2,800,000	3,026,905
Tulare Locomotive Emissions	23,954	28,273	28,556	30,798	33,040	35,717
Unincorporated Tulare Locomotive	**7,740**	**8,989**	**9,079**	**9,548**	**10,243**	**11,073**

Tulare Locomotive Emissions for Nox from the 2010 Emission Inventory from ARB Online Inventory
California Locomotive Emissions from ARB Mobile Source Emission Inventory for 2010 and 2013, Scoping Plan EI for 2020
Tulare GHG emissions are assumed to be proportional to Nox emissions from locomotives
Emissions for 2030 are assumed to grow proportionally with population.

Population Projections

	2010	2015	2017	2020	2030	2035
Unincorp Tulare County Total Pop	142,872	146,908	146,276	151,202	167,586	175,970
Unincorp Pop Fraction	**0.323**	0.318	0.310	0.310	0.310	0.310

State of California Population 2010-2050

	2010	2015	2020	2025	2030	2035
California	37,333,583	39,059,809	40,719,999	42,407,005	44,019,846	45,521,334

Tulare County Offroad Emission Inventory

Inventory for All Sources Except Ag and Rail

	2010	2015	2017	2020	2030
Entire County (Tons CO2e)		112,218	121,673	137,948	169,313
Entire County (MTCO2e)		101,804	110,381	125,146	153,601
Unincorporated County (MTCO2e/year)		**32,368**	**34,219**	**38,797**	**47,618**
Emissions for Tulare County from ARB 2015 GHG Inventory					

Agricultural Offroad Equipment

	2010	2015	2017	2020	2030
Ag Equipment Tons (CO2e)		16,246	16,249	16,254	16,257
Ag Equipment Tons (MTCO2e)	0	**14,738**	**14,741**	**14,746**	**14,749**

Assuming that all agrcultural equipment is operated in the unincorporated County.

Population Projections

	2010	2015	2017	2020	2030	2035
Unincorp Tulare County Total Pop	142,872	146,908	146,276	151,202	167,586	175,970
Unincorp Pop Fraction	**0.323**	0.318	0.310	0.310	0.310	0.310

Inventory for All Sources

	2010	2015	2017	2020	2030
Entire County (Tons CO2e)		128,464	137,922	154,202	185,571
Entire County (MTCO2e)		116,542	125,123	139,892	168,350
Unincorporated County (MTCO2e/year)		**37,054**	**38,789**	**43,368**	**52,190**
Emissions for Tulare County from ARB 2015 GHG Inventory					

Water System Emission Inventory

	2010	2015	2020	2030
Total without Regs	118.8	122.2	125.8	139.4
Total with MWELO	118.39	122.20	100.62	111.52
Total with RPS	118.40	104.60	82.81	95.46

Population Projections	**Population**	**Increase**
2010	142,872	0.027472976
2015	146,908	baseline
2020	151,202	0.029231749
2030	167,586	0.140751392
2035	175,970	0.197824836

Tulare County Population from DOF Report E-5

	2,020	2015	2030
RPS	0.177	0.144	0.31787176
MWELO	0.2		

RPS requires 33% by 2020 and 50% by 2030

Tulare County Landfill Emissions

Landfill Emission Summary

	2010	2015	2020	2030
Emissions (MTCO2e/	175,686	176,925	160,088	160,088

Teapot Dome

	Methane (MTCO2e)	MTCO2	Total (MTCO2e)	LFG Recovered	CH4 45.7	CO_2 36.3%
2010	39,448	6,300	**45,748**	82,352,333	31,293,887	26,105,690
2015	39,779	6,353	**46,132**			
2016	41,833	6,681	**48,514**			
2020	35,994	5,748	**41,742**			

Woodville Landfill

	Methane (MTCO2e)	MTCO2		LFG Recovered	CH4 35.1	CO2 30.2%
2010	39,696	6,339	**46,035** SCF	159,025,860	55,818,077	48,025,810
2015	41,341	6,602	**47,943**			
2016	40,522	6,471	**46,993**			
2020	37,407	5,974	**43,381**			

Visalia Landfill

	Methane (MTCO2e)	MTCO2		LFG Recovered	CH4 38.0	CO2 31.7%
2010	72,349	11,554	**83,903**	230,863,003	87,727,941	73,183,572
2015	71,441	11,409	**82,850**			
2016	76,404	12,202	**88,606**			
2020	64,642	10,323	**74,965**			

Total Landfill Emissions

	Methane (MTCO2e)	MTCO2							
2010	151,493	24,193	**175,686**						
2015	152,561	24,364	**176,925**			CCs per SCF	g CH4/cc	Grams	MT
2016	158,759	25,354	**184,113**	472,241,196	174,839,905	28316.8	0.42	2.07938E+12	2079380.8
2020	138,043	22,045	**160,088**						

Source: AB 32 Annual Report for the Visalia Landfill, Tulare County Solid Waste, March 2015 prepared by SCS Engineering
Source: AB 32 Annual Report for the Woodville Landfill, Tulare County Solid Waste, March 2015 prepared by SCS Engineering
Source: AB 32 Annual Report for the Teapot Dome Landfill, Tulare County Solid Waste, March 2015 prepared by SCS Engineering

Government Office Solid Waste Estimate

	2010	2015	2016	2020	2030
Government Employees	4,489	4,154	4,182	4,275	4,739
Average SF/emp Gov Office	250	250	250	250	250
Office Space	1,122,250	1,038,500	1,045,500	1,068,857	1,184,670
Emissions/1000 sf MTCO2e	0.433072	0.433072	0.433072	0.433072	0.433072
Emissions/Year (MTCO2e)	486.0	449.7	452.8	462.9	513.0

Emissions per 1,000 sf from CalEEMod 2013 rate for government office
SF per employee from data developed by the Costar Group for Montgomery and Fairfax County, VA

Tulare County Popul	Population	Increase	Employees Per Capita
2010	142,872	0.02747298	
2015	146,908	baseline	0.0283
2020	151,202	0.02923175	
2030	167,586	0.14075139	
2035	175,970	0.19782484	

Tulare County Population from DOF Report E-5

Tulare-Unincorporate	45	Staff Reviewe	2016, 2017, 2018,	Awaiting Review	152793.71	6.2	5.8	21.3	18.7

Tulare County Wastewater Treatment Plant Emissions

Name	Permitted Capacity (MGD)	Current Average Dry Weather Flows (AWDWF) (MGD)	Treatment Level
Pixley PUD	0.29	0.298	Primary
Lemon Cove SD	0.02	0.012	Primary
Richgrove CSD	0.22	0.25	Primary
Strathmore PUD	0.4	0.15	Primary
CSA #2 - Wells Tract	0.019	0.021	Primary
Primary Total MGD	**0.949**	**0.731**	
Million Gallons per Year	**346.385**	**266.815**	
Earlimart PUD	0.8	0.8	Advanced Primary
Poplar CSD	0.31	0.22	Advanced Primary
Terra Bella SMD	0.3	0.28	Advanced Primary
CSA #1 - Delft Colony	0.057	0.045	Advanced Primary
CSA #1 - Tooleville	0.035	0.024	Advanced Primary
CSA #1 - Traver	0.089	0.067	Advanced Primary
Advanced Primary Total MGD	**1.591**	**1.436**	
	1,591,000	**1,436,000**	
m3/hr	250.91	226.47	
Mg CO2/hr	0.057	0.052	
Mg CO2/hr	502.45	453.50	
tpy CO2	552.70	498.85	From Treatment
Mg CO2/hr	0.051	0.046	From anaerobic sludge digester
Mg CH4/hr	0.020	0.018	
CH4 Emissions (MG CO2e/hr)	0.423	0.382	
GHG Emissions from Digester (Mg CO2e/hr)	0.474	0.428	
MgCO2e/yr	4,153.3	3,748.6	
typ CO2	4,568.6	4,123.5	

