



Department of Development Services

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MEMORANDUM

DATE: April 11, 2017
TO: Butte County Board of Supervisors
FROM: Tim Snellings, Development Services Director
RE: Butte County Climate Action Plan 2016 Annual Report

Recommendation: Accept for information and provide any additional comment and direction to staff.

The Butte County Climate Action Plan 2016 Annual Report is attached for the Board of Supervisor's review. The Butte County Climate Action Plan was adopted in February 2014. Since that time, the Department of Development Service has provided three quarterly monitoring reports, one 2015 Annual Report, and one 2016 Mid-Year Report in support of General Plan Conservation and Open Space Element COS-A1.1.e., which requires monitoring and reporting of the CAP and related greenhouse gas (GHG) emissions.

This Annual Report, like previous reports, serves as a check-in on CAP-related actions taken by Butte County since adoption, which can inform staff, decision-makers, and the community, and shape the next steps for continued CAP implementation.

Through the General Plan and other mechanisms, Butte County strives to create a more sustainable place for residents and businesses by enhancing economic opportunity, viability, and community well-being while protecting and restoring the natural environment. To this end, the County developed the CAP to help sustain natural resources, promote efficient growth and development, ensure long-term resiliency to a changing environmental and economic climate, and improve transportation. The CAP is also consistent with state regulations and guidance documents that address GHG emissions, including Assembly Bill (AB) 32, Senate Bill (SB) 32, and the AB 32 Scoping Plan.

The CAP is also the County's mitigation strategy to address GHG emissions in a manner consistent with the California Environmental Quality Act (CEQA), and serves as a Qualified GHG Reduction Strategy. The CAP establishes GHG reduction targets of 15% below baseline (2006) levels by 2020, and 42% below baseline levels by 2030. These targets are consistent with state regulations and best practices that were in place at the time the CAP was developed.

Butte County Climate Action Plan

2016 ANNUAL REPORT



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I. Introduction

The Butte County Climate Action Plan (CAP) was adopted in February 2014, with the goal of reducing the County's greenhouse gas (GHG) emissions. The CAP helps to promote sustainable practices and public health in the unincorporated areas of Butte County, allowing the County to work toward achieving its adopted GHG reduction targets in a manner consistent with state guidance and law. The CAP also includes measures to address the County's vulnerability to natural hazards that may be exacerbated by climate change.

The CAP directs the Butte County Department of Development Services (DDS) to prepare an annual progress report on CAP implementation to the Board of Supervisors. Consistent with this direction, this report presents an overview of the County's GHG emissions since the CAP was adopted and progress made in implementing the CAP GHG reduction measures, and explains whether the County is on track to meet its adopted GHG reduction targets. Elected officials, County staff, and the public can use this report to better understand the County's implementation progress since CAP adoption and develop a path forward to achieve a more sustainable region.

ABOUT THE CLIMATE ACTION PLAN

Butte County's CAP is a strategic plan to reduce GHG emissions resulting from activities in the unincorporated area. It implements the County's General Plan, specifically General Plan Policy COS-A1.1, which directs the County to "develop a Climate Action Plan, which, in combination with other existing policies and regulations by other agencies and business sectors of the economy, would achieve reduction consistent with State guidelines using methodology deemed appropriate at time of quantification." This directive comes from the County's General Plan, which requires "monitoring and reporting of GHG emissions."

The CAP is also the County's mitigation strategy to address GHG emissions in a manner consistent with the California Environmental Quality Act (CEQA), and serves as a Qualified GHG Reduction Strategy. The CAP establishes GHG reduction targets of 15% below baseline (2006) levels by 2020, and 42% below baseline levels by 2030. These targets are consistent with state regulations and best practices that were in place at the time the CAP was developed.

In the first half of 2017, the California Air Resources Board (CARB) is set to adopt a recommended target for local governments of 6.0 metric tons of carbon dioxide equivalent (MTCO₂e) per person. This target is a suggestion, and the County is free to select an alternative target as long as the target achieves meaningful GHG reductions as required by State CEQA Guidelines. The County is set to complete a full GHG inventory and update to the CAP by 2019. At this time, the County may adopt new or alternative targets as desired.

