



City of Colton

2023 Climate Action Plan

(COLTON EXCERPT OF THE
SAN BERNARDINO COUNTY REGIONAL
GREENHOUSE GAS REDUCTION PLAN)



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SAN BERNARDINO COUNTY REGIONAL GREENHOUSE GAS REDUCTION PLAN

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Acronyms and Abbreviations

AB	Assembly Bill
ATVs	all-terrain vehicles
AVL	automatic vehicle location
BAPIS	Bus Arrival Prediction Information System
BAU	Business-as-Usual
BBARWA	Big Bear Area Regional Wastewater Agency
BRT	Bus Rapid Transit
BVES	Bear Valley Electric Service
CAA	Clean Air Act
CAFE	Corporate Average Fuel-Economy
Cal-EPA	California Environmental Protection Agency
CAP	climate action plan
CARB	California Air Resources Board
CCAs	Community Choice Aggregations
CCR	California Code of Regulations
CEC	California Energy Commission
CEEP	Community Energy Efficiency Program
CEQA	California Environmental Quality Act
CFL	compact fluorescent
CH ₄	methane
CIC	CAP Implementation Coordinator
CIT	CAP Implementation Team
CIM	California Institution for Men
CLEO	Custom Language Efficiency Outreach
CO ₂	carbon dioxide
CPUC	California Public Utilities Commission
EIR	environmental impact report
EPA	U.S. Environmental Protection Agency
ESPs	energy service providers
°F	degrees Fahrenheit
FED	Functional Equivalent Document
FY	fiscal year
GHG	greenhouse gas

GPS	global positioning system
GTFS	General Transit Feed Specification
GWh	gigawatt-hours
GWP	global warming potential
HERS	Home Energy Rating System
HFCs	hydrofluorocarbons
HQTA	High Quality Transit Areas
HVAC	heating/venting and air conditioning
IEUA	Inland Empire Utilities Agency
IOU	investor-owned utilities
IPCC	Intergovernmental Panel on Climate Change
ITS	Intelligent Transportation Systems
IVR	Interactive Voice Response
kW	kilowatts
LCFS	Low Carbon Fuel Standard
LED	light emitting diode
LFGTE	landfill-gas-to-energy
L RTP	Long Range Transit Plan
MCAP	municipal inventory and reduction plan
MEU	Mobile Energy Unit
M MTCO ₂ e	million MTCO ₂ e
MPOs	metropolitan planning organizations
MTCO ₂ e	metric tons of carbon dioxide equivalent
MW	megawatt
N ₂ O	nitrous oxide
NPV	Net Present Values
ODS	ozone-depleting substances
PACE	Property Assessed Clean Energy
Partnership	San Bernardino Council of Governments and Participating San Bernardino County Cities Partnership
PFCs	perfluorinated carbons
PPAs	Power Purchase Agreements
ppb	parts per billion
ppm	parts per million

ppt	parts per trillion
PS	GHG Performance Standard for New Development
QR	Quick Response
Reduction Plan	San Bernardino County Regional Greenhouse Gas Reduction Plan
Reporting Rule	Greenhouse Gas Reporting Rule
RHNA	Regional Housing Needs Allocation
RPS	Renewable Portfolio Standard
RTPs	Regional Transportation Plans
SB	Senate Bill
SBCOG	San Bernardino Council of Governments
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCGC	Southern California Gas Corporation
SCS	sustainable communities strategy
SF ₆	sulfur hexafluoride
SMP	Sustainable Master Plan
TDM	Transportation Demand Management
TRP	trip reduction plan
TSM	Transportation Systems Management Plan
UC	University of California
UPRR	Union Pacific Railroad
VERA	Voluntary Emission Reduction Agreement
VMT	vehicle miles traveled
VVWA	Victor Valley Wastewater Agency
WWTPs	wastewater treatment plants

Executive Summary

San Bernardino Council of Governments and San Bernardino County Jurisdictions Partnership

In 2006, the California legislature passed Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006. The law establishes a limit on greenhouse gas (GHG) emissions for the state of California to reduce state-wide emissions to 1990 levels by 2020. In 2016, the California Assembly and Senate expanded upon AB 32 with Senate Bill (SB) 32, which mandates a 40% reduction in GHG emissions from 1990 levels by 2030 (California Legislative Information, 2016). In January 2017, the California Air Resources Board (CARB) developed a plan (SB 32 Scoping Plan¹) that charted a path towards the GHG reduction goal using all technologically feasible and cost-effective means (CARB, 2017).

In response to these initiatives, an informal project partnership, led by the San Bernardino Council of Governments (SBCOG), compiled a GHG emissions inventory and an evaluation of reduction measures that could be adopted by the 25 Partnership Cities of San Bernardino County. For the purposes of this report, this group is referred to as the San Bernardino Council of Governments and Participating San Bernardino County Jurisdictions Partnership (Partnership).

The Partnership has committed to undertake the following actions that will reduce GHG emissions associated with its regional (or countywide) activities.

1. Prepare a baseline (2016) GHG emissions inventory for each of the 25 Partnership jurisdictions in the county.
2. Prepare future year (2020, 2030, and 2045²) GHG emissions forecasts for each of the jurisdictions.
3. Develop general GHG reduction measures and jurisdiction-specific measures appropriate for each jurisdiction.
4. Develop consistent baseline information for jurisdictions to use for their development of community climate action plans (CAPs) meeting jurisdiction-identified reduction goals.

By working in a collaborative manner on these goals, the jurisdictions aim to develop consistent information in an efficient manner that can subsequently be used by individual jurisdictions that choose to develop and adopt CAPs for their jurisdictions and/or implement specific GHG reduction measures. GHG reduction measures selected by jurisdictions for this report are non-binding unless the decision-making body of a jurisdiction decides to formally adopt them.

The 25 Partnership jurisdictions participating in this study are Adelanto, Apple Valley, Barstow, Big Bear Lake, Chino, Chino Hills, Colton, Fontana, Grand Terrace, Hesperia, Highland, Loma Linda,

¹ For the Scoping Plan, see: https://ww3.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf

² The primary focus of this regional plan is to achieve GHG reductions for 2030 in light of statewide legislative policy to reduce emissions through 2030. The 2045 forecast is provided as context for the post-2030 period because there will need to be additional reduction efforts to ultimately achieve post-2030 reduction targets that are likely to be adopted by the California legislature in the future.

Montclair, Needles, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Twentynine Palms, Upland, Victorville, Yucaipa, Yucca Valley, and the County of San Bernardino.

Reduction Plan Purpose and Description

This *San Bernardino County Regional Greenhouse Gas Reduction Plan* (Reduction Plan) satisfies Partnership goals 1, 2, 3, and 4 listed above. In 2019, a jurisdictional GHG emissions inventory was developed to help plan for GHG reduction strategies. This report includes the resulting inventory, *San Bernardino County Regional 2016 Community Greenhouse Gas Inventories*, in Appendix A.

This Reduction Plan summarizes the actions that 23 jurisdictions selected to reduce jurisdictional GHG emissions, as well as state-mandated actions. Additionally, for two cities, SBCOG's consultants (ICF and LSA) developed the reduction scenarios; for all other cities, the jurisdictions developed their reduction scenarios. This report describes the GHG emissions avoided in 2030 associated with each local and state action, and each jurisdiction's predicted progress towards their selected GHG reduction goal. The report consists of six chapters and two appendices, as follows.

Chapter 1: Introduction—presents basic information about the document itself and how to read it, the benefits of a regional GHG reduction plan, SBCOG's role, and the next steps jurisdictions may take.

Chapter 2: Background Information—describes GHG reduction and climate action planning at the federal, state, and local levels defines basic terms and concepts used in the report, and details the relationship of climate action plans to CEQA and local plans.

Chapter 3: Reduction Profiles—presents the profile for each participating jurisdiction, including a summary of the jurisdiction, its emissions reductions profile, specific emissions reduction measures and estimated reductions, and any relevant general plan policies.

Chapter 4: GHG Emissions Reduction Measures—includes a detailed description of each GHG reduction measure (or action). Each reduction measure description includes:

- General description of GHG reduction measure
- Entity responsible for implementing the measure
- Implementation details
- Level of commitment
- Range of GHG reductions
- Other co-benefits

Chapter 5: Implementation of Local Climate Action Plans and Regional Coordination—outlines key steps jurisdictions could follow to implement the selected reduction measures effectively and efficiently.

Chapter 6: References—lists all sources referenced in the report.

Appendix A: GHG Inventory and Forecast Introduction—summarizes the GHG emissions inventory and forecasted GHG emissions for each jurisdiction.

Appendix B: GHG Reduction Measure Methods—provides a detailed overview of the methodology used to calculate the GHG emissions reductions in the report.

This Reduction Plan is intended to be used as a reference document; it is not intended to be read continuously from beginning to end. Each jurisdiction has its own section that details the jurisdiction's 2016 GHG emissions inventory, 2030 GHG emissions forecast, reduction goal, jurisdiction-selected (or consultant-identified) GHG reduction measures, and related General Plan policies or other ongoing programs in the jurisdiction. The jurisdiction sections are largely graphical, so the authors encourage readers to read the reduction measure descriptions in Chapter 4, the implementation guidelines in Chapter 5, and the Appendices together with each jurisdiction section. The jurisdiction reduction plans developed as part of this document are intended to serve as a foundation upon which each individual jurisdiction may develop its own customized and comprehensive CAP. This plan leveraged efforts that would be common to all jurisdictions and allowed the selection of a unique set of individual programs and policies. SBCOG anticipates that individual jurisdictions may choose to utilize the information in this document to complete and adopt their own CAPs.

Why Prepare a Greenhouse Gas Reduction Plan?

Preparing a regional GHG reduction plan to inform a local CAP offers the following benefits:

- **Consistency:** Using consistent methodologies to prepare GHG inventories and to calculate GHG reductions avoids inconsistencies in how neighboring jurisdictions account for emissions and reductions, and promotes fair comparisons across jurisdictions in the region.
- **Economies of Scale for Plan Preparation:** The cost of preparing inventories, developing reduction measures, calculation reductions, evaluating costs and benefits and supporting technical detail can be substantially reduced by doing them together instead of on a one-by-one basis.
- **Opportunities for Collaboration in Implementation:** By working together on the regional reduction plan, jurisdictions can identify areas of common action where working together can result in cost savings in implementation. In the future, the Partnership jurisdictions can also seek external grant funding and other opportunities together, which can reduce implementing cost by leveraging economies of scale.

How Does this Plan Account for the COVID-19 Pandemic?

The COVID-19 pandemic erupted throughout the United States near the beginning of 2020, and most of the country went into lockdown in mid-March and into April, causing massive disruption to the society and economy of San Bernardino, but also across the United States and the world. Since the original outbreak, disruptions and lockdowns have ebbed and flowed. San Bernardino and the world have not returned to normal even at the end of 2020, and energy use and GHG emissions during the year have been atypical as travel and commuting have dropped significantly and as businesses reduced or ceased operations. In fact, GHG emissions decreased by 8.8% globally and by 13.3% in the U.S. during the first half of 2020, compared to the same period in 2019. However, emissions have since risen from that diminished level as restrictions were relaxed and economic activities resumed.³

³ *Nature Communications*. 2020. Near-Real-Time Monitoring of Global CO₂ Emissions Reveals the Effects of the COVID-19 Pandemic. Liu, Z., Ciais, P., Deng, Z. et al. Available at: <https://www.nature.com/articles/s41467-020-18922-7>.

Please note that the GHG inventory data in this document does not account for the impacts of COVID-19 in any way. The historical data is only as recent as 2016, i.e., pre-pandemic. However, this document does include emissions forecasts for future years, including 2020, based on historical data and predictive modeling methods. Because the emissions models and forecasts did not anticipate a global pandemic and the resulting impacts on energy use and emissions, it is unlikely that the pre-COVID business as usual (BAU) estimations will closely align with the actual results for 2020. It may also be the case that activities and priorities in the 25 Partnership jurisdictions may change post-pandemic, and individual jurisdictions may alter their GHG emission reduction measures accordingly. However, regardless of the current effect of the changes in economic activity and mobility during the COVID health emergency, it is expected that economic growth and mobility will increase as recovery from the emergency occurs, and along with it will come increases in GHG emissions unless local and state activity is taken to reduce those emissions in line with current policies to reduce GHG emissions substantially in the long run.

Regional Summary—Growth, Emissions, and Reductions

Challenges—How the Region Will Grow

Current and projected GHG emissions are directly correlated with activity within the jurisdictional boundary. As such, emissions reflect the unique geography, climate, demographics, economy, and character of a community. Further, future projections of GHG emissions reflect how a community plans to grow with respect to housing, jobs, and infrastructure. In 2016 (the baseline year for the inventories), the county's total population was 2,134,967 and 750,000 jobs (SCAG, 2019).⁴

Figure ES-1A shows a map of the county and areas of highest projected increase in population; Figure ES-1B shows a map of the county and areas of highest projected increase in employment. Table ES-1 shows current and projected population, households, and jobs for each of the jurisdictions in the Partnership. Partnership jurisdictions expected to experience the largest increase in population from 2016 to 2030 are Needles (52%), Adelanto (48%), Hesperia (38%), Ontario (29%), and Victorville (29%). Partnership jurisdictions expected to experience the largest growth in jobs from 2016 to 2030 are Hesperia (51%), Twentynine Palms (45%) and Grand Terrace (36%). Overall, the region will add approximately 329,000 residents and 135,000 jobs before 2030.

Partnership jurisdictions face a difficult challenge to reduce GHG emissions while population and economic activity continue to grow in the region at a rate higher than many other areas of California. Projections generated by the California Department of Finance show that San Bernardino County ranked 12th out of 58 California counties for expected growth between 2020 and 2030 (California Department of Finance, 2019); the neighboring counties of Kern and Riverside ranked first and fourth, respectively. Partnership jurisdictions and the state will need to pursue comprehensive approaches to improve the efficiency of and reduce the energy associated with the daily activities of workers and residents in the region.⁵

⁴ The baseline inventory for 2016 was derived in part from socioeconomic data in the SCAG 2016 RTP/SCS.

⁵ As explained in Appendix A, the forecasts for 2030 used forecasted changes in population, employment, and households between the baseline year of 2016 and 2030.

Figure ES-1A. Map of Percent Growth in Population for Partnership Jurisdictions from 2016 to 2030

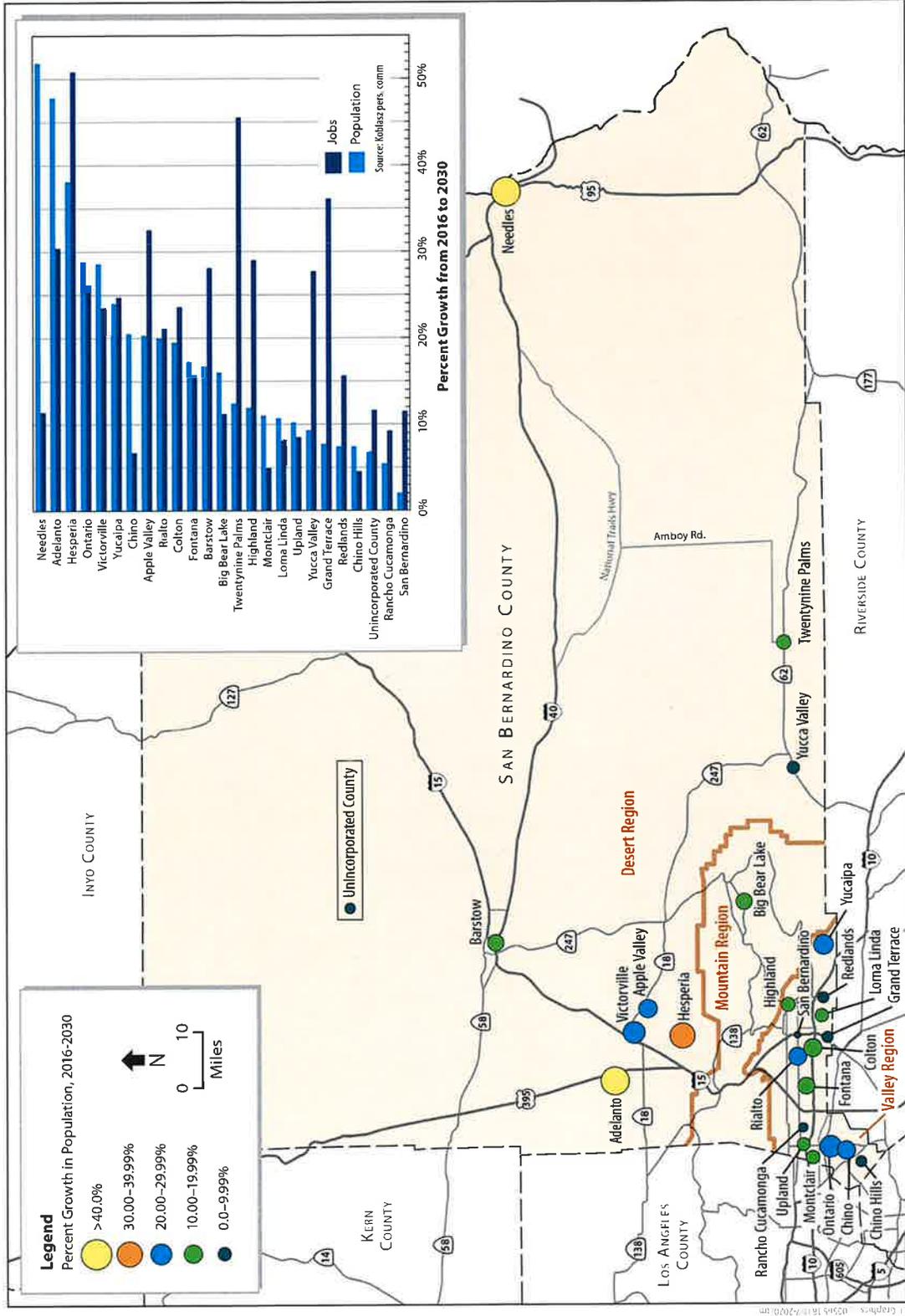


Figure ES-1B. Map of Percent Growth in Jobs for Partnership Jurisdictions from 2016 to 2030

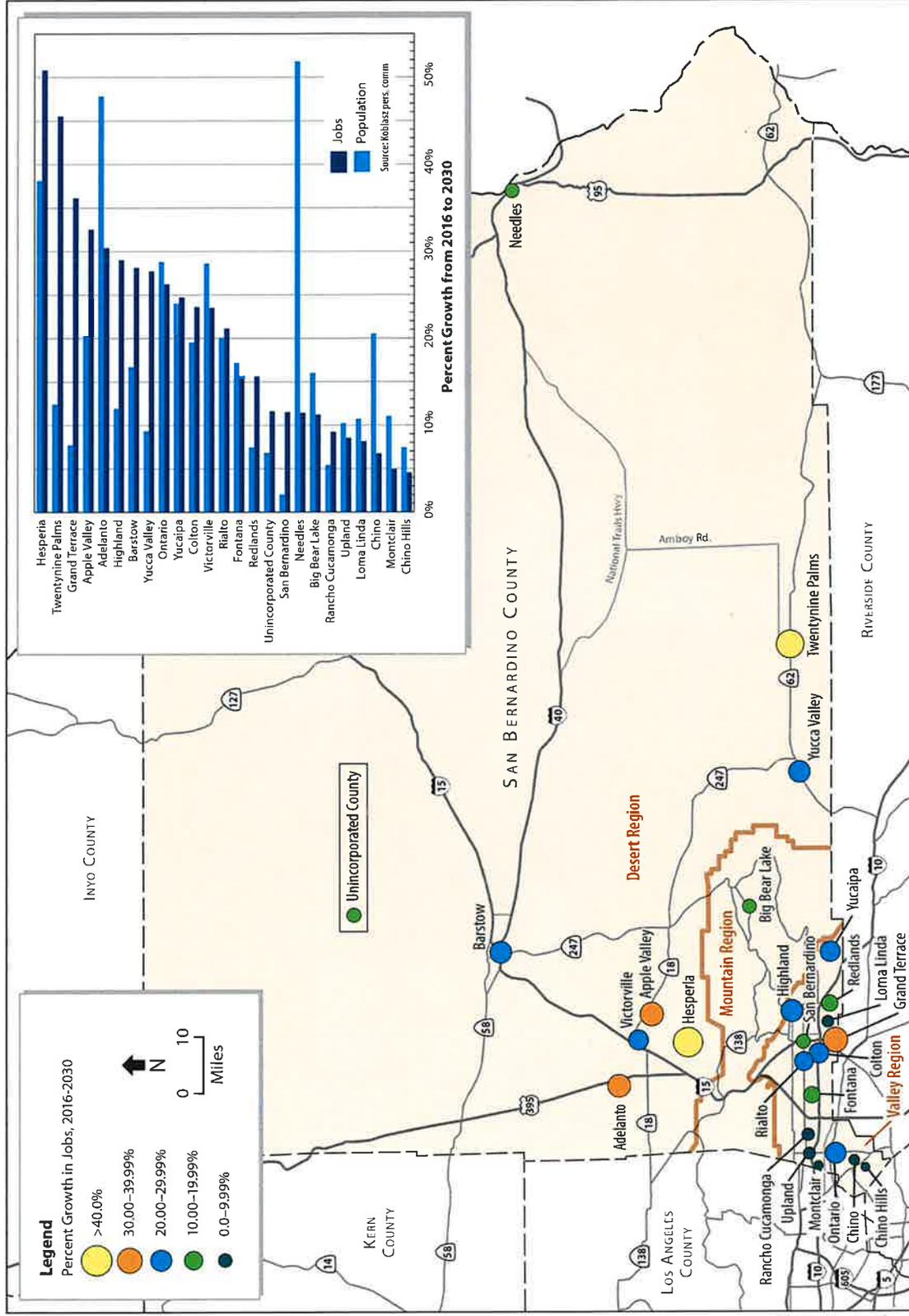


Table ES-1. Socioeconomic Data for Partnership Jurisdictions 2016, 2030, and 2045

Jurisdiction	2016			2030			2045		
	Population	Households	Employment	Population	Households	Employment	Population	Households	Employment
Adelanto	33,893	8,159	6,141	50,081	13,686	8,005	66,637	19,802	10,007
Apple Valley	74,313	24,734	18,012	89,425	31,547	23,871	101,405	37,386	30,160
Barstow	24,187	8,417	11,704	28,228	10,556	14,993	32,695	12,849	18,516
Big Bear Lake	4,932	2,095	4,683	5,722	2,442	5,207	6,569	2,813	5,768
Chino	81,294	23,227	50,408	97,940	27,983	53,796	115,773	33,078	57,425
Chino Hills	79,737	23,838	16,424	85,623	25,868	17,156	92,822	28,043	17,940
Colton	53,705	15,026	19,453	64,184	19,002	24,042	70,710	21,668	28,958
Fontana	210,983	51,518	56,724	247,196	64,192	65,619	286,666	77,772	75,149
Grand Terrace	12,400	4,421	3,481	13,359	4,975	4,738	14,501	5,569	6,085
Hesperia	93,687	26,764	22,460	129,410	39,503	33,861	168,067	53,153	46,077
Highland	54,201	15,391	6,938	60,631	17,956	8,952	68,942	21,410	11,116
Loma Linda	24,474	9,033	24,184	27,093	10,458	26,152	30,112	11,985	28,260
Montclair	38,701	9,866	19,309	42,971	10,492	20,259	49,150	11,162	20,892
Needles	5,031	1,941	1,731	7,636	3,070	1,928	10,281	4,280	2,140
Ontario	172,249	46,001	113,859	221,806	60,602	143,699	269,050	74,521	169,331
Rancho Cucamonga	176,503	56,764	88,314	186,120	61,426	96,434	201,255	66,421	105,135
Redlands	69,531	24,421	42,569	74,690	27,516	49,220	80,832	30,832	56,347
Rialto	99,318	26,485	25,472	119,193	31,785	30,837	139,068	37,085	35,524
San Bernardino	216,326	59,709	101,330	220,565	64,084	113,030	230,532	68,771	125,566
Twentynine Palms	26,487	8,367	4,427	29,768	10,031	6,440	33,266	11,814	8,596
Upland	76,403	26,088	35,893	84,208	29,336	38,960	92,963	32,817	42,247
Victorville	123,309	33,932	41,180	158,601	47,392	50,848	194,522	61,813	61,207
Yucaipa	53,779	19,987	10,824	66,706	23,716	13,500	75,209	27,349	17,624
Yucca Valley	21,445	8,358	6,937	23,447	9,566	8,857	25,810	10,861	10,914
Unincorporated w/ SOI	308,079	97,066	58,795	328,897	105,700	65,587	353,053	114,950	72,864
San Bernardino County Total	2,134,967	631,608	791,252	2,463,500	752,884	925,991	2,809,889	878,202	1,063,848

GHG Emissions for the Partnership Jurisdictions

Total GHG emissions,⁶ excluding stationary sources,⁷ for all Partnership jurisdictions in 2016 amounted to 15,972,244 metric tons of carbon dioxide equivalent (MTCO_{2e}).⁸ The Business as Usual (BAU)⁹ of GHG emissions for all Partnership jurisdictions in 2030 projects total emissions will be 17,674,452 MTCO_{2e}. Figure ES-2 shows the contribution of various activities to total regional GHG emissions, excluding stationary sources.

Total GHG emissions in 2016 and projected GHG emissions in 2030 are shown for each of the Partnership jurisdictions in Figure ES-3, excluding stationary sources. With a few exceptions, in 2016 and in 2030, the largest sources of regional GHG emissions are combustion of transportation fuels and electricity and natural gas used by residential and commercial buildings. Consequently, the on-road transportation and building energy sectors will figure prominently in jurisdiction GHG reduction plans.

Including stationary sources, the emissions in 2016 were 21,567,392 MTCO_{2e} and 2030 BAU emissions are estimated as 24,736,167 MTCO_{2e}. Stationary sources is the third largest source of emissions after transportation and building energy. As discussed in Appendix A, when including stationary sources, several of the jurisdictions, including Apple Valley and San Bernardino County, have notably higher overall GHG emissions due to the inclusion of very large stationary sources in these two jurisdictions, such as the CEMEX cement plant in Apple Valley and other large stationary sources in the unincorporated County.

A detailed description of each jurisdiction's GHG inventory is provided in Appendix A, *San Bernardino County Regional 2016 Community Greenhouse Gas Inventories*.

⁶ Total GHG emissions as reported above for the region, and unless otherwise stated in this document are the sum of Direct and Indirect emissions. Excluded emissions sources are not included in the regional or jurisdiction totals but have been calculated and reported for the region and for each jurisdiction. Please see the complete GHG Inventory Report for details (Appendix A).

⁷ Stationary sources are disclosed in the inventories, but are not included in the totals for local reduction planning as local municipalities have limited authority over large stationary sources, which are being regulated for GHG emissions by both the state (CARB) and by the federal government (U.S. Environmental Protection Agency).

⁸ Carbon dioxide equivalent" or "CO_{2e}" is a term that describes different greenhouse gases using a common unit. For any quantity and type of greenhouse gas, CO_{2e} signifies the amount of CO₂ which would have the equivalent global warming impact.

⁹ Business as Usual (BAU) reflects conditions that would exist in the future without any local or state action to reduce GHG actions. The 2030 BAU conditions are a raw projection of emissions using the 2016 emissions as a base and then inflating the emissions for 2030 based on the increases in population, housing, and employment. Methods used to develop the 2030 BAU forecast are described in Appendix A.