TOTAL (tpy CO2e)		5,121.3		4,622.3	Treatment & Digester
Cutler PUD	Note 1		Note 1		Secondary
East Orosi CSD		0.06		0.053	Secondary
Goshen CSD		0.5		0.315	Secondary
Ivanhoe PUD		0.56		0.36	Secondary
London CSD		0.3		0.2	Secondary
Orosi PUD	Note 1		Note 1		Secondary
Porter Vista PUD	Note 2			0.4	Secondary
Springville PUD		0.06		0.056	Secondary
Sultana CSD		0.08		0.085	Secondary
Tipton CSD		0.4		0.19	Secondary
Woodville PUD		0.33		0.12	Secondary
CSA #1 – El Rancho		0.012		0.01	Secondary
CSA #1 - Seville		0.05		0.048	Secondary
CSA #1 - Tonyville		0.06		0.028	Secondary
CSA #1 - Yettem		0.042		0.015	Secondary
Secondary Total MGD		**2.454**		**1.88**	
Advanced Primary Total MGD		**2.454**		**1.88**	
		2,454,000		**1,880,000**	
m3/hr		387.0		296.5	
Mg CO2/hr		0.088		0.068	
Mg CO2/hr		775.0		593.7	
tpy CO2		**852.5**		**653.1**	
Mg CO2/hr		0.079		0.060	
Mg CH4/hr		0.031		0.024	
CH4 Emissions (MG CO2e/hr)		0.652		0.500	
GHG Emissions from Digester (Mg CO2e/hr)		0.731		0.560	
MgCO2e/yr		6,406		4,908	
typ CO2		7,047		5,398	
TOTAL (tpy CO2e)		**7,899**		**6,052**	**13,951**

1. The Cutler PUD and Orosi PUD are allocated capacity in terms of Equivalent Single Family Dwellings (ESDs).
2. The contracted capacity for the Porter Vista PUD is Unknown. The ADWF from Porter Vista PUD system is estimated at 0.400 MGD.

	N20 Secondary	
EPA Emission Factor	3.3	g/capita/yr

California WW Treatment 2013

	Methane (MT)	MTCO2e	N20 (MT)	MTCO2e
Centralized Anaerobic Treatment	16,020	400,503		
Centraliized Aerobic Treatment			2,394	713,519
Septic Systems	14,984	374,592		
		775,095		

ARB Inventory for 2013 8th edition upated 4/24/15
GWP CH4 =25 N2O = 298

California Proportion in Septic Systems	0.1
Calfornia Proportion if centrally treated	0.9
California Population ARB EI Documentation	38,340,074
Emissions per Capita Septic	0.00977
Emissions per Capita Central Treatment Aerobic	0.01861

Tulare County Inventory 2015

	Population/1,000	Emissions (MTCO2e)
Earlimart	7.61	
Woodlake	7.37	
Cutler	4.17	
Ivanhoe	3.92	
Goshen	3.7	
Pixley	3.38	
Richgrove	2.99	
Terra Bella	2.98	
Poplar	2.35	
Tipton	2.19	
London	2.04	
Woodville	1.85	
Traver	0.96	
Total	45.51	

Population Served by WWTF	45,510	847
Population Unincorporated Tulare County	146,908	
Population Served by Septic Systems	101,398	991
Total Emissions from WWTP UI Tulare Co		**1,838**

Populaton from Statistical Atlas: http://statisticalatlas.com/county/California/Tulare-County/Population

Water System Emission Inventory

	2010 MTCO2e	**2015 MTCO2e**	**2020 MTCO2e**	**2030 MTCO2e**
Population Served by WWTF	824	847	872	966
Population Served by Septic	968	995	1,024	1,024
Total	**1,787**	**1,838**	**1,891**	**2,096**

Tulare County Population Projections	**Population**	**Increase**	**Population**				
2010	142,872	0.027472976	**2015**	**2017**	**2020**	**2030**	**2035**
2015	146,908	baseline	146,908	146,276	151,202	167,586	175,970
2020	151,202	0.029231749					
2030	167,586	0.140751392					
2035	175,970	0.197824836					

Tulare County Population from DOF Report E-5

Aviation - Tulare County Aircraft Emissions

Airport Data for 2010, 2015 and 2025

	Operations 2010	Large Aircraft	Aircraft Served	Ops 2015	Ops 2025
Sequoia Field (Visalia)	12,000	500	Single Engine under 12k lb	12,011	23,200
Exeter Airport	400		Single	403	400
Eckert Field (Strathmore)	3,850		Single	3,878	3850
Woodlake Municipal Airport	16,370		Single	12,002	24,600
Tulare Municipal Airport (Mefford Fie	10,800		Single	26,224	17,200
Porterville Municipal Airport	51,200			43,641	93,000
Visalia Municipal Airport	26,000		single and turbo	34,855	33,000
Total	120,620			133,014	195,250
Total Single Engine	118,752			131,146	193,382

	Grams/Gallon
Emission Factor	8,310

Operations from the Tulare County ALUC
ARB Documentation of California's GHG Inventory
http://www.arb.ca.gov/cc/inventory/doc/docs1/1a3aii_aviation_domesticairtransport_fuelcombustion_aviationgasoline_co2_2013.htm

Fuel Burn Range by Aircraft Class

	Gal/Hr	Gal/Hr	Average
Turboprop	58	100	79
Light Jet	77	239	158
Midsize Jet	233	336	284.5
Long Range Jet	358	672	515

Sherpa Report Fuel Burn rates for Private Aircraft http://www.sherpareport.com/aircraft/fuel-burn-private-aircraft.html

	Gallons/Hr	Gallons/Hr	Average (Gal/Hr)
Cesna 172 Single 160 hp	6.8	9.5	
Cesna 152 Single	5.0	9.0	
Piper 180	6.3	8.8	
Average Rate	6.0	9.1	7.57

Source: Manufacturers Specifications and Owners Forums

Aircraft Emission Estimates

	Fuel Rate (gal/hr)	Emission Factor (g/gal)	Average Hours/Flight	Single Engine Flights/Year	Single Engine Emissions MTCO2	Other Aircraft Flights/Year	Other Aircraft Emissions (MTCO2e)	Total Aircraft Emissions (MTCO2e)
Private Plane Emissions 2010	7.57	8,310	2	118,752	14,934.0	1,868	1,215.7	16,150
Private Plane Emissions 2015	7.57	8,310	2	131,146	16,492.7	1,868	1,215.7	17,708
Private Plane Emissions 2020	7.57	8,310	2	168,505	21,190.9	1,868	1,215.7	22,407
Private Plane Emissions 2025	7.57	8,310	2	193,382	24,319.3	1,868	1,215.7	25,535
Private Plane Emissions 2030	7.57	8,310	2	218,259	27,447.8	1,868	1,215.7	28,663

Data from 2010, 2015, and 2025. Projections used for other years.

Turboprop Plane Emissions 2010	79	8,310	1	1825	1,198.1			
Two Engine Planes 2015	38	8,310	1	39	12.3			
Light Jet 2015 Visalia	158	8,310	1	4	5.3			
				1868	1,215.7			

Average of 5 flights per day per Tulare County ALUC Airport Land Use Plan
2015 data from Tulare County operations report
Two engine fuel estimate from: http://www.planeandpilotmag.com/aircraft/best-buys/twin-engine-pistons-buyers-guide-2014.html#.Vp02tvkrK70

Population and Housing Data

Tulare County Population Jan 1, 2017

County / City	POPULATION			HOUSING UNITS							Vacancy Rate
	Total	Household	Group Quarters	Total	Single Detached	Single Attached	Two to Four	Five Plus	Mobile Homes	Occupied	
Tulare County Jan 2018											
Balance Of County	**144,375**	**142,428**	**1,947**	**44,432**	**34,860**	**57**	**1,722**	**1,187**	**6,606**	**38,661**	**13.0%**
Incorporated	331,459	328,600	2,859	104,910	78,378	3,874	10,631	8,000	4,027	99,153	5.5%
Tulare County Jan 2017											
Balance Of County	**146,276**	**144,381**	**1,895**	**44,573**	**35,018**	**53**	**1,718**	**1,187**	**6,597**	**39,002**	**12.5%**
Incorporated	325,566	322,657	2,909	103,516	77,167	3,874	10,529	7,919	4,027	96,845	6.4%
County Total	471,842	467,038	4,804	148,089	112,185	3,927	12,247	9,106	10,624	135,847	8.3%
Tulare County Jan 2016											
Balance Of County	**145,252**	**143,384**	**1,868**	**44,437**	**34,911**	**51**	**1,716**	**1,187**	**6,572**	**38,883**	**12.5%**
Incorporated	321,311	318,369	2,942	102,512	76,275	3,874	10,415	7,919	4,029	95,907	6.4%
County Total	466,563	461,753	4,810	146,949	111,186	3,925	12,131	9,106	10,601	134,790	8.3%
Tulare County Jan 2015											
Balance Of County	**146,908**	**144,912**	**1,996**	**45,049**	**34,783**	**826**	**1,715**	**1,187**	**6,538**	**39,419**	**12.5%**
Incorporated	315,153	312,184	2,969	100,854	75,501	3,067	10,339	7,919	4,028	94,349	6.4%
County Total	462,061	457,096	4,965	145,903	110,284	3,893	12,054	9,106	10,566	133,768	8.3%
Tulare County Jan 2014											
Balance Of County	146,370	144,409	1,961	44,884	34,682	826	1,711	1,169	6,496	39,295	12.5%
Incorporated	312,470	309,484	2,986	99,986	74,637	3,067	10,335	7,919	4,028	93,565	6.4%
County Total	458,840	453,893	4,947	144,870	109,319	3,893	12,046	9,088	10,524	132,860	8.3%