The CAP requires DDS to report annually on the County's progress in implementing the CAP. Monitoring efforts began in March 2015. County staff, with assistance from Michael Baker International, provided quarterly updates on CAP implementation in May 2015 and November 2015. These reports summarized what actions the County had taken to implement the CAP since adoption. The CAP 2015 Annual Report, presented in February 2016, explained implementation progress as well as a summary of changes in GHG emissions from the baseline to 2013. A successive mid-year report, in September 2016, identified additional implementation progress and GHG reduction trends.

This Annual Report provides another update and discusses the County's continued implementation efforts leading to GHG emissions reductions. It also explains how GHG emissions have changed through 2015, relative to the 2006 baseline year.

THE COUNTY'S COMMITMENT TO ADDRESSING CLIMATE CHANGE

Through the General Plan and other mechanisms, Butte County strives to create a more sustainable place for residents and businesses by enhancing economic opportunity, viability, and community well-being while protecting and restoring the natural environment. To this end, the County developed the CAP to help sustain natural resources, promote efficient growth and development, ensure long-term resiliency to a changing environmental and economic climate, and improve transportation. The CAP is also consistent with state regulations and guidance documents that address GHG emissions, including Assembly Bill (AB) 32, Senate Bill (SB) 32, and the AB 32 Scoping Plan. These regulations and guidance documents are discussed further in **Section III**.

THE IMPORTANCE OF MONITORING AND REPORTING PROGRESS

As directed by the CAP, in accordance with Butte County General Plan, this Annual Report measures the implementation progress of the CAP and provides an estimate of changes in GHG emissions between 2006 and 2015. Monitoring the progress of the CAP measure implementation helps the County understand successes and opportunities to improve or build on existing efforts to achieve its GHG emissions reduction targets. County staff can use this report to identify potential new strategies that may achieve additional reductions. Additionally, providing information about progress to elected officials and the public can help sustain momentum and support for future sustainability efforts.

STATE ACTIONS

California law first addressed climate change in 1988, when AB 4420 directed the state to prepare a GHG inventory and study the impacts of climate change. Since then, California has adopted several laws to assess climate change, analyze and reduce GHG emissions and their effects, and prepare for the impacts of climate change. Many of these laws and associated regulations affect local governments, although only some create specific requirements for individual communities. Butte County's efforts to reduce emissions are supported by actions at the state level, some of which provide reductions through no effort of the community. State regulations provide important guidance for GHG inventories, by offering guidance on baseline years, relevant horizon years, and evaluation of forecasts to set appropriate emissions reduction targets.

Key state actions on GHG emissions include the following:

- **Executive Order S-3-05:** In 2005, then-Governor Schwarzenegger signed Executive Order (EO) S-3-05, which establishes GHG reduction goals for the state of reducing emissions to 2000 levels by 2010, reducing emissions to 1990 levels by 2020, and reducing emissions 80% below 1990 levels by 2050.
- **The California Global Warming Solutions Act of 2006:** This law, also known as AB 32, codifies into law the 2020 GHG reduction goal established by EO S-3-05. It directs the state to reduce GHG emissions to 1990 levels by 2020 through a combination of market-based and regulatory actions. AB 32 designates CARB as the agency responsible for implementing these actions and achieving the GHG reduction target.