Figure ES-2. 2016 Baseline GHG Emissions and 2030 BAU GHG Emissions Forecast for the 25 Partnership Jurisdictions by Activity (MTCO₂e)

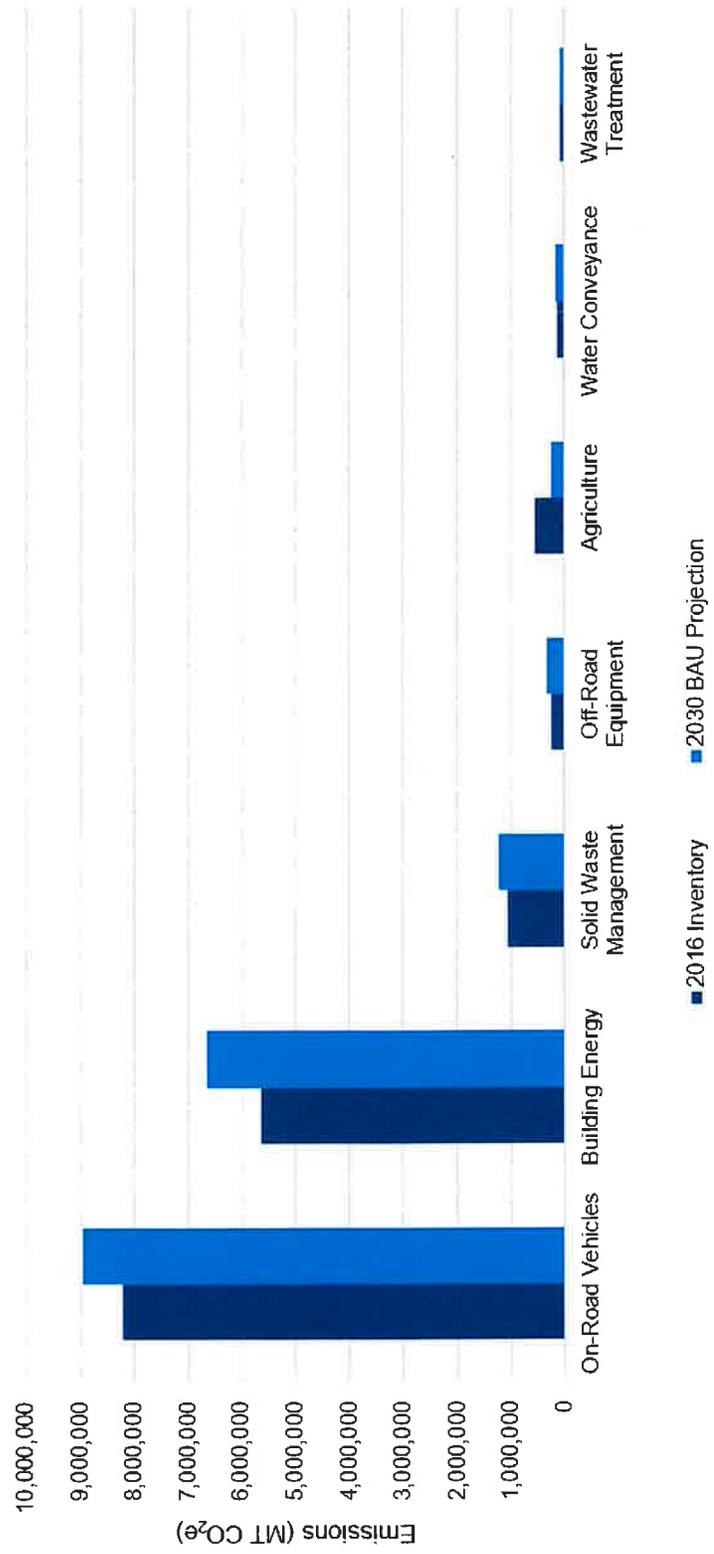
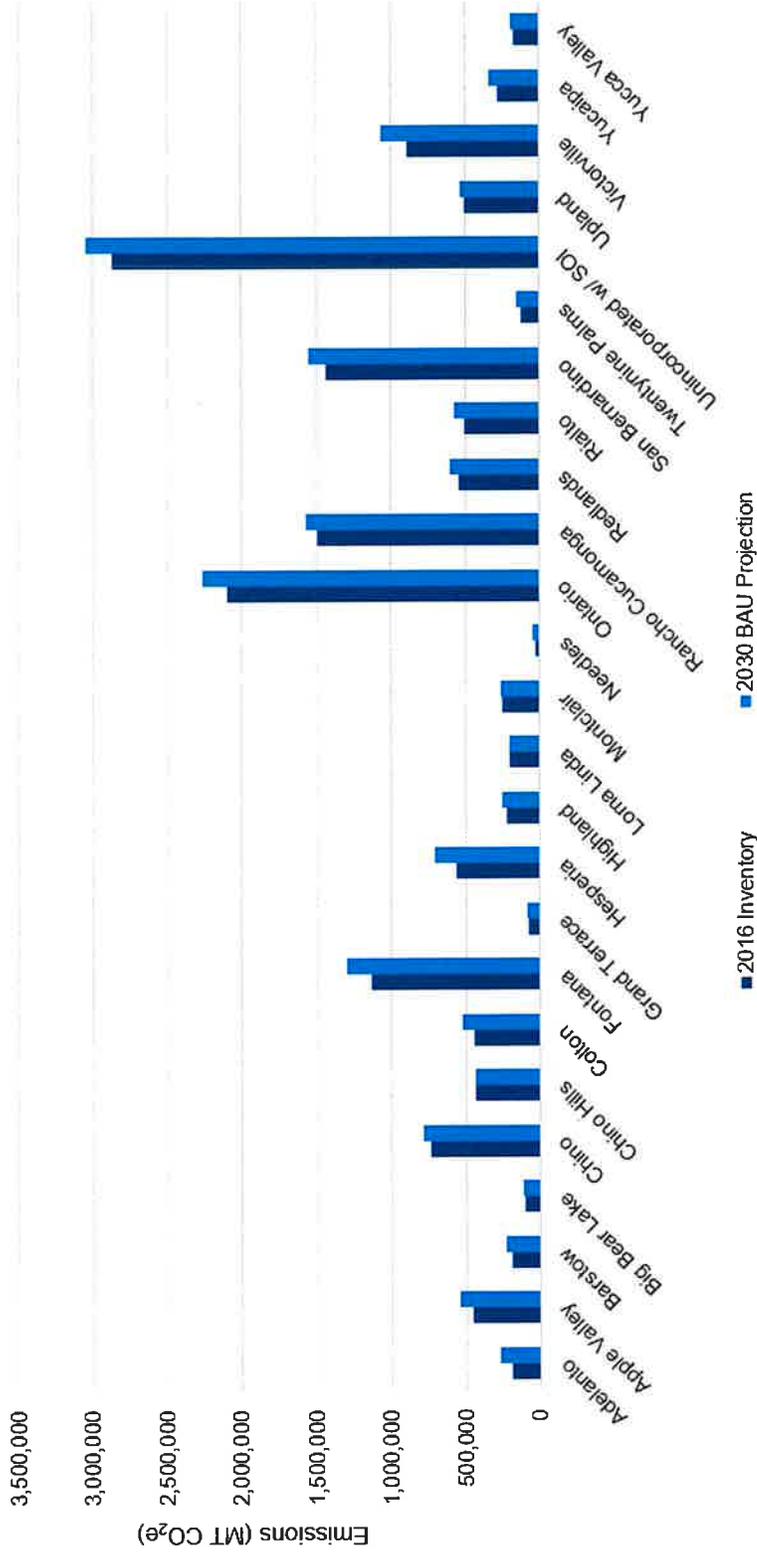


Figure ES-3. 2016 Baseline GHG Emissions and 2030 BAU GHG Emissions Forecast for the Partnership Jurisdictions (MTCO₂e)



Regional GHG Reductions—Sector View

Through this project, Partnership jurisdictions identified actions that could become the basis of each jurisdiction’s individual CAP, if it chooses to move forward with development and adoption of a local CAP. These actions include those mandated by the state, such as the Pavley fuel economy standards (AB 1493), and those implemented individually by each Partnership jurisdiction, such as local energy efficiency retrofits, urban tree planting, or waste diversion requirements. Through the combination of these actions, each Partnership jurisdiction and the region as a whole will be able to reduce GHG emissions. Reduction targets are only identified on a per jurisdiction basis.¹⁰

According to CARB’s 2016 inventory data for GHG emissions, California is on track to exceed its 2020 target of reaching 1990 emission levels as required by AB 32.

Additionally, some GHG reduction actions are best suited to regional planning and cooperation and the benefits are best monitored at the regional level, as opposed to the jurisdiction level. The results presented in this document can be used to support both jurisdiction-level and regional-level planning.

Figure ES-4 shows the amount of GHG reductions achieved in the region within each GHG emission sector (i.e., the sum of all actions taken by all jurisdictions within that sector, including state level programs). Additionally, Figure ES-4 conveys that there is a potential for approximately nearly 8 million MTCO₂e in GHG reductions due to the combined effect of state, regional, and local actions detailed in this report.

Figure ES-4 shows that 75% of the region’s reductions will come from state level programs, and 25% from local measures—12% from measures implemented in the building energy sector, and 13% from other local programs.

Regional GHG Reductions—Jurisdiction View

Figure ES-5 shows the amount of GHG reductions that have been identified by each of the Partnership jurisdictions relative to their 2030 BAU projection and their identified target. Figure ES-5 shows that all jurisdictions will meet their specified reduction target with the actions identified in this report, including state mandates, regional measures, and local actions. Selected reduction targets for Partnership jurisdictions are diverse. Selected targets include a range of custom levels between 25% and 46% below 2008, 40% below 2016 GHG emissions levels, 36% to 42% below 2020 BAU, or several per capita emissions levels. Figure ES-6 shows a comparison of emissions by sector in 2030 and reductions by sector in 2030. The pie charts show a similar distribution across sectors, indicating that emissions are projected to be reduced proportionally in the sectors where projected 2030 emissions are the highest, such as building energy and on-road transportation.

¹⁰ Using CARB’s inventory data for GHG emissions for 2016, the state is on track to exceed its 2020 target of reaching 1990 emission levels (as required by AB 32). The 2008 AB 32 Scoping Plan recommended local jurisdictions reduce their emissions by 15% relative to “current” emissions, which at the time of the Scoping Plan was understood to be roughly 2005 – 2008 emission levels. The 2017 SB 32 Scoping Plan expands upon the 15% goal, recommending that local jurisdictions should derive evidence-based local per capita, mass emissions, or service population goals to reach state-wide 2030 and 2050 climate goals. In this plan, jurisdictions have identified individual targets for 2030.

Figure ES-7a shows projected 2030 emissions for each jurisdiction, excluding stationary source emissions, and figure ES-7b shows the contribution of each jurisdiction to the overall GHG reductions in the region. These contributions generally parallel the distribution of population and employment in the region.

Figure ES-4. Total Identified GHG Reductions in 2030 for the 25 Partnership Jurisdictions (MTCO₂e)

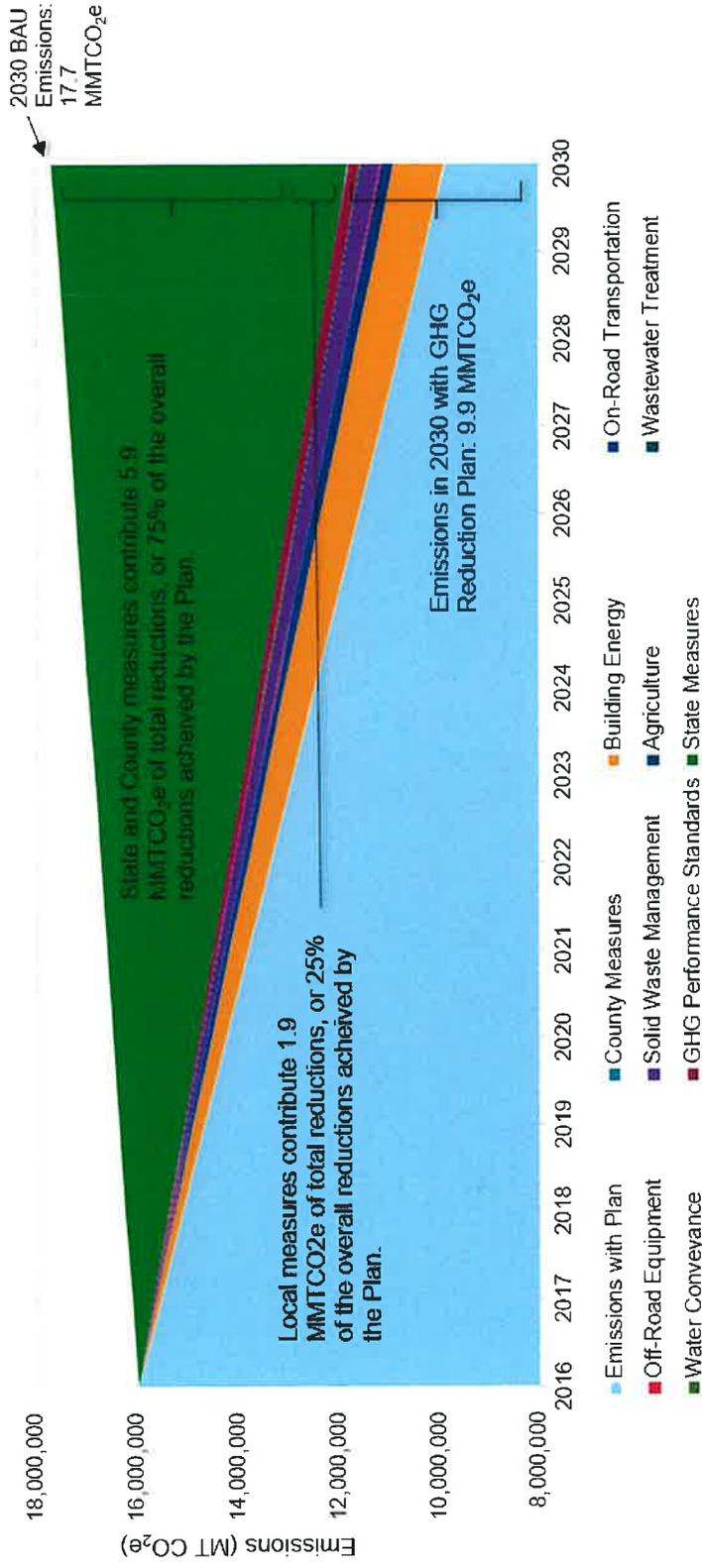


Figure ES-5. 2030 BAU GHG Emissions Forecast and Identified GHG Reductions in 2030 for All Partnership Jurisdictions (MTCO₂e)

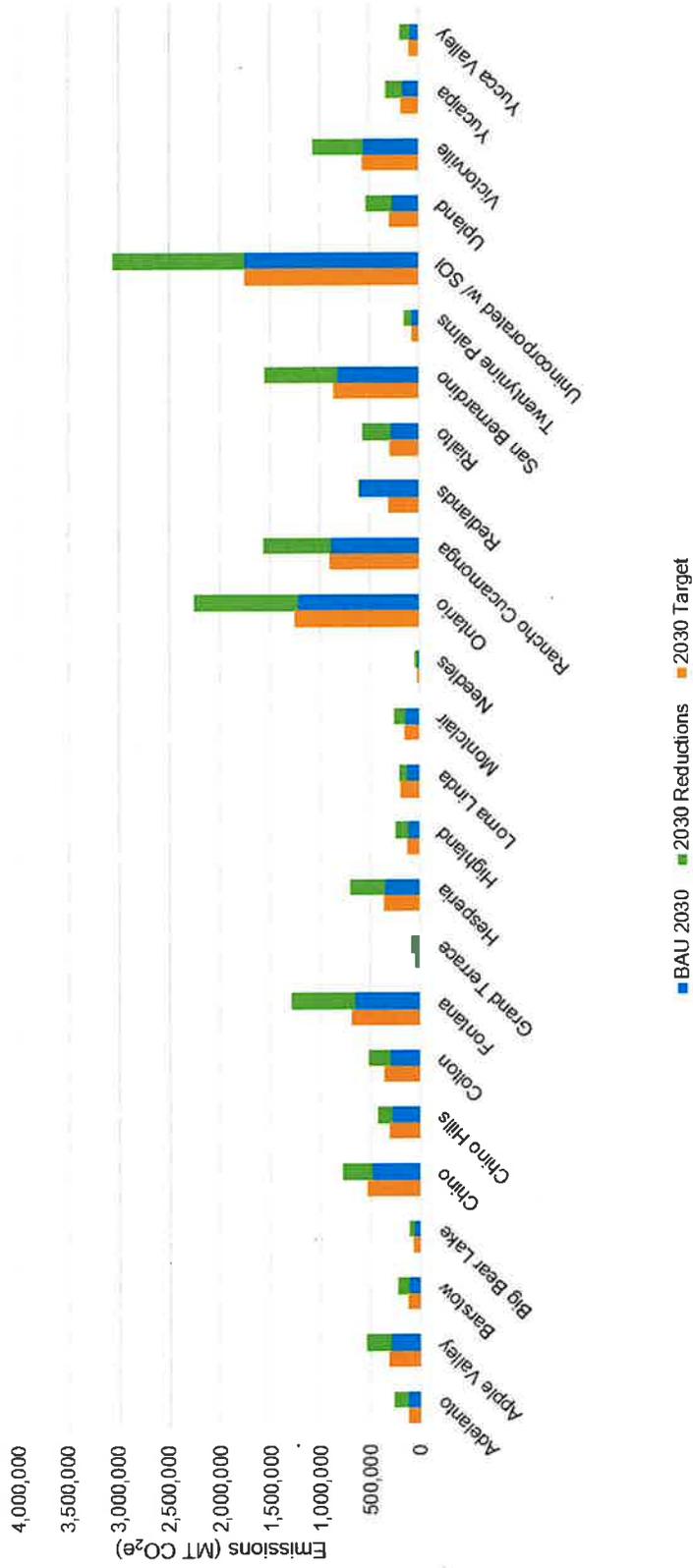


Figure ES-6. Distribution of Regional BAU Emissions and Reductions in 2030 by Sector (MTCO₂e)

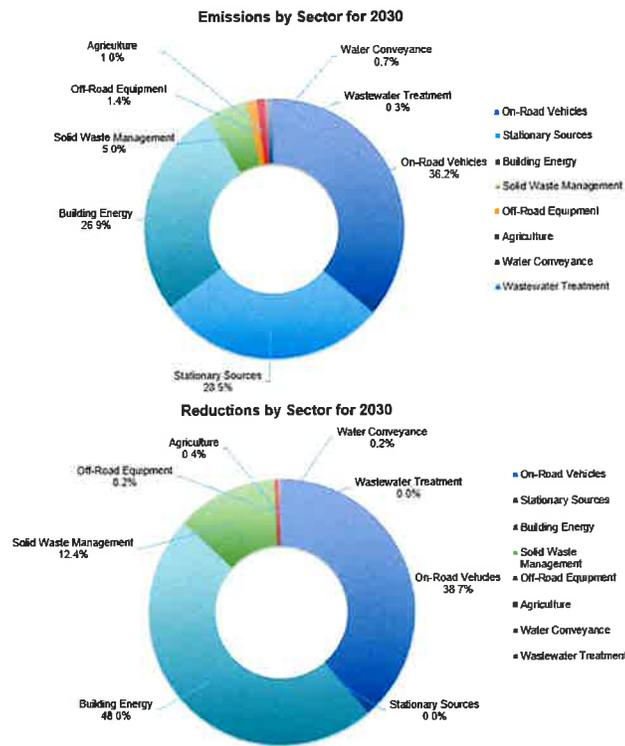


Figure ES-7a. Distribution of Projected GHG Emissions in 2030 for all Partnership Jurisdictions (MTCO_{2e})

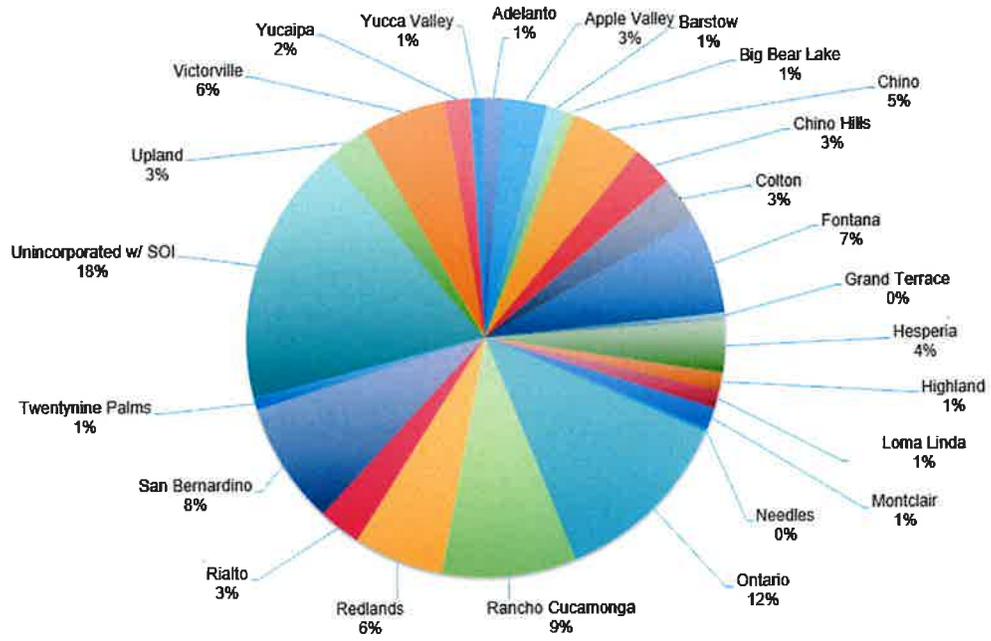
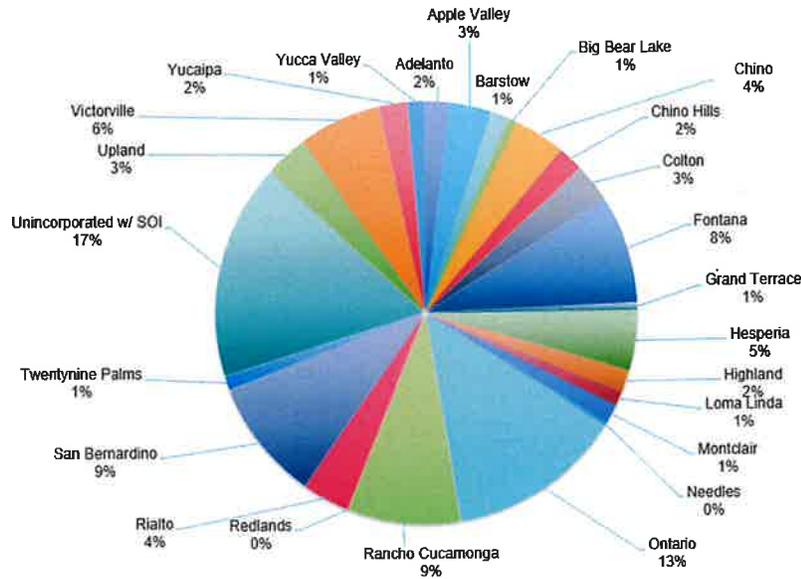


Figure ES-7b. Distribution of Identified GHG Emissions Reductions in 2030 for all Partnership Jurisdictions (MTCO_{2e})



Next Steps

This Reduction Plan identifies state measures applicable to every Partnership jurisdiction, as well as local measures selected by each jurisdiction that could reduce future GHG emissions within jurisdictional boundaries. Through the development of this Reduction Plan, each Partnership jurisdiction individually selected GHG reduction measures, tailored the level of commitment for reduction measures, and set unique GHG reduction goals for the year 2030. Neither SBCOG nor the region has set a regional GHG reduction goal and this Reduction Plan is not a mandate from SBCOG. Instead, it represents the collective effect of the individual jurisdictions' actions. This document describes the projected GHG reductions that can be achieved for the region through the combined efforts of all Partnership jurisdictions if they were to fully implement the reduction measures identified in this Reduction Plan.

This Reduction Plan is intended to serve as a foundation upon which the Partnership jurisdictions can develop individual jurisdiction-specific CAPs to be adopted and enacted according to their own internal procedures. The next steps for Partnership jurisdictions that choose to move forward with this process and ultimately develop their own local climate action planning are listed below.

1. **Plan Adoption:** Partnership jurisdictions may adopt (but are not required to do so) CAPs based upon this Reduction Plan or their respective portions of the regional reduction plan presented herein. This would occur after SBCOG approves this Reduction Plan. Development of a CAP may require the development of a jurisdiction-specific implementation plan that will identify responsible parties, funding and tracking protocols, and schedule actions. Each Partnership jurisdiction would undertake steps needed to formally adopt the CAP in their jurisdiction, such as gathering input from stakeholders; conducting public meetings; review by jurisdiction

council, planning commission ,or board of supervisors; California Environmental Quality Act (CEQA) analysis as needed; and/or vote by a governing body.

2. **CEQA Compliance on the Regional Reduction Plan:** SBCOG will be completing CEQA compliance to assess the potential environmental impacts associated with implementation of this Reduction Plan as an update to the prior Regional Reduction Plan from 2015. A comprehensive Environmental Impact Report was certified by SANBAG in 2015. It is expected that CEQA compliance for the updated regional plan will likely be an addendum or supplement to the prior EIR. The CEQA document will rely on the assumption that all jurisdictions will implement the measures selected in this Reduction Plan prior to 2030, but does not require that all Partnership jurisdictions formally adopt this Reduction Plan. After adoption of the CEQA document for the Regional Reduction Plan by SBCOG, additional CEQA analyses will only be required at the jurisdiction level if Partnership jurisdictions choose to change their GHG reduction measures from those identified in this Reduction Plan, and if those measures have potentially significant secondary impacts on the environment.
3. **Implementation and Tracking of the Reduction Plan(s):** Properly tracking the progress of the Reduction Plan, monitoring the real benefits, and reporting these results are crucial to the success of implementing the Reduction Plan and to adaptive management of GHG reductions measures going forward. Each Partnership jurisdiction is expected to monitor the progress of actions identified, and to monitor metrics of the program such as energy consumption, water consumption, or waste diversion. SBCOG can take a lead role in communicating with each Partnership jurisdiction, tracking regional progress, and regularly updating and communicating relevant issues to the whole Partnership, including future updates to the Reduction Plan, if desired by the Partnership jurisdictions (discussed further in Chapter 5).
4. **Tiering of CEQA Analysis of Greenhouse Gas Emissions:** Those Partnership jurisdictions choosing to complete and adopt local CAPs that are consistent with this GHG Reduction Plan and with the prior Regional Plan Program EIR and the addendum or supplemental CEQA document prepared by SBCOG will be able to tier their future project-level CEQA analyses of GHG emissions from their CAP. This can help to streamline project-level CEQA review.

1.1 What Is This Document?

This document presents greenhouse gas (GHG) inventories, assesses the effectiveness of California initiatives to reduce GHG emissions, and identifies local GHG reduction strategies that were selected for 25 Partnership jurisdictions to reduce local GHG emissions. This *San Bernardino County Regional Greenhouse Gas Reduction Plan* (Reduction Plan) presents the collective results of all local efforts to reduce GHG emissions consistent with statewide GHG targets expressed in Senate Bill (SB) 32, the “Global Warming Solutions Act of 2006,” and SB 375. Partnership jurisdictions will use this document in a variety of ways, depending on their needs.

This Reduction Plan is not mandatory for the Partnership jurisdictions. Instead, it provides information that can be used by Partnership jurisdictions, if they choose so, to develop individual climate action plans (CAPs). Each jurisdiction will need to decide whether or not to finalize and adopt a local CAP, including strategies described in this Reduction Plan, as part of a separate process. This Reduction Plan describes the reductions that are possible if San Bernardino Council of Governments (SBCOG) and every Partnership jurisdiction were to adopt the reduction strategies as described in this document.

1.2 What Are the Benefits of a Regional GHG Reduction Plan?

Partnership jurisdictions have chosen to prepare GHG inventories and evaluate local GHG reduction measures jointly. SBCOG and the Partnership jurisdictions see several advantages to this approach.

Economies of Scale: Although many aspects of GHG planning and policy making are unique to each jurisdiction, certain steps are standard and would be conducted in exactly the same way by all jurisdictions. These steps include:

1. Collecting GHG inventory data;
2. Calculating GHG inventory results;
3. Forecasting 2030 and 2045 GHG estimates;
4. Reviewing standard GHG reduction measures to support 2030 reduction targets;
5. Quantifying the benefits of state level GHG reduction measures; and
6. Preparing basic regulatory language and text common to GHG reduction plan documents.

Completing these standard steps together saves both money and time for all Partnership jurisdictions.

Assurance of Standard Methods, Data, and Baseline Year: Even though GHG inventory protocols are standard and communities generally follow the recommended protocols, some subtle differences exist that can limit comparability between jurisdictions. Ensuring consistency of the

selection of the baseline year, the type of data collected, and the methodology and boundaries used greatly improves the comparability of plans. With a regional inventory and reduction plan, Partnership jurisdictions can be assured of an “apples to apples” comparison across all sectors for jurisdiction-to-jurisdiction comparisons as well as jurisdiction-to-region comparisons.

Regional Communication and Education: Similar to most communities in California and across the U.S., San Bernardino jurisdictions are undertaking a GHG inventory and reduction plan for the first time. As jurisdiction staff, stakeholders, and residents go through this process, each learns lessons that can be shared with other communities in the region. Sharing information and lessons learned benefits all Partnership jurisdictions.

Holistic Regional View: Certain sectors of GHG emissions are the result of activity that occurs only within the boundary of a jurisdiction, for example, residential natural gas use. Other emissions, such as on-road transportation, are the result of activity that occurs across jurisdictional boundaries and for which both jurisdictions are responsible for the emissions. For certain sectors, looking only at the GHG emissions of a single jurisdiction is of limited utility and GHG reduction planning cannot be undertaken alone. This Reduction Plan supports both jurisdiction-specific and regional planning.

Streamlining CEQA Compliance: The California Environmental Quality Act (CEQA) Guidelines require lead agencies to describe, calculate, or estimate the amount of GHG emissions that would result from a project. CEQA Guidelines (Section 15183.5) also allow individual projects to tier off of a qualified GHG reduction plan.¹ Thus, individual projects do not need to each conduct a GHG analysis to comply with CEQA if they can demonstrate consistency with a qualified plan. By completing CEQA compliance for a qualified GHG reduction plan, projects in jurisdictions with an qualified plan can tier project analysis from the plan and be considered less than significant under CEQA if they show consistency with their qualified plan

1.3 What Is SBCOG’s Role?

The *San Bernardino County Regional Greenhouse Gas Reduction Plan* has been sponsored and facilitated by SBCOG. The purpose of SBCOG is to speak with a collective voice on important issues that affect its member agencies. SBCOG is leveraging its role as a planning agency and its regional scope of authority to reduce GHG emissions in several emissions sectors in the region. As a regional agency, SBCOG is in a unique position to support coordinated jurisdiction efforts and facilitate regional dialogue and cooperation on GHG issues.

SBCOG worked closely with Southern California Association of Governments (SCAG) and San Bernardino County Transportation Authority (SBCTA) in the development and adoption of SCAG’s *2016-2040 Regional Transportation Plan/Sustainable Communities Strategy*, the benefits of which are captured for the region in this analysis. SBCTA is also spearheading efforts to transition to zero-emission vehicles and is leading other regional efforts related to energy efficiency, multimodal transportation infrastructure, and renewable energy. To learn more about SBCOG and SBCTA, visit <https://www.gosbcta.com/cog/about-cog/>.

¹ “Tiering off” refers to an instance in which if there is an earlier, broader environmental document that covers the general impacts of a program or project, then subsequent environmental documents for a related individual project can focus on unique or unanalyzed issues.

1.4 How Do I Use This Document?

This Reduction Plan is intended to serve three purposes for the Partnership jurisdictions.