Population and Housing Summary 2014 to 2018

	Population	Year to Year Increase	% Inc.	Total Housing Units	Year to Year Increase	Occupied Housing Units	Year to Year Increase		County Share of Population	County Population	Annual Increase
2014	146,370			44,884		39,295			0.319	458,840	
2015	146,908	538	0.004	45,049	165	39,419	124		0.318	462,061	3,221
2016	145,252	-1,656	-0.011	44,437	-612	38,883	-536		0.311	466,563	4,502
2017	146,276	1,024	0.007	44,573	136	39,002	119		0.310	471,842	5,279
2018	144,375	-1,901	-0.013	44,432	-141	38,661	-341				
Increase 14-18		**-1,995**			**-452**		**-634**	758			**13002**
Percent Increase		-1.36					Annual	-0.00874314			2.833667509
							3 year	-0.01608361			
Residential Construction FY 2016/17 and 2017/18							5 Year	-0.01613437			

	2017 Units	2018 Units	2017 Rural	2017 Comm Plan	2018 Rural	2018 Comm Plan	2018 VMT	GHG MTCO2e		
Single Family Homes	208	163	105	103	66	97	4,340,524		310	
Mobile Homes	52	46	52		41	5	635,528		39109	
Multifamily Home	35	5		35	1	4	79,649		0.0079266	
	295	**214**	**157**	**138**	**108**	**106**	**5,055,701**	3,879	0.0015853	
			0.5322034	0.467797			24,866,337			
Incorporated City Population							0.203315068			

	Population	Increase	Percent Inc	City Occupied Housing Units	Increase	Percent Inc.	Total Occupied Units	Increase	Percent Inc.
2014	312,470			93,565			132,860		
2015	315,153	2,683	0.009	94,349	784		133,768	908	
2016	321,311	6,158	0.020	95,907	1,558		134,790	1,022	
2017	325,566	4,255	0.013	96,845	938		135,847	1,057	
2018	331,459	5,893	0.018	99,153	2,308		137,814	1,967	
Increase since 2014		**18989**	0.061		**5,588**	0.0597		4,954	0.037
Average annual Increase			0.015			0.0199			0.012

Tentative Subdivision Maps

	Lots	AC	DU/AC
TSM 16-002	200	48	4.17
TSM 17-001	6	11.52	0.52
TSM 17-003	34	7.04	6.50
TSM 17-004	8	159.85	0.05
	248	226.41	

Commercial/Office/Industrial Projects 2016/17

	Sq.Ft	
Rite Aide Exeter	17,972	
Rite Aide Farmersville	10,601	
Dollar General Porterville	9,100	
Car/Truck Wash	5,114	
	42,787	2,674,048
Office Ranch Office Visalia	1,345	
Office Addition Ducor	663	
Office Addition Kawaeah	623	
	2,631	52,689
Total	45,418	2,726,737

Building Completions Commercial 2017/18			**VMT/Yr**
Family Dollar Store	Pixley	8,320	
Dollar General Store	Porterville	9,070	
Dollar General Store	Goshen	7,500	
Commercial Building Addition	Farmersville	530	
Total Shopping Center Projects		**25,420**	1,588,667
Large Animal Vet Lab Facility	Tulare	6,160	
Dental Clinic Addition	Woodville	369	
Medical Clinic – Modular Building	Exeter	5,760	
Medical Clinic- Modular Building	Exeter	5,760	
Commercial Building Addition – Dental	Exeter	121	
Total Medical Buildings		**18,170**	971,181
Office Building – Pallet Repair and Sales	**Pixley**	**1,920**	38,450
Total all Projects		**45,510**	**2,598,298**

Vehicle Miles Traveled/Year	2,598,298
Emissions (MTCO2e/year)	1,842

DOF Population Estimates

Population	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Tulare County	442,551	447,493	452,135	455,854	459,831	463,291	468,235	473,308	478,239	483,257	488,293
						462,033	466,431	470,716	475834		

DOF Report P-1 Population Estimates and Projections 2010 to 2060 February 2017

Residential Building Permits

Rural Comm.	103				
Rural Areas					
VMT		6908097			
		24886337			
		0.27758593			
CAP Population Vs. Actual Population		2018	2015	2020	2030
CAP 2015	160605		160605		
CAP 2020	170925		146908		
Ave. Annual Increase	2064		13697		
CAP 2017/2018	164733	166797		170,925	191,564
DOF 2017/2018	146246	144375		151,197	167,580
Difference	18487	22422		19,728	23,984
Percent Diff	0.11222402	0.13442688	0.0852838	0.115418	0.125202

Population	Estimates							Projections				
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2030
Tulare County	442,551	447,493	452,135	455,854	459,831	463,291	468,235	473,308	478,239	483,257	488,293	541,140
Tulare County Update	442,330	447,350	452,000	455,891	459,910	464,337	467,960	472,748	477,679	482,697	487,733	540,580
	DOF Report P-1 Population Projections March 2017 Release.										151,197	167,580
	2018											
Tulare County Fraction	0.310											

Occupied Housing Units Unincorporated Tulare County

	2015	2017	2020	2030	2035
Occupied Housing Units	39,419	39,002	40,316	44,684	46,919

DOF Report E-1 and P-1
2020 and later projected based on population projections.

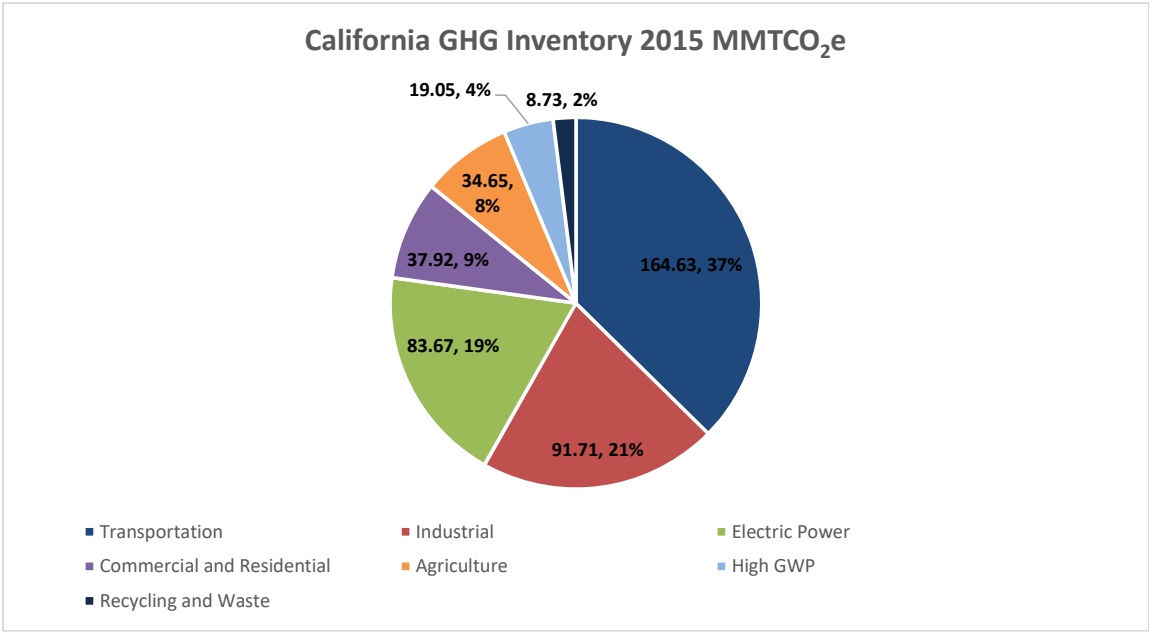
	2007	2020	2030
2012 CAP Housing Estimates	42606	55,724	65814
Increase to 2020	13,118		
Increase to 2030	23,208		
Avg Annual Increase	1,009		
Increase by 2018	11,100		
2012 CAP Housing Units in 2018	**53,706**		