- **AB 32 Scoping Plan:** AB 32 directs CARB to prepare a Scoping Plan that identifies the specific actions CARB will take to achieve the state GHG reduction goals. It also provides information on actions that local governments can take to reduce GHG emissions in a manner consistent with state efforts. In accordance with AB32, the Scoping Plan is updated at least once every five years. The first major update was adopted in 2014, and a second update is set to be adopted in the first half of 2017.
- **EO B-30-15:** This 2015 executive order from Governor Brown establishes a statewide GHG reduction goal of reducing emissions 40% below 1990 levels by 2030. It also directs state agencies to take a number of actions to reduce GHG emissions and prepare for the effects of climate change.
- **Pavley Vehicle Standards and the Low Carbon Fuel Standards:** These two regulations work to reduce emissions from vehicle use by improving the fuel efficiency of cars and decreasing the carbon intensity of vehicle fuels. According to the CAP, this action will reduce 2020 GHG emissions in Butte County by 79,730 MTCO₂e.
- **Renewables Portfolio Standard:** The Renewables Portfolio Standard requires that electricity suppliers in California obtain 33% of their electricity from eligible renewable sources (such as solar, wind, and geothermal) by 2020, and 50% of their electricity from eligible renewable sources by 2030. According to the CAP, this action will reduce 2020 GHG emissions in Butte County by 16,860 MTCO₂e.
- **Title 24 Energy Efficiency Standards:** The Title 24 Energy Efficiency Standards establish minimum energy use performance requirements for new homes and nonresidential buildings in California. The standards regularly become more stringent every three years, ensuring that new buildings are consistently more energy efficient than older structures. According to the CAP, this action will reduce 2020 GHG emissions in Butte County by 5,350 MTCO₂e. This estimate does not take into account the stated goal of having all new buildings in California eventually be zero net energy, meaning that they generate as much energy in a year as they use.

Since the Butte County 2016 Interim Report was prepared in August 2016, California has taken additional action at the state level to reduce GHG emissions.

Senate Bill 32 and Assembly Bill 197

SB 32 and AB 197 are a pair of bills adopted by the state legislature and signed by Governor Brown in 2016. SB 32 codifies the statewide 2030 reduction goal of 40% below 1990 levels first outlined in EO B-30-15. AB 197, a companion bill, requires CARB to make specific information about GHG emissions and reduction strategies available in updates to the AB 32 Scoping Plan and through other sources.

AB 32 Target 2030 Scoping Plan

In EO B-30-15, Governor Brown directed CARB to prepare a second major update to the Scoping Plan, outlining how the state could achieve a GHG reduction goal of 40% below 1990 levels by 2030; this target was subsequently codified by SB 32, as discussed above. The 2030 Target Scoping Plan, a draft of which was released in December 2016, meets this direction by providing a set of actions for achieving the more ambitious 2030 reduction level. This update to the Scoping Plan also details recommendations for how local governments can achieve reductions in a manner consistent with state efforts, in accordance with AB 197, including suggesting potential 2030 and 2050 reduction targets for local governments. The 2030 Target Scoping Plan is set to be adopted by CARB in the first half of 2017.

II. Butte County Community GHG Emissions Summary

TRACKING GHG EMISSIONS METHODS AND REGULATORY SETTING

Using the CAP Implementation and Monitoring Tool developed by Michael Baker International, a quantitative analysis of annual GHG emissions for 2014 and 2015 (the latest available data years) was conducted. This analysis does not involve a complete inventory of emissions, but estimates emissions using data from the CAP Implementation and Monitoring Tool, readily accessible data from a variety of sources, and County records. The CAP recommends conducting a full inventory of GHG emissions within five years after the CAP was adopted (by 2019), and every successive five years. Because of the level of effort required to prepare a full GHG emissions inventory, these annual quantitative estimates provide a more efficient method for interim analysis of CAP progress. The team updated activity data for the transportation, energy, and solid waste disposal sectors and estimated changes in GHG emissions for the agriculture, off-road equipment, water, and wastewater sectors using demographic data. Then, the team used the Monitoring Tool to translate those changes into GHG emissions estimates.

KEY TERMS

This analysis uses several key terms to provide further detail about annual GHG emissions, including the following:

- **Activity:** Any action that directly or indirectly results in GHG emissions. Examples include electricity use, vehicle use, and solid waste disposal. Activity data is a discrete measure of how much of an activity occurred in Butte County in a certain year (e.g., how much waste was thrown away in a given year). The measurement unit of activity data varies depending on the activity.
- **Baseline year:** The year against which future changes are measured. Many communities in California use a baseline year from 2005–2008 for consistency with AB 32. Butte County's baseline year is 2006.
- **Carbon dioxide equivalent (CO₂e):** A unit of measurement commonly used to measure GHGs, which accounts for the varying potency of different GHGs. GHGs in this report are measured in metric tons of carbon dioxide equivalent (MTCO₂e).
- **Emission factor:** A number that describes the amount of GHGs released per unit of a certain activity (e.g., GHGs per unit of natural gas used). Factors are provided by utility companies, state agencies, and guidance documents.
- **Greenhouse gas (GHG):** A gas capable of trapping heat radiated out by the earth and reflecting it back rather than allowing it to escape, much like the glass walls and ceiling of a greenhouse. Consistent with the US Community Protocol and the Local Government Operations Protocol (LGOP), the six GHGs assessed in the inventory are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). GHGs are often measured in units of CO₂e.
- **Sector:** A category of activities responsible for GHG emissions, such as transportation, water use, or energy use. Sectors may comprise multiple GHG sources and activities.

BASELINE COMMUNITY-WIDE GHG EMISSIONS

Butte County's 2006 GHG emissions inventory and forecast set the groundwork for the CAP planning process. This inventory used the methods and protocols described above to determine the largest contributors to community-wide GHG emissions. As shown in **Table 1**, agriculture was the largest source of GHGs in 2006 (390,400 MTCO_{2e}, or 43% of total emissions). Transportation (265,450 MTCO_{2e}, 29%) and residential energy use (150,630 MTCO_{2e}, 17%) were the next two largest sectors. Nonresidential energy use (61,450 MTCO_{2e}, 7%) and off-road equipment, solid waste, wastewater, and water cumulatively accounted for the remaining emissions (43,700 MTCO_{2e}, 5%) in 2006. This baseline inventory was used to create multiple emissions forecasts, which allowed the County to project emissions for 2020 and 2030, and determine the measures that would help Butte reach its established GHG reduction targets.

TABLE 1: 2006 Baseline Greenhouse Gas Emissions by Sector, MTCO_{2e}

Sector	MTCO _{2e}	Percentage of Total
Agriculture	390,400	43%
Transportation	265,450	29%
Residential Energy	150,630	17%
Nonresidential Energy	61,450	7%
Solid Waste	13,980	2%
Off-Road Equipment	17,360	2%
Water and Wastewater	12,360	1%
Total	911,630	100%

POST-2006 COMMUNITY-WIDE GHG EMISSIONS

As described above, the CAP Implementation and Monitoring Tool provides an estimate of post-2006 GHG emissions in the unincorporated data using readily accessible data and County reports. For some GHG sectors (agriculture, off-road equipment, water, and wastewater), emissions are estimated based on observed demographic trends.

The team made the following assumptions for post-2006 GHG emission estimates:

- Emissions in the agricultural sector remain constant. Activity in the agricultural sector depends on changes in economic systems and local weather conditions, which can be difficult to accurately forecast. As such, these emissions are held constant in the absence of any specific and accurate predictions.
- Transportation activity remained constant between 2014 and 2015, as 2015 data was not available when this report was prepared.
- Emissions from the off-road equipment sector grew at the same rate as the population in Butte County. As off-road emissions are caused by various household and commercial activities, it is assumed that these emissions will grow as population increases.