1. **Reference Document:** This Reduction Plan establishes a baseline GHG inventory and an emissions forecast for all jurisdictions and the region as a whole. This baseline can be referenced for all future GHG analyses and planning. This document contains basic terms and concepts and regulatory information that may be useful for future planning (jurisdiction-specific or regional).
2. **Climate Action Plan Template:** This Reduction Plan provides the technical information to support a jurisdiction's selection of appropriate targets and GHG emissions reduction measures that could be included in a local CAP. The information in this document will help jurisdictions understand their GHG emissions and their options for local reductions. This Reduction Plan is provided in an electronic format that allows jurisdictions to utilize relevant portions in developing their own local CAPs. At a minimum, it is expected that jurisdictions will develop their own schedule, funding, and implementation plans in harmony with their existing infrastructure and procedures and in tune with each jurisdiction's unique priorities and needs. Beyond that, it is expected that many jurisdictions will use the Reduction Plan to develop a local CAP.
3. **Outline for a Local Climate Action Plan:** The CEQA guidelines adopted pursuant to SB 97 specify that a GHG reduction plan must include the following elements in order to allow for tiering under CEQA—each element has already been developed and included in this Reduction Plan, areas where local refinement is needed are noted.
 - An inventory of GHG emissions.
 - A forecast of future GHG emissions.
 - An identified GHG reduction goal.
 - Measures to reduce GHG emissions under the control of the jurisdiction.
 - Implementation actions to ensure that the measures result in actual reductions (requires local refinement).
 - Monitoring of the Reduction Plan's success over time (requires local refinement).
 - Adaptation and revision of the Reduction Plan over time as needed to meet the adopted goal (requires local refinement).

Because this document provides the required components of a GHG reduction plan listed above, a jurisdiction could adopt the Reduction Plan as its local CAP with limited refinement. However, as the Reduction Plan contains only basic implementation steps that would apply to all jurisdictions, jurisdictions will need to identify a specific schedule, funding, and implementation actions. Similar refinement would be needed for the monitoring and adaptation components of the Reduction Plan.

Please note that this document is not intended to be read through sequentially; rather, it should be used as a reference document and readers should skip to sections of interest. The document map below (Table 1-1) will help you find specific types of information.

Table 1-1. Document Map

For a complete list and description of GHG policy and legislation (both federal and state)	→	Go to Chapter 2.1
For a description of the underlying chemistry and physics of global warming	→	Go to Chapter 2.3.3
For a list of on-going efforts related to GHG emissions reductions in the region (“What are we doing already?”)	→	Go to Chapter 2.2
For the definitions of basic terms and concepts related to GHG inventories and reduction planning	→	Go to Chapter 2.3
For a look at GHG emissions for the region as a whole and how the combined efforts of the state, SBCOG, other regional agencies and individual jurisdictions can result in reduced GHG emissions for the region	→	Go to the Executive Summary
For descriptions of all the GHG measures considered by the jurisdictions	→	Go to Chapter 4
For a glossary of individual GHG reduction measures, their full descriptions, their methods of calculation, including key assumptions and likely means of implementation	→	Go to Appendix B
For each jurisdiction’s individual GHG inventory and reduction plan, including charts, tables, and related general plan policies	→	Go to Chapter 3
For an overview of how the Reduction Plan and each individual plan can be implemented, including suggestions for scheduling, funding mechanisms, outreach, a timeframe for future plan updates, recommendations for data collection and record keeping, and recommendations for long-term management	→	Go to Chapter 5
For a discussion of the relationship of this Reduction Plan to CEQA	→	Go to Chapter 5
For references cited in this document	→	Go to Chapter 6
For detailed descriptions of each jurisdiction’s GHG inventory	→	Go to Appendix A
For a detailed description of the methods used to calculate GHG emissions and GHG reductions	→	Go to Appendix B

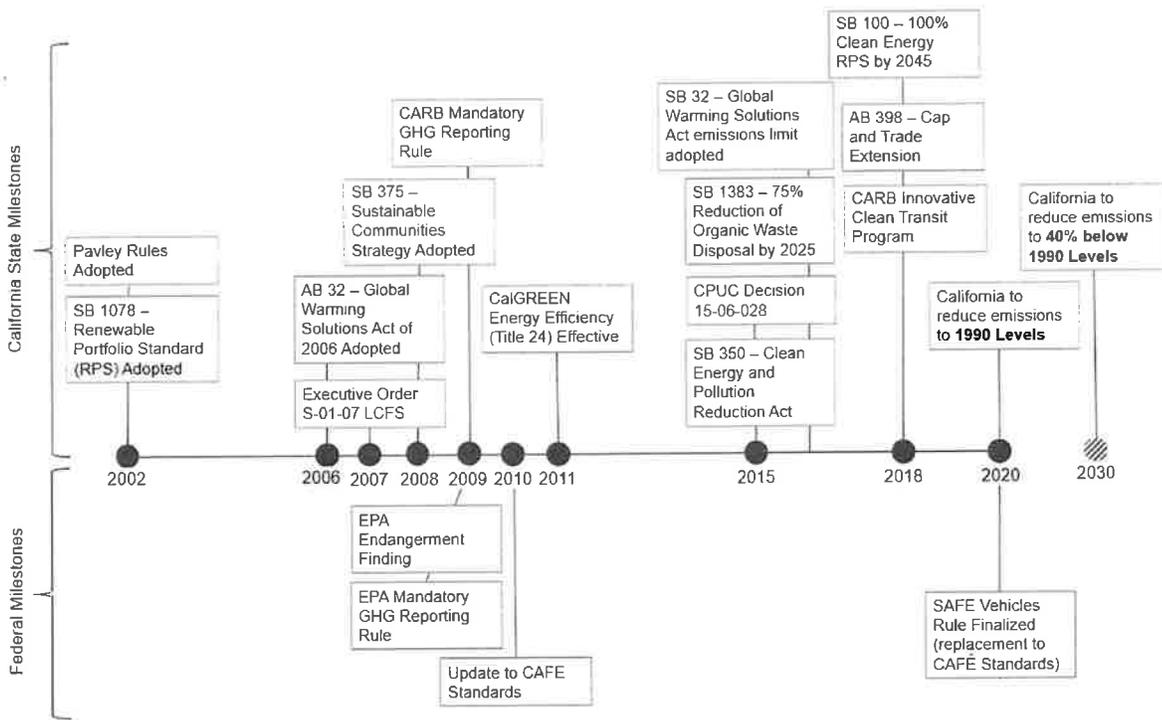
1.5 What Are the Next Steps?

Following SBCOG’s approval of this Reduction Plan, Partnership jurisdictions anticipate developing their own CAPs or adopting the regional CAP as their local CAP. Next, Partnership jurisdictions may begin working together with stakeholders, residents, and businesses within their respective communities to implement GHG reduction measures and systems to track their success. Partnership jurisdictions will continue to communicate with each other on progress through the auspices of SBCOG.

Greenhouse Gas Reduction and Climate Action Planning in California

This section describes important laws, policies and documents related to GHG emissions, including AB 32, SB 32, SB 375, the Renewable Portfolio Standard, Pavley fuel economy standards (AB 1493), and the Low Carbon Fuel Standard (LCFS). This section also briefly discusses pending national legislation and the challenges associated with GHG reduction and climate action planning at the state level. Figure 2-1 displays a timeline of key state and federal regulatory activities.

Figure 2-1. Milestones in Federal and State Legislation and Regulation



Federal Regulations

Although there is currently no comprehensive federal law specifically related to climate change or the reduction of GHGs, the U.S. Environmental Protection Agency (EPA) leads the implementation of the federal Clean Air Act (CAA) and related regulations. The following federal regulations are related to climate change and GHG emissions.

Mandatory Greenhouse Gas Reporting Rule: EPA (2009)

On September 22, 2009, EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), which required EPA to develop “mandatory reporting of greenhouse gasses above appropriate thresholds in all sectors of the economy...” The Reporting Rule applies to most entities that emit 25,000 metric tons of carbon dioxide equivalent (MTCO_{2e}) or more per year. Starting in 2010, facility owners were required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also mandates recordkeeping and administrative requirements to help EPA to verify annual GHG emissions reports.

Endangerment and Cause and Contribute Findings: EPA (2009)

On December 7, 2009, EPA signed the Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the CAA. Under the Endangerment Finding, EPA found that the current and projected concentrations of the six key well-mixed GHGs—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorinated carbons (PFCs), sulfur hexafluoride (SF₆), and hydrofluorocarbons (HFCs)—in the atmosphere threaten the public health and welfare of current and future generations. Under the Cause or Contribute Findings, EPA found that the combined emissions of these well-mixed GHGs from new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

These findings did not by themselves impose any requirements on specific industries or other entities. However, this action was a prerequisite to finalizing EPA’s corporate average fuel economy (CAFE) standards for light-duty vehicles for future years.

Updates to CAFE Standards and SAFE Rules: EPA and NHTSA

The 2012 CAFE standards (for model years 2017-2025) incorporated stricter fuel economy requirements promulgated by EPA and the National Highway Traffic and Safety Administration (NHTSA). The 2012 standards established GHG emissions regulations and would have required new passenger cars and light trucks to reach 54.5 miles per gallon in 2025. Additionally, the program included incentives to encourage adoption of new technologies to improve vehicle performance, including incentives for electric vehicles (U.S. Department of Transportation, 2014). In 2018, the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule was proposed, which would amend prior CAFE and GHG emissions standards and create new standards for 2021-2026, reducing fuel economy requirements. In September 2019, NHTSA and EPA established “The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program,” which withdrew California’s ability to create their own fuel economy standards under the Clean Air Act. In 2020, the SAFE rule, Parts one and two were finalized. The SAFE rule has been legally challenged by a number of states, led by California. In January 2021, the Biden Administration has indicated that it intends to pursue new rulemaking to make vehicle efficiency requirements that are more stringent than the SAFE rule.

Because California is party to the litigation on the SAFE Rule and California vehicle standards have not been changed, this study presumes that the California vehicle standards (i.e., the 2012 CAFE standards) will be in effect (e.g., this study presumes California will be successful in its legal appeal and/or that the Biden Administration will put in place new standards equivalent or better than the 2012 standards).

State Regulations

California has adopted statewide legislation addressing various aspects of climate change and GHG emissions mitigation. This legislation establishes a broad framework for the state's long-term GHG reduction and the California Air Resources Board and other agencies have adopted associated regulations and prepared detailed implementation plans. Several executive orders related to the state's evolving climate change policy have also been adopted. The following state regulations are related to climate change and GHG emissions.

Executive Order S-03-05 (2005)

Signed by Governor Schwarzenegger on June 1, 2005, Executive Order S-3-05 asserts that California is vulnerable to the effects of climate change (CA Office of the Governor, 2005). To combat this concern, Executive Order S-3-05 established the following GHG emissions reduction targets for state agencies:

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

Executive orders are binding only on state agencies. Accordingly, EO S-03-05 will guide state agencies' efforts to control and regulate GHG emissions but will have no direct binding effect on local government or private actions. The secretary of the California Environmental Protection Agency (Cal-EPA) is required to report to the governor and state legislature biannually the impacts of global warming on California, mitigation and adaptation plans, and progress made toward reducing GHG emissions and meeting the targets established in this executive order.

Assembly Bill 1493—Pavley Rules (2002, Amendments 2009)

Known as "Pavley I," AB 1493 standards were the nation's first GHG standards for automobiles. AB 1493 requires the California Air Resources Board (CARB) to adopt vehicle standards that will lower GHG emissions from new light-duty autos to the maximum extent feasible beginning in 2009. In 2012, CARB strengthened the Pavley standards with Advanced Clean Cars, a set of regulations that limit GHG emissions from model-year 2017–2025 passenger vehicles (California Air Resources Board, 2020).

EPA and CARB worked together on a joint rulemaking to establish GHG emissions standards for model-year 2017–2025 passenger vehicles. Under the Obama administration, the federal government completed rulemaking in summer 2012, resulting in the adoption of new standards that would lead to a fleet average of 54.5 mpg in 2025 (New York Times, 2012). In 2017, President Trump ordered a rollback of Obama-era fuel efficiency standards, and in 2018 announced a plan to eliminate California's waiver, which, since 1963, has allowed the state to set tighter fuel economy standards than the rest of the United States. President Trump's new plan orders annual increases in fuel efficiency of 1.5%, significantly less than the 5% increases ordered under the Obama administration (New York Times, 2020).

Senate Bills 1078 (2002), Senate Bill 107 (2006), Senate Bill 2 (2011), Senate Bill 350 (2015), Senate Bill 100 (2018)—Renewable Portfolio Standard

SB 1078 and SB 107, California's Renewable Portfolio Standard (RPS), obligates investor-owned utilities (IOUs), energy service providers (ESPs), and Community Choice Aggregations (CCAs) to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, by no later than 2010. The California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are jointly responsible for implementing the program. Senate Bill 2 (2011) set forth a longer-range target of procuring 33% of retail sales by 2020. Following Senate Bill 2, Senate Bill 350 established a long-range, more ambitious target of sourcing 50% of electricity retail sales from renewable resources by 2030. This was further accelerated by SB 100 (2018), which escalates the RPS to 60% by 2030, and mandates that California source 100% of its electricity from carbon-free resources by 2045 (California Public Utilities Commission, 2020).

Assembly Bill 32—California Global Warming Solutions Act (2006)

In September 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. AB 32 establishes a cap on statewide GHG emissions and sets forth the regulatory framework to achieve the corresponding reduction in statewide emission levels. Under AB 32, CARB is required to take the following actions (California Legislative Information, 2006):

- Adopt early action measures to reduce GHGs,
- Establish a statewide GHG emissions cap for 2020 based on 1990 emissions,
- Adopt mandatory reporting rules for significant GHG sources,
- Adopt a scoping plan indicating how emission reductions would be achieved through regulations, market mechanisms, and other actions, and
- Adopt regulations needed to achieve the maximum technologically feasible and cost-effective reductions in GHGs.

Executive Order S-01-07—Low Carbon Fuel Standard (2007)

Executive Order S-01-07 mandates: (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020, and (2) that an LCFS for transportation fuels be established in California. The executive order initiated a research and regulatory process at CARB. CARB approved the LCFS on April 23, 2009 and the regulation became effective on January 12, 2010 (California Air Resources Board 2011). The U.S. District Court for the Eastern District of California ruled in December 2011 that the LCFS violates the Commerce Clause of the U.S. Constitution. CARB appealed this ruling in 2012 and on September 18, 2013, a 9th U.S. Circuit Court of Appeals panel upheld the LCFS, ruling that the program does not violate the Commerce Clause and remanded the case to the Eastern District. In 2015, CARB re-adopted the regulation, and in 2018 CARB passed amendments to the LCFS. These amendments, in alignment with the GHG reduction targets outlined in SB 32, strengthened California's carbon intensity standards through 2030 (California Air Resources Board, 2019).

Senate Bill 375—Sustainable Communities Strategy (2008)

SB 375 provides for a new planning process that coordinates land use planning, regional transportation plans, and funding priorities in order to help California meet the GHG reduction goals established in AB 32. SB 375 requires regional transportation plans, developed by metropolitan planning organizations (MPOs) to incorporate a sustainable communities strategy (SCS) in their regional transportation plans (RTPs). The goal of the SCS is to reduce regional vehicle miles traveled (VMT) through land use planning and consequent transportation patterns. SB 375 also includes provisions for streamlined CEQA review for some infill projects such as transit-oriented development (San Diego Council of Governments, 2008).

The Southern California Association of Governments (SCAG) is the MPO responsible for the southern California region that includes San Bernardino County. SCAG updated their RTP/SCS in April 2016, outlining strategies to meet or exceed the reduction targets set by CARB to reduce passenger and light-duty vehicle per capita GHG emissions by 8% by 2020 and by 13% by 2035 compared to 2005 per capita GHG emissions levels. The RTP/SCS anticipates that strategies employed will result in an eight percent reduction in greenhouse gas emissions per capita by 2020, an 18% reduction by 2035 and a 21% reduction by 2040 compared with 2005 levels (Southern California Association of Governments, 2016). The RTP/SCS includes a combination of land use and transportation strategies to reduce VMT and associated GHG emissions. However, it should be noted the land use pattern in the SCS is not mandatory as local land use agencies retain their jurisdiction and authority over land use planning. The Regional Housing Needs Allocation (RHNA) must be consistent with the SCS and local cities must meet the RHNA for their city in their housing elements, but the RHNA does not specify the location or design of new housing, which is a prerogative of local planning.

California Energy Efficiency Standards for Residential and Nonresidential Buildings—Title 24 (2008), Green Building Code (2011), Title 24 Update (2014), Title 24 Update (2019)

California has adopted aggressive energy efficiency standards for new buildings and has been continually updating them for many years. The latest update to the standards occurred in 2019 and improved upon previous standards for the construction of new buildings and the addition to and alteration of existing buildings (California Energy Commission, 2019).

In 2008, the California Building Standards Commission adopted the nation's first green building standards, which include standards for many other built environment aspects apart from energy efficiency. The California Green Building Standards Code (proposed Part 11, Title 24) was adopted as part of the California Building Standards Code (24 California Code of Regulations [CCR]). Part 11 establishes voluntary standards that became mandatory in the 2010 edition of the code, including planning and design for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. The latest update to the California Green Building Standards Code was in 2019 (California Department of General Services, 2019).

California Air Resources Board Greenhouse Gas Mandatory Reporting Rule Title 17 (2009)

In December of 2007, CARB approved a rule requiring mandatory reporting of GHG emissions from certain sources, pursuant to AB 32. Facilities subject to the mandatory reporting rule started to

report their emissions from the calendar year 2009 and were required to have those emissions verified by a third party in 2010. In general, the rule applies to facilities emitting more than 25,000 MTCO₂e in any given calendar year or electricity generating facilities with a nameplate generating capacity greater than 1 megawatt (MW) and/or emitting more than 25,000 MTCO₂e per year. Additional requirements also apply to cement plants and entities that buy and sell electricity in the state. The most recent amendments to the CARB Mandatory Reporting Regulation were made in 2018, and became effective in April of 2019, for 2019 data (California Air Resources Board, 2018a). These amendments a) more clearly define current requirements for calculation and reporting, b) make certain that electricity import emissions are fully accounted for, and c) support the GHG Cap-and-Trade Program that was adopted in 2011 (California Air Resources Board, 2018b).

California Environmental Quality Act (CEQA) – 2010, CEQA Update (2018)

The State CEQA Guidelines require lead agencies to describe, calculate, or estimate the amount of GHG emissions that would result from a project. Moreover, the State CEQA Guidelines emphasize the necessity to determine potential climate change effects of the project and propose mitigation as necessary (California Natural Resources Agency, 2019). The State CEQA Guidelines confirm the discretion of lead agencies to determine appropriate significance thresholds, but require the preparation of an environmental impact report (EIR) if “there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with adopted regulations or requirements” (Section 15064.4).

The guidelines were updated in 2010 to address GHG emissions. State CEQA Guidelines section 15126.4 includes considerations for lead agencies related to feasible mitigation measures to reduce GHG emissions, which may include, among others:

- Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency’s decision;
- Implementation of project features, project design, or other measures which are incorporated into the project to substantially reduce energy consumption or GHG emissions;
- Offsite measures, including offsets that are not otherwise required, to mitigate a project’s emissions; and
- Measures that sequester carbon or carbon-equivalent emissions.

The guidelines were updated again in 2018; changes included revisions to transportation impact analysis following Senate Bill 743, revisions to greenhouse gas emissions analysis, and updates to Section 15126.2(a) pursuant the California Supreme Court’s decision in California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal 4th 369 (California Governor’s Office of Planning and Research, 2018).

Greenhouse Gas Cap-and-Trade Program (2011)

On October 20, 2011, CARB adopted the final cap-and-trade program for California. The California cap-and-trade program creates a market-based system with an overall emissions limit for effected sectors. The program currently regulates more than 85% of California’s emissions and has staggered compliance requirements in the following order: (1) electricity generation and large industrial sources (2012), and (2) fuel combustion and transportation (2015) (California Air Resources Board,

2015). The first auction was in late 2012 with the first compliance year in 2013. Since its adoption, the GHG Cap-and Trade Program has undergone several amendments. The most recent amendments, passed in 2018, address (1) the proceedings for an entity covered by the program that filed for bankruptcy and sold its power plant to its creditor-purchaser, and (2) the procedure set in place to address disparities in jurisdiction-specific Auction Reserve Price values (California Air Resources Board, 2018c).

Senate Bill 743 (2013)

In accordance with Senate Bill 743, the California Natural Resources Agency has adopted changes to the California Environmental Quality Act (CEQA) Guidelines that “promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses,” as described under Section 21099(b)(1) of the California Public Resources Code. With these changes, vehicle miles traveled (VMT) has been identified as the most appropriate metric for evaluating a project’s transportation impact, and automobile delay—as measured by “level of service” or similar measures of vehicular capacity of traffic congestion—generally no longer constitutes a significant environmental effect under CEQA. The requirement to analyze VMT under CEQA became mandatory as of July 1, 2020. With analysis of VMT under CEQA, it can be expected there will be project-level reductions in VMT for new development, but predicting exactly how many reductions will actually occur is difficult to forecast at this initial time of application.

Senate Bill 32—California Global Warming Solutions Act (2016)

In September of 2016, the California Assembly and Senate expanded on AB 32 with Senate Bill (SB) 32, which mandates a 40% reduction in GHG emissions from 1990 levels by 2030. SB 32 directs CARB to utilize the most advanced technology feasible to achieve the most cost-efficient reductions in GHG emissions. SB 32 also has an important environmental justice component: GHG reduction targets must be met in a way that benefits the state’s “most disadvantaged communities,” who are often impacted first and more profoundly by the effects of climate change (California Legislative Information, 2016a).

Assembly Bill 197—State Air Resources Board: Greenhouse Gases – Regulations

In September of 2016, the California Assembly passed the companion bill to SB 32, AB 197, which provides guidance to CARB on enacting GHG emission reduction measures and making air emissions data more accessible to the public. Specifically, AB 197 outlines the following requirements (California Legislative Information, 2016b):

- Public, statewide posting of GHG benchmarks and toxic air contaminant data.
- Consideration of social costs of GHG emissions and prioritization of the following when passing emission reduction rules and regulations that protect disadvantaged communities.
 - Rules/regulations that facilitate direct reductions in emissions from large stationary sources and mobile sources.
 - Rules/regulations that facilitate direct emissions reductions from other sources.
- Identification of the following for each GHG emissions reduction measure:

- Potential range of GHG emissions reductions brought about by the measure.
- Potential range of air pollution reductions brought about by the measure.
- Effectiveness of the measure in terms of costs (including social costs).

Executive Order B-55-18 (2018)

- Signed by Governor Brown in 2018, Executive Order B-55-18 established a goal to achieve carbon neutrality by 2045.

The Role of Local Governments

The 2017 SB 32 Scoping Plan builds on the 2008 AB 32 Scoping Plan, which laid out California’s plan for achieving the GHG reductions required by AB 32 (California Air Resources Board, 2017). The SB 32 Scoping Plan proposes a continuation of successful aspects of the AB scoping plan, including Cap-and-Trade Regulation, LCFS, the movement towards cleaner vehicles, the transition to cleaner renewable energy, and the effort to reduce methane emissions from agricultural and other waste.

Because the state does not have jurisdictional control over many of the activities that produce GHG emissions in California, the AB 32 Scoping Plan articulated a unique role for local governments in achieving the state’s GHG reduction goals. The AB 32 scoping plan recommended that local governments reduce GHG emissions from both their municipal operations and the community at large to a level that is 15% below 2017 levels. The SB 32 Scoping Plan expands upon this goal, directing local governments to strive for per capita emissions of no more than 6 MTCO_{2e} by 2030 and 2 MTCO_{2e} by 2050 (California Air Resources Board, 2017). These per capita reduction targets align with statewide emissions limits outlined in AB 32, SB 32, and Executive Orders S-3-05. They are also consistent with the Under 2 MOU that began in California and has been adopted or supported by jurisdictions in 33 countries across six continents.

In response to AB 32, SB 32 and the SB 32 Scoping Plan, many jurisdictions across California have completed a GHG inventory and reduction plan, commonly called a climate action plan or CAP. These plans generally address two types of emissions:

- The “community inventory”—emissions that arise from the community at large (residents, businesses, and their associated activities within the jurisdictional boundary).
- The “municipal inventory”—emissions that arise from the county/city’s operations only (county/city buildings, vehicle fleet, activities required to provide services to the jurisdiction).

Many jurisdictions in southern California have completed a community or municipal CAP, or both, including San Bernardino County, Ontario, Redlands, Chino, Colton, Yucaipa, Hesperia, Upland, Apple Valley, as well as Los Angeles, San Diego, and many others.

Current Local Efforts

This section describes large-scale GHG planning efforts in southern California, including regional transportation planning, utility programs, SBCOG efforts, and efforts in unincorporated San Bernardino County and several jurisdictions in San Bernardino County.

Regional Transportation Planning

On April 7, 2016, the Regional Council of SCAG adopted the *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future* (Southern California Association of Governments, 2016). The RTP/SCS is the culmination of a multi-year effort involving stakeholders from across the SCAG Region. SCAG has prepared RTPs for the southern California region for over 30 years, with the primary goal of increasing mobility for the region's residents and visitors.

The 2016–2040 RTP/SCS includes the following key initiatives (Southern California Association of Governments, 2016):

- **Investment of \$275.5 billion in the existing transportation system**, with the goal of preserving or improving state highways, transit and passenger rail systems, and regionally significant roads and streets.
- **Creation of alternatives to driving alone** through the expansion of the regional transit system. Key entities in this initiative include the Metro subway, Light Rail Transit system, new Bus Rapid Transit system, local and rapid bus systems, streetcar systems, and Metrolink systems.
- **Expansion of the passenger rail system** to escalate pieces of the regional rail network to the federally defined speed of 110 mph or higher, and to help spearhead an integrated system of rail services.
- **Improvement of highway and arterial capacity** to achieve maximum productivity of and expanding access to the highway system. This initiative supports the distribution and employment of new technology, as well as preservation of and addition to the regional network of Express lanes.
- **Management of transportation system demands**, with a focus on reducing overall vehicle miles traveled through encouragement of ridesharing, telecommuting, and alternative modes of travel.
- **Optimization of transportation system capacity and performance** through advanced ramp metering, improved managements of incidents, removal of bottlenecks, traffic signal integration, extensive data collection, intentional congestion management, and other Intelligent Transportation System enhancements.
- **Promotion of active transportation**, such as walking and biking, through the improvement of the quality of sidewalks and bicycle lanes.
- **Improving goods movement throughout the Regional Transportation Network**, through the instatement of truck-only lanes, addition of mainline trucks to the system, building highway-rail grade separations, modernization of intermodal infrastructure, and encouragement of the use of low-emission trucks and trains.
- **Leveraging advanced technologies**, especially those that enhance communication, reduce environmental impacts of existing transportation, and improve transportation system efficiency.

- **Bettering access to airports** to improve efficiency and reduce on-the-ground congestion that results from frequent air-travel trips.
- **Stimulating growth around transit**, by supporting policies that expand the development of a) High Quality Transit Areas, b) livable corridors, and c) Neighborhood Mobility Areas.
- **Reduction of GHG emissions and enhancement of air quality** through integrated land-use planning and sustainable transportation initiatives.
- **Natural land preservation**, especially for areas that do not have associated conservation plans and may be susceptible to development.

Utility Incentive Programs

Local and regional utility providers, including Southern California Edison (SCE), Southern California Gas Company (SCGC), Southwest Gas Corporation, Bear Valley Electric Service (BVES), and the Inland Empire Utilities Agency (IEUA) have a wide range of incentive programs aimed at promoting energy efficiency and renewable energy use; these are summarized below.

Southern California Edison Programs

Income Qualified Programs—Energy Savings Assistance Program: This program helps income-qualified households conserve energy and reduce their electricity costs. SCE pays all the costs of purchasing and installing energy-efficient appliances and equipment, which are free to eligible customers.

Mobile Energy Unit (MEU): The MEU promotes energy-efficiency solutions and energy management for both residential and business customers.

Energy Solutions: SCE provides their customers with a home energy survey, residential energy guides, and energy saving tips.

Energy Management Solutions: SCE provides its commercial customers with energy management solutions by industry sector in order to cut costs and greenhouse gas emissions.

Refrigerator & Freezer Recycling Program: SCE hauls away old refrigerators and freezers for free and provides a \$50 incentive to customers.

Home Energy Efficiency Survey: SCE provides its residential customers a 15-minute survey and helps them find tips to maximize savings, and useful information about rebates that they can qualify for. The results are customized for each household.

Incentives For Home Energy Upgrades: SCE provides home energy-efficiency product rebates on products such as compact fluorescent (CFL) and energy efficiency lighting, Energy Star® refrigerators, energy efficiency water heaters, Energy Star air conditioners, whole-house fans, and energy-efficient evaporative cooling systems.

Plug-In Electric Vehicle Survey & Checklist: SCE provides a survey and checklist to help customers with electric vehicles set up their homes.

Renewables Standard Contract Program: SCE provides a standardized procurement process (for renewable power generation projects not to exceed 20 MW) that leads to quicker execution of the project, relative to other procurement processes.

California Solar Initiative: CE provides financial incentives for installing eligible solar photovoltaic (PV) systems.

New Solar Homes Partnership: The New Solar Homes Partnership program, part of the California Solar Initiative, provides financial incentives and other support for installing eligible solar generating systems on new residential buildings—single family, income-eligible, and multifamily housing.

California Solar Initiative Thermal Program: SCE offers incentive rebates for electric-displacing solar water heating systems in its service territory.

Multifamily Affordable Solar Housing: This program is part of the California Solar Initiative. It offers incentives for installing eligible photovoltaic systems for qualifying multifamily affordable housing. It is designed to subsidize photovoltaic systems in multifamily housing, which will offset electricity loads and provide economic benefits for housing property owners and managers as well as building tenants.

Multifamily Property Rebates: includes T8 replacement lamps (\$6.50 per lamp), Energy Star certified smart thermostats (\$50 per thermostat).

Savings by Design: Encourages high-performance, non-residential building design and construction to help maximize energy performance in new and upgraded building projects.

Solar Programs: includes the Single Family Affordable Solar Homes (SASH) program, the Disadvantaged Communities Single Family Affordable Solar Homes (DAC-SASH) program, and the Solar on Multifamily Affordable Housing (SOMAH) program.

