4 GREENHOUSE GAS EMISSIONS REDUCTION TARGET

This chapter establishes the local target of GHG emissions reductions that Vacaville will strive to reach through implementation of this Energy and Conservation Action Strategy.

As explained in Chapter 1, the California Air Resources Board (CARB) 2008 statewide Climate Change Scoping Plan (2008 Scoping Plan) represents the State's strategy for achieving the GHG emissions reduction target identified in Assembly Bill (AB) 32, the 2006 Global Warming Act. The AB 32 target is to reduce GHG emissions to 1990 levels by the year 2020. In order to identify the appropriate level of GHG emissions reductions needed statewide over the 12 years from 2008 to 2020, the 2008 Scoping Plan used statewide GHG emissions inventory data that had been collected through the year 2004, and that projected future emissions based on prior inventory data. Specifically, the 2008 Scoping Plan identified:

- Statewide 1990 GHG emissions (to establish the targeted amount of reductions needed): 427 million metric tons of carbon dioxide equivalent ($MTCO_2e$).
- Statewide 2002-2004 GHG emissions: 469 million $MTCO_2e$ (average for three years).
- Projected statewide 2005-2008 GHG emissions: 498 million $MTCO_2e$ (average for four years).
- Projected statewide 2020 GHG emissions if no actions were taken to reduce GHG emissions (i.e. business as usual [BAU] conditions): 596 million $MTCO_2e$.

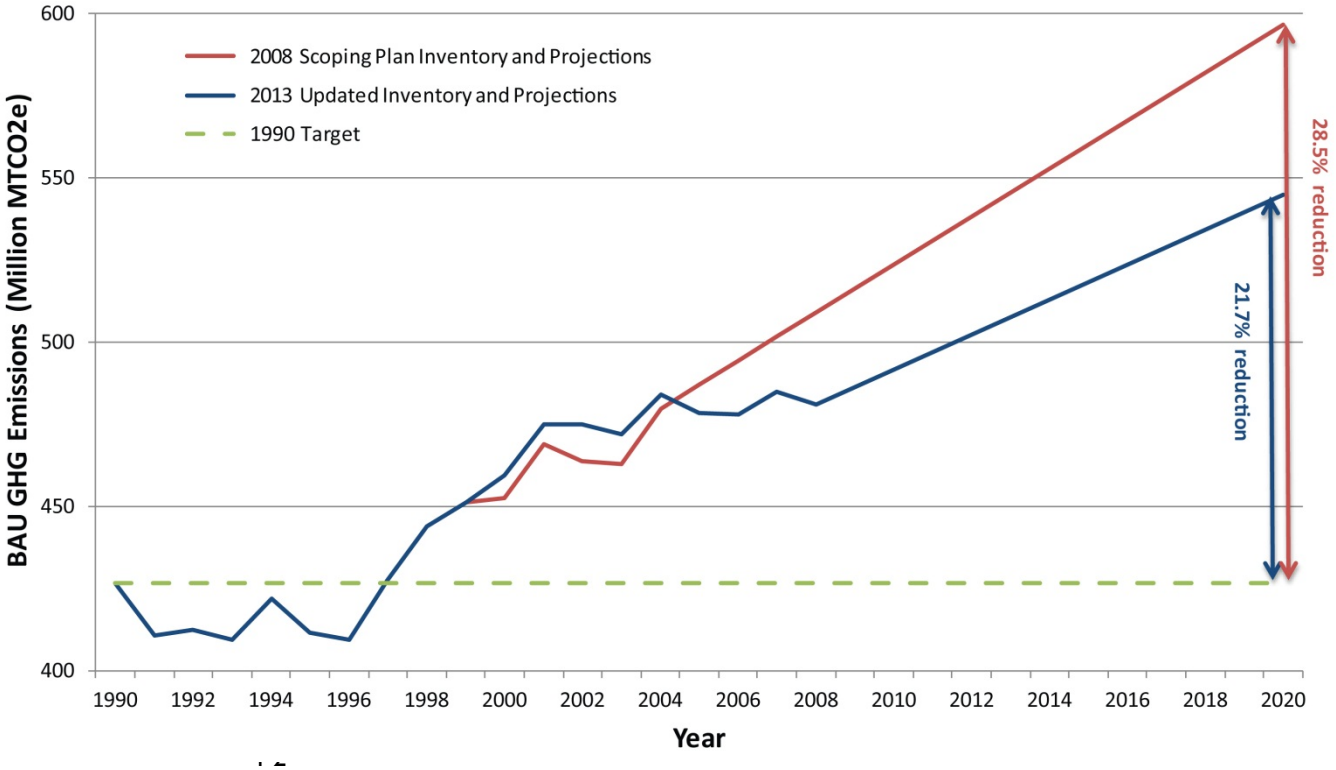
Using the above data, the 2008 Scoping Plan concluded that in order to achieve the targeted 1990 levels of GHG emissions (427 million $MTCO_2e$), the State would need to reduce GHG emissions as follows:

- Reduce 2005-2008 GHG emissions (498 million $MTCO_2e$) by 71 million $MTCO_2e$, an approximately 15-percent reduction.
- Reduce 2020 BAU GHG emissions (596 million $MTCO_2e$) by 169 million $MTCO_2e$, an approximately 30-percent reduction.

Based on the conclusions above, the 2008 Scoping Plan recommends, but does not require, that local governments (cities and counties) reduce GHG emissions by 15 percent below "current" (i.e. 2005-2008) emissions by 2020. Some local governments have used this recommended target for local GHG emission reduction plans, while others have established their target as a 30-percent reduction from 2020 BAU GHG emissions. Some jurisdictions have established other targets that take into account local considerations, such as local air district guidance.

CARB is in the process of completing a five-year update to the 2008 Scoping Plan, as required by AB 32. A discussion draft of the 2013 Scoping Plan was released on October 1, 2013. The 2013 Scoping Plan update defines CARB's climate change priorities for the next five years and lays the groundwork to reach the post-2020 goal set forth in Executive Order S-3-05, including a recommendation for the State to adopt a mid-term target. Because the State has not yet adopted a mid-term target, this ECAS does not include a target beyond 2020.

Many factors affect GHG emissions, including the economy, demographics, improved efficiency standards, and changes in environmental conditions such as drought, so it is important to periodically update the statewide inventory to measure actual emissions and account for these factors.[1] In 2013, as part of the ongoing process of meeting the 1990 statewide GHG emissions target required by AB 32, CARB released an updated statewide GHG emissions inventory for the years 2000 to 2010.[2] This update provides actual GHG emissions data for this time period, whereas the previous statewide inventory relied on projections for years after 2004. This updated and comprehensive annual statewide emissions inventory offers a better understanding of historical GHG emission trends, which, in turn, helps track progress towards meeting the State's target.



The 2000-2010 statewide GHG emissions inventory shows that GHG emissions in California are increasing at a slower rate than anticipated in the 2008 Scoping Plan, likely due to the downturn in the economy. Based on the revised data available in the 2000-2010 inventory, CARB projects that statewide BAU emissions in 2020 would be approximately 545 million $MTCO_2e$, about 10 percent lower than the 596 million $MTCO_2e$ projected in 2008. Therefore, to achieve the AB 32 target of 427 million $MTCO_2e$ by 2020 (i.e. 1990 emissions levels by 2020), the State would only need to reduce emissions by 118 million $MTCO_2e$ compared to BAU conditions, a reduction of 21.7 percent from BAU in 2020.[3] Table 4-1 illustrates the GHG emissions inventories and reductions identified by the State.

TABLE 4-1 **STATEWIDE GHG EMISSIONS INVENTORY HISTORY**

GHG Emissions Inventory Years	Projected 2020 BAU GHG Emissions (Million $MTCO_2e$/Year)[a]	Reduction Needed to meet 1990 Levels	
		Million $MTCO_2e$/Year	Percentage
1990 to 2004 (2008 Scoping Plan)	596	169	28.5
2000 to 2010 (2013 Updated Inventory)	545	118	21.7

BAU = business as usual, $MTCO_2e$ = metric tons of carbon dioxide equivalent.
[a] The 2020 BAUGHG emissions forecasts in this column are based on the actual inventory data collected for each of the GHG emissions inventory years indicated below (1990-2004 and 2000-2010).
Source: Association of Environmental Professionals, 2012, *Forecasting Community-Wide Greenhouse Gas Emissions and Setting Reduction Targets (Draft)*, available at: http://www.califaep.org/docs/AEP_Next_Steps_White_Paper.pdf.