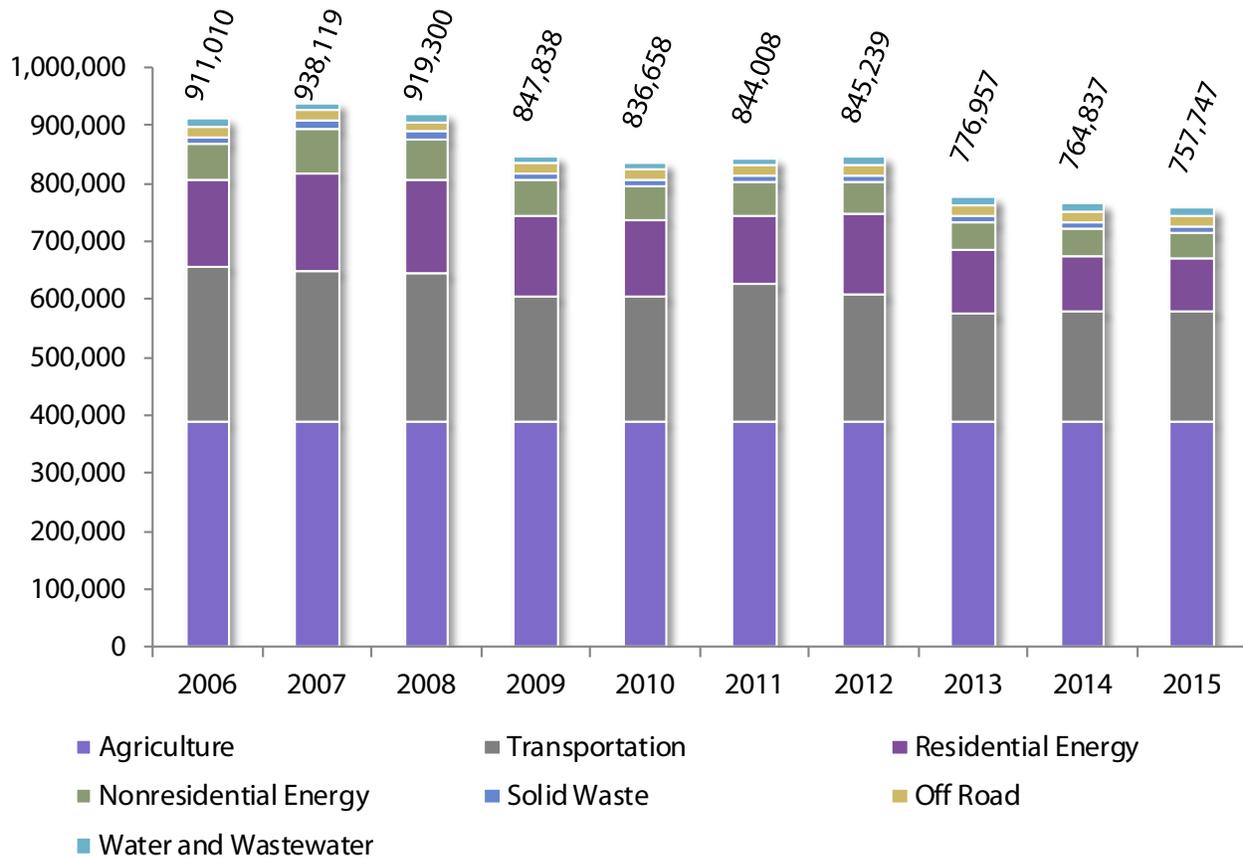
- Water and wastewater use (used to estimate water and wastewater emissions) grew at the same rate as Butte County's population. In the absence of conservation behaviors, people use a fairly consistent amount of water per person from year to year. Thus, it is assumed that water and wastewater use will follow population changes.

Table 2 and **Figure 1** show changes in GHG emissions by sector since 2006.

TABLE 2: Changes to GHG Emissions By Sector Since 2006

Sector	2006 MTCO ₂ e	2013 MTCO ₂ e	2014 MTCO ₂ e	2015 MTCO ₂ e	Percent Change, 2006–2015
Agriculture	390,400	390,400	390,400	390,400	0%
Transportation	265,450	186,580	188,510	188,510	-29%
Residential Energy	150,630	108,500	95,610	92,290	-39%
Nonresidential Energy	61,450	47,630	46,240	42,460	-31%
Solid Waste	13,980	12,520	12,530	12,310	-12%
Off-Road Equipment	17,360	18,270	18,400	18,530	7%
Water and Wastewater	12,360	13,060	13,150	13,250	7%
Total	911,630	776,960	764,840	757,750	-17%

FIGURE 1: Estimated Greenhouse Gas Emissions by Sector 2006–2015



SUMMARY OF GHG REDUCTION TRENDS

The CAP directs Butte County to reduce GHG emissions to 15% below 2006 levels, or 774,890 MTCO₂e by 2020. The 2015 estimate of GHG emissions is 757,750 MTCO₂e, approximately 17% below 2006 levels. The decrease appears primarily due to a decrease in residential natural gas use, cleaner supplies of electricity, and more fuel-efficient vehicles coupled with a decline in vehicle miles traveled. While this report indicates Butte County has exceeded its 2020 reduction target, it is possible for emissions to rise to above target levels (for example, a cold year would likely cause an increase in residential natural gas use). Additionally, this estimate of 2015 GHG emissions, while useful for planning purposes and evaluating County progress, is not a substitute for a full inventory update, and such an update could show that total GHG emissions are actually at a higher level, affecting the assumed 2020 target achievement. The County must continue to implement the CAP to ensure that GHG emissions remain below the 2020 target level.