Self-Generation Incentive Program: SCE customers with a demand of 30 kilowatts (kW) or more can receive a cash incentive from \$0.60 to \$4.50 per watt for installing qualifying electricity generating equipment.

Southern California Gas Company (SCGC) Programs

Direct Assistance Program: SCGC offers no-cost energy-saving home improvements and furnace repair or replacement services for qualified limited-income renters and homeowners.

Conservation Tips: SCGC provides useful tips for residential customers to conservation energy.

Instant Rebate Program: Customers may receive instant rebates for energy efficient products.

Residential Rebates: SCGC offers money-saving rebates on qualifying energy-efficient appliances or upgrades for residential customers. Qualified appliances include clothes washers, dishwashers, low-flow showerheads, furnaces, insulation, natural gas storage water heaters, and natural gas tankless water heaters.

Rebates for Property Managers: The Multifamily Rebate Program offers rebates for the installation of qualified energy-efficient products in apartment units and common areas of apartments, condominium complexes, and mobile home parks.

Energy Efficiency Starter Kit: The kit includes three faucet aerators and a low-flow showerhead to help save energy and water.

Home Energy Efficiency Survey: Customers may save money and resources by taking a free Home Energy Efficiency Survey. When customers take the survey, they get customized gas, electricity, and water saving tips on the best ways to use appliances in their homes.

Financing for Energy Efficiency Upgrades: Customers can qualify for \$2,500 to \$20,000 to purchase and install energy-efficient upgrades with the Home Energy Upgrade Financing program.

Comprehensive Mobile Home Program: Qualifying mobile home customers are provided with no-cost energy conservation evaluations, installations of low-flow showerheads and faucet aerators, and gas energy-efficiency improvements, such as duct test and seal of heating/venting and air conditioning (HVAC) systems.

LivingWise® School Program: This program combines classroom learning and home retrofit/audit projects completed by sixth grade students and their parents. It provides a LivingWise® Activity Kit for each customer.

Upstream High Efficiency Gas Water Heater Rebate Program: This program offers rebates to distributors and wholesalers for high-efficiency gas water heaters to reduce or remove the price differential between these appliances and standard gas water heaters.

On-Demand Efficiency (Recirculation Loops for Central Domestic Hot Water Heaters): This program installs on-demand intelligent pumps in central domestic hot water systems with recirculation loops in multifamily buildings to help reduce unnecessary natural gas consumption.

High Efficiency Hot Water Distribution Program (Solar): This program helps customers install new solar pool heating systems to augment an existing gas pool heater. This program is for qualified apartment complexes that heat swimming pools throughout the year.

Multifamily Direct Installation Programs: Qualifying owners and managers of multifamily buildings are provided with no-cost energy audits, products, and their installation. No-cost products include super low-flow energy-efficient showerheads, kitchen aerators, bathroom aerators, and pipe wrap for hot water distribution systems.

CoolGas Replacement Program: This program provides incentives, based on calculated energy savings, for the replacement of smaller (50 tons or less), older, inefficient natural gas air conditioning systems with new energy-efficient units and quality installation procedures.

Domestic Hot Water Controls Project: This program installs domestic hot water controller technology on the hot water systems in hotels and motels to reduce natural gas consumption by a minimum of 25 therms per hotel room, per year.

Energy Challenger: This program offers business customers an interactive online assessment to develop practical energy-efficiency recommendations.

Home Energy Rating System (HERS) Rater Advanced Training Program: This program will provide advanced training and education delivered both in the classroom and online. Training is for currently certified HERS raters and energy analysts involved in new construction.

Program for Resources Efficiency in Private Schools: This program is to help private grade schools, colleges and universities, preschools, and trade and technical schools reduce energy use and energy costs. Program activities and services will include customer screening, comprehensive energy audit reports, rebates, bonuses, and installation support services.

Small Industrial Facility Upgrades: The program is targeted at small industrial customers to deliver natural gas savings. Program offerings include, but are not limited to, improvements for heat recovery; process equipment replacement and equipment modernization; furnace and oven

improvements and excess air reduction; onsite audits to identify energy savings opportunities; and design assistance to help customers understand the best ways to achieve energy savings.

Steam Trap and Compressed Air Survey: This program will provide comprehensive compressed air and steam surveys and evaluations to small through large industrial customers. Survey activities carried out onsite will include a baseline of the customer's current energy consumption; field analysis of energy-consuming equipment; application of best practices; use of standard engineering protocols for design; identification of alternate methods of accomplishing the same task with less energy input; and methods to maintain quality, reliability, and safety of plant operations while achieving the energy-savings objectives.

Custom Language Efficiency Outreach (CLEO) Program: This program promotes SCGC energy-efficiency programs and education/training to customers in SCGC's service territory who speak Chinese, Korean, Vietnamese, and Indian languages. The program will also address the needs of the African American community. Offerings include interactive workshops, community booths and energy surveys, and low-cost and no-cost recommendations.

Property Assessed Clean Energy (PACE) Energy Savings Project: This program promotes energy-efficiency programs in the SCGC service area. The primary focus is ethnic minority communities (Vietnamese, Indian, Chinese, Korean, and Hispanic) for customers with historically low participation in SCGC energy-efficiency programs.

California Sustainability Alliance Program: This program includes public and private organizations dedicated to increasing and accelerating adoption of sustainability best practices in the planning, design, construction, and operations of new and existing facilities and communities to increase efficient utilization of resources and develop self-sustaining community initiatives and capabilities.

Portfolio of the Future Program: This program is designed to identify the market commercialization of emerging technologies that can improve energy efficiency and reduce reliance on natural gas supplies in the southern California market at a quick pace.

Vendor Participation Program: Suppliers and installers of insulation, steam traps, boilers, and other qualifying products can apply for rebates on behalf of their customers.

Seminars & Training at the Energy Resource Center: SCGC offer training on the latest in energy-efficient equipment and technologies. SCGC also sponsors seminars about energy-efficient equipment, kitchen ventilation, food safety, equipment maintenance, industry trends, and more.

Zero Percent On-Bill Financing: Working in conjunction with rebate and incentive programs, SCGC offers qualified customers purchasing qualified natural gas equipment 0%, unsecured financing.

Energy Efficiency Benchmarking: SCGC benchmarking allows building owners and managers to track and assess the energy performance of their buildings at no charge.

Southwest Gas Corporation Programs

Commercial Service Planning Representatives: Southwest Gas Corporation's commercial service planning representatives are trained in energy-related aspects of business, and can perform a variety of equipment specific evaluations to optimize a company's energy decisions, including providing energy savings option information.

California Low-Income Energy Efficiency Weatherization Program: In order to participate in this program, a customer must meet the income qualifications set forth by CPUC.

Winter Energy and Money Saving Ideas: Southwest Gas Corporation provides ideas for customers to save energy and money.

Bear Valley Electric Service (BVES) Programs

Program for Income Qualified customers: BVES offers a program that provides free energy-saving home improvements and education to qualified customers.

Energy Star Rebate Program: BVES offers rebates for Energy Star qualified refrigerators and room air conditioners. For customers that need to replace their electric water heater, BVES offers rebates for high-efficiency replacements.

Lighting Exchange Events: Throughout the year, BVES holds a series of free Lighting Exchange Events where customers can exchange up to four incandescent bulbs for up to four CFLs.

Energy Conservation Booklet: BVES makes saving energy easy for customers with the Energy Conservation Booklet. This booklet includes helpful tips and information about ways to reduce their electric bills.

Energy Saving Tips: BVES provides seasonal and year-round tips for how customers can save energy.

Small/Medium Business Lighting Cash Rebates: BVES offers rebates for customers that make lighting improvements. Eligible measures include T12 to T8 retrofits, light emitting diode (LED) exit signs, occupancy sensors, and time clocks.

Inland Empire Utilities Agency (IEUA) Programs

Residential Conservation Rebates: IEUA offers rebates for the purchase of residential water conservation appliances and equipment including high efficiency clothes washers, SmartTimer controllers for lawns, and high efficiency sprinkler nozzles. IEUA also offers free landscape evaluations and a high efficiency toilet installation co-pay program.

Commercial Conservation Rebates: IEUA offers rebates for the purchase of commercial water conservation appliances and equipment including toilets and urinals, laminar flow restrictors, connectionless food steamers, cooling towers, dry vacuum pumps, air cooled ice machines, smart controllers for irrigation, high efficiency sprinkler nozzles, large rotary nozzles for irrigation, and in-stem flow regulators. IEUA also offers free landscape evaluations and a high efficiency toilet installation co-pay program.

Water Calculator: Through IEUA's website, residents and businesses can calculate their annual water usage using the H₂O Conserve Water Calculator.

Landscaping: IEUA provides the following water conservation resource materials related to landscaping: how to use irrigation controllers and leading manufacturers of controllers; a guide to edible landscaping; a database of California friendly plants; cost comparison tools for sustainable landscapes and traditional landscapes and advice from garden experts.

SBCTA Transportation Plans

Long Range Transit Plan

San Bernardino County's Transportation Authority's (SBCTA)'s *Long Range Transit Plan* (LRTP) (San Bernardino Council of Governments 2010¹) addresses San Bernardino County's current and future travel challenges, including addressing growing travel demand. The goal of the LRTP is to provide transit facilities and services to support this demand. The LRTP prioritizes goals and projects for transit growth and connects land use and transportation strategies. The LRTP identifies premium transit routes and station locations that helped to develop the SCS for areas in the county.

Non-Motorized Transportation Plan

SBCTA's *Non-Motorized Transportation Plan* (NMTP) (SBCTA 2018²) has a goal of developing a cohesive, integrated plan to deliver a safe-interconnected cycling and walking system for San Bernardino County and identifying sources of funds to implement that plan. The NMTP identifies a comprehensive network, with a focus on the bicycle system. It is also a response, in part, to the initiatives to reduce vehicle travel and greenhouse gas emissions embedded in California Senate Bill 375 (SB 375). The Plan satisfies the State of California requirements of a Bicycle Transportation Plan (BTP) for purposes of Caltrans Bicycle Transportation Account (BTA) funding. Implementation of the Plan requires a strong partnership among local governments, transportation agencies, and the citizens of San Bernardino County can make it happen. The NMTP serves as a vehicle for communicating the non-motorized vision for the County, which is represented by the collective visions of each jurisdiction. Although the jurisdictions are responsible for implementation of the Plan, the Plan cuts across subareas and jurisdictions so that coordination can occur on a physical facility level as well as in scheduling and funding.

Inland Empire Comprehensive Multimodal Corridor Plan

The *Inland Empire Comprehensive Multimodal Corridor Plan* (IECMCP) (SCAG et al 2020³) studies multiple north-south and east-west sub-corridors in the urbanized portion of San Bernardino and Riverside counties, excluding the Coachella Valley. North-south sub-corridors analyzed in San Bernardino County include Victorville to San Bernardino, San Bernardino To Riverside. East-west corridors in San Bernardino County include Apple Valley to the Los Angeles County Line, Banning to Rialto, and Riverside/Rialto to the Los Angeles County Line. The results of the IE CMCP include a detailed assessment of the corridor conditions, a list of recommended projects and programs to improve corridor conditions in each of the sub-corridors, and a framework for evaluating the potential improvements. To understand the transportation issues facing the corridors and to inform the recommendations of the study, the IE CMCP includes detailed assessments of both current and projected transportation future conditions. This included an analysis of all modes (roadway, transit, active transportation, and freight) as well as cross-cutting themes such as safety. .

¹ Available at: <https://www.gosbcta.com/wp-content/uploads/2019/10/San-Bernardino-County-Long-Range-Transit-Plan.pdf>.

² Available at: <https://www.gosbcta.com/plan/non-motorized-transportation-plan-2018/>.

³ Available at: <https://www.gosbcta.com/plan/inland-empire-comprehensive-multimodal-corridor-plan/>.

Zero Emission Vehicle Readiness and Implementation Plan

SBCTA's *Zero Emission Vehicle Readiness and Implementation Plan* (ZEV RIP)(SBCOG 2019⁴). The Plan accomplished the following goals: 1) Assessed the current ZEV charging infrastructure within San Bernardino County; 2) Provided quantitative analysis and recommendations for additional ZEV infrastructure at public agencies, workplace, destinations, transit stations, and multi-unit dwellings (MUDs) with focus on disadvantaged communities (DACs); 3) Identified implementation actions to promote ZEV and ZEV infrastructure adoption over the next 10 years; and 4) Provided local governments and stakeholders with tools to effectively procure, site, and install ZEV infrastructure; develop a list of potential "shovel-ready" projects in the County.

Unincorporated San Bernardino County

In September 2011, San Bernardino County adopted the *County of San Bernardino Greenhouse Gas Emissions Reduction Plan* (Emissions Reduction Plan), which outlines a strategy to use energy more efficiently, harness renewable energy to power buildings, enhance access to sustainable transportation modes, and recycle waste. It has the following specific goals.

- Reduce emissions from activities over which the County has jurisdictional and operational control to 15% below 2007 levels by 2020, consistent with the target reductions of the AB 32 Scoping Plan.
- Provide estimated GHG reductions associated with the County's existing sustainability efforts and integrate the County's sustainability efforts into the discrete actions of the Emissions Reduction Plan.
- Provide a list of discrete actions that would reduce GHG emissions.
- Approve a GHG reduction plan that satisfies the requirements of Section 15183.5 of the CEQA Guidelines, so that compliance with the GHG reduction plan can be used in appropriate situations to determine the significance of a project's effects related to GHG emissions, thus providing streamlined CEQA analysis of future projects that are consistent with the approved GHG reduction plan.

⁴ Available at: <https://www.gosbcta.com/plan/zero-emission-vehicle-readiness-and-implementation-plan/>

Other Climate Action Planning Efforts in San Bernardino County

There are a number of community CAPs that have been completed in San Bernardino County. These are introduced and briefly described below.

Town of Apple Valley

The Town of Apple Valley adopted a Climate Action Plan in 2016, which includes a 2005 inventory and baseline and proposed reduction measures that will enable the City to achieve the target of 15% below 2005 levels by 2020. The Climate Plan also introduces the statewide reduction target of 40% below 2005 levels by 2030. The Apple Valley Climate Plan includes actions such as VMT reduction measures, fuel efficiency measures, mass transit incentives, waste reduction measures, increased solar adoption, and energy efficiency measures (Town of Apple Valley 2016).

City of Chino

The City of Chino adopted a Citywide Climate Action Plan in November 2013 (City of Chino 2013). The CAP identifies strategies to reduce the City's GHG emissions and enhance sustainability. The CAP includes an GHG emissions inventory for the year 2008 and set a target of reducing GHG emissions 15 percent below 2008 levels by 2020. Some primary benefits from the CAP include improving community health and wellness, reducing carbon emissions, protecting the natural environment, and increasing sustainability of city operations. An updated Climate Action Plan is underway (City of Chino 2013).

City of Colton

The City of Colton adopted a Climate Action Plan in 2015, outlining actions to reduce greenhouse gas emissions. The City's GHG emissions reduction target was 15% below the 2008 emissions level, which aligns with California's statewide reduction target. The City of Colton's CAP includes mitigation measures such as increasing solar installation, tree planting programs, sustainable transportation efforts, and waste and wastewater emission reduction measures (City of Colton 2015).

City of Hesperia

The City of Hesperia adopted the *City of Hesperia Climate Action Plan* in June of 2010. The Hesperia CAP outlines a course of action for the City government and the community of Hesperia to reduce per capita GHG emissions 29% below 2010 levels by 2020 and to adapt to the effects of climate change. The Hesperia CAP includes actions such as reducing emissions from new development through CEQA, increasing bicycle use through a safe and well-connected system of bicycle paths and end of trip facilities, reducing energy use from the transport and treatment of water, and improving the City's recycling and source reduction programs to make continued progress in minimizing waste (City of Hesperia 2010).

City of Ontario

The City of Ontario adopted a Climate Action Plan in 2014, with an GHG emissions reduction goal of 30% below business as usual (City of Ontario 2014). This goal roughly aligns with the Scoping Plan adopted by the State of California in 2008, recommending a target of 15% below current emissions

levels. The Climate Action Plan identified feasible actions to reduce GHG emissions generated from community actions. The largest reductions from the City's CAP came from the building and renewable energy sector, on-road transportation, and off-road equipment (City of Ontario 2014).

City of Redlands

The City of Redlands adopted a Climate Action Plan in 2017, demonstrating how the city will comply with the State of California's GHG emission reduction standards (City of Redlands 2017). The Climate Action Plan includes a GHG inventory, GHG emissions projections through 2035, monitoring and reporting process to track progress, and options to reduce GHG emissions beyond what is required by the State of California. The plan covers emissions from ten sectors: residential, commercial, industrial, transportation, solid waste, water, wastewater, off-road equipment, public lighting, and agriculture. Based on the Plan's inventory, the sector with the most emissions was transportation, followed by residential and commercial (City of Redlands 2017).

City of Yucaipa

The City of Yucaipa adopted a Climate Action Plan in 2014, with the goal of reducing its community GHG emissions to 15% below its 2008 GHG emissions level by 2020 (City of Yucaipa 2014). The City planned to meet this goal through a combination of state (~81%) and local (~19%) efforts. The selected measures in Yucaipa's Climate Action Plan had the greatest impacts on GHG emissions in the on-road transportation, building energy, and water conveyance sectors (City of Yucaipa 2014).

Basic Terms and Concepts

This section defines terms and explains basic concepts inherent to understanding GHG inventories and reductions, as well as the basics of climate change science. Important terms like *community inventory* and *business as usual* are defined below, along with a description of global warming and major greenhouse gases.

Basic Terms

Business as Usual (BAU): BAU represents a future scenario that does not consider the possible reduction of GHG emissions that may result from any legislation or regulation that would go into effect after the baseline year. The BAU projections are estimates of future emissions based on energy and carbon intensity in the existing economy with the expected increases in population and economic growth in the future.

Community Inventory: The community inventory includes GHG emissions occurring in association with the land uses within the jurisdictional boundaries of the planning areas, and generally consists of emissions sources that the community can influence or control. The inventory includes emissions that occur both inside and outside the jurisdictional boundaries, but only to the extent that such emissions are due to land uses and activities within the planning areas.

Emissions Type: GHG emissions can be defined as either direct (emissions that occur at the end use location, such as natural gas combustion for building heating) or indirect (emissions that result from consumption at the end use location but occur at another location, such as emissions that occur at the power plant itself but result from residential electricity use of in-home appliances or other uses).

This report addresses both types of emissions. In this report, the term emission refers to GHG emissions and not to emissions of air quality pollutants.

Unit of Measure: The unit of measure used throughout this GHG inventory is MTCO₂e. Presenting inventories in CO₂e (carbon dioxide equivalence) allows the characterization of the complex mixture of GHGs as a single unit taking into account that each gas has a different global warming potential (GWP). A million MTCO₂e is abbreviated as MMTCO₂e.

Emissions Sectors Explained

GHG emissions and reductions presented in this document are done so in terms of “sectors.” The term sector refers to the type of emissions or the type of activity that produces the emission. For example, the on-road transportation sector includes emissions from the cars and trucks driven on the region’s roads and freeways. Table 2-1 offers a brief description of each sector considered in this document, as well as a list of the GHG reduction measures applicable to that sector. Chapter 4 contains a glossary of all GHG reduction measures and Appendix B contains a detailed description of the methods used to calculate the associated GHG reductions.

Table 2-1. Emissions Sectors and Reduction

Sector	How GHG emissions are avoided	Associated Reduction Measures
Building Energy Emissions result from the use of electricity and natural gas by residential and commercial buildings.	New construction built to a high energy-efficiency standard; retrofits to existing buildings to make them more energy efficient; and the increased use of renewable energy to power buildings.	State-1, State-2, State-3, State-4, State-5; Energy-1, Energy-2, Energy-3, Energy-4, Energy-5, Energy-6, Energy-7; Land-Use-1, Land-Use-2; PS-1.
On-Road Transportation Emissions result from the burning of gasoline and diesel fuel by light-, medium-, and heavy-duty vehicles that travel on the region’s roads and freeways.	Increased fuel economy of all vehicles; reduced carbon content of the fuel; reduced vehicle miles traveled (increased use of alternative modes of transportation, carpooling, alternative work schedules and smart growth).	State-6; On-Road-1, On-Road-2, On-Road-3, On-Road-4, On-Road-5; PS-1.
Off-Road Transportation Emissions result from the burning of gasoline and diesel fuel by off-road equipment and vehicles.	Increased fuel economy of all vehicles and equipment; reduced carbon content of the fuel; idling limitations, and increased use of electric or alternatively fueled vehicles and equipment.	Off-Road Equipment-1, Off-Road Equipment-2, Off-Road Equipment-3.
Agriculture Emissions result from the application of fertilizer and the management of manure. Emissions also result from the burning of gasoline and diesel fuel by agricultural equipment, but these emissions are captured in the Off-Road equipment sector.	Installation of methane-capture technologies on manure ponds and systems.	Agriculture-1.

Sector	How GHG emissions are avoided	Associated Reduction Measures
<p>Solid Waste Management Emissions result from the decay of garbage under the anaerobic conditions present in landfills. This sector captures both the waste that is generated by San Bernardino County residents in the inventory year and the waste that was historically generated by any person or business that has sent waste to a landfill located within San Bernardino County.</p>	Waste reduction and increased methane capture at relevant landfills.	State-8; Waste-1, Waste-2; PS-1.
<p>Wastewater Treatment Emissions result from the chemical and biological breakdown of the waste. Emissions also result from the energy used to power plants and pump water, but these emissions are captured in the Building Energy sector.</p>	Increased energy efficiency at wastewater treatment plants and installation of biogas capture and gas to energy technologies.	Wastewater-1, Wastewater-2.
<p>Water Conveyance Emissions result from the energy used to bring water from outside the jurisdiction to the border of a jurisdiction, including deliveries from the state water project or Colorado River.</p>	More efficient water pumping equipment and both indoor and outdoor water conservation.	Water-1, Water-2, Water-3; PS-1.

Climate Change and Global Warming

Climate change describes a change in the state of the Earth's climate that can be scientifically identified by changes in the mean and/or variability of its properties, and which persists for an extended period of time—typically decades or longer (Intergovernmental Panel on Climate Change 2018). Recent climate change has been unequivocally linked to rapid increasing concentrations of GHGs in Earth's lower atmosphere (Intergovernmental Panel on Climate Change 2007a). Although the climate has historically responded to natural drivers, the recent and rapid increase of GHGs in the atmosphere is primarily due to anthropogenic (i.e., human caused) emissions of GHGs, particularly from burning fossil fuels.

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the industrial revolution. The higher concentration of heat trapping GHGs in the atmosphere intensifies the greenhouse effect, which results in increasing global surface temperatures; this phenomenon is commonly known as *global warming*.

Rising atmospheric concentrations of GHGs in excess of natural levels have increased global surface temperatures, which in turn result in changes to the Earth's climate system, including ocean circulation patterns, precipitation patterns, global ice cover, and biological distributions (Intergovernmental Panel on Climate Change 2007a, 2007b, 2014b). Put another way, global

warming is only one piece of climate change, and it causes a cascade of other effects that further affect the climate system. Some of these large-scale climate changes will result in specific impacts at the state and local level.

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC identifies the following compounds as key anthropogenic GHGs: CO₂, CH₄, N₂O, PFCs, SF₆, and HFCs (Intergovernmental Panel on Climate Change 2007a, 2014a). Each is discussed in detail below.

To improve comparability and to simplify reporting and analysis, methods have been established to describe emissions of GHGs using a common unit. The most commonly accepted method to compare GHG emissions is the Global Warming Potential (GWP) methodology defined in IPCC reference documents (Intergovernmental Panel on Climate Change 1996, 2001:241–280). IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO₂e, which compares the gas in question to that of the same mass of CO₂ (CO₂ has a GWP of 1 by definition).

Table 2-2 lists the global warming potential, lifetime, and atmospheric abundance of CO₂, CH₄, N₂O, PFCs, SF₆, and HFCs.

Table 2-2. Lifetimes and Global Warming Potentials of Several Greenhouse Gases

Greenhouse Gases	Global Warming Potential (100 years)	Lifetime (years)	2011 Atmospheric Abundance
CO ₂ (ppm) ^a	1	*	390
CH ₄ (ppb)	28	12.4	1,803
N ₂ O (ppb)	265	121	324
CF ₄ (ppt) ^a	6,630	50,000	79
C ₂ F ₆ (ppt) ^a	11,100	10,000	2.9
SF ₆ (ppt)	23,500	3,200	7.3
HFC-23 (ppt)	12,400	222	24
HFC-134a (ppt)	1,300	13.4	62
HFC-152a (ppt)	138	1.5	6.4

Sources: Intergovernmental Panel on Climate Change 2013.

Notes: ppm = parts per million

ppb = parts per billion

ppt = parts per trillion

^a CF₄ and C₂F₆ are PFCs

* No single lifetime can be given for CO₂

Principal Greenhouse Gases

Carbon Dioxide

Carbon dioxide (CO₂) is the most abundant anthropogenic GHG, accounting for more than 75% of all GHG emissions caused by humans. The primary sources of anthropogenic CO₂ in the atmosphere

include the burning of fossil fuels, gas flaring, cement production, and land use changes (e.g., deforestation, oxidation of elemental carbon). CO₂ can be removed from the atmosphere by photosynthetic organisms (e.g., plants and certain bacteria). Atmospheric CO₂ has increased from a pre-industrial concentration of 280 parts per million (ppm) to 405 ppm in 2017 (National Oceanic and Atmospheric Administration, 2020a).

Methane

Methane (CH₄), the main component of natural gas, is the second most abundant GHG and has a GWP of 28—that is to say that one kilogram of CH₄ has the same warming effect as 28 kilograms of CO₂ (Intergovernmental Panel on Climate Change 2013). Sources of anthropogenic emissions of CH₄ include growing rice, raising cattle, using natural gas, landfill outgassing, and mining coal (National Oceanic and Atmospheric Administration 2005). Certain land uses also function as both a source and sink for CH₄. For example, the primary terrestrial source of CH₄ is wetland areas, whereas undisturbed, aerobic soils act as a CH₄ sink (i.e., they remove CH₄ from the atmosphere). Atmospheric CH₄ has increased from a preindustrial concentration of 715 parts per billion (ppb) to 1,850 ppb in 2017 (National Oceanic and Atmospheric Administration, 2020b).

Nitrous Oxide

Nitrous oxide (N₂O) is a powerful GHG, with a GWP of 265 (Intergovernmental Panel on Climate Change 2013). Anthropogenic sources of N₂O include agricultural processes (e.g., fertilizer application), nylon production, combustion of fossil fuel by power plants, nitric acid production, and vehicle emissions. N₂O also is used in rocket engines, racecars, and as an aerosol spray propellant. Natural processes, such as nitrification and denitrification, can also produce N₂O, which can be released to the atmosphere by diffusion. In the United States, more than 70% of N₂O emissions are related to agricultural soil management practices, particularly fertilizer application. Atmospheric N₂O concentrations have increased from a preindustrial concentration of 270 ppb to 330 ppb in 2017 (National Oceanic and Atmospheric Administration, 2020c).

Perfluorocarbons

The most abundant perfluorocarbons (PFCs) are CF₄ (PFC-14) and C₂F₆ (PFC-116). These human-made chemicals are emitted largely from aluminum production and semiconductor manufacturing processes. PFCs are extremely stable compounds that are destroyed only by very high-energy ultraviolet rays; hence, PFCs have very long lifetimes. They also have high GWPs, ranging from 6,630 for CF₄ to 11,100 for C₂F₆ (Intergovernmental Panel on Climate Change 2013). PFCs are incredibly powerful GHGs due to the combination of very high GWPs and very long lifetimes.

Sulfur Hexafluoride

Sulfur hexafluoride (SF₆) is a human-made chemical used in the magnesium industry, semiconductor manufacturing, as an electrical insulating fluid for power distribution equipment, and as a tracer chemical for the study of oceanic and atmospheric processes (U.S. Environmental Protection Agency 2006). In 2017, atmospheric concentrations of SF₆ were 9.3 parts per trillion (ppt) and steadily increasing (National Oceanic and Atmospheric Administration, 2020d). SF₆ is the most powerful of all GHGs listed in IPCC studies, with a GWP of 23,500 (Intergovernmental Panel on Climate Change 2013).

Hydrofluorocarbons

Hydrofluorocarbons (HFCs) are human-made chemicals used in commercial, industrial, and consumer products and have high GWPs ranging from 140 to 11,700 (U.S. Environmental Protection Agency, 2006). HFCs are generally used as substitutes for ozone-depleting substances (ODS) in automobile air conditioners and refrigerants. The most abundant HFCs, in descending order, are HFC-134a, HFC-23, and HFC-152a.

Greenhouse Gas Inventories and Emissions Sources

A GHG inventory identifies and measures the sources of all GHG emissions and sinks within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (e.g., for a country) or on a small scale (e.g., for a building or person). A GHG inventory is a valuable tool for policymakers who can use it to develop strategies and policies to reduce emissions, and track progress over time.

The majority (75%) of GHG emissions in the United States result from burning fossil fuels (U.S. Environmental Protection Agency, 2020). Fossil fuels are burned to create electricity, which powers homes, commercial buildings, and vehicles. Energy used to power buildings is the primary source of GHGs in California and the nation. Vehicle emissions are a close second, comprising approximately 30% of total national emissions and 37% of total statewide emissions (U.S. Environmental Protection Agency 2010; California Air Resources Board 2010). Other sources of GHG emissions include agriculture, land clearing, landfills, refrigerants, and certain industrial processes.

Table 2-3 outlines the most recent global, national, and statewide GHG inventories to help contextualize the magnitude of San Bernardino County's GHG emissions.

Table 2-3. Global, National, State, and Local GHG Emissions Inventories

Emissions Inventory	CO₂e (metric tons)
2010 IPCC Global GHG Emissions Inventory	49,000,000,000
2018 EPA National GHG Emissions Inventory	6,677,000,000
2018 CARB State GHG Emissions Inventory	425,300,000

Sources: Intergovernmental Panel on Climate Change 2014c; U.S. Environmental Protection Agency 2020; California Air Resources Board 2013.