	2010	2018	Increase	% Decrease
DOF Report E5 OccupiedHousing Unit	39109	38861	248	0.006341

California GHG Emission Inventory

Year	Transportation	Industrial	Electric Power	Commercial and Residential	Agriculture	High GWP	Recycling and Waste	Total
2015	164.63	91.71	83.67	37.92	34.65	19.05	8.73	440.36
Percent of EI	37.4	20.8	19.0	8.6	7.9	4.3	2.0	

	MMTCO2e
Transportation	**164.63**
On Road	***149.42***
Passenger Vehicles	117.01
Heavy Duty Vehicles	32.41
Ships & Commercial Boats	***3.89***
Aviation (Intrastate)	***4.20***
Rail	***2.42***
Off Road [1]	***2.53***
Unspecified	***2.16***
Industrial	**91.71**
Refineries and Hydrogen Production	***28.21***
General Fuel Use	***19.65***
Natural Gas	15.08
Other Fuels	4.57
Oil & Gas: Production & Processing [2]	***19.83***
Fuel Use	17.22
Fugitive Emissions	2.60
Cement Plants	***7.56***
Clinker Production	5.17
Fuel Use	2.39
Cogeneration Heat Output	***8.98***
Other Fugitive and Process Emissions	***7.48***
Natural Gas Transmission & Distribution [5]	3.94
Manufacturing	0.18
Wastewater Treatment	1.82
Other	1.54



Electric Power	**83.67**
In-State Generation	***49.93***
Natural Gas	45.16
Other Fuels	3.65
Fugitive and Process Emissions	1.13
Imported Electricity	***33.74***
Unspecified Imports	11.21
Specified Imports	22.52
Commercial and Residential	**37.92**
Residential Fuel Use	***23.17***
Natural Gas	21.90
Other Fuels	1.27
Commercial Fuel Use	***12.77***
Natural Gas	10.50
Other Fuels	2.26
Commercial Cogeneration Heat Output	***0.56***
Other Commercial and Residential	***1.42***
Agriculture	**34.65**
Livestock	***23.25***
Enteric Fermentation (Digestive Process)	11.54
Manure Management	11.71
Crop Growing & Harvesting	***7.00***
Fertilizers	5.28
Soil Preparation and Disturbances	1.64
Crop Residue Burning	0.08
General Fuel Use	***4.39***
Diesel	3.66
Natural Gas	0.64
Gasoline	0.10
Other Fuels	0.00
High GWP	**19.05**
Ozone Depleting Substance (ODS) Substitutes	***18.37***
Electricity Grid SF6 Losses [4]	***0.42***
Semiconductor Manufacturing [3]	***0.26***
Recycling and Waste	**8.73**
Landfills [3]	***8.40***
Composting	***0.33***
	440.36

Estimated Change in GHG Emissions by Sector (MMTCO2e)

	1990	2030 Scoping Plan Ranges	% Change from 1990
Agriculture	26	24–25	-8 to -4
Residential and Commercial	44	38–40	-14 to -9
Electric Power	108	30–537	-72 to -51
High GWP	3	8–118	267 to 367
Industrial	98	83–909	-15 to -8
Recycling and Waste	7	8–970	14 to 29**
Transportation (Including TCU)	152	103–111	-32 to -27
Natural Working Lands Net Sink*	-7***	TBD	TBD
Sub Total	431	294–339	-32 to -21
Cap-and-Trade Program	n/a	34–79	n/a
Total	431	260	-40

California's 2017 Climate Change Scoping Plan

	2030 GHG Savings (MMTCO2e)
50% RPS (vs. Reference ~40% RPS)	3.1
Energy efficiency (Res., Com. Ind., Ag. & TCU)	9.3
Low-carbon fuel standard (biofuels)	5.0
Transportation measures	13.5
SLCP measures (non-energy GHGs)	34.9
Total change in SP vs. Ref. scenario (reflecting intera	**68.5**

Scoping Plan GHG Reduction Meas	Scenario Input Description
Low Carbon Fuel Standard (18%)	18% reduction in carbon intensity of transportation fuels from the Low Carbon Fuel Standard (GHG savings isolated are from biofuels only / note there are interactive effects with transportation measure)
50% RPS	50% renewable portfolio standard by 2030 (vs. Historical Procurement in Reference scenario, ~40% RPS by 2020) **Note: This case was updated in August 2017 to reflect banking of RECs, PPC3 out-of-state RECs and other model fixes including to reflect loads that are excluded from the RPS regulation (i.e. pumping loads). None of the other cases have been updated, which may introduce some inconsistencies between sensitivity results.
Energy efficiency (Res, Com., Ind. A	2x additional achievable energy efficiency in the 2015 IEPR
Mobile Sources CFT and Freight	All transportation measures: cleaner technologies and fuels scenario from the mobile source strategy, sustainable freight and reductions in off-road transportation (does not include biofuels / note there are interactive effects with the LCFS)
SLCP	Mitigation scenario in the short-lived climate pollutant strategy plus additional reductions in nitrogren oxides and CO2 from cement production

Appendix B:
CAPCOA GHG Mitigation Measures from CARB 2017 Scoping Plan Feasibility Assessment

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CAPCOA GHG Mitigation Measures from CARB 2017 Scoping Plan
Feasibility Assessment

GHG Mitigation Measures	Feasibility Assessment
Energy	
- Streamline permitting and environmental review and reduce fees for small-scale renewable energy systems	Tulare County already has review procedures in place for renewable projects.
- Adopt a community solar program to help realize economies of scale and help residents without appropriate rooftop space to participate in clean energy generation	Requires complex management and billing system. May be more appropriate in apartment projects.
- Promote property-assessed clean energy financing districts or other financing mechanisms to fund permanent energy-efficiency, water-efficiency, and renewable energy improvements in the residential and commercial sectors	Tulare County has a PACE program.
- Incentivize energy-efficiency upgrades for existing buildings at the time of a major remodel or change of ownership	Not consistent with affordable housing concerns. Incentives available for all home owners.
- Reduce permit fees and streamline permitting requirements for energy-efficiency- and renewable energy-related building renovations	No funding available to subsidize fees. Permitting is already streamlined.
- Implement building energy audit and retrofit programs and residential solar programs	Audit programs already operated by other entities such as utilities
- Adopt residential and commercial energy conservation, renewable energy, and/or zero net energy ordinances (consider requirements for audits or upgrades at major renovation or time of sale)	Not practical with T24 updates every 3 years and approaching net zero mandates. Concern with housing affordability at sale.
- Incorporate renewable energy and energy efficiency into public facilities' capital	Tulare County does this in normal practice in new and remodeled facilities.

GHG Mitigation Measures	Feasibility Assessment
improvements	
- Replace public lighting with energy-efficient lighting	County replacing old lighting with LED as funding permits. Would likely need grants to replace fixtures.
- Permit renewable energy generation facilities as of right in zones with compatible uses	Already in place. Solar allowed in nearly all circumstances subject to design and aesthetic considerations.
- Create incentive programs to promote the building energy-efficiency projects	Plenty of existing incentive programs available from State and utilities. No County funding is available.
- Implement large-scale energy storage in commercial and industrial buildings to control peak loads	Needs to be economically feasible and use private financing
- Require new residential and commercial construction to install solar or be solar ready (see California Energy Code)	Required by CEC action recently approved by the agency.
- Encourage the development of brightfields – brownfields that are used to develop solar energy – through tax incentives, streamlining, and use of locally-owned land	No incentives available at local level.
- Pursue renewable energy development on municipal buildings or purchase renewable energy to power municipal operations	Investigate for future remodeling projects. Utility power will be increasingly clean without purchasing from third party providers.
- Require on-site renewable energy generation by large-scale residential and commercial projects	Recent CEC mandate for residential.
- Incentivize energy-efficiency upgrades to existing buildings, where appropriate, upon issuing a permit for substantial modification	No County incentive money available
Transportation and Land Use	
- Update Lead Agency's transportation impact analysis guidelines and congestion management plans to comply with SB 743	In process. Working with TCAG and other agencies to identify a workable approach.
- Adopt general plan policies and diagram designations and zone map and standards that	General Plan already consistent. Limited development occurring in the unincorporated County.