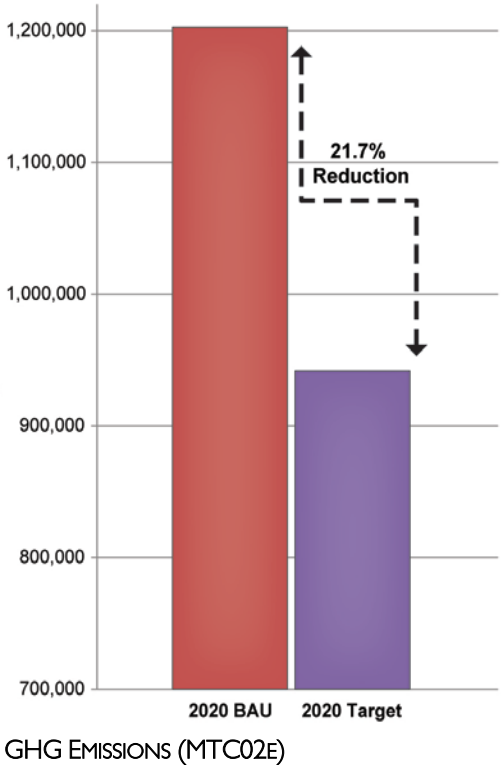
Based on the updated statewide GHG emissions inventory and forecast data discussed above, this Energy and Conservation Action Strategy uses the following local target, which applies the same statewide ratio of reductions needed to Vacaville's local emissions:

- **Reduce GHG emissions by 21.7 percent below Vacaville's 2020 BAU forecast.**

Vacaville's 2020 BAU emissions are projected to be 1,202,710 $MTCO_2e$. To achieve the local target of a 21.7-percent reduction, forecasted 2020 GHG emissions in Vacaville must be

[3] Association of Environmental Professionals, 2012, *Forecasting Community-Wide Greenhouse Gas Emissions and Setting Reduction Targets (Draft)*, available at: http://www.califaep.org/docs/AEP_Next_Steps_White_Paper.pdf.

reduced by 260,988 $MTCO_2e$.[4] This reduction would result in 941,722 $MTCO_2e$ in total emissions in 2020 for Vacaville.[5]



TARGET OPTIONS CONSIDERED BUT REJECTED

To support State efforts, Vacaville would need to select a target that is compatible with adopted State GHG emission reduction targets or related regional targets. The majority of the Vacaville city limits are within the Yolo Solano Air Quality Management District (YSAQMD) and a small part of the city limits are within the Bay Area Air Quality Management District (BAAQMD).[6] The YSAQMD has not yet established any guidance on appropriate targets for local greenhouse gas reduction plans, and the BAAQMD GHG emissions thresholds are based on conditions that are specific to the San Francisco Bay Area, which are different than the majority of Vacaville. As discussed above, the 2008 Scoping Plan is the State's strategy for achieving the GHG emissions reduction target identified in AB 32. Therefore, the City selected the 2008 Scoping Plan and statewide GHG emissions inventory data as the guiding documents to prepare this Energy and Conservation Action Strategy.

Based on the 2008 Scoping Plan and the statewide GHG emissions inventory data, the City considered the following target options:

- **Reduce GHG emissions to 1990 levels by 2020**. This is a direct translation of the AB 32 goal.

[4] 1,202,710 MTCO2e times 0.217 equals 260,988 MTCO2e.

[5] 1,202,710 MTCO2e minus 260,988 MTCO2e equals 941,722 MTCO2e.

[6] As discussed in Chapter 1, the extreme southwest corner of Vacaville is located within the Bay Area Air Quality Management District.

Because the City did not conduct a 1990 emissions inventory, and data is not available to conduct such an inventory today, the first target option is not feasible.

- **Reduce GHG emissions by 15 percent below baseline (2008) emissions by 2020.** This is the target that the 2008 Scoping Plan recommends in order for local jurisdictions to support the State's goal to achieve 1990 levels by 2020.