Impacts of Climate Change on Southern California

Increases in the atmospheric concentration of GHGs will cause the lower atmosphere to warm, in turn inducing myriad changes to the global climate system. These large-scale changes will cause potentially severe impacts in the western United States, California, and the region surrounding San Bernardino county. Current research efforts coordinated through CARB, CEC, Cal-EPA, University of California (UC) system, and others are examining the specific changes to California's climate that would occur as the earth's surface warms.

Existing evidence indicates that climate change is expected to affect California's natural environment in the following ways:

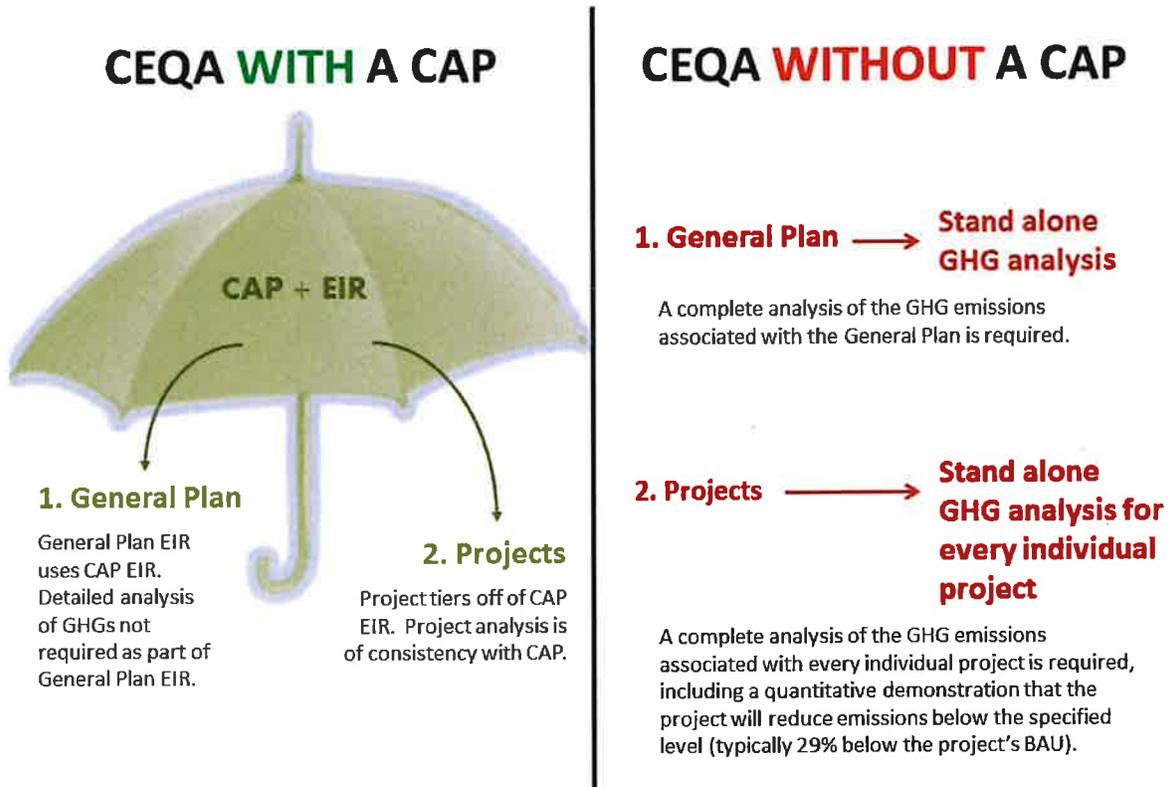
- Increased **sea level rise** along the coastline.

- Increased frequency and intensity of **extreme heat conditions**, such as heat waves and very high temperatures.
- Increased frequency, intensity, and duration of conditions that are conducive to forming air pollution, causing **reduced air quality**.
- Increased heat-related **human deaths** and **infectious diseases**.
- **Higher risk of respiratory problems** caused by deteriorating air quality.
- **Reduced water supplies** (all end uses).
- Potential increased severity of **winter storms**, affecting peak stream flows and flooding.
- Changes in growing season conditions that could affect agricultural production, such as **variations in crop quality and yield**.
- Changes in **distribution of plant and wildlife species**.
- Decreased Sierra snowpack and altered timing and amount of snowmelt, causing **reduced water supply** and affecting water management.
- **Increased frequency and intensity of wildfires**.

Relationship of Climate Action Plans to CEQA and Local General Plans

This section describes the general relationship of CAPs to CEQA and to local general plans, including legal requirements and evolving practices throughout California. Figure 2-2 illustrates these relationships.

Figure 2-2. CAPs, General Plans, and CEQA



As a discretionary action, prior to adoption of the GHG reduction plan by local cities, CEQA review is required. SBCOG has prepared an EIR that analyzes the physical impacts of the measures selected by the Partnership jurisdictions on the environment. This analysis will be used to complete CEQA compliance prior to consideration of adopting of the portions of the reduction plan applicable to SBCOG and to each individual jurisdiction.

Amendments to the CEQA guidelines in 2018 state that CEQA project evaluations of GHG emissions can tier off a programmatic analysis of GHG emissions provided that the GHG analysis (or CAP) includes the following (CEQA Guidelines Section 15183.5).

- *Quantify GHG emissions*, both existing and projected over a specified time period, resulting from activities within a defined geographic area. This Reduction Plan has quantified all primary sectors of GHG emissions within each jurisdiction for 2016 and 2030. Partnership jurisdictions may choose to adopt portions of this document as their individual CAP or build upon the information here to develop a more comprehensive CAP document.
- *Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by a CAP would not be cumulatively considerable.* This Reduction Plan includes the different proposed reduction targets of each of the Partnership jurisdictions. Some, but not all, of the participating jurisdictions have identified reduction targets, like 40% or more below 2016 levels, which are roughly consistent with the recommendations in the SB 32 Scoping Plan for municipalities to support the overall SB 32 reduction targets.

The 2016 state GHG inventory is roughly equivalent to 1990 levels. The SB 32 reduction target is 40% below 1990 levels. As such, 40% below 2016 levels is roughly equivalent to the SB 32 reduction target. For jurisdictions with GHG reduction targets that are not equivalent to (or better than) the SB 32 reduction target and that used such targets for their Climate Action Plan, they would not be able to tier their individual project compliance from their CAP as they would not meet the requirement in CEQA guidelines 150183.5

- *Identify and analyze the GHG emissions* resulting from specific actions or categories of actions anticipated within the geographic area. This Reduction Plan analyzes community emissions for each Partnership jurisdiction as a whole and includes predicted growth expected by 2030.
- *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. This Reduction Plan identifies both specific measures and project-level reduction standards (where selected by individual jurisdictions) to achieve the overall reduction target.
- *Monitor the plan's progress.* This Reduction Plan outlines general monitoring steps. Individual CAPs that utilize this Reduction Plan as a base would include locally specific identification of monitoring actions.
- *Adopt the GHG Reduction Strategy in a public process following environmental review.* For each jurisdiction that chooses to do so, a CAP would be adopted in a public process. The CEQA documentation for this Reduction Plan can be used to support local jurisdiction compliance with CEQA.

Once adopted, subsequent project-level CEQA evaluations of GHG emissions can tier off from the adopted jurisdiction CAP, provided that the local jurisdiction has adopted a qualified CAP and the specific project is consistent with all applicable requirements from the relevant adopted city CAP.

The South Coast Air Quality Management District (SCAQMD) adopted an interim GHG significance threshold for stationary source projects where the SCAQMD is the lead agency. SCAQMD does not currently have GHG significance thresholds for development projects. SCAQMD encourages local governments to adopt a qualified GHG reduction strategy consistent with state goals and the new statewide CEQA guidelines described above. SCAQMD recommends that stationary source projects, consistent with an adopted qualified GHG reduction plan that meets the standards described in the CEQA guidelines, can be presumed to have no significant GHG emissions and do not need to be evaluated against SCAQMD's recommended mass emissions thresholds. For stationary source projects not consistent with an adopted qualified GHG reduction plan, if they exceed a screening significance threshold level of 10,000 MTCO_{2e} of emissions per year, then the project must demonstrate design features and/or other measures to mitigate GHG emissions to the maximum extent feasible, or implement offsite mitigation (GHG reduction projects) to reduce GHG emission impacts to less than the proposed screening level. SCAQMD has draft thresholds for land use projects (residential and commercial development) that similarly allow for tiering off a qualified GHG reduction plan and use of numeric thresholds where a qualified reduction plan has not been adopted.

As noted above, CEQA Guidelines Section 15183.5 establishes opportunities for tiering for qualified GHG reduction plans. Accordingly, emissions associated with projects that are consistent with the GHG reduction plans adopted by jurisdictions can be considered less than significant and their

contributions to cumulative emissions are not cumulatively considerable. Clearly, projects that are consistent with the plans adopted by jurisdictions would still create emissions; however, they can be approved knowing that overall emissions projected to occur in 2030 would be less than the emissions that would occur in 2030 under BAU. This determination only relies on an individual jurisdiction's actions relative to its GHG emissions. Provided that a project is within a jurisdiction with a qualified GHG reduction plan that is being implemented in full, tiering can be used. If some of the Partnership jurisdictions choose not to adopt CAPs or choose to adopt different targets or measures than described in this Reduction Plan, this would not affect the ability of other cities to tier their project analysis from their adopted plans, provided the plans are being implemented.

3.1 Introduction

This chapter presents the GHG inventory, 2030 BAU forecast, and GHG emission reductions for each Partnership jurisdiction in the Reduction Plan. For each Partnership jurisdiction, the following items are presented.

1. **Jurisdiction Summary**—Presents background information for each jurisdiction, such as its location, socioeconomic data, and key points of interest; demographic information consistent with the Southern California Association of Governments (SCAG) Local Profiles¹ is also summarized. An overview of the jurisdiction’s emissions and selected reduction measures is also provided.
2. **Emission Reductions Graphics**—Three graphics are presented in this section:
 - i. A bar chart showing the jurisdiction’s 2016 GHG emissions inventory, state emission reductions, local emission reductions, and unmitigated emissions in 2030, along with the jurisdiction’s 2030 emissions goal;
 - ii. A bar chart showing the 2030 BAU GHG emissions by sector and the projected 2030 GHG emissions under full implementation of the Reduction Plan; and
 - iii. Pie charts showing GHG emission reductions by controlling entity and by sector.
3. **Emissions and Reductions Table**—This table presents the same information as shown in the graphics, including the jurisdiction’s 2016 GHG emissions inventory, 2030 BAU GHG forecast, and GHG emission reductions by sector.
4. **Reduction Measures Table**—This table presents all GHG emission reduction measures considered by the jurisdiction for this Reduction Plan, along with simple descriptions of each measure.
5. **Relevant General Plan Policies**—For each jurisdiction, a summary of general plan policies that are relevant to avoiding or reducing GHG emissions in general, or that support specific reduction measures in the Reduction Plan. General Plan policies are listed in reference to the specific GHG reduction measures they support. Refer to Chapter 1 for an explanation of the main goal of each reduction category and to Chapter 4 for a definition of each individual reduction measure listed.

Each jurisdiction has selected a goal to reduce their community’s GHG emissions from BAU levels by the year 2030. Each jurisdiction has selected their goal based on what each jurisdiction considers feasible given the local conditions within that jurisdiction. City selections are non-binding and will only become binding if the decision-making body of the jurisdiction decides to formally adopt them.

¹ Koblasz, Ginger. 2019. Personal communication via email with Cory Matsui of ICF to transmit regional socioeconomic data.

Each jurisdiction has selected their own set of measures independently of other jurisdictions' selections, with the exception of Apple Valley, Montclair, and Rialto, for which the consultants created reduction scenarios based on prior selections in the prior regional plan and a general assessment of suitable reduction plans. Some jurisdictions have chosen wide-ranging measures that apply to all economic sectors of their inventory, others have chosen a more limited set of measures. Selections include both the measure itself and the participation rate associated with each measure. For example, jurisdictions that chose to include Energy Efficiency for Existing Buildings (Energy-1) also chose the specific percentage of homes and businesses that will be retrofitted by the year 2030; this can vary greatly among jurisdictions. The measure selections were based on each jurisdiction's best judgment about what is feasible for their jurisdiction, and depend on the specific emissions source profile (i.e., GHG inventory) and the anticipated growth within each jurisdiction. For example, jurisdictions that are expected to construct many new homes to support a rising population may select a measure for new homes, while jurisdictions that are fully built-out would have limited use for a measure aimed at new homes. Not all jurisdictions selected the same measures and there is reasonable variation between the measures selected for each jurisdiction.

3.8 City of Colton



3.8.1 City Summary

The City of Colton is located in the valley region of San Bernardino County, east of the City of Fontana and between San Bernardino and Riverside. Colton was incorporated in July of 1887, making it one of the oldest jurisdictions in the county. The City owes much of its historical growth to its location along a main artery of the Union Pacific Railroad transcontinental rail line, constructed in 1875. When the Burlington Northern Santa Fe Rail line was later constructed, Colton was placed at the center of what is today one of the busiest at-grade rail crossings in the United States.

Colton covers approximately 16 square miles. The population in Colton as of 2016 was 53,705 and is expected to grow to 64,184 by 2030 (20% increase over 2016). Colton’s demographic composition in 2018 was 17.2% Non-Hispanic White, 7.5 % Non-Hispanic Black, 0.4% Non-Hispanic American Indian or Alaska Native, 4.5% Non-Hispanic Asian, and 1.5 from all other non-Hispanic races. Persons of Hispanic or Latino origin were 68.9%, which is notably larger than the SCAG region’s average of 46.5%. Major regional employers in Colton include Arrowhead Regional Medical Center, the Colton school district and the Ashley Furniture joint factory and retail outlet. Employment is expected to grow by 24% by 2030. Colton’s location in the southern area of the county and its proximity to freeways have made it, like other valley jurisdictions, a desirable and fast-growing community in recent decades.

Table 3-19 presents socioeconomic data for Colton, including population, housing, and employment (SBCOG, 2019).

Table 3-19. Socioeconomic Data for Colton

Category	2016	2030	2045
Population	53,705	64,184	70,710
Households	15,026	19,002	21,668
Jobs	19,453	24,042	28,958



The City of Colton adopted a Climate Action Plan in 2015, outlining actions to reduce greenhouse gas emissions. The City’s GHG emissions reduction target was 15% below the 2008 emissions level, which aligns with California’s statewide reduction target. The City of Colton’s CAP includes mitigation measures such as increasing solar installation, tree planting programs, sustainable transportation efforts, and waste and wastewater emission reduction measures (City of Colton, 2015).

3.8.2 Emission Reductions

The City of Colton selected a goal to reduce its community GHG emissions to a level that is 46% below its 2008 GHG emissions level by 2030. The City will exceed this goal through a combination of

state (~65%) and local (~35%) efforts. The Pavley vehicle standards, the state's low carbon fuel standard, the RPS, and other state measures will significantly reduce GHG emissions in Colton's on-road and building energy sectors in 2030. An additional reduction of 80,526 MTCO_{2e} will be achieved primarily through the following local measures, in order of reductions achieved: All Electric Buildings (Energy-3); Solar Installation for Existing Commercial/Industrial Facilities (Energy-8); and Waste Diversion and Reduction (Waste-2). Colton's reduction plan has the greatest impacts on GHG emissions in the waste, on-road transportation, and building energy sectors.

The City of Colton has been able to successfully leverage state resources to enhance its emissions reductions plan. Properties in the City of Colton receive electric services from the Colton Electric Department (CED). CED met the state's renewable portfolio standard of 25% by 2016 and expects to exceed the goal of 33% by 2020. The Colton Electric Utility offers incentives and programs to increase the community's energy efficiency, including the Residential Energy Efficiency Rebate Program, residential energy audits, commercial energy audits, and more.

The bars in Figure 3-19 show Colton's 2016 GHG emissions total, 2030 BAU emissions forecast total, and the total emissions remaining after meeting the City's emissions reduction target (i.e., 15% below its 2008 GHG emissions level). The contribution of state and local reductions are overlaid on the 2030 BAU emissions forecast total ("2030 Plan"), representing the total emissions reductions achieved in 2030. As stated above, state reductions account for the majority (~65%) of the total reductions needed to achieve the 2030 target.

Figure 3-20 presents emissions by sector, for both the 2030 BAU and the 2030 reduction or "Reduction Plan" scenarios. The largest emissions contributions are in the on-road transportation and building energy emissions sectors.

Table 3-20 summarizes the 2016 inventory, 2030 BAU forecast, and GHG reduction ("Reduction Plan") results by sector. It shows the percent reduction in each sector's emissions in 2030 and demonstrates that Colton exceeds its emissions reduction goal. Emissions sectors with the greatest percent reduction include the waste, on-road transportation, and building energy emissions sectors.

Figure 3-21 presents emission reductions by sector and by control (i.e., state control versus local or city control). As stated previously, the majority of emissions reductions are due to state measures. Of the state measures, the majority of reductions are in the building energy and on-road transportation sectors. Of the local measures, the majority of reductions are in the building energy sector.

Figure 3-19. Emissions Reduction Profile for Colton



Figure 3-20. Emissions by Sector for Colton

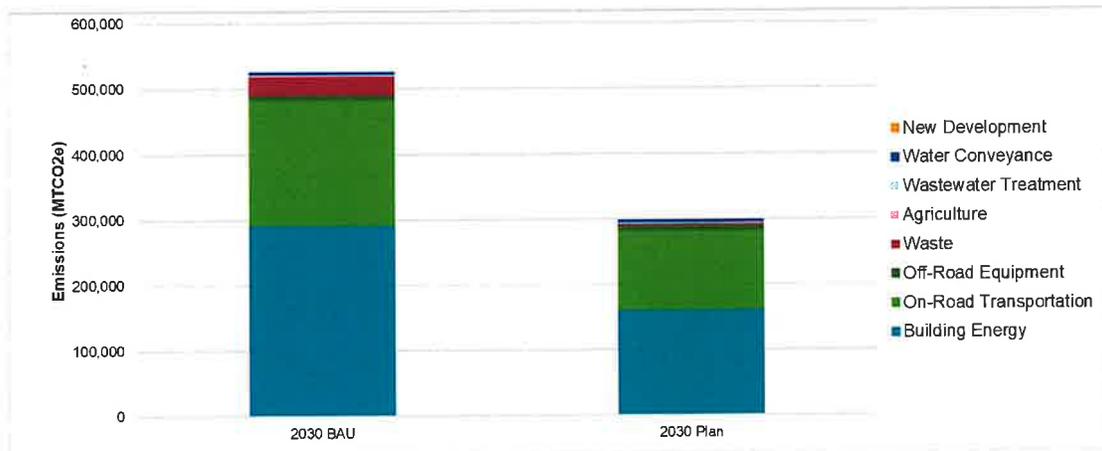


Table 3-20. Emission Reductions by Sector for Colton

Sector	2016 Emissions (MTCO _{2e})	2030 BAU (MTCO _{2e})	2030 Reductions (MTCO _{2e})	2030 Emissions with Reduction Plan (MTCO _{2e})	Reduction (percent)
Building Energy	236,568	291,094	130,186	160,908	44.7%
On-Road Transportation	176,831	191,706	71,648	120,058	37.4%
Off-Road Equipment	5,997	8,687	655	8,032	7.5%
Waste	23,755	28,390	25,017	3,374	88.1%
Agriculture	426	240	0	240	0.0%
Wastewater Treatment	1,682	2,011	194	1,817	9.6%
Water Conveyance	3,689	4,324	278	4,046	6.4%
GHG Performance Standard*	-	-	-	-	-
Total	448,948	526,453	227,979	298,474	43.3%
Goal	-	-	-	357,876	-
Goal Met?	-	-	-	Yes	-
Reductions Beyond Goal	-	-	-	59,402	-

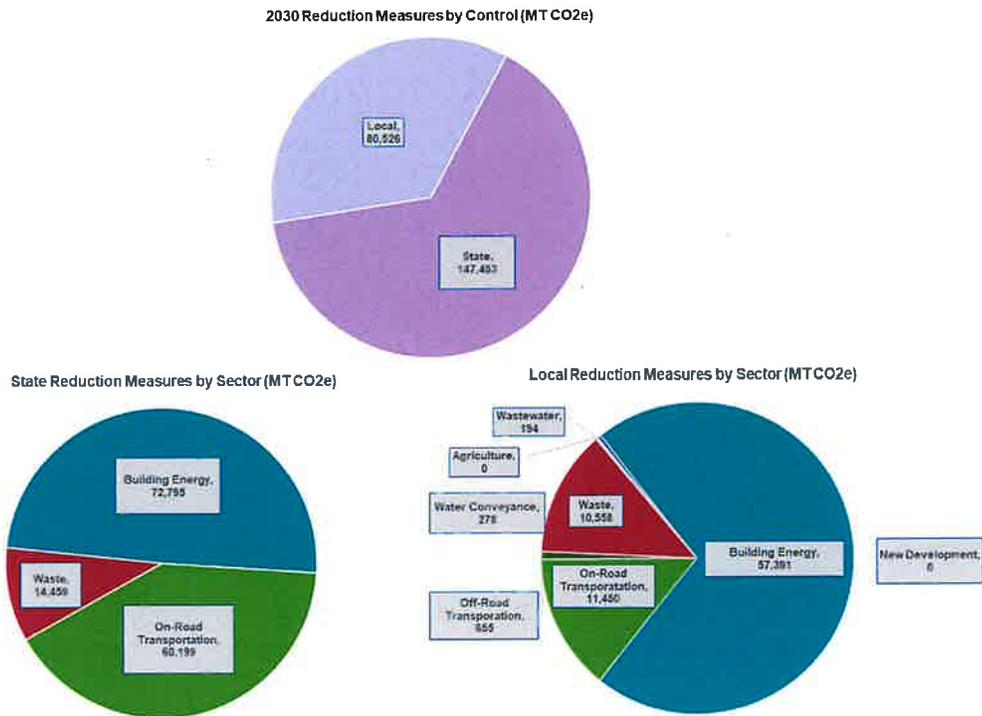
Notes:

Values may not sum due to rounding.

Dashes indicate no value or not applicable.

* The GHG Performance Standard for New Development is not a sector of the inventory, but it contributes toward the City's reduction goal by promoting reductions in multiple sectors. See Chapter 4 for a complete description of this measure.

Figure 3-21. Emission Reductions by Control and by Sector for Colton



3.8.3 Reduction Measures

Table 3-21 presents each reduction measure evaluated for Colton. For each measure, the short title and estimated GHG reductions in 2030 are listed. Measures are organized by state control and local control and listed by sector.

Table 3-21. GHG Reduction Measures and Estimated 2030 reductions for Colton

Measure Number	Measure Description	Reductions (MTCO _{2e})
State Measures		
State-SB 100	SB 100	47,669
State-SB 350	SB 350	19,159
State-T24	Title 24 (Energy Efficiency Standards)	5,554
State-Solar Water Heater	Solar Water Heaters (Residential)	34
State-Increased CHP	Increased Combined Heat and Power (Commercial)	379
State-OnRoad	State Fuel Efficiency Measures	60,199
State-SB 1383	Methane Capture	14,459
Total State Reductions		147,453
Local Measures		
<i>Building Energy</i>		
Energy-1	Building Energy Efficiency	2,897
Energy-2	Lighting Efficiency	1,854
Energy-3	All Electric Buildings	22,313
Energy-5	Renewable Energy – New Commercial/Industrial	2,367
Energy-6	Solar Energy for Warehouse Space	3,478
Energy-7	Solar Installation for Existing Housing	4,765
Energy-8	Solar Installation for Existing Commercial/Industrial	16,650
Energy-9	Rooftop Gardens	0
Energy-10	Urban Tree Planting for Shading and Energy Savings	7
<i>On-Road Transportation</i>		
OnRoad-1	Alternative Fueled Transit Fleets	127
OnRoad-2	Encourage Use of Mass Transit	4,737
OnRoad-3	Transportation Demand Management and Synchronization	1,315
OnRoad-4	Expand Bike Routes	2,006
OnRoad-5	Community Fleet Electrification	3,264
<i>Off-Road Equipment</i>		
OffRoad-1	Electric-Powered Construction Equipment	426
OffRoad-2	Idling Ordinance	89
OffRoad-3	Electric Landscaping Equipment	140
<i>Waste</i>		
Waste-1	Methane Capture - Local	0
Waste-2	Waste Diversion and Reduction	10,558
<i>Agriculture</i>		
Agriculture-3	Methane Capture at Large Dairies	-
<i>Wastewater</i>		
Wastewater-1	Methane Recovery at Wastewater Treatment Plants	0
Wastewater-2	Equipment Upgrades and Wastewater Treatment Plants	194
<i>Water Conveyance</i>		

Water-1	Require Tier 1 Voluntary CALGreen Standards for New Construction	951
Water-2	Renovate Existing Buildings to Achieve Higher Levels of Water Efficiency	2,109
Water-3	Water-Efficient Landscaping Practices	278
<i>GHG Performance Standard for New Development</i>		
PS-1	GHG Performance Standard for New Development (29% below projected BAU emissions for the project)	0
Total Local Reductions		80,526
Total Reductions		227,979

Notes:

Values may not sum due to rounding.

3.8.4 Relevant General Plan Policies

This section summarizes key general plan policies that support the City of Colton's GHG reduction measures or would contribute to GHG reductions and sustainable practices in the City. All policies listed below are from the Colton 2013 General Plan unless otherwise noted (City of Colton, 2013).

3.8.4.1 Building Energy

Energy-1. Building Energy Efficiency

- **Policy LU-5.1:** Require the incorporation of energy conservation features into the design of all new construction and site development, as required by State law and local regulations.
- **Policy LU-5.2:** Provide incentives, as funding opportunities become available, for the installation of energy conservation features in existing multi-family residential and commercial developments, including technical assistance and possible low interest loans.
- **Policy LU-5.3:** Educate the public using a variety of outreach channels regarding the need for energy conservation, techniques which can be employed, and systems which are available.
- **Policy LU-5.4:** Support the ongoing efforts of the California Air Resources Board to implement AB32 and SB375, and fully follow any new AB32 and SB375-related regulations.

Energy-2. Lighting Efficiency

- **Policy LU-5.2:** Provide incentives, as funding opportunities become available, for the installation of energy conservation features in existing multi-family residential and commercial developments, including technical assistance and possible low interest loans.
- **Policy LU-5.3:** Educate the public using a variety of outreach channels regarding the need for energy conservation, techniques which can be employed, and systems which are available.

Energy-3. All Electric Buildings

- **Policy LU-5.5:** Develop and implement greenhouse gas emissions reduction measures, including discrete, early-action greenhouse gas reducing measures that are technologically feasible and cost effective.

Energy-5. Renewable Energy - New Commercial/Industrial

- **Policy LU-5.5:** Develop and implement greenhouse gas emissions reduction measures, including discrete, early-action greenhouse gas reducing measures that are technologically feasible and cost effective.
- **Policy LU-5.6:** Require detailed air quality and climate change analyses for all applications that have the potential to adversely affect air quality, and incorporate the analyses into applicable CEQA documents. Projects with the potential to generate significant levels of air pollutants and greenhouse gases, such as manufacturing facilities and site development operations, shall be required to incorporate mitigation into their design and operation, and to utilize the most advanced technological methods feasible.

Energy-6. Solar Energy for Warehouse Space

- **Policy LU-5.5:** Develop and implement greenhouse gas emissions reduction measures, including discrete, early-action greenhouse gas reducing measures that are technologically feasible and cost effective.

Energy-7. Solar Installation - Existing Housing

- **Policy LU-5.5:** Develop and implement greenhouse gas emissions reduction measures, including discrete, early-action greenhouse gas reducing measures that are technologically feasible and cost effective.

Energy-8. Renewable Energy - Existing Commercial/Industrial

- **Policy LU-5.5:** Develop and implement greenhouse gas emissions reduction measures, including discrete, early-action greenhouse gas reducing measures that are technologically feasible and cost effective.

Energy-10. Urban Tree Planting for Shading and Energy Savings

- **Policy LU-12.4:** Provide five acres of park space for every 1,000 residents.
- **Policy LU-12.1:** Preserve and protect the City's established recreational and open space uses.
- **Policy LU-12.2:** Pursue opportunities for providing additional open space and recreation areas for residents, working toward the goal of having a City park within one-half mile of every residential neighborhood in Colton.

3.8.4.2 On-Road

OnRoad-2. Encourage Use of Mass Transit

- **Policy LU-16.8:** Link projects and downtown with public transit and/or trails (bus rapid transit, bike lanes, etc.).
- **Goal M-7:** Coordinate with other jurisdictions and agencies on regional transportation projects.
- **Policy M-3.13:** Maintain the Long-range Developer Impact Fee program to help fund the cost of transportation system improvements.
- **Policy M-3.8:** Require new developments of more than 100 employees (per building or per tenant/company) to develop Transportation Demand Management programs to minimize automobile trips and to encourage use of transit, ridesharing, bicycling, and walking.
- **Goal M-2:** Provide a transportation system that includes connected transit, bicycle, and pedestrian networks.

- **Policy M-2.1:** Work with Omnitrans to increase the use of public transit, establish or modify routes, and improve connectivity to regional services that respond to the needs of the Colton community.
- **Policy M-2.3:** Require that private development projects provide transit amenities, including bus stops that meet Omnitrans' bus stop design guidelines.
- **Policy M-2.5:** Work with Metrolink and the Southern California Regional Rail Authority to establish a Metrolink station in Colton along existing Metrolink rail lines.