GHG Mitigation Measures	Feasibility Assessment
are consistent with the Sustainable Communities Strategy	
- In appropriate locations, adopt: 1) as-of-right zoning, and 2) design standards and guidelines, to enable mixed use, walkable, compact, infill development that includes a range of housing types and affordability levels	Tulare County General Plan encourages this action. If a new Specific Plan were proposed, the County could Include concepts in projects proposed by developers
- Build infrastructure necessary for residential development in existing communities, and ensure any urban growth boundaries are paired with significant infill promotion strategies and removal of infill development barriers	GP Policy already consistent.
- Streamline permitting and environmental review and reduce fees for construction of secondary units to promote infill in targeted areas	No funds to subsidize reduced fees. Projects must qualify for existing exemptions.
- Adopt a jurisdiction-wide transportation demand management plan which sets numeric targets or caps for the proportion of non-single occupancy vehicle (SOV) trips associated with new development, and/or an overall vehicle miles traveled (VMT) target	Dispersed employment in County. Rule 9410 already applied to larger employers
- Require employer-based trip reduction programs and provide funding to support them if feasible	Comply with SJVAPCD Rule 9410
- Update code of ordinances to reduce parking requirements and eliminate parking minimums; impose parking maximums	Not appropriate for suburban development
- Institute paid parking for local on-street parking, structures and lots	Not applicable to rural communities
- Adopt and implement EV and hydrogen	Difficult to stay ahead of technology and provide infrastructure that doesn't quickly become

GHG Mitigation Measures	Feasibility Assessment
readiness plans	obsolete. Market forces may provide incentive for construction of infrastructure if providers can make a profit from selling the electricity.
- Adopt voluntary green building standards that exceed minimum State building standards for EV Capable parking spaces (e.g., by requiring installation of EV chargers and/or a larger number of EV-capable parking spaces) or match local climate action plan goals	Not appropriate for limited development expected in a rural area.
- Replace public fleet vehicles and trips with electric or alternative fueled vehicles as much as feasible and provide EV chargers in public spaces	Consider buying more EVs for County use
- Adopt and implement a bicycle and pedestrian master plan which includes targets for trips taken by bicycle and on foot	Have County-wide bike plan in place
- Adopt complete streets policies and active design guidelines	Have complete streets program. Working to add sidewalks in rural communities where needed.
- Develop a transportation impact fee program to fund low-carbon transportation	No interest in charging higher fees. Funds already insufficient to fund regular infrastructure
- Support biogas use in the transportation sector	No authority over fuels. If fuel meets specifications for vehicle and doesn't void warranty and price is competitive, could consider.
- Provide incentives for certifying development plans and projects using LEED for Neighborhood Development or similar third-party certification system.	No incentive funds available
- Partner with local/regional transit agencies to enhance transit ridership	Already accomplished. County works with transit providers.
- Adopt a Transportation Management Ordinance to require carpool, electric vehicle, and/or vanpool preferential parking spaces close	Rule 9410 covers large employers.

GHG Mitigation Measures	Feasibility Assessment
to the major employment areas	
- Adopt a Safe Routes to School Program that encourages youth to walk or ride bicycles to schools o At schools where students drive, reduce the number of student parking spaces to encourage walking, biking and carpooling	County has program in place that does this. Many students already use school buses in the rural areas.
- Develop Safe Routes to transit programs for pedestrians and bicyclists	County has program in place that does this
- Develop intelligent traffic management systems to improve traffic flow	County not responsible for congested segments. Limited congestion in rural areas.
- Incentivize use of alternative fuel or high-fuel efficient vehicles by public agencies and private businesses	No County money is available for incentives
- Require local public agencies to contract with fleets that set targets and policies for lowering the average GHG emissions of their fleet vehicles	Excessive management oversight required to contract with fleets. County manages its own fleet.
- Require clean vehicles be purchased as part of municipal vehicle fleet procurement	County purchasing considers clean vehicles when buying new vehicles. Has large numbers of dual fuel and hybrid vehicles.
- Adopt regional joint-purchase agreements to facilitate local fleets to purchase EVs, hybrids, telematics, and other technology that can reduce GHG emissions	Consider in County budgeting process if coordination with other agencies can be accomplished.
- Require local specific plans for rideshare-designated parking spaces, new bus stops, employment centers, and commercial areas	Not applicable to rural communities
- Expand transit and rail services and clean-fueled transit vehicles	Transit agencies doing this to serve their customers.

GHG Mitigation Measures	Feasibility Assessment
- Promote ridesharing and last-mile connections	Support concept. Difficult to implement in rural areas with dispersed population.
- Create incentives for electric landscaping power tools and off-road equipment	No County funding available for incentives
- Promote smart driving strategies through public education and outreach	Not within County expertise/oversight
- Restrict idling for all vehicles, especially in sensitive areas such as near schools	Too hard to enforce. Signage encouraging limiting idling have significant costs and may not be effective.
Natural and Working Lands (NWL)	
Policy in this sector should balance carbon sequestration with other co-benefits. The overall objective is to maintain NWL as a carbon sink and minimize the net GHG emissions associated with management, biomass disposal, and wildfire events. Examples that could be considered include:	Most NWL not within County jurisdiction. National Park, National Forest, Tribal.
- Adopt policies to expand and improve management of urban forests for net long- term carbon storage	Rural communities/tree management that enhance current practices could be considered in areas that have street trees.
- Adopt policies that encourage management practices known to enhance carbon sequestration on NWL	Too vague – what practices would apply to lands under County jurisdiction such as foothill grasslands and oak woodland?
- Incorporate NWL conservation into local land use plans including adoption of a natural and working lands climate plan, land climate plan, and the recognition of the climate resiliency benefits of NWL	General Plan already includes related policies
- Adopt urban forestry and green infrastructure programs	Going more towards drought tolerant to meet water conservation goals.
- Adopt ordinances preserving trees in urban areas through the review of proposed land use	May apply to some areas with large oak trees, but new planting could provide enough

GHG Mitigation Measures	Feasibility Assessment
developments where trees are present on either public or private property	replacement trees to cover losses.
- Adopt ordinances preserving and enhancing carbon sequestration of wetlands, forests, croplands, and grasslands	County already preserves these lands.
- Adopt plans to conserve lands, water, and other natural features and resources for habitat function, watershed protection, air and water quality protection, and other ecosystem services	County already preserve these resources.
- Adopt zoning to allow empty lots and other underutilized space to be converted into community gardens and greenspace	Private property concerns.
- Adopt plans and support projects for forest management activities to restore California forest lands that have high tree mortality and unnaturally dense fuel loads to a fire resilient condition that will mitigate wildfire size and severity	Most forested areas are under federal jurisdiction. County already requires fuel mitigation on private lands around dwellings and businesses.
- Promote and encourage the development of value-added alternatives, such as composting, energy, biochar, and wood products to avoid open burning of forest biomass wastes	The County will gladly accept and process development applications proposing these facilities and conduct appropriate levels of CEQA review.
- Develop strategies to value the benefits of forest fuels reductions on upper-watershed water quality, quantity, and timing	Fits with normal forest management practices
Agriculture	
- Incorporate farmland conservation in local land use plans	Included in County General Plan
- Provide incentives for carbon sequestration and carbon-based conservation farming	No County incentive money available.

GHG Mitigation Measures	Feasibility Assessment
techniques, including the use of biochar and compost from biomass wastes that would have otherwise been landfilled or open burned	
- Promote value-added alternatives, such as composting, energy, biochar, and wood products, and prohibit open burning of agricultural biomass wastes	GP policy already in place to promote these activities.
- Develop incentives to reduce applications of pesticides and fertilizers and increase use of compost	No County funds available for incentives. Incentive for growers is to spend less money on pesticides and fertilizers
- Support development of farmers markets and provide guidance and support for local farmers, especially in disadvantaged communities	Natural trend. Farmers markets seem to be everywhere.
- Develop programs to encourage use of composting to enhance soil for carbon sequestration and soil healthy farms plans	NRCS program
- Promote grazing management and animal dietary strategies to reduce methane emissions from enteric fermentation	NRCS program
- Require best management practices for livestock waste for confined animal facilities	See Dairy CAP
Water	
- Adopt water-efficient landscaping ordinances (see CALGreen Divisions 4.3 and 5.3), including the use of compost and mulch, to reduce water use and encourage use of greywater for landscaping, when available	Done. Ordinance in place.
- Develop a plan requiring water recycling, and greywater and rain water reuse and provide funding for incentives and other program	Consider when upgrading WWTPs

GHG Mitigation Measures	Feasibility Assessment
delivery mechanisms if feasible	
- Develop a plan to quantify and reduce GHG emissions at publicly operated treatment works (POTWs)	Consider anaerobic digesters at WWTPs. Consider energy efficiency of process when buying new equipment.
- Develop a residential water efficiency auditing program	Most of County is on individual wells. CSDs should consider audits in their service areas.
- Create an incentive program to promote efficient water use projects	State provides incentives for water efficiency.
- Work with local water agencies to evaluate the impact of proposed new developments and land use plans on groundwater and long-term water supply	Required by CEQA
- Eliminate Homeowner Association requirements for lawns and landscaping	Consider. Seems like meddling in private property issue, but could mandate drought tolerant in new PUDs and Condos during CEQA review.
Waste Management	
- Prohibit disposal of organic materials at landfills and/or prohibit the jurisdictions' hauler(s) and self-haulers from taking organic material to landfills	Consider program if needed to meet State mandate.
- Require edible food recovery programs; require collected organic waste materials be used as feedstock for composting and anaerobic digestion; include assessment of 15 years organics recycling capacity needs in the General Plan; and provide appropriate zoning in compatible areas for large and community-scale composting and digestion operations	Potential liability and health hazard for edible. May need for future waste mandates.
- Implement residential and commercial waste prevention, recycling, organics collection, and	Will do what it takes to meet legislated mandates.