III. 2015 CAP Implementation Status

Since the adoption of the CAP in 2014, Butte County has continued to take actions that reduce GHG emissions. The County has completed several projects and promoted programs to the general public that have led to reductions in electricity and natural gas use in buildings, decreased water use and waste

generation, increased renewable energy and production, and decreased vehicle miles traveled. Some of these recent ongoing or completed successes are as follows:

Community Choice Energy: Butte County is still evaluating the feasibility of implementing a Community Choice Energy (CCE, also known as Community Choice Aggregation or CCA) program. CCE programs allow local governments to procure electricity and supply it to customers, as a substitute for service from an investor-owned utility (IOU) such as PG&E. As CCE allows for increased local control of electricity supplies and rates, it enables electricity customers to receive a greater supply of renewable energy than is typically provided by an IOU, for a comparable or lower cost. There are currently five CCE programs operating in California, with several other programs under consideration or preparing to launch in 2017. Butte County is currently soliciting proposals to evaluate the feasibility of a CCE. The County will then decide whether to move forward with the preparation of a feasibility study.

Property Assessed Clean Energy (PACE): Butte County participates in multiple PACE programs, which provide financing opportunities for property owners to make energy efficiency, water efficiency, and renewable energy improvements. These improvements may include high-efficiency heaters and air conditioners, insulating windows and doors, cool roof surfaces, solar photovoltaic panels, artificial turf, and water-efficient appliances, among many others. PACE program providers in Butte County include the Home Energy Retrofit Opportunity (HERO) program, Ygrene, FigTree, and California First. In 2016, 100 homes in the unincorporated areas of Butte County made retrofits through a PACE program and leveraged \$1.6 million in PACE financing to complete various efficiency upgrades.

Energy Efficiency Rebate Programs: In addition to PACE programs, the state, utility companies, and local and regional partnerships offer a variety of rebate programs to incentivize energy efficiency retrofits in existing buildings. In the unincorporated areas of Butte County, 230 retrofit projects were completed between 2013 and 2015 and January through June 2016, another 25 were completed. The 2016 retrofits save an estimated 46,460 kilowatt hours (kWh) of electricity annually, and the 2013–2015 retrofits save approximately 2,779,350 kWh each year. Major projects included an agricultural irrigation retrofit program in Nelson (saving 697,530 kWh annually), upgrades to air circulation pumps for an agricultural operation in Durham (saving 449,050 kWh annually), and improvements to a grocery refrigerator case in Magalia (saving 108,520 kWh annually). **Table 3** lists the types of rebate programs available in Butte County from 2013 through the first half of 2016. Data from the second half of 2016 is not yet available.

TABLE 3: Energy Efficiency Rebate Programs

Retrofit Type	Number of Retrofits	Estimated kWh Savings
Agricultural irrigation upgrades	6	1,132,540
Appliance replacements	38	137,670
Cool roof installation	1	Unknown
Food service improvements	1	Unknown
HVAC upgrades	13	454,040
Lighting upgrades	117	468,670
Monitoring and smart sensors installation	3	46,890

Retrofit Type	Number of Retrofits	Estimated kWh Savings
Pool retrofits	10	80,660
Refrigeration improvements	26	461,990
Surveys and education	9	7,290
Vending machine upgrades	2	10,320
Water efficiency and heating improvements	19	21,080
Whole building retrofits	3	4,660
Other	7	Unknown
Total	255	2,825,810

Electric vehicles: Electric vehicles (EVs) have become an increasingly popular choice for new car buyers as EV technology improves, leading to increased range (miles per charge) and costs decline. While EVs are most common in the major population centers of Southern California and the San Francisco Bay Area, they are now found in virtually every county of California. These vehicles emit no pollution from their tailpipes, and the GHG emissions associated with recharging an EV's batteries is much lower than the emissions from burning a comparable amount of gasoline or diesel. Additionally, EVs can be recharged by electricity from a renewable energy system such as a rooftop solar panel, making them entirely GHG-free to operate. According to California's Clean Vehicle Rebate Project, there are 115 EVs in Butte County, of which approximately 31 are registered in the unincorporated area.