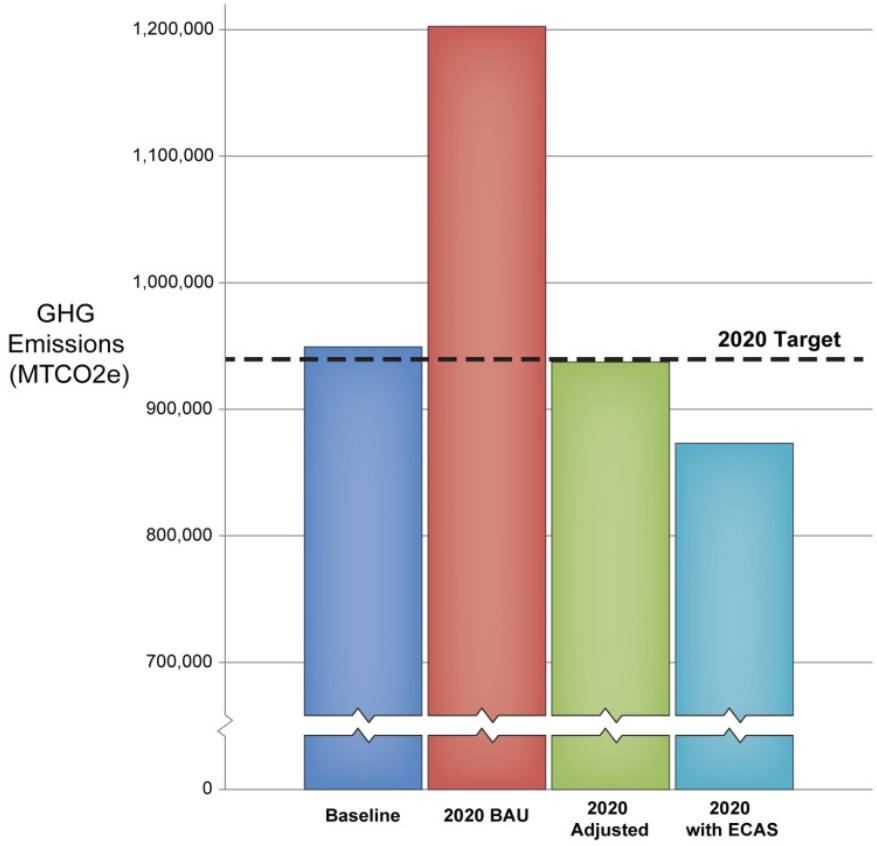
Although the 2008 Scoping Plan recommends the second target option, it does not mandate any specific level of reduction for local governments. The 2008 Scoping Plan's recommend-dation applies to California as whole, but does not require each individual city in California to meet this specific target in order to support the State's goal of reducing emissions to 1990 levels by the year 2020. Not all cities in California are growing at the same rate. It is difficult for cities like Vacaville, which has the capacity and demand to accommodate its fair share of expected population growth in the region, to achieve a 15 percent reduction from baseline emissions, because the amount of anticipated population growth is likely to overwhelm the needed reduction. Therefore, this target option is also considered infeasible for this Energy and Conservation Action Strategy.

- **Reduce GHG emissions by approximately 30 percent below the 2020 BAU forecast.** This is a target option that is derived from the 2008 Scoping Plan, which indicated that the State would need to reduce GHG emissions by 28.5 percent from 2020 BAU levels in order to reach 1990 levels.

The third target option is very similar to the City's selected target of reducing 2020 BAU GHG emissions by 21.7 percent. Both the selected target and this third target option utilize the same approach of a substantial percentage reduction from the 2020 BAU forecast. However, option #3 would be based on outdated data from the 1990 to 2004 statewide GHG emissions inventory. Therefore, the City has selected a target based on the more current data that indicates that a 21.7-percent reduction from 2020 BAU would achieve the 1990 target.

ACHIEVING THE TARGET

As noted above, to achieve the target of reducing 2020 BAU emissions by 21.7 percent, 2020 BAU GHG emissions in Vacaville must be reduced by 260,988 $MTCO_2e$,[7] to achieve no more than 941,722 $MTCO_2e$ in total emissions in 2020.



As described in the adjusted forecast in Chapter 3, federal and State regulations regarding fuel standards, renewable energy generation, energy conservation, and green building materials will substantially reduce GHG emissions in Vacaville, regardless of actions by the City. After taking these reductions into account in the 2020 adjusted forecast, we can see that 2020 emissions in Vacaville would be 940,780 $MTCO_2e$, just below the 941,722

[7] This number was calculated by multiplying the 2020 BAU emissions described in Chapter 2 as 1,202,710 MTCO2e by 0.217.

$MTCO_2e$ that represents the target of a 21.7 percent reduction from 2020 BAU. This means that federal and State regulations alone would achieve the City's GHG emissions reduction target. Nevertheless, the City has identified additional measures to implement at the local level in order to further reduce GHG emissions in Vacaville. The main reason to do this is because the federal and State measures would only exceed the target by 942 $MTCO_2e$, or less than 1 percent of the needed reduction from 2020 BAU. Because the GHG emissions reductions from the federal and State measures rely on modeling estimates, it's possible that the actual reductions will be less effective than expected, and the City would not meet the target without additional local actions. In addition, the City has identified additional local measures in order to demonstrate the City's responsiveness to community concerns about this issue and the City's commitment to supporting State and national efforts to reduce GHG emissions.

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