GHG Mitigation Measures	Feasibility Assessment
edible food recovery programs to meet requirements of AB 341, AB 1826, and SB 1383	
- Require generators of edible food to have contracts/agreements with food recovery organizations and prohibit edible food from being disposed or destroyed	Too intrusive, management difficult
- Adopt ordinances to meet zero waste goals by 2020	Seems excessive to require an ordinance unless mandated by the State. Waste haulers could offer composting of food waste as a collection option
- Adopt ordinances requiring hauling routes and fuels that minimize vehicle emissions compared to current practices (e.g., through use of renewable fuels, route optimization plan, etc.)	It is in the interest of waste haulers to optimize routes to save time and money. No ordinance required.
- Adopt a construction & demolition waste recycling ordinance (see CALGreen Divisions 4.4 and 5.4)	Incorporate CalGreen waste requirements into building permit/inspection process.
- Adopt an ordinance for zero waste from construction and demolition waste	Zero waste seems excessive with limited market for waste products.
- Adopt green building standards that include targets to exceed minimum State building standards for new construction, including requiring new construction to include bin space for organics recycling (see CALGreen Divisions 4.4 and 5.4 as well as Appendices A4.4 and A5.4)	Standards are updated frequently. Too hard to keep up with changes at the local level especially for a rural county.
- Require that landfills incorporate the financial impact of organics disposal reductions pursuant to SB 1383 into their Financial Assurance plans	The landfills will need to cover costs through tipping fees.
- Create an effective solid waste management plan to reduce source generation and to divert waste from landfills to achieve emission reductions and address in General Plan	Update plans when needed to meet State mandates.

GHG Mitigation Measures	Feasibility Assessment
- Ensure compost materials meet standards to be used in rural lands application for carbon sequestration	County solid waste department would need to comply with State standards for composting
- Expand anaerobic digestion capacity at existing wastewater treatment plants to allow them to accept food waste	Depends on cost benefit of upgrading the system. May be more feasible if the system is being expanded to meet new growth. Gas from WWTP requires extensive treatment to meet clean air standards.
- Require zero waste at public events, including food recovery and recycling	Difficult to manage and enforce. No resources available to manage this program.
- Require food waste reduction at commercial facilities such as restaurants, hotels, hospitals, etc., including food donations	Difficult to manage and enforce. Health hazard may be an issue.
- Require large commercial landscapers and public projects to use compost-based nutrients and soil amendments on landscaping and plants instead of artificial fertilizers and soil amendments	Are the materials more costly than fertilizer? If yes, implementation would be difficult. Are the reductions cost-effective?
- Implement recycled content procurement practices in all operations	Consider if meets needs and cost differential is not excessive.
- Implement a plan for food recovery for municipal food operations	Seems excessive. May cost more to recover and transport food than it is worth to recipients.
- Establish waste diversion programs like “pay as you throw” where people pay per pick up amount	May need to consider to get to zero waste.
Short-Lived Climate Pollutants	
– Require biogas generation at wastewater treatment plants and methane capture at landfill	County landfills capture biogas already.

GHG Mitigation Measures	Feasibility Assessment
facilities	
– Require that air conditioning and refrigeration units in new construction (and at major renovation) rely on refrigerants with low global warming potential (e.g., they use CO2 or ammonia instead of hydrofluorocarbons)	Would need to be technologically feasible and cost effective to implement. HVAC is a very large investment and builders would need assurances that the technology is proven and cost-effective.
– Promote alternatives to open pile burning as disposal options for woody biomass wastes	SJVAPCD Regulation already limits most burning.
– Support hazardous fuel reduction, defensible space clearing and forest fuel reduction in rural forested areas with high tree mortality and unnaturally high fuel loads to reduce the size and severity of catastrophic wildfires which reduces the release non-anthropogenic black carbon and methane	Already doing this with forest and land management practices.
– Adopt use of low global warming potential (GWP) alternative refrigerants	Best by regulations at State level.
– Work with local utility and waste management agencies to adopt a curbside program for old refrigerators, air-conditioning units, and automobiles to ensure proper disposal of refrigerants	Recyclers are required to collect refrigerants when they process refrigerators and autos.
– Provide incentives to reduce wood smoke by changing out uncertified wood heating devices to gas, electric, or pellet devices	SJVAPCD Incentives available
– Adopt programs, ordinances, or regulations to reduce wood smoke from residents, commercial, and recreational activities	SJVAPCD Rule 4901 applies.
– Require alternatives to wood heating such as heat pumps or gas heating devices in new developments, in appropriate climate zones,	SJVAPCD Rule 4901 applies to rural communities so few woodstoves are installed, but may be an option for rural development that uses propane for heat.

GHG Mitigation Measures	Feasibility Assessment
where infrastructure is available	
– Implement organics waste prevention, recycling, and food recovery programs	Impractical for County implementation due to rural nature of development.
Green Buildings	
- When determined to be feasible and achievable within the local jurisdiction, adopt "Tier 2" residential and commercial green building standards of the California Green Building Standards (CALGreen Code2), or a third party green building rating systems such as the LEED or GreenPoint Rated for new construction and existing building retrofits. CALGreen allows a local jurisdiction to adopt "Tier 2" as a more restrictive option. The California Health and Safety Code also allows local jurisdictions to adopt more restrictive building standards based on local conditions. Local jurisdictions also may adopt green rating systems, but in addition to the mandatory CALGreen requirements.	Not practical when codes are updated every three years. Local codes will be out of date and obtain little early benefit in slow growth areas.
- Incentivize implementation of CALGreen Code building code voluntary provisions to divert and recycle construction and demolition waste, and use locally-sourced building materials and recycled content building materials, including mulch/compost, to the extent possible	No incentive money available.
- Adopt Guidelines for incentivizing new buildings to maximize energy conservation designs to promote passive solar energy generation, natural ventilation, effective use of daylight, and on-site electricity generation	Incentives should be the future energy savings of the systems not upfront cash.
Encourage the use of on-site renewable energy combined with storage	Storage is not economically viable under most circumstances. Consider when costs decline.
- Link green building with transportation	Green building code requires EV charging ready wiring in homes and parking lots.

GHG Mitigation Measures	Feasibility Assessment
planning to encourage lowest possible transportation impacts	
- Develop strategies and goals to reduce urban heat islands through cool roofs, urban forestry (shade trees) and cool non-roof surfaces, including covered parking areas with PV systems to provide shading	PV required by Title 24 changes for ZNE. Cool surfaces should be considered if installation costs and maintenance are similar
- Require cool roofs and/or green roofs on new construction, for all buildings or a subset (commercial, multi-family, etc.) of building types	Consider some form of this, but better if part of Green building code for consistency.
- Require cool paving and/or light reflective permeable surfaces in sidewalks, patios, driveways, parking lots, or other paved areas	Consider if cost-effective.
Measures listed are from the 2017 Scoping Plan Update Appendix B Local Action	

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Appendix C:
Tulare County CAP Consistency Checklist

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Tulare County CAP Consistency Checklist

The CAP is expected to achieve its 2020 and 2030 target through compliance with State regulations adopted to implement the 2008 and 2017 Scoping Plans and local regulations and local implementation of certain State regulations regarding water conservation and solid waste. CEQA encourages Lead Agencies to address environmental impacts at the programmatic level rather than on a project by project basis whenever possible. For greenhouse gas impacts all major sources of emission are addressed at a programmatic level by the State. If the measures in the 2017 Scoping Plan are implemented as required by State legislation, sufficient reductions will be made to reach the 2030 target set by SB 32. In addition, the State's Cap-and-Trade Program provides a mechanism to close gaps in emissions if other programs and regulations fall short of expectations. The CAP takes the programmatic approach by demonstrating that applying State programs and regulations to Tulare County sources, the County will provide its share of the reductions needed by the State to achieve the targets.