Solar Panels: Butte County has a number of policies to encourage the installation of solar photovoltaic (PV) panels, particularly smaller-scale PV panels that provide electricity to a specific property. According to data collected by the California Public Utilities Commission there were 146 newly approved solar PV installations in the unincorporated area of Butte County in 2015, totaling approximately 1,190 kilowatts (kW) of solar PV potential. In the first 11 months of 2016 (December data is not yet available) there were 98 new solar PV installations approved in the unincorporated areas of Butte County, totaling approximately 1,020 kW. **Table 4** summarizes 2016 solar PV approvals in the unincorporated area of Butte County, as reported by the CPUC.

TABLE 4: 2016 Approved Solar PV Installations

Installation Type	Number of Installations	Total Installation Size (kW)	Average Installation Size (kW)
Residential	94	671.38	7.14
Commercial	3	280.66	93.55*
Industrial	1	67.46	67.46
Total	98	1,019.50	-
<i>*The size of the commercial solar arrays were 121.7 kW, 56.8 kW, and 102.2 kW.</i>			

Butte County also maintains data on solar PV system installations. According to the Building Division, commercial and industrial facilities in the unincorporated area have installed approximately 8,940 kW of solar PV potential since the CAP was adopted, substantially more potential than reported by the CPUC. A likely reason for this discrepancy is that larger PV arrays may not be reported to the CPUC due to differences in how systems of varying sizes are regulated.

Annexations: The incorporated communities of Butte County have recently annexed approximately 32.4 acres of land that was previously part of the unincorporated County area. Annexations decrease emissions in the unincorporated area by “reassigning” the emissions from the annexed land from the County to the incorporated communities. The most recent annexations in Butte County are Oroville annexing approximately 7 acres east of Table Mountain Boulevard, and Chico annexing approximately 25.4 acres north of Humboldt Road. By themselves, these two annexations have reduced emissions in the unincorporated area by approximately 80 MTCO₂e. In total, incorporated communities in Butte County have annexed approximately 460 acres since the CAP was adopted, reducing emissions by 1,080 MTCO₂e.

Government operations energy efficiency: The County has continued to improve the energy efficiency of County government buildings. The County has conducted approximately 15 retrofits to the HVAC systems of County government buildings, including replacing old boiler equipment (in some cases, installed in the 1960s) with more efficient modern devices. The County recently replaced a lift station installed at detention ponds at Juvenile Hall and the County Jail, and has constructed two new buildings (the Hall of Records and the Chico Public Works Yard) to green building standards. The County has also begun to identify further energy efficiency and green buildings projects as part of the 2017-2018 budget process, including evaluating the feasibility of a solar PV array at the Hall of Records.

Some of these projects are included in the Government Campus Infrastructure part of Phase 1 of the Oroville Government Center Master Plan, prepared in 2012. This plan includes the design and construction of utility infrastructure improvements and detention ponds for future buildings and site improvements on the 126-acre Oroville Government Center. The plan emphasizes replacing and installing new sewer, storm drains, and water lines where needed. The lift station and detention ponds at Juvenile Hall and the County Jail are part of this effort, and are sized for future improvements. Phase 1 also includes dry utilities, such as electrical service to the new lift station. Future phases of this plan will continue to address energy efficiency in County facilities, including the sub-metering of buildings that are currently on one meter.

IV. Looking Forward

Butte County's CAP Work Plan, adopted with the CAP in February 2014, separates measures from the CAP into different implementation time frames. Currently, DDS is working with all responsible departments in determining the status of the Work Plan, including the level of progress made on all CAP measures. The Work Plan will be updated in time for the next monitoring report, which will be presented to the Board in fall, 2017.