OnRoad-3. Transportation Demand Management and Signal Synchronization

- **Policy LU-10.4:** Establish land use patterns and provide pedestrian amenities within the mixed-use districts that minimize the need for vehicle travel among the uses within a district.
- **Policy LU-17.6:** Reduce the visual and environmental impacts of expansive parking lots along major corridors by encouraging a street-oriented development pattern that encourages pedestrian activity, with buildings sited at or near the sidewalk edge.
- **Policy LU-20.11:** Require that roadway systems are adequate to accommodate new volumes, existing demands, and emergency response needs.
- **Policy M-2.9:** Condition discretionary projects to require bicycle amenities such as bike racks and secure storage areas.
- **Policy M-1.5:** Minimize vehicle emissions by encouraging land use patterns and multi-modal transportation improvements that reduce the need for automobile trips by making biking, walking, and use of public transit more convenient and available.
- **Policy M-1.1:** Provide for the needs of drivers, public transportation vehicles and patrons, bicyclists, and pedestrians of all ages and abilities in planning, programming, design, construction, reconstruction, retrofit, operations, and maintenance activities of all streets.

OnRoad-4. Expand Bike Routes

- **Policy LU-20.9:** Create connections between neighboring land uses that make alternatives to the automobile safe and attractive. Provide pedestrian linkage to surrounding neighborhoods, and require that development plans and designs facilitate both pedestrian and bicycle use.
- **Policy LU-21.5:** Establish community recreation and park facilities, including open space areas with hiking and bicycle trails.
- **Policy M-1.2:** View all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in Colton. Recognize bicycle, pedestrian, and transit modes as integral elements of the transportation system.
- **Policy M-1.3:** Require all new nonresidential, mixed-use, and large-scale residential development projects, through the development review process, to include public transit, bicycle, and pedestrian facilities.
- **Policy M-1.4:** Plan for multi-use recreation trails and paths that allow for physical activities, including running, walking, and bicycling.
- **Policy M-1.5:** Minimize vehicle emissions by encouraging land use patterns and multi-modal transportation improvements that reduce the need for automobile trips by making biking, walking, and use of public transit more convenient and available.
- **Goal M-2:** Provide a transportation system that includes connected transit, bicycle, and pedestrian networks.

3.8.4.3 Off-Road

Off-Road-1. Electric-Powered Construction Equipment

- **Policy LU-5.5:** Develop and implement greenhouse gas emissions reduction measures, including discrete, early-action greenhouse gas reducing measures that are technologically feasible and cost effective.

Off-Road-2. Idling Ordinance

- **Policy LU-5.5:** Develop and implement greenhouse gas emissions reduction measures, including discrete, early-action greenhouse gas reducing measures that are technologically feasible and cost effective.

Off-Road-3. Electric Landscaping Equipment

- **Policy LU-5.5:** Develop and implement greenhouse gas emissions reduction measures, including discrete, early-action greenhouse gas reducing measures that are technologically feasible and cost effective.

3.8.4.4 Wastewater Treatment

Wastewater-2. Equipment Upgrades at Wastewater Treatment Plants

- **Policy LU-21.8:** Ensure that safety services and sewer, water, and utility infrastructure are adequate to accommodate new development.

4.1 Introduction

This section contains a detailed description of all reduction strategies discussed in the Reduction Plan. Strategies are organized below into state and local categories. For local strategies, the following sectors are included: energy efficiency, renewable energy, land use, on-road transportation, off-road equipment, solid waste management, agriculture, wastewater treatment and discharge, and new development. Each sector description includes an overview, summary results, relative importance, and major opportunities for reductions.

For each strategy, the following information is provided.

- Strategy Description
- Entity Responsible for Implementation
- Strategy Implementation Details
- Level of Commitment
- Co-Benefits

At the end of this chapter, Table 4-1 summarizes the GHG reductions strategies and indicates the number of jurisdictions participating, and percent contribution to total state or local GHG reductions achieved for the region based on the reductions of the jurisdictions that selected each strategy. Jurisdictions differed in which strategies they chose; all jurisdictions did not select all strategies. Thus, the level of participation in each strategy differs among jurisdictions. All jurisdictions benefitted from state strategies.

The methods used for the reduction strategies calculations are included in Appendix B of this GHG Reduction Plan. The strategies selected by each Partnership jurisdiction and the reductions potential for each jurisdiction are presented in Chapter 3.

4.2 State Strategies

Actions undertaken by the state will contribute to GHG reductions in each Partnership jurisdiction. For example, the state requires electric utility companies to increase their procurement of renewable resources to specified levels by 2030 and 2045. Renewable resources such as wind and solar power produce the same amount of energy as coal and other traditional sources, but do not emit any GHGs. By generating a greater amount of energy through renewable resources, electricity provided to each jurisdiction would be cleaner and less GHG intensive than if the state had not required the renewable standard. Even though state measures do not always require local government action, emissions reductions achieved by this and other state measures would help lower GHG emissions in each jurisdiction. This Reduction Plan includes seven statewide initiatives that will contribute to GHG reductions in each jurisdiction. The majority of these programs would improve building energy efficiency and renewable energy generation. Specifically, Title 24 energy efficiency standards for new residential and nonresidential buildings would require building shells

and components to be designed to conserve energy and water. Similarly, energy efficiency strategies required by SB 350 would double energy efficiency savings by 2030. Finally, the state's RPS would increase the amount of electricity generated by renewable resources.

Over the past several decades, California has become a leader in establishing initiatives to reduce fuel consumption and on-road vehicle emissions. CARB has also adopted the LCFS, which requires a 20% reduction in the carbon intensity of California's transportation fuels by 2030, and has outlined several VMT-reducing measures in the 2017 Scoping Plan. Together, these measures would reduce light- and heavy-duty vehicle emissions.

A complete list of state programs included in the Reduction Plan, as well as anticipated GHG reductions, is presented below. Appendix B provides more details for each state measure.

4.2.1 **State-1: Senate Bill 1078 (2002), Senate Bill 107 (2006), Senate Bill 2 (2011), and SB 100 (2018) Renewable Portfolio Standard**

Measure Description: This measure obligates IOUs, ESPs, and CCAs to procure 33% of retail sales per year from eligible renewable sources by 2020 and sets forth a longer-term target of procuring for 2030 and 2045.

Entity Responsible for Implementation: IOUs, ESPs, and CCAs are responsible for implementing this measure.

Measure Implementation Details: The responsible entities will procure incremental amounts of retail sales each year from renewable sources. By 2020, 33% of retail sales will be procured from renewable sources, 50% of retail sales will be procured from renewable sources by 2030, and 100% of retail sales will be procured from renewable sources by 2045.

Co-Benefits: Reduced air pollution, waste reduction, energy diversity and security, reduced price volatility, economic development, and public health improvements.

4.2.2 **State-2: Title 24 Standards for Non-Residential and Residential Buildings (Energy Efficiency Standards and CALGreen)**

Measure Description: Requires that building shells and building components be designed to conserve energy and water. Mandatory and voluntary measures became effective on January 1, 2020, and the guidelines are periodically updated. Local governments are responsible for adoption and enforcement of the standards. The next energy efficiency update of standards will occur in 2022 and the CEC intends to update them approximately every 3 years in future years. Note that in some instances, implementation of the CALGreen *voluntary* measures has been identified by local jurisdictions as part of their selected local measures.

Entity Responsible for Implementation: Local governments are responsible for implementation and enforcement of the standards.

Measure Implementation Details: This measure would be implemented in the Partnership cities gradually as new homes are built.

Co-Benefits: Reduced energy use, reduced air pollution, resource conservation, increased property value, public health improvements, and increased quality of life.

4.2.3 State-3: SB 350 Clean Energy and Pollution Reduction Act

Measure Description: SB 350 requires the state to double statewide energy efficiency savings in electricity and natural gas end uses by 2030.

Entity Responsible for Implementation: The California Energy Commission (CEC), working with state agencies, including the California Public Utilities Commission (CPUC), CARB, California Independent System Operator, large utilities, and electrical corporations.

Measure Implementation Details: This measure would double savings from energy efficiency by 2050.

Co-Benefits: Reduced energy use, reduced air pollution, increased property values, and increased quality of life.

4.2.4 State-4: AB 1470 (Huffman), AB 797 Solar Water Heating

Measure Description: AB 1470 created a 10-year incentive program funded at \$25 million per year to encourage the installation of 200,000 solar water heating systems that offset natural gas use in homes and businesses throughout the state. AB 797 extended the operation of the program through July 31, 2020, reserving 50% of the total program budget for the installation of solar thermal systems in low-income residential housing or in buildings in disadvantaged communities and expanding the program to homeowners that lack access to natural gas, among other things.

Entity Responsible for Implementation: The State of California is responsible for implementing this measure.

Measure Implementation Details: This measure would be implemented gradually as residents replace their heaters with solar water heating systems.

Co-Benefits: Reduced energy use, reduced air pollution, increased property values.

4.2.5 State-5: Co-Generation Facilities

Measure Description: The CPUC administers a Qualifying Facilities and Combined Heat and Power (QF/CHP) Program. Qualifying facilities are co-generation CHP facilities that meet certain size and efficiency criteria. The QF/CHP Settlement is implemented through this program, and requires that California's three largest IOUs (PG&E, SDG&E, and SCE) collectively procure 3,000 MW of capacity from CHP facilities by 2018. The QF/CHP Settlement also requires that California's three largest IOUs reduce GHG emissions by 4.82 MMT by 2020, consistent with targets in the 2017 CARB scoping plan. This goal was modified later by CPUC in 2015's Decision 15-06-028 to 2.72 MMT.

Entity Responsible for Implementation: California's three largest IOUs are responsible for implementing this measure.

Measure Implementation Details: This measure would be implemented by qualifying facilities that sell the energy they generate to IOUs at predetermined prices and conditions.

Co-Benefits: Reduced energy use and reduced air pollution.

4.2.6 State-6a: AB 1493 (Pavley I and II) Greenhouse Reductions from New Passenger Vehicles

Measure Description: AB 1493 (Pavley I), requires CARB to adopt vehicle standards that started lowering GHG emissions from new light-duty autos in 2009. Additional strengthening of the Pavley standards (Pavley II or Advanced Clean Cars measure) has been adopted by California for vehicle model years 2017–2025. Together, the two standards are expected to increase average fuel economy through 2025 and to reduce GHG emissions from the transportation sector in California.¹

Entity Responsible for Implementation: The State of California, EPA, NHTSA, and vehicle manufacturers are responsible for implementing the Pavley and CAFE standards.

Measure Implementation Details: The 2011—2016 standards would be implemented through 2016 and the 2017—2025 standards would be implemented through 2020. Implementation in the Partnership jurisdictions would be gradual through 2016 and 2020 as older vehicles are replaced with more fuel-efficient vehicles.

Co-Benefits: Reduced energy use, reduced air pollution, public health improvements, and energy security.

4.2.7 State-6b: (On-Road) and State-8 (Off-Road): Executive Order S-1-07 Low Carbon Fuel Standard

Measure Description: This measure mandates the following: (1) that a statewide goal be established to reduce the carbon intensity of California’s transportation fuels by at least 10% by 2020, and (2) that a LCFS for transportation fuels be established in California.

Entity Responsible for Implementation: The State of California and vehicle fuel manufacturers are responsible for implementing this measure.

Measure Implementation Details: The standard will be fully implemented by 2020. Implementation in the Partnership jurisdictions would occur as fuel is improved statewide.

Co-Benefits: Reduced air pollution, public health improvements, energy security, reduced price volatility, and economic development.

4.2.8 State-7: AB 32 Methane Capture

Measure Description: The Landfill Methane Rule requires gas collection and control systems on landfills with greater than 450,000 tons of waste-in-place. The rule requires a 40% reduction in

¹ Please note that the new federal SAFE rules finalized in 2020 have lower vehicle standards than what California has adopted (and what the Obama Administration had adopted) and the Trump administration has also withdrawn California’s waiver to set its own standards. California and many other states have challenged the new federal rules in court. This report presumes that California is successful in defending its standards.

landfill methane emission by 2030 from a 2013 baseline. The rule also requires the installation of methane capture technology and associated monitoring systems on all landfills without methane capture with a goal of increasing the facility level methane capture rate to the highest extent feasible (i.e., approaching 100%) The measure also establishes statewide performance standards to maximize methane capture efficiencies.

Entity Responsible for Implementation: Landfill owners and operators are responsible for complying with the landfill regulation.

Measure Implementation Details: This measure would be implemented gradually beginning in 2020 as landfill operators comply.

Co-Benefits: Reduced air pollution, resource conservation, and increased quality of life.

4.3 Local Strategies

4.3.1 Building Energy

Building energy use from residential, commercial, and industrial buildings is a large component of the regional GHG inventory, accounting for 26% of the total regional emissions in 2016. Building energy consumption includes electricity and natural gas usage. Electricity use in buildings results in indirect emissions from the power plants that produce electricity outside of city boundaries. Natural gas consumption by furnaces and other appliances in buildings results in direct emissions where the natural gas is combusted.

The building energy sector is typically the largest or second largest contributor of GHG emissions to a jurisdiction's GHG inventory. Consequently, building energy-related reduction measures typically yield substantial reductions.

Reduction measures to address GHG emissions from building energy use are separated into two categories: energy efficiency and renewable energy. Energy efficiency measures are intended to promote efficient energy usage, whereas renewable energy measures are intended to change the carbon content of electricity.

Energy consumption typically represents a large portion of GHG emissions for regions. Reducing electricity usage and improving energy performance are therefore vital to the Reduction Plan. Energy retrofits have upfront costs, but can result in savings over the long term. In this sector, private residents, businesses, and the municipal governments would incur costs to upgrade to energy efficient technologies but would also realize the resulting energy cost savings. Costs to the city governments would mainly be associated with staff time for development of the incentive programs, as well as costs of retrofits to existing municipal buildings and upfront costs for building new city facilities.

The building energy measures would also result in other benefits for both small and large businesses, as well as households in each jurisdiction. Reductions in electricity use and the generation of renewable energy from clean technologies (e.g., wind, solar) would contribute to reductions of regional criteria pollutants. Less combustion of natural gas may also result in local air quality and public health benefits. Overall, reductions in energy consumption and expenditures would enhance the ability of homeowners and business to withstand unexpected surges in future

energy costs. Energy retrofits would also improve home values and likely contribute to economic growth by providing new jobs within the community.

Tree planting and rooftop gardens would both reduce energy use from the building energy sector and increase the carbon sequestration potential of the cities. Emission reductions occur in the building energy sector; carbon sequestration was not calculated. Land uses strategies related to reducing transportation emissions were addressed separately in Section 4.3.3, *On-Road Transportation*.

Large scale tree planting creates dynamic ecosystems within the Participating jurisdictions that provide environmental and aesthetic benefits. Trees help to clean the air and water, strengthen the quality of place, reduce storm water runoff, create walkable communities, and raise property values. Trees also reduce the heat island effect and provide shading for buildings, reducing air conditioning electricity use. Rooftop gardens provide a cooling effect to the buildings beneath through insulation, reducing energy consumption that would be used to power a central air conditioning system. Reduction measures in this sector are typically the smallest contributor to GHG reductions.

The Reduction Plan includes the following seven building energy measures. Reductions for these measures are presented in Appendix B.

4.3.1.1 Energy Efficiency Measures

Energy-1: Energy Efficiency Incentives and Programs to Promote Energy Efficiency for Existing Buildings

Measure Description: Promote energy efficiency in existing residential and nonresidential buildings, and remove funding barriers to energy-efficiency improvements. The following implementation strategies can be used to help achieve these goals:

- Promote energy efficiency in *residential* buildings:
 - Implement a low-income weatherization program.
 - Partner with community services agencies, utilities, nonprofits, and other entities to incentivize energy-efficiency projects, including HVAC, lighting, water heating equipment, insulation, and weatherization for low-income residents. Residential energy-efficiency projects can be financed through programs such as PACE or California First, which allow property owners to finance improvements that are repaid through an assessment on their property taxes for up to 20 years. Incentives, such as those available from California Energy Upgrade, can also assist. These and similar programs are often administered through the participating local government entity.
 - Launch energy-efficiency campaigns targeted at residents. Provide public education on the need for energy efficiency and emissions reduction programs and incentives.
 - Promote Smart Grid².
- Promote energy efficiency in *nonresidential* buildings:

² Smart Grid refers to an electrical grid that uses digital information and controls technology to improve reliability, security, and efficiency of the grid.

- Incentivize schedule energy-efficiency “tune-ups” of existing buildings. Energy audit and tune-up programs are typically run by the local utility. Jurisdictions would work with utilities to take advantage of energy audit programs for municipal buildings and promote awareness of these programs for private commercial buildings.
- Promote individualized energy management services for large energy users. Jurisdictions would work with utilities to take advantage of energy audit programs for municipal buildings and promote awareness of these programs for private commercial buildings.
- Partner with utilities to leverage the Savings by Design incentive program for commercial projects. The Savings by Design incentive requires efficiency standards to be 10% better than Title 24 energy in order to qualify; up to \$200,000 in performance rebates per project are available.
- Remove funding barriers to energy-efficiency improvements. For example, leverage federal tax credits or local rebates, such as those offered by Southern California Edison. Participate in programs (national, state, or regional) that provide innovative, low-interest financing for energy-efficiency and alternative energy projects. Promote incentives to encourage the use of energy-efficient equipment and lighting. Provide financial incentives for adoption of identified efficiency measures.
 - Launch energy-efficiency campaigns targeted at business. Provide public education on the need for energy efficiency and emissions reduction programs and incentives. Outreach programs can be sponsored by individual jurisdictions or by a region-wide consortium.
 - Remove funding barriers to energy-efficiency improvements. For example, leverage federal tax credits or local rebates, such as those offered by Southern California Edison. Identify funding sources to assist affordable housing managers in incorporating energy-efficient designs and features.
 - Participate in PACE programs such as California First or similar programs, as feasible. These programs allow property owners to finance improvements that are repaid through an assessment on their property taxes for up to 20 years. These and similar programs are often administered through the participating local government entity.

Entity Responsible for Implementation: This measure would be implemented by individual jurisdiction governments and, in part, by utilities. It would also involve collaboration between jurisdictions (sub-regional implementation).

Measure Implementation Details: SBCOG is supporting potential PACE-style funding district development in San Bernardino for interested jurisdictions. To implement this measure, the jurisdiction governments can leverage external funding sources, develop educational campaigns, and other strategies outlined in the measure description. Implementation of this measure would be gradual through 2030 as residents change their energy consumption behavior and as existing buildings undergo energy-efficiency improvements. Implementation would vary by jurisdictions.

Level of Commitment: The jurisdictions selecting this measure would retrofit a portion of existing homes and nonresidential buildings by 2030 based on their selected levels of commitment.

Co-Benefits: Reduced energy use, reduced air pollution, increased property values, public health improvements, and increased quality of life.

Energy-2: Outdoor Lighting Upgrades for Existing Development

Measure Description: Adopt outdoor lighting standards in the zoning ordinance to reduce electricity consumption. This could be achieved by requiring a percentage of outdoor lighting fixtures to use LED bulbs by 2030. The lighting standards could also include the following provisions.

- Encourage lighting along the urban-rural edge, not to exceed one-half the current maximum lighting standard.
- Prohibit continuous all-night outdoor lighting in parks, sport facilities, construction sites, and other relevant areas (unless it compromises safety).
- Implement or exceed CALGreen's nonresidential voluntary mandatory measures related to outdoor lighting controls and equipment (Section A5.209.3) and outdoor lighting (Section A5.209.4), (i.e., achieve CALGreen Tier 1 lighting standards or otherwise demonstrate that energy efficiency of lighting fixtures exceeds mandatory Title 24 by a minimum 15%).

Entity Responsible for Implementation: The individual jurisdictions governments are responsible for implementing this measure.

Measure Implementation Details: To implement this measure, jurisdiction governments can adopt outdoor lighting standards in their zoning ordinances. Implementation would be gradual through 2030 as an increasing number of outdoor lighting fixtures and traffic lights are replaced with energy-efficient fixtures.

Level of Commitment: Each city selecting this measure would require a certain percentage of all nonresidential outdoor lighting to be LED lights, and a certain percentage of all traffic signals to be LED lights.

Co-Benefits: Reduced energy use, reduced air pollution, increased property values, and increased quality of life.

Energy-3: Building Electrification

Measure Description: Adopt building electrification targets and incentives, for both new commercial and residential buildings and retrofits. Establish a goal that a percentage of new and existing buildings use electric HVAC and water heating systems. This goal could be supported through nonfinancial incentives or streamlined permitting.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: The jurisdiction governments can each establish a building electrification goal. This measure would be implemented when each jurisdiction adopts an ordinance. Benefits from the measure would be gradual as new buildings are constructed to fully run on electricity and existing buildings are retrofitted. SCE has programs and incentive funding such as rebates for heat pump water heaters, central HVAC heat pumps, and mini split HVAC heat pumps.

Level of Commitment: Each jurisdiction selecting this measure would incentivize a percentage of new and existing buildings to be built to or retrofit to eliminate gas consumption.

Co-Benefits: Reduced energy use, reduced air pollution, resource conservation, increased property values, public health improvement, and increased quality of life.

4.3.1.2 Renewable Energy

Energy-4: Solar Installations for New Commercial/Industrial Development

Measure Description: Establish a goal for solar installations on new commercial and industrial development to be achieved before 2030. Potential goals might be:

- **Aggressive commitment** —30% of energy requirements for new development supplied by onsite solar power.
- **Medium commitment** —15% of energy requirements for new development supplied by onsite solar power.
- **Low commitment**—5% of energy requirements for new development supplied by onsite solar power.

These goals could be supported through nonfinancial incentives or streamlined permitting through the jurisdictions. Primary funding would likely be through state- or utility-level programs or through private funding such as a PPA. Jurisdictions may also act as a resource for connecting project proponents with funding opportunities.

Entity Responsible for Implementation: The individual jurisdiction governments, in coordination with various private companies, are responsible for implementing this measure.

Measure Implementation Details: To implement this measure, the jurisdiction governments can work with private companies to provide funding for solar energy projects. Implementation of this measure would be gradual through 2030 as new commercial and industrial developments are constructed and equipped with solar installations.

Level of Commitment: Each jurisdiction selecting this measure would establish a percentage goal of new commercial/industrial buildings to install solar to provide a minimum percentage of the building's onsite energy needs.

Co-Benefits: Reduced air pollution, waste reduction, energy diversity and security, reduced price volatility, economic development, public health improvements, and increased property values.

Energy-5: On-site Solar Energy for New and Existing Warehouse Space

Measure Description: Promote and incentivize solar installations on existing and new warehouse space through partnerships with SCE and other private sector funding sources including SunRun, Tesla, and other solar lease or PPA companies. Establish a goal that a percentage of new and existing warehousing projects install solar on a percentage of the building's roof space. This goal could be supported through nonfinancial incentives or streamlined permitting. Jurisdictions may also act as a resource for connecting project proponents with funding opportunities.

Entity Responsible for Implementation: The individual city governments, in coordination with various private companies, are responsible for implementing this measure.

Measure Implementation Details: To implement this measure, jurisdiction governments can work with private companies and utilities to provide funding for solar energy projects. Implementing this measure would be gradual through 2030 as new warehouse spaces are constructed and equipped with solar installations and existing warehouse spaces are retrofitted.

Level of Commitment: Each jurisdiction selecting this measure would incentivize a percentage of new and existing warehouses to install solar on a minimum percentage of the building's roof space.

Co-Benefits: Reduced air pollution, waste reduction, energy diversity and security, reduced price volatility, economic development, public health improvements, and increased property values.

Energy-6: Solar Installations for Existing Housing

Measure Description: Establish a goal for solar installations on existing single-family homes to be achieved before 2030. Potential goals might be:

- **Aggressive commitment**—25% of existing single-family homes install solar.
- **Medium commitment**—20% of existing single-family homes install solar.
- **Low commitment**—15% of existing single-family homes install solar.

These goals could be supported through nonfinancial incentives or streamlined permitting through the jurisdictions. Primary funding would likely be through state- or utility-level programs or through private funding such as a PPA. Jurisdictions may also act as a resource for connecting project proponents with funding opportunities.

Entity Responsible for Implementation: The individual jurisdiction governments, in coordination with various private companies, are responsible for implementing this measure.

Measure Implementation Details: To implement this measure, the jurisdiction governments can work with private companies to provide funding for solar energy projects. Implementation of this measure would be gradual through 2030 as new single-family residential developments are constructed and equipped with solar installations.

Level of Commitment: Each jurisdiction selecting this measure would establish a percentage goal of existing single-family homes to install solar.

Co-Benefits: Reduced air pollution, waste reduction, energy diversity and security, reduced price volatility, economic development, public health improvements, and increased property values.

Energy-7: Solar Installations for Existing Commercial/Industrial Buildings

Measure Description: Establish a goal for solar installations on existing commercial/industrial buildings to be achieved before 2030. Potential goals might be:

- **Aggressive commitment**—30% of existing buildings have solar installations.
- **Medium commitment**—20% of existing buildings have solar installations.
- **Low commitment**—10% of existing buildings have solar installations.

The selected goal could be achieved in part through private funding from SunRun, Tesla, or other solar lease PPAs. Additionally, nonfinancial incentives and streamlined permitting at the local level can support this goal. Jurisdictions may also act as resources for connecting property owners with

funding opportunities. This measure could complement voluntary CALGreen measures related to solar photovoltaic systems.

Entity Responsible for Implementation: The individual jurisdiction governments, in coordination with external funding programs and/or private companies, are responsible for implementing this measure.

Measure Implementation Details: To implement this measure, the jurisdiction governments can work with building owners, state funding programs, and private companies to provide funding for solar energy projects. Implementation of this measure would be gradual through 2030 as solar is installed on existing buildings.

Level of Commitment: Each jurisdiction selecting this measure would establish a percentage goal of existing commercial and industrial buildings (private and/or public buildings) to install solar to provide a minimum of 15% of the building's onsite energy needs.

Co-Benefits: Reduced air pollution, waste reduction, energy diversity and security, reduced price volatility, economic development, public health improvements, and increased property values.

4.3.2 Land Use

4.3.2.1 Land Use-1: Promote Rooftop Gardens

Measure Description: Establish a goal for 5% of new multifamily residences and 15% of new commercial facilities over 100,000 square feet to construct rooftop gardens. Rooftop green space insulates the building underneath and increases energy efficiency. Rooftop gardens also cool the surrounding area through moisture retention and surface reflectivity. This measure could also reduce energy consumption and associated GHG emissions in the building energy sector. This measure could be implemented through the following incentives.

- Consider offering nonfinancial incentives, as feasible, to encourage rooftop gardens.
- Consider providing informational materials to contractors, homeowners, and businesses about the benefits of and incentives for rooftop gardens.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: The jurisdiction governments can set goals for new multifamily residences and commercial facilities to have rooftop green space. Implementation of this measure would be gradual as new developments are constructed with rooftop gardens.

Level of Commitment: Each jurisdiction selecting this measure would require a certain percentage (e.g., 5%) of new multifamily residences and a certain percentage (e.g., 15%) of new commercial facilities over 100,000 square feet to construct rooftop gardens.

Co-Benefits: Reduced energy consumption, reduced air pollution, reduced urban heat island effect, and increased quality of life.

4.3.2.2 Land Use-2: Urban Tree Planting

Measure Description: Establish a jurisdiction-wide tree planting goal or tree preservation goal. Possible implementation mechanisms might include a requirement to account for trees removed and planted as part of new construction and/or establishing a goal and funding source for new trees planted on jurisdiction property. This measure will reduce energy consumption and associated GHG emissions in the building energy sector by reducing the heat island effect.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: The jurisdiction governments can require trees to be planted as part of new construction, possibly as part of CEQA review and approval of new projects. Implementation of this measure would be gradual as new developments are constructed with accompanying trees.

Level of Commitment: Each jurisdiction selecting this measure chooses a certain number of trees to plant each year. They can choose from 10 trees per year.

Co-Benefits: Reduced energy consumption, reduced air pollution, reduced urban heat island effect, and increased quality of life.

4.3.3 On-Road Transportation

On-road transportation emissions include emissions from light- and medium-duty vehicles and heavy-duty trucks associated with land use activity in each of the jurisdictions. Emissions originate from the combustion of fossil fuels (such as diesel, gasoline, and compressed natural gas) to power the vehicles. These emissions are direct emissions and accounted for approximately 38% of total regional emissions in 2016.

The total VMT by residents and employees in the jurisdictions is expected to increase by the years 2030 and 2045 under BAU conditions as new housing units are developed and new jobs are created. The transportation sector represents the largest source of GHG emissions in the jurisdictions' future community GHG inventory. As a result, transportation-related reduction measures must be a part of reducing the region's overall GHG emissions in 2030 and 2045.

Reduction measures in the on-road transportation sector have among the highest GHG reduction potential relative to other sectors. It is important to note that the measures outlined below would also contribute to significant reductions in GHG emissions beyond 2045 because they would create a transportation and land use network that supports mixed-use, high density development, and alternative modes of transportation.

On-road transportation measures can achieve significant benefits for both individual residents and the region as a whole. Reductions in VMT and traffic congestion would reduce smog-forming emissions, toxic air contaminants, and diesel particulate matter. Alternative modes of transportation, such as bicycling, walking, and transit, may also help reduce many serious health risks associated with vehicle exhaust. Community well-being and quality of life may also be improved as individuals spend less time commuting, waiting for the bus, and/or sitting in heavily congested traffic.

4.3.3.1 On-Road-1: Alternative Fueled Transit Fleets – CNG to Electric

Measure Description: The majority of the transit fleet in the County is currently compressed natural gas (CNG). Converting from CNG to electric would reduce GHG emissions because electricity from renewable sources produces less emissions than natural gas.

Entity Responsible for Implementation: Transit authorities serving the County are primarily responsible for this measure, including OmniTrans, Victor Valley Transit Authority, Morongo Basin Transit Authority, Mountain Transit, and Needles Area Transit. The jurisdiction governments would coordinate with transit authorities as appropriate.

Measure Implementation Details: To implement this measure, the jurisdictions would coordinate with transit authorities in the region to convert CNG transit buses to electric. Implementation of this measure would most likely be achieved in increments because the electric transit bus technology is evolving.

Level of Commitment: Transit authorities are primarily responsible for this measure. Therefore, no local action is required from the jurisdictions.

Co-Benefits: Reduced air pollution and public health improvements.