Although, the County is expected to achieve its target with reliance primarily on State programs and regulations, circumstances such as a rapid increase in population and economic growth over State projections or failure of the regulatory measures to produce sufficient reductions could require substitute measures to be implemented. The CAP Progress Reports provide a mechanism to identify shortfalls in regulations and sustained higher than predicted growth rates. Another mechanism to ensure the County remains on track is to review individual development projects for consistency with the CAP and to perform a quantitative analysis on large projects to demonstrate that their contribution to greenhouse gas impacts is less than significant.

The following summarizes the programmatic elements of the CAP strategy that mitigate project impacts to less than significant levels.

Energy Related Impacts:

Building Energy Efficiency: Title 24 Building Energy Efficiency Standards

Building Water Use: CalGreen Building Code

Landscaping Water Use: Model Water Efficient Landscape Ordinance (MWELO)

Electric Utility Renewable Portfolio Standard

Cap-and-Trade Program

Mobile Source and Transportation Related Impacts

Vehicle Fuel Efficiency: LEV III Passenger Car and Light Truck Regulations, Heavy Duty Truck and Bus Regulation.

Renewable Fuels Use: Low Carbon Fuel Standard and incentive programs

Vehicle Miles Traveled: SB 375 Regional Targets/SCS, General Plan Policy Implementation, Complete Streets Policy, Bike Plans, SJVAPCD Rule 9410 and Rule 9510.

Solid Waste Impacts

CalRecycle Recycling and Diversion Mandate: Enforced at the County and waste hauler level. Homes and businesses participate in programs whether new or existing.

Incentive Funding Programs

Vehicle and energy efficiency tax credits. Cap and Trade money, utility sponsored programs, or other source used to fund energy efficiency projects, early adoption of solar energy, EVs, etc.

The CAP shows that the programs listed above are adequate for the State of California to reach its 2020 and 2030 targets.

The impacts of all new projects in the State in 2030 is equal to the combined impact of all projects built between now and 2030 after compliance with regulations in place at the time they are built. Where the growth will occur is forecast by the local governments, transportation planning agencies, MPOs, and the DOF. The impact intensity will vary due to differences in climate, jobs/housing balance, transportation infrastructure, and economics and is reflected in the emission modeling for Tulare County. Energy use accounts for differences in climate between the regions of California. Motor vehicle use and fleet data is based on conditions in each county.

Project CAP Consistency Checklist

CEQA allows the use of a qualitative approach for assessing greenhouse gas impacts for areas with a CAP. The following describes the qualitative approach that can be used for most projects proposed in Tulare County. A quantitative threshold based on reductions needed by Tulare County to achieve the 2030 target also included for projects where the qualitative approach is deemed inadequate.

Residential Projects

1. **General Plan Consistency Analysis**. Identify General Plan policies included in the CAP that apply to the project. Perform a qualitative assessment of whether the project is consistent. If an inconsistency exists does it rise to the level of a significant effect? If yes, are there mitigation measures available to reduce the impact to less than significant levels? A consistency table may be used to list the policies and describe the reasons why the project is consistent or not.

2. **Best Practices Review**. Review the project description and site design to determine if the project includes appropriate design features and energy efficiency measures. List measures where compliance with regulation is the best practice. If the project will exceed the requirements of regulations, indicate that in the analysis results. For example, commitment to exceed current Title 24 mandatory requirements by 10 percent or the project will install solar panels in excess of requirements. (Title 24

compliance reports cannot be prepared until building plans have been prepared because the energy efficiency calculations are based on all building components working together.)

3. **Projects Where Emission Quantification is Required**. Some projects may require emission quantification when requested by the project applicant or determined to be needed by the County on a case by case basis. Emission quantification is currently accomplished with the CalEEMod emission model and with off model calculations using ARB and Air District emission factors and methodologies. When quantification is done, the results can be provided for disclosure purposes or for comparison to a quantitative threshold of significance. For projects with buildout prior to 2020, the SJVAPCD threshold of a 29 percent reduction from business as usual (BAU) can continue to be used as a project threshold. For projects after 2020, no SJVAPCD threshold has been prepared to determine if a project is consistent with the 2030 target. In the absence of a SJVAPCD threshold, the County must develop its own threshold based on substantial evidence that demonstrates that the project's contribution to climate change is less than significant.

The 2018 CAP Update includes a development related emission inventory and a target inventory for 2030 based on achieving consistency with reductions required by the State to achieve the 2030 target. The 2030 CAP inventory is based on County emission sources with projected growth and adopted regulations applied in the milestone year. The County requires reductions of 10 percent from the 2030 adjusted BAU inventory that accounts for adopted regulations. Therefore, an additional 10 percent reduction is needed through the State SLCP program and Cap-and-Trade Program, additional regulatory measures or reductions from other sources not identified in the Scoping Plan. The Scoping Plan strategy assumes that the Cap-and-Trade Program will be used to make up the difference from the regulations on specific sources and the target. Therefore, no additional reductions from CEQA compliance by individual development projects is relied upon in the Scoping Plan. However, reductions from any source will help the State achieve the targets.

CAP Consistency Checklist

The CAP Consistency Checklist is intended for use by Tulare County staff in performing a qualitative assessment of development projects subject to CEQA review and to identify projects that should include a quantitative analysis to determine if project emissions would result in a potentially significant impact on climate change.

CAP Consistency Checklist

Checklist Question	Consistency Method and Criteria	Consistency Assessment
Residential Projects		
1. Is the project consistent with applicable General Plan goals and policies listed in CAP?	Review CAP General Plan policies to identify applicable policies. If not consistent, provide additional justification for approving the project in light of the inconsistency or revise the project or perform quantitative analysis.	Consistent/Inconsistent/Not Applicable. Discussion:
2. Is the project within a rural community plan or hamlet plan? If yes, is the project consistent with the plan?	If the project requires a plan amendment, findings are required on why the project is appropriate for the site and will be consistent with plan goals and policies after approval of the amendment. Amendments for large residential projects (500 units) in community plan areas or hamlets should perform a GHG quantitative analysis and should identify best management practices including subdivision design for walking and bicycling, energy efficiency and self-generation measures, and water conservation as part of the environmental review.	Consistent/Inconsistent/Not Applicable. Discussion:
3. Is the project in a Rural Community? If yes, is the density 5.2 units per acre or greater goal of the Tulare County Blueprint?	The Tulare County Blueprint includes a County-wide residential density goal of 5.3 units/acre. If a project in a Rural Community does not meet or exceed this target are there special circumstances that require larger lots for the development. The 5.3-acre goal is not a threshold or limit; however, approved projects are tracked annually to determine if new projects on average are achieving the goal. If under goal on a cumulative basis, the County will determine if incorporated cities and County as a whole achieving the goal. If the entire County including the cities is not achieving the target, additional project level analysis or mitigation may be required.	Consistent/Inconsistent/Not Applicable. Discussion:
4. Is the project a parcel map in a rural area of the County?	If yes and the project is consistent with the General Plan, no further review is required.	Consistent/Inconsistent/Not Applicable. Discussion:
5. Is the project a large subdivision or new	If yes, a GHG analysis is required. The analysis should	Consistent/Inconsistent/Not Applicable.

Checklist Question	Consistency Method and Criteria	Consistency Assessment
specific plan in a rural area of the County?	identify best management practices (BMP) including subdivision design for walking and bicycling, energy efficiency and self-generation measures, and water conservation as part of the environmental review.	Discussion:
6. Is the development site appropriate for locating an improved TCAT transit stop?	If yes, work with TCAG to identify a fair share contribution for the transit stop construction and reserve right of way if needed.	Consistent/Inconsistent/Not Applicable. Discussion:
7. Does the multifamily site plan have space set aside for recycling bins or compost collection?	Review site plan to determine if refuse collection area dimensions and location is consistent with County standards.	Consistent/Inconsistent/Not Applicable. Discussion:
8. Does the multifamily site include shared EV charging stations per CalGreen requirements?	Review site plan and/or project description to determine if charger installations meet CalGreen requirements. Currently only conduits to future charger locations are required.	Consistent/Inconsistent/Not Applicable. Discussion:
9. Does the project comply with Tulare County Solar Roof Ordinance?	Title 24 is expected to require solar installation in coming years.	Consistent/Inconsistent/Not Applicable. Discussion:
10. Does the project include drought tolerant landscaping and Irrigation systems meeting County standards and the MWELO.	Ensure developers are aware of drought tolerant landscaping and Irrigation requirements from County standards and the MWELO. Include the requirement as a standard condition of approval or similar mechanism	Consistent/Inconsistent/Not Applicable. Discussion:
11. Ensure building plans comply with Title 24 building energy efficiency, lighting, and interior water efficiency requirements.	Prior to issuing building permits, the County will review building plans to ensure Title 24 compliance. If the project's Title 24 compliance report quantifies percent above standard, track the information for the annual Progress Report.	Consistent/Inconsistent/Not Applicable. Discussion:
12. Is the project required to comply with SJVAPCD Rule 9510 Indirect Source Review	Review project description to determine if the project meets Rule 9510 applicability criteria. For example, 50 single family residential units or 2,000 square feet of retail development. Include Rule 9510 compliance as a condition of approval if applicable	Consistent/Inconsistent/Not Applicable. Discussion:

Checklist Question	Consistency Method and Criteria	Consistency Assessment
Non-Residential Project		
1. Is the project consistent with applicable General Plan goals and policies listed in CAP?	Review CAP General Plan policies to identify applicable policies. If not consistent, provide additional justification for approving the project in light of the inconsistency or revise the project or perform quantitative analysis.	Consistent/Inconsistent/Not Applicable. Discussion:
2. Is the project within a rural community plan or hamlet plan? If yes, is the project consistent with the plan?	If the project requires a plan amendment make findings on why the project is appropriate for the site and will be consistent with plan goals and policies after approval of the amendment. Amendments for large non-residential projects (100 square feet of retail or projects generating 4,200 ADT or higher) in community plan or hamlets should perform a GHG analysis to identify best management practices including site design for walking and bicycling, energy efficiency and self-generation measures, and water conservation as part of the environmental review.	Consistent/Inconsistent/Not Applicable. Discussion:
3. Is the project an agriculture oriented commercial or industrial project in a rural area of the County?	If yes and the project is consistent with the General Plan, the project will comply with applicable State and local regulations. No further GHG review is required.	Consistent/Inconsistent/Not Applicable. Discussion:
4. Is the project a general commercial or industrial project in a rural area of the County? If yes, is the project consistent with the General Plan?	If a plan amendment is required, perform a GHG analysis to identify best management practices including site design to encourage walking and bicycling, energy efficiency and self-generation measures, and water conservation as part of the environmental review. Sites in rural areas with no other development nearby would need to assess pedestrian measures; however, carpool and vanpool parking may be appropriate.	Consistent/Inconsistent/Not Applicable. Discussion:
5. Is the project required to construct a portion of a bicycle or pedestrian path that is part of an approved bicycle or mobility plan?	If yes, ensure that funding for construction of the project's fair share is included as a condition of approval.	Consistent/Inconsistent/Not Applicable. Discussion:
6. Is the development site appropriate for locating an improved TCAT transit stop?	Review TCAT transit maps to determine if project is on an existing line. For large projects consult with TCAG and	Consistent/Inconsistent/Not Applicable. Discussion:

Checklist Question	Consistency Method and Criteria	Consistency Assessment
	TCAT to determine if project is on a planned route and is suitable for a future transit stop. Work with TCAG to identify a fair share contribution for the transit stop construction and reserve right of way if needed.	
7. Does the site plan have space set aside for recycling bins or compost collection?	Review site plan to determine if refuse collection area dimensions and location is consistent with County standards.	Consistent/Inconsistent/Not Applicable. Discussion:
9. Does the site include shared EV charging stations per CalGreen requirements?	Review site plan and/or project description to determine if charger installations meet CalGreen requirements. Currently only conduits to future charger locations are required.	Consistent/Inconsistent/Not Applicable. Discussion:
10. Does the project comply with Tulare County Solar Roof Ordinance and/or Title 24 solar installation whichever is more stringent?	The project description should include the solar installation plans for the project. Compare installation plans to Solar Ordinance and Title 24 to determine if the project is in compliance.	Consistent/Inconsistent/Not Applicable. Discussion:
11. Does the project include drought tolerant landscaping and Irrigation systems meeting County standards and the MWELO.	Ensure developers are aware of drought tolerant landscaping and Irrigation requirements from County standards and the MWELO. Include the requirement as a standard condition of approval or similar mechanism.	Consistent/Inconsistent/Not Applicable. Discussion:
12. Does the project comply with Title 24 building energy efficiency, lighting, and interior water efficiency requirements?	Prior to issuing building permits, the County will review building plans to ensure Title 24 compliance.	Consistent/Inconsistent/Not Applicable. Discussion:
13. Is the project required to comply with SJVAPCD Rule 9510 Indirect Source Review	Review project description to determine if the project meets Rule 9510 applicability criteria. For example, 50 single family residential units or 2,000 square feet of retail development. Include Rule 9510 compliance as a condition of approval if applicable.	Consistent/Inconsistent/Not Applicable. Discussion:
14. Does the project employ over 100 employees arriving for work during peak traffic hours?	Determine if the project has the potential to be a large employer. Include a standard condition of approval to inform the applicant that the project may be subject to Rule 9410 Employer Trip Reduction Plans.	Consistent/Inconsistent/Not Applicable. Discussion:

Checklist Question	Consistency Method and Criteria	Consistency Assessment
Projects Requiring Quantitative Analysis		
1. Is the project inconsistent with one or more checklist questions?	If the inconsistency would result in a potentially significantly increase GHG emissions, a quantitative analysis may be used to determine if emissions would exceed the threshold of significance for Tulare County.	Quantitative Assessment Required/Not Required. Discussion:
2. Does the project contain 500 or more residential units?	Residential projects of this magnitude are considered to be large projects requiring a quantitative GHG analysis to determine significance. This constitutes more than one year's average growth in County residential development and provides sufficient scale to fully integrate energy and water use efficiency, walkability, and infrastructure supporting multimodal transportation into the project. The threshold of significance is a 10 percent reduction from BAU by 2030 or per capita emissions of 4.12 MTCO2e per person in 2030.	Quantitative Assessment Required/Not Required. Discussion:
3. Does the project contain 100,000 square feet or more of retail space.	Shopping centers of this size would provide a large percentage of the retail services of any Tulare County rural community, and could be constructed in a designated transportation corridor to serve a regional market. Shopping centers provide an opportunity to fully integrate energy and water use efficiency, walkability, and infrastructure supporting multimodal transportation into the project. The County threshold of significance for projects requiring quantification is a 10 percent reduction from BAU by 2030. Per capita thresholds are not applicable to retail, service, and industrial uses.	Quantitative Assessment Required/Not Required. Discussion:
4. Does the project generate over 4,200 average daily trips?	Motor vehicles produce the largest share of GHG impacts from development projects and provide a surrogate to determine impacts from non-residential projects of many types. The approximate number of trips generated by 100,000 square feet of regional retail are 4,200 trips per day. Trip rates for other uses can be obtained from ITE Trip Generation Manual. An exception to this quantification	Quantitative Assessment Required/Not Required. Discussion:

Checklist Question	Consistency Method and Criteria	Consistency Assessment
	threshold is neighborhood commercial uses with very high trip generation rates including fast food restaurants and convenience markets with gas pumps. These uses in rural communities often provide services not previously available to residents and required travel to neighboring cities. These uses have high rates of pass by trips and diverted link trips that occur on the way to another destination and are not considered new trips. Highway commercial uses also have high percentages of pass by trips and diverted link trips and are not expected be accessed by vehicles other than cars and trucks. Supermarkets have a high daily trip generation rate of 122 trips/ksf, so a 35,000 square foot supermarket would exceed the 4,200 trip per day quantification threshold.	
Notes. This checklist does not address all potential types of projects. Tulare County staff may consider the circumstances of individual projects in determining whether a qualitative or quantitative assessment is required. Industrial projects with stationary sources of emissions such as boilers and process heaters or energy generation are subject to SJVAPCD permit and BMPs for stationary sources. Large industrial projects are subject to mandatory emission reporting and may be subject to Cap-and-Trade. Therefore, industrial projects will generally be subject to a qualitative assessment using the checklist.		

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