4.3.3.2 On-Road-2: Encourage Use of Mass Transit, Carpooling, Ridesharing, and Telecommuting

Measure Description: Commute Trip Reduction programs aim to reduce commute trips and VMT through various strategies. The strategies include encouraging the use of mass transit, carpooling, ridesharing, and telecommuting. The level of VMT reductions that this measure could achieve depends on the level of commitment, from completely voluntary to required implementation with monitoring and performance standards. Jurisdictions could start implementing this measure for government employees, and then expand to adopting an ordinance to require businesses to implement Commute Trip Reduction programs. This measure only reduces commute trip VMT; it is assumed that commute trip VMT makes up 30% of total VMT.

The COVID-19 pandemic caused an unexpected increase in telecommuting in 2020. According to Gallup,³ at the height of the pandemic in April, 51% of the U.S. workforce worked remotely full time, and 18% of the workforce was able to work remotely part time. By September, the percentage of full-time telecommuters dropped to 33% and part-time telecommuters increased to 25%. Although this high level of telecommuting is anticipated to significantly reduce VMT in 2020 (and possibly in future years now that it has been demonstrated to be feasible for many), it is not reflected in the current modeling scenarios used for this plan.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: Jurisdictions could adopt a Commute Trip Reduction Ordinance and require businesses to implement Commute Trip Reduction programs to achieve the highest level of VMT reductions. Alternatively, jurisdictions could implement this measure on government employees and encourage businesses to provide employer support on commute trip reductions.

³ Gallup. 2020. "COVID-19 and Remote Work: An Update." October 13, 2020. Available online at: <https://news.gallup.com/poll/321800/covid-remote-work-update.aspx>.

Level of Commitment: Jurisdictions choosing this measure should identify the percent of employees eligible for this measure. For government employees only, no more than 10% of total employees would be eligible. Jurisdictions adopting a Commute Trip Reduction Ordinance could assume 80–100% of employees eligible.

Co-Benefits: Reduced energy use, increased quality of life, reduced air pollution, public health improvements, and energy security.

4.3.3.3 On-Road-3: Improve Efficiency through Signal Synchronization

Measure Description: Signal synchronization could improve traffic flow and reduce GHG emissions due to less idling time and less stop-and-go driving. Signal timing optimization could be done with or without real-time traffic data.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: The jurisdiction's traffic engineers would study all signaled intersections in the jurisdiction and develop a signal timing optimization plan, and then adjust the signal timing. New signals need to be designed consistent with the signal timing optimization plan before approval for installation.

Level of Commitment: Jurisdictions choosing this measure and implementing signal synchronization would reduce 1% of on-road transportation GHG emissions from reduced idling time and reduced stop-and-go.

Co-Benefits: Reduced energy use, increased quality of life, reduced air pollution, public health improvements, and energy security.

4.3.3.4 On-Road-4: Expand Bike Routes Including Pedestrian and Bicycle Friendly Streets

Measure Description: Pedestrian- and bicycle-friendly roads are crucial to promoting walking and bicycle use as a transportation method. People tend to walk or bicycle if sidewalks and bicycle routes are available and separate from motor vehicles so that pedestrians' and bicyclists' safety can be ensured. Adopting and implementing a bicycle master plan and constructing more bicycle routes would encourage more bicycle rides and would help to reduce VMT.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: The jurisdiction governments are encouraged to develop and adopt a bicycle master plan that sets a goal for miles of bicycle lanes to be constructed within the jurisdiction.

Level of Commitment: Jurisdictions choosing this measure need to compare the existing miles of bicycle lanes with the future planned miles of bicycle lanes. Potential commitment levels could be 2 miles of bicycle lanes per square mile, 4 miles of bicycle lanes per square mile, or 8 miles of bicycle lanes per square mile.

Co-Benefits: Reduced energy use, increased quality of life, reduced air pollution, public health improvements, and energy security.

4.3.3.5 On-Road-5 Community Fleet Electrification

Measure Description: Hybrid electric vehicles, plug-in hybrid electric vehicles, and all-electric vehicles (EVs) produce lower emissions than conventional vehicles. All EV types emit at least 40% less GHG emissions than conventional vehicles. However, more than 95% of people still drive conventional gasoline or diesel vehicles, so programs to encourage the use of EV or hybrid vehicle ownership are greatly needed.

Executive Order (EO) B-16-2012 tasked the California Energy Commission (CEC) and other State agencies to support benchmarks to bring 1.5 million zero emission vehicles (ZEVs) to California's roads, and in conjunction to make sure that Californians have easy access to ZEV infrastructure to charge those vehicles by 2025. SBCTA projected that to comply with EO B-16-2012, there would be 44,846 ZEVs in San Bernardino County by 2025, and a total of 4,761 Level 2 and Level 3 charging stations would be needed to support the ZEVs.⁴ Each jurisdiction would be responsible for a portion of the charging station needs to support increased number of ZEVs.

Entity Responsible for Implementation: Jurisdictions would cooperate with SBCTA to implement this measure.

Measure Implementation Details: Jurisdictions choosing this measure would need to require new residential and commercial development to install charging stations on site. In addition, jurisdiction governments could work with businesses to install charging stations in office parking lots and provide incentives to encourage residences to install charging stations at home.

Level of Commitment: Each jurisdiction is assigned a goal for the number of ZEV charging stations to comply with the 1.5 million ZEVs by the 2025 target. Jurisdictions choosing this measure could commit to installing all or a portion of the targeted charging stations.

Co-Benefits: Reduced air pollution and public health improvements.

4.3.4 Off-Road Equipment

Off-road equipment emissions accounted for approximately 1% of the total regional emissions in 2016. These emissions are direct emissions resulting from equipment fuel combustion. Off-road equipment includes construction equipment and off-road vehicles. Typical industries that use off-road equipment include the agricultural, construction, industrial, entertainment, rail yards, and dredging sectors. In addition, recreational vehicles (e.g., all-terrain vehicles [ATVs]), pleasure craft (e.g., jet skis), and lawn and garden equipment (e.g., mowers) are sources of off-road emissions.

Reduction measures in the off-road equipment sector typically provide modest GHG reductions relative to other sectors.

The Partnership jurisdictions have identified the following measures to increase the use of alternative fuels in off-road equipment and reduce the consumption of fossil fuels. These measures would also achieve significant benefits for both individuals and the region as a whole. For example, electrification of off-road equipment would reduce fossil fuel consumption, thereby contributing to

⁴ San Bernardino Council of Governments. (2019). Zero-Emission Vehicle Readiness and Implementation Plan. August.

reductions in smog-forming emissions, toxic air contaminants, and diesel particulate matter (California Air Resources Board 2008). Serious health risks associated with heavy-duty vehicles may also be reduced accordingly, resulting in improvements in community health and well-being.

4.3.4.1 Off-Road Equipment-1: Electric-Powered Construction Equipment

Measure Description: Establish a goal such that a percentage of construction equipment utilizes electricity to power. With current technology, equipment with relatively low horsepower could be converted to electric. Potential goals might be to require 80-100% of equipment that is less than 120 horsepower to be electric powered.

Achieving the goal would require close coordination with the air district that sets requirements related to air quality on construction vehicles, and would also require providing mitigation options related to construction vehicles through Voluntary Emission Reduction Agreement (VERA) programs, which may overlap with this measure.

Entity Responsible for Implementation: Jurisdictions, SCAQMD, and the Mojave Desert Air Quality Management District could all share in implementing this measure.

Measure Implementation Details: Because the air districts sometimes have mitigation programs for air quality that focus on construction equipment and sometimes have funding to assist with equipment swap-out, jurisdictions choosing this measure would benefit from coordinating with the air districts in implementing this measure. Once the goals are adopted, implementation of this measure would be complete, and benefits would be achieved.

Level of Commitment: Each jurisdiction choosing this measure would provide a percentage goal of construction equipment less than 120 horsepower in the jurisdictions to be electric powered by 2030 and 2045.

Co-Benefits: Reduced air pollution, public health improvements, and increased quality of life.

4.3.4.2 Off-Road Equipment-2: Idling Ordinance

Measure Description: Adopt an ordinance that limits idling time for heavy-duty diesel trucks beyond CARB or local air district regulations and if not already required as part of CEQA mitigation. Recommended idling limit is 3 minutes. As part of permitting requirements or city contracts, encourage contractors to submit a construction vehicle management plan that includes such things as idling time requirements; requiring hour meters on equipment; and documenting the serial number, horsepower, age, and fuel of all on-site equipment. State law currently requires all off-road equipment fleets to limit idling to no more than 5 minutes.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: The jurisdiction governments can adopt ordinances restricting idling time. Implementation of this measure would be a one-time action. Once the ordinance is adopted, the measure would begin to yield benefits.

Level of Commitment: Each jurisdiction choosing this measure would have to adopt an ordinance that limits idling time for heavy-duty construction equipment to 3 minutes.

Co-Benefits: Reduced energy use, reduced air pollution, and public health improvements.

4.3.4.3 Off-Road Equipment-3: Electric Landscaping Equipment

Measure Description: Adopt an ordinance that reduces gasoline or diesel-powered landscaping equipment use. With current technology, equipment with relatively low horsepower could be converted to electric. Potential goals might be to require 80-100% of equipment that is less than 120 horsepower to be electric powered. Jurisdictions would work in close cooperation with the air district in drafting an ordinance or developing outreach programs to be consistent with current air district rules and CEQA guidelines. The ordinance could also include the following provisions for community landscaping equipment.

- Sponsor a lawnmower exchange program that allows residents to trade in their gasoline or diesel-powered mower for an electric mower at a low or discounted price.
- Require exterior electrical outlets on all new building developments.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: The jurisdiction governments can each adopt an ordinance that would result in compliance with the measure. Implementation of this measure would be gradual through 2030 and 2045 as residents exchange equipment, and as the jurisdictions swap old equipment for new equipment.

Level of Commitment: Each jurisdiction choosing this measure would provide a percentage goal of landscaping equipment less than 120 horsepower in the jurisdictions to be electric powered by 2030 and 2045.

Co-Benefits: Reduced air pollution, public health improvements, and increased quality of life.

4.3.5 Solid Waste Management

Total emissions from solid waste generated by the cities account for approximately 5% of total regional emissions for 2016. These emissions are fugitive emissions of methane that occur at numerous landfills spread throughout the state, and are considered an indirect emissions source. The materials disposed of by each Partnership city are recycled, composted, or placed in a landfill. Organic waste that is buried in landfills decomposes under anaerobic conditions to produce methane. Landfill-related emissions from waste are primarily methane, which is released over time when waste decomposes.

Reducing the Partnership cities' GHG emissions from the solid waste management sector includes two approaches: 1) methane capture and 2) waste reduction through diversion programs. Methane capture reduces fugitive methane emissions that are emitted from waste in landfills as a result of the decomposition process. Capturing the fugitive methane prevents it from reaching the atmosphere. Captured methane can also be utilized as an energy source onsite at a landfill, which reduces the need for external energy from a utility.

Waste diversion programs are designed to reduce the amount of waste sent to landfills. In addition to GHG emissions and cost savings, diversion programs may reduce waste-hauling fees, as well as fuel combustion emissions for transporting waste to landfills. Likewise, reductions in landfilled waste would reduce the need for landfill space, which may contribute to future land conservation.

Increased recycling and reuse would reduce the need for raw material and energy for manufacturing, thereby contributing to fuel savings and criteria pollutant reductions.

Reduction measures in the solid waste management sector typically provide modest GHG reductions relative to other sectors.

4.3.5.1 Waste-1: Increased Waste Diversion

Measure Description: Exceed the waste diversion goal (75%) required by AB 341 by adopting citywide waste goals to divert more than 75% of waste. In instances where cities operate their own waste services programs, they will have responsibility to expand or establish composting, recycling, and yard waste programs to residences and businesses. Cities would work with waste providers to identify a baseline, opportunities, and achievable diversion goals before a certain time period, all of which can be incorporated into the waste provider's contract with a jurisdiction. This measure could include:

- Expand educational programs to inform residents about reuse, recycling, composting, waste to energy, and zero waste programs. Encourage local recycling and composting initiatives at the neighborhood level.
- Adopt a construction and demolition waste recovery ordinance that meets or exceeds the CALGreen voluntary guidance of a 65-75% reduction in nonhazardous construction and demolition waste.
- Encourage local businesses to expand their recycling and composting efforts and to reduce packaging of products manufactured in the cities.
- Establish a reuse/recycling center where furniture, appliances, building materials, and other useful, nonhazardous items may be dropped off or purchased for a nominal fee.
- Enhance regional coordination on waste management, to take advantage of economies of scale of recycling, composting, and other diversion programs.

Entity Responsible for Implementation: The individual jurisdiction governments, along with waste service providers, are responsible for implementing this measure.

Measure Implementation Details: Jurisdiction governments that operate their own waste services programs can develop educational programs to encourage residents to reduce waste. Jurisdiction governments that utilize a private contractor for waste collection can work with that contractor to expand education and outreach programs. Waste diversion generally increases gradually on an annual basis.

Level of Commitment: Each jurisdiction selecting this measure would provide a diversion goal (e.g., at least 75%) of diversion of waste from landfills.

Co-Benefits: Reduced air pollution and resource conservation.

4.3.6 Water Conveyance

Water consumption emissions accounted for approximately 1% of total regional emissions in 2016. Each city's water consumption includes the following indirect emissions by activity: electricity consumption for water supply and conveyance, water treatment, water distribution, and wastewater treatment. Water is not only an important resource with limited supplies, but the treatment, distribution, and conveyance of water requires considerable amounts of electricity. The

generation of this electricity consumes fossil fuels and releases GHGs. Reducing water demand and conserving water can therefore save energy and avoid future emissions. Reduction measures in the water conveyance sector typically contribute small GHG reductions relative to other sectors.

The Partnership jurisdictions have identified the following strategies to enhance community-wide water and resource conservation. These strategies would collectively reduce water consumption, which would likewise contribute to reductions in building energy use. For example, efficient faucets that use less water would require less electricity and natural gas for hot water heating. Additionally, energy required to transport, distribute, and treat water would be reduced. The consumption of less electricity and natural gas would ultimately translate to reductions in region and local criteria pollutants, which may improve community health and well-being. Water measures that encourage building retrofits also have an additional benefit of enhancing building value and resale.

It is important to note that the water conservation measures would achieve reductions in the building energy sector. However, the emissions savings are reported as part of the water sector because they are a direct result of implementation of water conservation measures.

4.3.6.1 Water-1: Require Adoption of the Voluntary CALGreen Water Efficiency Measures for New Construction

Measure Description: Require adoption of the voluntary CALGreen water efficiency measures (at least Tier 1) for new construction. CALGreen voluntary measures recommend use of certain water-efficient appliances, plumbing and irrigation systems, as well as more aggressive water-savings targets. Update building standards and codes for new residential and nonresidential buildings to require adoption of these voluntary measures, including:

- Use of low-water irrigation systems.
- Installation of rainwater and gray water systems.
- Installation of water-efficient appliances and plumbing fixtures, as well as composting toilets.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: The jurisdiction governments can choose to include the voluntary CALGreen measures in their building codes. Implementation would be gradual beginning in 2020 as new buildings are constructed with water-efficient fixtures.

Level of Commitment: Each jurisdiction selecting this measure would have to require adoption of the voluntary CALGreen water-efficiency measures (at least Tier 1) for new construction.

Co-Benefits: Reduced energy use, reduced air pollution, resource conservation, and increased property values.

4.3.6.2 Water-2: Require Adoption of the Voluntary CALGreen Water Efficiency Measures for Existing Construction

Measure Description: Require adoption of the voluntary CALGreen water efficiency measures for existing construction. CALGreen voluntary measures recommend use of certain water-efficient appliances, plumbing and irrigation systems, as well as more aggressive water-savings targets.

Update building standards and codes for existing residential and nonresidential buildings to require adoption of these voluntary measures, including:

- Use of low-water irrigation systems.
- Installation of water-efficient appliances and plumbing fixtures, as well as composting toilets.
- A 30-40% reduction over baseline in indoor water use, and a 55-60% reduction in outdoor potable water use (CALGreen Tier 1 or 2).

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: The jurisdiction governments can choose to include the voluntary CALGreen measures in their building codes. Implementation would be gradual beginning in 2020 as existing buildings are retrofitted with water-efficient fixtures.

Level of Commitment: Each jurisdiction selecting this measure would have to require adoption of the voluntary CALGreen water-efficiency measures for existing construction.

Co-Benefits: Reduced energy use, reduced air pollution, resource conservation, and increased property values.

4.3.6.3 Water-3: Encourage Water-Efficient Landscaping Practices

Measure Description: Encourage water-efficient landscaping practices. Adopt a landscaping water conservation ordinance that exceeds the requirements in the Model Landscape Ordinance (AN 1881). The conservation plan could include provisions for any of the following.

- Reducing the ET Adjustment factor listed in the Model Ordinance further.
- Limiting turf grass areas.
- Providing approved plant lists.
- Implement a public education and outreach campaign to promote water conservation. The program should highlight specific water-wasting activities to discourage, such as the watering of non-vegetated surfaces and using water to clean sidewalks and driveways, as well as educate the community about the importance of water conserving techniques. Water efficiency training and certification for irrigation designers, installers, and property managers should also be offered.
- Encourage alternatives to lawns and turf uses, except for parks, playing fields, children's play areas and other specialized uses.
- Promote underground irrigation techniques.
- Encourage extensive use of mulch in landscape areas to improve the water-holding capacity of the soil by reducing evaporation and soil compaction.
- Require drought-tolerate landscape plantings for all municipal buildings.
- Establish landscape maintenance districts along streets for water conservation purposes.
- Promote and Incentivize the use of smart-irrigation technologies such as irrigation sensors.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure in concert with water retailers.

Measure Implementation Details: The individual jurisdiction governments can adopt water conservation plans that surpass the requirements of the Model Landscape Ordinance. Implementation would be gradual from 2020 onward as residents adopt new water conservation behaviors, and as new developments utilize less water-demanding plants, alternatives to lawns, and gray water infrastructure.

Level of Commitment: Each jurisdiction selecting this measure would adopt a landscaping water conservation plan that exceeds the requirements in the Model Landscape Ordinance (AN 1881) to achieve outdoor water use reductions for a certain percentage of residential and nonresidential buildings.

Co-Benefits: Reduced energy use, reduced air pollution, and resource conservation.

4.3.7 Agriculture

Agriculture emissions accounted for approximately 3% of the total regional emissions in 2016. These emissions are direct emissions resulting from livestock activity and the application of fertilizer. The three general sources of agricultural emissions evaluated in this inventory include livestock enteric fermentation, livestock manure management, and N₂O emissions from the application of fertilizer. Reduction measures in the agriculture sector typically provide modest GHG reductions relative to other sectors.

Reducing the jurisdictions' GHG emissions from the agriculture sector includes methane capture and combustion at large dairies and animal operations facilities. The large dairies with more than 1,000 cattle are located in Chino, Ontario, and Unincorporated County. Methane capture reduces fugitive methane emissions that are emitted from livestock as a result of decomposing manure. Capturing the fugitive methane prevents it from reaching the atmosphere. Captured methane can also be utilized as an energy source to generate electricity or produce vehicle fuel, which reduces the need for external energy or fuel from a utility.

4.3.7.1 Agriculture-1: Methane Capture at Large Dairies

Measure Description: This is a voluntary measure to be undertaken by large dairies and encourages the installation of methane digesters to capture methane emissions from the decomposing manure. The methane could be used on site as an alternative to natural gas in combustion, power production, or as a transportation fuel. Further, individual project proponents may be able to sell GHG credits associated with these installations on the voluntary carbon market.

Entity Responsible for Implementation: Large dairies within the applicable Partnership jurisdictions are responsible for implementing this measure.

Measure Implementation Details: Dairies would need to install methane capture and control equipment at their facilities and employ other best-management practices for reducing fugitive methane emissions. The City of Chino, City of Ontario, Unincorporated San Bernardino County, along with the air districts, can collaborate with the dairies to achieve this. The installation of equipment is a one-time event, and implementation would be complete once the equipment begins operating.

Level of Commitment: Chino, Ontario, and Unincorporated County would have to collaborate with the relevant dairies to help establish methane recovery systems.

Co-Benefits: Reduced air pollution, resource conservation, and economic development.

4.3.8 Wastewater Treatment and Discharge

Total emissions from wastewater treatment account for approximately less than 1% of the total regional emissions in 2016. There are numerous large and small wastewater treatment plants (WWTPs) located within the County that serve the County's residents and businesses. Twentynine Palms and Yucca Valley utilize septic systems. The Inland Empire Utilities Agency (IEUA) operates four plants, servicing the more metropolitan areas of Chino, Chino Hills, Fontana, Ontario, Rancho Cucamonga, Montclair, Upland, and unincorporated portions of the County. The City of San Bernardino also operates several WWTPs, servicing the cities of San Bernardino, Loma Linda, Highland, and unincorporated portions of the County. The Cities of Big Bear Lake, Victorville, and Hesperia are served by the smaller regional agencies, Big Bear Area Regional Wastewater Agency (BBARWA) and Victor Valley Wastewater Agency (VVWA). The remaining jurisdictions (Adelanto, Barstow, Colton, Grand Terrace, Needles, Redlands, Rialto, and Yucaipa) have individual plants. GHG emissions result from electricity and/or natural gas used to power the facilities. These indirect emissions are included in the inventory in either the building energy or the water sectors, depending on where the WWTP is located. Additional emissions of CH₄ and N₂O result from the treatment and breakdown of waste in the facility. These are commonly referred to as fugitive emissions and are classified as direct emissions. In general, the fugitive emissions associated with septic systems are higher than those at a centralized WWTP. Wastewater generated in each jurisdiction would be sent to WWTPs, which may be outside the jurisdiction. Consequently, some of these emissions would not occur within the boundaries of the jurisdiction generating the wastewater, but each jurisdiction is responsible for creating this wastewater. Reduction measures in the wastewater treatment and discharge sector typically provide modest GHG reductions relative to other sectors.

Reducing the jurisdictions' GHG emissions from the wastewater treatment sector includes methane capture and combustion at the WWTPs, and improving the efficiency of equipment such as pumps. These types of retrofits are for centralized WWTP systems and do not apply to septic systems. WWTP operators confirmed the presence of or plans for methane capture and the status of their respective energy efficiency projects. For plants operated by an individual jurisdiction, the jurisdiction's selection of any measure related to capital improvements at the plant was considered equivalent to the commitment of a plant operator.

Methane capture reduces fugitive methane emissions that are emitted during the wastewater treatment process. Capturing the fugitive methane prevents it from reaching the atmosphere. Captured methane can also be utilized as an energy source to generate electricity or produce vehicle fuel, which reduces the need for external energy or fuel from a utility. Equipment upgrades can reduce the amount of electricity and natural gas used to power the equipment, which in turn reduces emissions associated with fuel combustion.

4.3.8.1 Wastewater-1: Methane Recovery

Measure Description: Work with the IEUA or other local wastewater treatment providers to identify funding and cooperating agencies for establishing methane recovery systems at all WWTPs that service the County residents. WWTPs in the region operated by IEUA, City of San Bernardino, and VVWA already have approximately 62% methane capture rate. Jurisdictions serviced by these providers would only benefit from this measure if the methane capture rate could be increased. For WWTPs that currently do not have methane capture systems, plants operators would work with regional power providers, local jurisdictions, or other entities to identify funding for methane capture system installation.

Entity Responsible for Implementation: The WWTPs that serve the region are responsible for implementing this measure. However, they may be funded through public private partnership.

Measure Implementation Details: This measure would require the individual WWTPs to install methane recovery equipment. The installation of equipment is a one-time event and implementation would be complete once the equipment begins operating.

Level of Commitment: Each jurisdiction selecting this measure would have to collaborate with the IEUA or other local wastewater treatment provider to establish methane recovery systems.

Co-Benefits: Reduced energy use, resource conservation, and economic development.

4.3.8.2 Wastewater-2: Energy Efficiency Equipment Upgrades at Wastewater Treatment Plants (Regional)

Measure Description: Work with IEUA or other local wastewater treatment provider to upgrade and replace wastewater treatment and pumping equipment with more energy-efficient equipment, as is financially feasible, at the existing facilities. Require all pumping and treatment equipment to be 25% more energy efficient at the time of replacement. Utilize best management practices for the treatment of waste. This measure could also include assessing the feasibility of using advanced treatment of recycled water with microfiltration or reverse osmosis for future potable water use. Assess associated energy/GHG tradeoffs and out of basin water supply.

Entity Responsible for Implementation: The WWTPs that serve the region are responsible for implementing this measure.

Measure Implementation Details: This measure would require the individual wastewater treatment plants to upgrade pumping and treatment equipment. The upgrade of equipment is a one-time event, and implementation would be complete once the upgraded equipment begins operating.

Level of Commitment: Each jurisdiction selecting this measure would have to collaborate with the IEUA or other local wastewater treatment provider to upgrade pumping and treatment equipment.

Co-Benefits: Reduced energy use and reduced air pollution.

4.3.9 GHG Performance Standard for New Development

4.3.9.1 PS-1: GHG Performance Standard for New Development

Measure Description: Individual jurisdictions may adopt a GHG Performance Standard for New Development (PS-1) that would provide a streamlined and flexible program for new residential and nonresidential projects to reduce their emissions. The PS would be a reduction standard for new private developments as part of the discretionary approval process under CEQA. Under PS-1, new projects would be required to quantify project-generated GHG emissions and adopt feasible reduction measures to reduce project emissions to a level that is a certain percent below BAU project emissions. PS-1 does not require project applicants to implement a pre-determined set of measures. Rather, project applicants are allowed to choose the most appropriate measures for achieving the percent reduction goal, while taking into consideration cost, environmental or economic benefits, schedule, and other project requirements.

A jurisdiction may select a suite of other local measures that may already meet the PS-1 percent reduction goal specified by that jurisdiction. In these cases, a jurisdiction can still select PS-1 and use it to support those local measures, even though direct reductions from PS-1 for those jurisdictions

may be zero. An effort was made to not to double-count emissions reductions from PS-1 and overlapping local measures.

Entity Responsible for Implementation: The individual jurisdiction governments are responsible for implementing this measure.

Measure Implementation Details: Measurable reductions of GHG emissions would be achieved through each jurisdiction's review and discretionary approval of residential, commercial, and industrial development projects. It is expected that project proponents would often include energy-efficiency and alternative energy strategies to help reduce their project's GHG emissions because these are often the most cost-effective approach to reducing GHG emissions, but are free to propose any valid measures that would achieve the overall reduction goal.

One means of implementing the Performance Standard would be through development of a point-based "screening table" that identifies a wide-range of project-level measures that could be used to provide GHG reductions. The screening table provides the points for different types of measures and level of commitment and allows an easy way for project applicants to tally up their different proposed measures and see whether they meet the jurisdiction's specific PS. San Bernardino County has developed screening tables and guidance of how to apply them that are presently being used by new project applicants in the County as a means to help streamline project review. Each jurisdiction that ultimately chooses a PS approach as part of their local plan could develop its own screening tables. In addition, the jurisdictions participating in the regional reduction plan have discussed a potential to develop regional screening tables that could apply to multiple cities which may further streamline reviews for cities that choose this approach.

In order to calculate the reductions from this measure, state measures and local mandatory measures were quantified for new development for each jurisdiction. These measures achieve a certain portion of the PS goal, depending on the jurisdiction. The PS contributes the remaining percent reduction required to achieve the PS goal in new developments. The reduction amounts for each individual project within each jurisdiction from state or other local measures would vary; however, state and local mandatory measures are still expected to result in the largest share of the burden in meeting the PS reduction target for all cities.

Some jurisdictions already require discretionary projects, through the CEQA process, to identify their GHG emissions and to mitigate those emissions when feasible mitigation is available and there are no overriding circumstances.

Level of Commitment: Each jurisdiction selecting this measure would have to adopt a GHG Performance Standard for New Development, requiring a certain percent reduction in new development emissions within the cities. The percent reduction goals selected by the jurisdictions range from 29% to 87% for new development emissions.

Co-Benefits: Co-benefits would depend on the exact measures selected by individual project proponents, but would be the same as the corresponding strategies described for the other measures (e.g., if a project proponent were to select energy efficiency measures as part of meeting project reductions, the benefits would be similar in character to those described for energy-efficiency retrofits).

Table 4-1. Regional GHG Reductions for All GHG Reduction Measures

Measure No.	GHG Reduction Measure	GHG reductions	Percent of State/County reductions (for state measures)	Percent of local reductions (for local measures)	Number of cities selecting/benefitting from measure (for local measures)	Notes
<i>State and County Measures</i>						
State-1	Renewable Portfolio Standard	1,741,332	29%	NA	NA	
State-2	Title 24 (Energy Efficiency Standards)	812,849	13%	NA	NA	
State-3	SB 350	146,388	2%			
State-4	Solar Water Heating	1,427	<1%	NA	NA	
State-5	Co-Generation Facilities	812,849	<1%	NA	NA	
State-6	Pavley plus LCFS	2,791,668	46%	NA	NA	
State-7	AB 32 Methane Capture	602,052	10%	NA	NA	
<i>Local Measures</i>						
<i>Building Energy</i>						
Energy-1	Energy Efficiency for Existing Buildings	10,032	NA	5%	24	
Energy-2	Outdoor Lighting	82,810	NA	1%	18	
Energy-3	Building Electrification	20,876	NA	20%	9	
Energy-4	Solar Installations for New Commercial/Industrial Development	342,851	NA	2%	17	
Energy-5	On-site Solar Energy for New and Existing Warehouse Space	28,124	NA	5%	9	
Energy-6	Solar Installations for Existing Housing	78,538	NA	6%	24	
Energy-7	Solar Installations for Existing Commercial Buildings	102,296	NA	12%	23	
<i>On Road Transportation</i>						
On-Road-1	Alternative Fueled Transit Fleets – CNG to Electric	3,354	NA	<1%	19	

Measure No.	GHG Reduction Measure	GHG reductions	Percent of State/County reductions (for state measures)	Percent of local reductions (for local measures)	Number of cities selecting/benefitting from measure (for local measures)	Notes
Transportation-2	Encourage Use of Mass Transit, Carpooling, Ridesharing, and Telecommuting	73,489	NA	4%	15	
Transportation-3	Improved Efficiency through Transportation Demand Management and Signal Synchronization	28,820		2%	17	
Transportation-4	Expand Bike Routes	37,397		2%	18	
Transportation-5	Community Fleet Electrification	49,586		3%	18	
<i>Off Road Transportation and Equipment</i>						
Off Road-1	Electric-Powered Construction Equipment	8,512	NA	1%	17	
Off Road-2	Idling Ordinance	4,593	NA	<1%	19	
Off Road-3	Electric Landscaping Equipment	7,159	NA	<1%	18	
<i>Solid Waste Management</i>						
Waste-1	Waste Diversion	379,076	NA	22%	23	
<i>Water Conveyance</i>						
Water-1	Require Adoption of the Voluntary CALGREEN water efficiency measures for New Construction	0	NA	<1%	12	GHG reductions also include reductions in the building energy
Water-2	Require Adoption of the Voluntary CALGREEN water efficiency measures for Existing Buildings	63,912	NA	4%	20	GHG reductions also include reductions in the building energy
Water-3	Encourage Water-Efficient Landscaping Practices	9,101	NA	1%	23	GHG reductions also include reductions in the building energy
<i>Wastewater Treatment and Discharge</i>						
Wastewater-1	Methane Recovery	1,194	NA	<1%	8	
Wastewater-2	Equipment Upgrades	3,149	NA	<1%	16	GHG reductions occur in the building energy sector

Measure No.	GHG Reduction Measure	GHG reductions	Percent of State/County reductions (for state measures)	Percent of local reductions (for local measures)	Number of cities selecting/benefitting from measure (for local measures)	Notes
<i>Agriculture</i>						
Agriculture-1	Methane Capture at Large Dairies	0	NA	<1%	2	
<i>Land Use and Urban Design</i>						
Land Use-1	Urban Tree Planting	2	NA	<1%	18	GHG reductions occur in the building energy sector
Land Use-2	Promote Rooftop Gardens	323	NA	<1%	5	GHG reductions occur in the building energy sector
<i>GHG Performance Standard for New Development</i>						
PS-1	GHG Performance Standard for New Development	169,203	NA	10%	12	

Chapter 5

Implementation of Local Climate Action Plans and Regional Coordination

5.1 Implementation of the Local Climate Action Plans

Meeting the individual reduction targets set by the Partnership jurisdictions and achieving GHG reduction benefits will require participation of both jurisdiction governments and the communities at large. Full implementation of the local CAPs, for those jurisdictions that choose to adopt one, will also benefit from communication and coordination among the Partnership jurisdictions and SBCOG to identify cost-effective means of implementation wherever possible. This section outlines the key steps that a Partnership jurisdiction could follow to ensure that the measures it has identified for inclusion in this Reduction Plan can be implemented effectively and efficiently. This section assumes that each jurisdiction reviews the information in this Reduction Plan and then adopts its own local, jurisdiction-specific CAP. This section refers to implementation of individual jurisdiction CAPs.

Successful implementation of each jurisdiction's local CAP would require the following components. These are described in more detail below.

- Administration and/or staffing
- Financing and budgeting
- Timelines for measure implementation
- Community outreach and education
- Monitoring, reporting, and adaptive management
- Regional coordination

The components above are basic steps that any jurisdiction might take and that other California communities have taken to implement a GHG reduction plan. These are suggested, not required, and are intended to guide a jurisdiction in its implementation planning.

5.2 Local CAP Implementation Steps

5.2.1 Administration and Staffing

It is recommended that a jurisdiction should develop a CAP Implementation Team (CIT), consisting of jurisdiction staff from key departments, to support implementation of the GHG reduction measures. Some jurisdictions may wish to have the CIT work primarily as part of the development review process for new projects. The CIT team may comprise existing staff and does not necessarily require dedicated full-time staff for these roles. For example, the CIT could comprise individuals from the following primary departments; additional members may be added as needed to ensure coordinated and effective leadership.

- Office of the Jurisdiction Attorney—Responsible for providing legal advice related to the development of new policies, programs, and requirements.
- Office of the Jurisdiction Clerk—Responsible for maintaining monitoring and reporting records.
- Community Development/Planning—Responsible for providing expertise in evaluating and managing the community impacts of the CAP, including implementation of the Building Energy measures and the Transportation Measures (in regard to planning in cooperation with the Public Works Department).
- Public Works—Responsible for providing expertise on the development and implementation of transportation (as it relates to capital projects and maintenance), water, wastewater, urban forestry, and solid waste reduction measures.

Alternatively, or in addition, the jurisdiction could appoint a single CAP Implementation Coordinator (CIC) to oversee the successful implementation and tracking of all selected GHG reduction strategies. The CIC would primarily be responsible for coordinating with contacts across departments to gather data, report on progress, track completed projects, and ensure that scheduling and funding of upcoming projects is discussed at key jurisdiction meetings.

For smaller communities, in lieu of a team, the CIC could be responsible for communicating with the relevant offices and ensuring their input on key decisions related to projects outlined in the jurisdiction's local CAP is considered. In addition, the CIC could have the following responsibilities.

- Secure long-term financing for GHG reduction measures (i.e., grant application primary contact).
- Coordinate CIT meetings.
- Serve as the external communication hub to local and regional planning and climate action organizations, including SBCOG.
- Conduct public outreach to inform the community of the jurisdiction's reduction planning efforts.
- Investigate methods to utilize existing resources and harness community support to better streamline implementation of the local CAP.
- Develop a protocol for monitoring the effectiveness of emissions reduction programs.
- Establish guidelines for reporting and documenting emissions reduction progress.
- Submit annual reports to the jurisdiction council.
- Develop a protocol for utilizing the real-time information collected through the verification process to modify and revise existing reduction programs.
- Track state and federal legislation and its applicability to the jurisdiction.

Administration of a local CAP does not necessarily require a new full-time employee position, although a jurisdiction may certainly opt to have a single dedicated person if numerous and disparate jurisdiction departments will be involved in implementing the CAP, if the jurisdiction will be applying for multiple grants to fund GHG reduction measures, or if the CAP is particularly ambitious and requires numerous new jurisdiction initiatives. In general, the goal in implementing

the CAP is not to create new administrative tasks or new staff positions necessarily, but rather to leverage existing programs and staff to the maximum extent feasible. Jurisdictions should seek to fold GHG planning and long-term reduction goals into their existing procedures, institutional organization, reporting, and long-term planning; a process that will be unique to each jurisdiction.

5.2.2 Financing and Budgeting

5.2.2.1 Funding Mechanisms

Implementation of the local GHG reduction measures would require the jurisdiction and other public agencies, local businesses, developers/builders, and existing commercial building owners, residential homeowners, and individuals to incur increased costs for the capital improvements and other investments and increased operations and maintenance costs. However, in some cases operating costs are anticipated to decrease, resulting in offsetting savings. This section presents a summary of funding and financing options (Table 5-1) available at the writing of this document. Some funding sources are not necessarily applicable to a jurisdiction but to a larger regional agency, such as SBCOG, a JPA, or a waste services provider serving multiple jurisdictions. Jurisdictions should continually monitor private and public funding sources for new grant and rebate opportunities and to better understand how larger agencies are accessing funds that can be used for GHG reductions in their area. Leveraging financing sources is one of the most important roles a local government can play in helping the community to implement many of the GHG reduction measures.

Table 5-1. Potential Funding Sources to Support GHG Reduction Measures

State and Federal Funds	
Federal Tax Credits for Energy Efficiency	<ul style="list-style-type: none"> • Tax credits for energy efficiency can be promoted to residents. • Tax credits available through the end of 2021 include renewable energy products, specifically: geothermal heat pumps, small (residential) wind turbines, solar energy systems, and fuel cells (residential fuel cell and microturbine system). • The tax credit is for 22% of cost for geothermal heat pumps, wind turbines, and solar energy systems in service before 01/01/2022. • For fuel cells, the maximum tax credit is \$500 per 0.5 kW of power capacity in a principal residence.
Energy Efficient Mortgages (EEM)	<ul style="list-style-type: none"> • An EEM is a mortgage that credits a home’s energy efficiency in the mortgage itself. • Residents can finance energy saving measures as part of a single mortgage. • To verify a home’s energy efficiency, an EEM typically requires a home energy rating of the house by a home energy rater before financing is approved. • EEMs are typically used to purchase a new home that is already energy efficient, such as an ENERGY STAR® qualified home.
California Department of Resources Recycling and Recovery (CalRecycle)	<ul style="list-style-type: none"> • CalRecycle grant and loan programs allow jurisdictions to assist public and private entities in management of waste streams. • Incorporated jurisdictions and counties, and other organizations in California are eligible for funds. • Program funds are intended to: <ul style="list-style-type: none"> ○ Reduce, reuse, and recycle all waste. ○ Manage food waste and other organics responsibly through the use of

- composting facilities.
 - o Encourage development of recycled-content products and markets.
 - o Protect public health and safety and foster environmental sustainability.

- California Air Resources Board (CARB)
 - CARB offers several grants, incentives, and credits programs to reduce on-road and off-road transportation emissions. Residents, businesses, and fleet operators can receive funds or incentives depending on the program.
 - The following programs can be utilized to fund local measures:
 - o Air Quality Improvement Program (AB 118)
 - o Carl Moyer Program – Voucher Incentive Program
 - o Goods Movement Emission Reduction Program (Prop 1B Incentives)
 - o Loan Incentives Program

- Existing Capital Improvement Program
 - State and federal funds would most likely continue to local governments, builders, and homeowners in the following forms.
 - o Grants
 - o Transportation and transit funding
 - o Tax credit and rebate programs
 - The Capital Improvement Program can be utilized for measures relating to traffic or transit.

- State Funding for Infrastructure
 - The state’s Infill Infrastructure Grant Program may potentially be used to help fund measures that promote infill housing development.
 - Grants can be used for gap funding for infrastructure improvements necessary for specific residential or mixed-use infill development projects.

- Transportation-Related Federal and State Funding
 - For funding measures related to transit, bicycle, or pedestrian improvements, the following funding sources may be utilized.

Surface Transportation Block Grant Program (STBG)	FTA Section 5311(f)
Congestion Mitigation and Air Quality Improvement Program, Section 1110 (CMAQ)	California’s Active Transportation Program (ATP)
Transportation Enhancement Activities (TEA)	Environmental Enhancement and Mitigation (EEM) Program
National Recreational Trails Program	Federal Transit Administration (FTA) 5309
National Highway System Fund (NHS)	Office of Traffic Safety (OTS)
National Highway Safety Act, Section 402	Transportation Development Act (TDA) Article III
Transportation Funds for Clean Air (TFCA, formerly AB 434)	U.S. DOT Better Utilizing Investments to Leverage Development (BUILD) Transportation Grant
Section 3 Mass Transit Capital Grants	Flexible Congestion Relief (FCR) Program
Bridge Repair & Replacement Program (BRRP)	State Highway Operations and Protection Program (SHOPP)

Strategic Growth
council

- Transformative climate communities
- Affordable housing and sustainable communities
- Climate change research
- Health in all policies
- Sustainable ag. Lands conservation
- Community assistance for climate equity
- Prop 84 wildfire resilience and recovery planning grants
- Tribal programs

Jurisdiction-Level Funding

Public Utility
Enterprises

- Jurisdictions that operate water and sewer public utilities can utilize increased rates to fund capital improvements associated with water or wastewater measures.

Other Local/Regional
Funding Sources

- SCAQMD has several grant programs related to air quality improvement, some of which may apply to various reduction measures.
- Bus Stop Sponsorships—Advertisement sponsorship of bus stops has been utilized as a revenue source.
- Transit Fare Increases—Transit fares could be increased to help fund capital improvements, though increases also have the potential to decrease ridership in the short term.
- Parcel Tax—An election consistent with Proposition 218 could serve to increase the existing level of taxation and provide additional funding for transit-related capital improvements. However, in the current economic climate, this may not be a likely financing source unless economic conditions improve and community support for such a taxation approach is favorable.

Utility Rebates

California Solar
Initiative

- SoCal Edison is one of the three utilities participating in the Go Solar initiative.
- A variety of rebates are available for existing and new homes.
- Photovoltaics, thermal technologies, and solar hot water projects are eligible.
- Single-family homes, commercial development, and affordable housing are eligible.
- Budget for solar generation for 2007–2020: \$2.7 billion.
- Budget for new solar hot water systems for 2010–2017: \$260 million.

Energy Upgrade
California

- Program is intended for home energy upgrades.
- Utilities administer the program, offering homeowners rebates on equipment and appliances and energy efficiency financing.
- Homeowners are connected to home energy professionals.
- Rebates, incentives, and financing are available.

Private Funding

- Private equity can be used to finance energy improvements, with returns realized as future cost savings.
- Rent increases can fund retrofits in commercial buildings.
- Net energy cost savings can fund retrofits in households.
- Power Purchase Agreements (PPA) involve a private company that purchases, installs, and maintains a renewable energy technology through a contract that typically lasts 15 years. After 15 years, the company would uninstall the technology or sign a new contract.
- Power produced from a PPA is sold to customers. In the past, SBCOG has approved contracts for solar power site assessments, bringing together a number of jurisdictions and agencies to aggregate their solar sites.
- On-Bill Financing (OBF) can be promoted to businesses for energy-efficiency retrofits. Funding from OBF is a no-interest loan that is paid back through the monthly utility bill. Lighting, refrigeration, HVAC, and LED streetlights are all eligible projects.

Other Funding Mechanisms for Implementation

- Increased operating costs can be supported by grants from the State Department of Conservation (DOC) to fund sustainable community planning, natural resource conservation, and development, adoption, and implementation of Sustainable Community planning elements, including climate action plans and general plan amendments.

Future Funding Options: Funding Mechanisms for Capital and/or Implementation Costs

New Development Impact Fees	<ul style="list-style-type: none"> ● These types of fees may have some potential to provide funding, but such fees are best implemented when the real estate market and overall regional economic conditions are strong.
Utility User Tax Increase	<ul style="list-style-type: none"> ● Increasing this tax could help fund ongoing implementation, operations, and maintenance efforts. Any increase of tax rates will need to be highly sensitive to current local economic conditions and overall local, state, and national economic and financial context.
Additional Local Sales Parcel Tax	<ul style="list-style-type: none"> ● Increasing local sales or parcel taxes would require voter approval and could provide funding for measures related to transit improvements or retrofit programs. Any increase of tax rates will need to be highly sensitive to current local economic conditions and overall local, state, and national economic and financial context.
Community Facilities District (CFD) Special Taxes	<ul style="list-style-type: none"> ● Creating this special tax would require voter approval and could be best directed towards measures with broad benefits for the community (e.g., transit, pedestrian and bicycle facilities, safe routes to schools). Any increase of tax rates will need to be highly sensitive to current local economic conditions and overall local, state, and national economic and financial context.
General Obligation Bond	<ul style="list-style-type: none"> ● A general obligation bond is a form of long-term borrowing and could be utilized to fund municipal improvements.

AB 811 Districts
Property-Assessed
Clean Energy (PACE)

- AB 811 is intended to help municipalities accomplish goals outlined in AB 32.
 - The PACE finance program is intended to finance energy and water improvements within a home or business through a land-secured loan, and funds are repaid through property assessments.
 - Municipalities are authorized to designate areas where property owners can enter into contractual assessments to receive long-term, low-interest loans for energy and water efficiency improvements, and renewable energy installation on their property.
 - Financing is repaid through property tax bills.
 - As of 2020, there are several active PACE programs that are available for property owners in California.
-

5.2.2.2 Additional Considerations

In addition to pursuing the funding options above and monitoring the availability of others, Partnership jurisdictions would need to take the following steps in order to best inform decisions related to the cost of GHG reductions measures.

Perform and refine cost estimates. Cost estimates for local reduction measures should be performed to identify the cost-effectiveness of each measure to inform and guide the implementation process. This analysis will likely be based on a variety of participation, per-unit, and other assumptions. As programs are developed, cost estimates should be refined and updated over time with more precise implementation-level data.

Integrate GHG measures into existing jurisdiction budget and CIP. Certain capital improvements, particularly those identified in Energy and Land Use/Transportation Measures, may need to be added to the jurisdiction's CIP and facility master plan programs, as well as those of the jurisdiction utility enterprises and other public agencies (such as transit agencies) that have control for project implementation. For CIPs completely under the jurisdiction's control, new projects would need to be assessed for consistency with a jurisdiction's local CAP or adherence to some minimum energy efficiency standard similar to that achieved by the local plan.

Adopt or update ordinances and/or codes. Some local reduction measures may represent a continuation of recently enacted ordinances, while others would require new ordinances (e.g., Trans-1: Idling ordinance, if not previously adopted by a jurisdiction that selected this measure). Staff would need to coordinate these efforts in conjunction with planning departments, planning commissions, and jurisdiction councils.

Pursue outside funding sources. A range of funding from state and federal agencies has been identified in Table 5-1 above. The jurisdiction would need to pursue these (and other emerging) funding sources as a part of implementation efforts.

Implement and direct preferred jurisdiction funding sources. While jurisdiction funding sources are limited in most jurisdictions, the jurisdiction, when financially able as a part of its budget process, could appropriate funding from general sources or make changes in its fee schedules, utility rates, and other sources as needed to support funding the implementation of the GHG reduction measures.

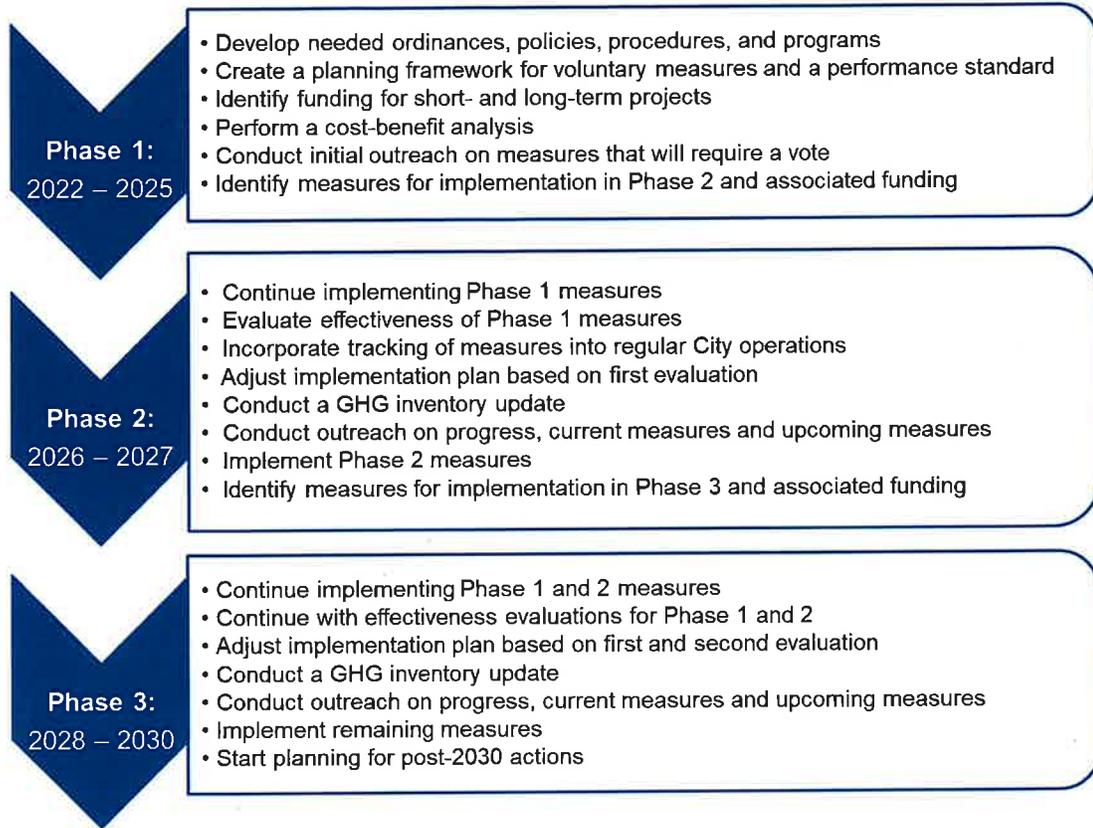
Create monitoring/tracking processes. Local reduction measures will usually require program development, tracking, and/or monitoring. For example, Energy-1 (Promote Energy Efficiency for Existing Buildings) would require staff time to promote the replacement of water fixtures; the jurisdiction may also want to track the number of households that participate in the program and the amount of electricity, natural gas, water, and cost savings over time.

Identify economic indicators to consider future funding options. Economic recovery may occur rapidly or slowly. Whatever the timeframe, the jurisdiction would need to determine the point at which certain additional funding sources may become feasible and/or favorable. Identification and monitoring of economic indicators and trends, such as home prices, energy costs per kWh on solar installations, unemployment rates, or real wage increases can help the jurisdiction decide when to further explore the potential for funding local reduction measures through different financing mechanisms.

5.2.3 Timelines for Measure Implementation

If a Partnership jurisdiction uses the Reduction Plan to develop its own jurisdiction-specific CAP, it is anticipated that the jurisdiction would implement its CAP in phases. Figure 5-1 shows an outline of potential key priorities for three potential implementation phases for the jurisdiction's CAP. The phasing described requires as a first step that each Partnership jurisdiction develop a CAP Implementation Timeline. Conceptually, phasing could be broken out into Phase 1 (2022–2025), Phase 2 (2026–2027), or Phase 3 (2028–2030), as proposed below. Although it would be optimal to start in 2021, given the economic downturn due to the COVID-19 health emergency, it is expected that economic recovery activities will be the priority until at least 2022. Also, the first phase has been extended to 2025 recognizing that phasing in the plan may take time given long-term economic and fiscal impacts of the COVID health emergency. However, where feasible, jurisdictions may be able to incorporate low-cost/no cost/net saving GHG reduction strategies earlier, as well as potential use of economic recovery funding that may be available from the state or federal government during Phase 1. Each conceptual phase is discussed in more detail below.

Figure 5-1. Sample Implementation Timeline for a Jurisdiction CAP



Phase 1 (2022–2025): During Phase 1, the jurisdiction would develop key ordinances, programs, policies, and procedures required to support and enforce the local mandatory GHG reduction measures. Likewise, the jurisdiction would create a planning framework that would guide implementation of the voluntary measures and performance standards. Also, funding would be secured, and a detailed finance plan would be developed. The jurisdiction would encourage implementation of cost-effective measures identified in the CAP. A cost-benefit analysis of measures not previously analyzed in the CAP could be completed. The jurisdiction could begin to evaluate the effectiveness of implemented measures and adapt management procedures accordingly.

Phase 2 (2026–2027): During Phase 2, the jurisdiction would continue to implement measures that were begun in Phase 1. The jurisdiction would evaluate the effectiveness of these measures and adapt management procedures accordingly. Likewise, the jurisdiction would conduct an updated community GHG inventory to monitor emissions trends. The jurisdiction would also select and encourage implementation of Phase 2 measures.

Phase 3 (2028–2030): During Phase 3, the jurisdiction would continue to implement and support measures begun in Phases 1 and 2, and encourage implementation of all remaining CAP measures (Phase 3 measures). An analysis of the effectiveness of Phase 1 and 2 measures would

be conducted, as well as an updated community GHG inventory. The jurisdiction could also begin developing plans for post-2030 actions during this period (see further discussion below)

To encourage implementation of all reduction measures, the CIT or CIC, with consultation from the planning commission, jurisdiction council, jurisdiction staff and/or other key stakeholders, would develop a CAP Implementation Timeline. Measure prioritization could be based on the following factors.

- **Cost/Funding**—How much does the measure cost? Is funding already in place for the measure?
- **GHG Reductions**—How effective is the measure at reducing GHGs?
- **Other Benefits**—For example, does the measure improve water quality or conserve resources? Would it create jobs or enhance community well-being?
- **Consistency with Existing Programs**—Does the measure complement or extend existing programs?
- **Impact on the Community**—What are the advantages and disadvantages of the measure to the community as a whole?
- **Speed of Implementation**—How quickly can the measure be implemented and when would the jurisdiction begin to see benefits?
- **Implementation Effort**—How difficult will it be to develop and implement the program?

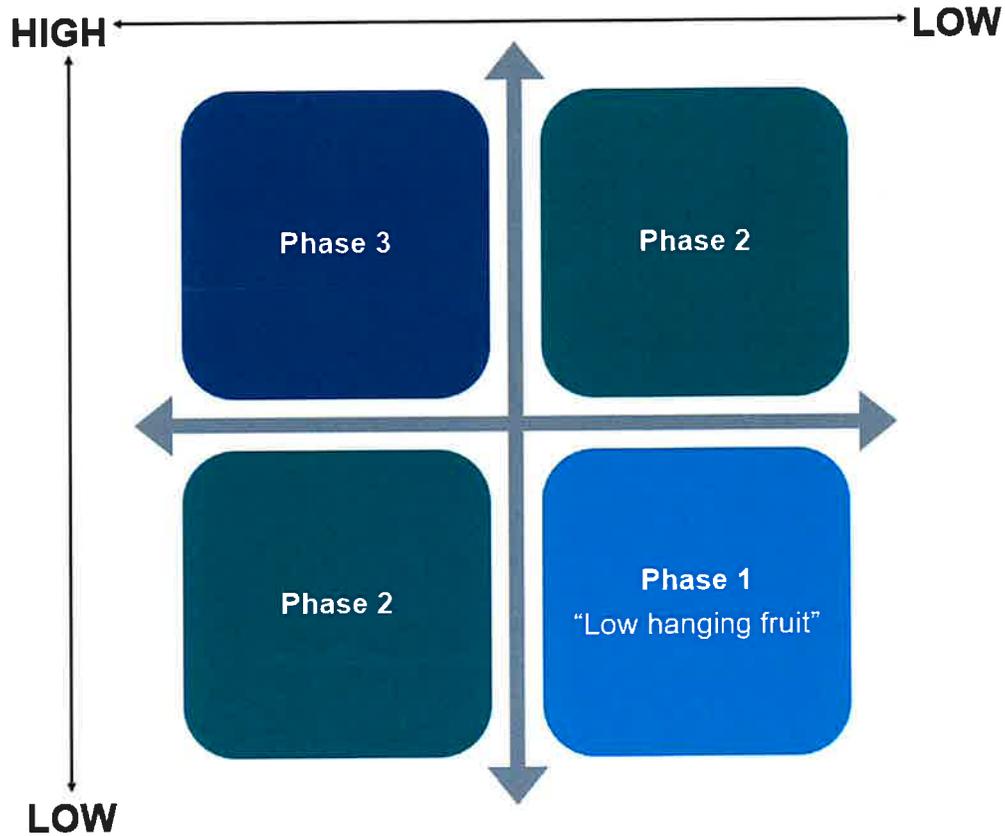
A qualitative appraisal of implementation effort for the jurisdiction is also provided. Measures can be categorized based on the convention of low, medium, or high, with low-level measures being the most likely to be pursued immediately (i.e., the low hanging fruit).

Table 5-2. Implementation Matrix

Implementation Effort Level	Sample Criteria
Low	<ul style="list-style-type: none"> • Requires limited staff resources to develop. • Existing programs in place to support implementation. • Required internal and external coordination is limited. • Required revisions to policy or code are limited.
Medium	<ul style="list-style-type: none"> • Requires staff resources beyond typical daily level. • Policy or code revisions necessary. • Internal and external coordination (e.g., with stakeholders, other jurisdictions or agencies, or general public) is necessary.
High	<ul style="list-style-type: none"> • Requires extensive staff time and resources. • Requires development of completely new policies or programs and potential changes to the general plan. • Robust outreach program required to alert residents and businesses of program requirements and eligibility. • Requires regional cooperation and securing long term funding.

The Action Priority Matrix (Figure 5-2) shows an example of how different GHG reduction measures can be categorized and scheduled based on implementation effort and cost.

Figure 5-2. Activity Priority Matrix



5.2.3.1 Community Outreach and Education

The citizens and businesses in Partnership jurisdictions are integral to the success of the individual CAPs and to overall reductions in GHG emissions for the region. Their involvement is essential, considering that several measures depend on the voluntary commitment, creativity, and participation of the community.

Each jurisdiction could educate stakeholders, such as businesses, business groups, residents, developers, and property owners, about the GHG reduction measures that require their participation, encourage their participation in these programs, and alert them to program requirements, incentives and/or rebate availability, depending on the measure. The CIT or CIC would schedule periodic meetings to facilitate formal community involvement in CAP implementation and adaptation over time. This could include focused meetings for a specific measure or program such as the PACE program and/or agenda items at planning commission, jurisdiction council, or other public meetings. These meetings would be targeted to particular stakeholder groups and provide information on CAP implementation progress as well as the implementation of a specific program or new policy. Alternatively, periodic written updates could be provided in jurisdiction newsletters, SBCOG’s newsletter, on jurisdiction websites, or through other media communications with the general public such as press releases and public service announcements. Stakeholders would be provided an opportunity to comment on potential

improvements or changes to the CAP. The CIT or CIC would also sponsor periodic outreach events to directly inform and solicit the input, suggestions, and participation of the community at large.

5.2.3.2 Monitoring and Reporting

Regular monitoring is critical to ensure programs are functioning as they were originally intended. Early identification of effective strategies and potential issues would enable the jurisdiction to make informed decisions on future priorities, funding, and scheduling. Moreover, monitoring provides concrete data to document the jurisdiction's progress in reducing GHG emissions. The CIT or CIC would be responsible for developing a protocol for monitoring the effectiveness of emissions reduction programs as well as for undertaking emissions inventory updates.

- **Update GHG Inventory**—It is recommended that each jurisdiction inventory its emissions at a minimum for 2014, 2017, and 2019, including regular data collection in each of the primary inventory sectors (utility, regional VMT, waste, wastewater, and water), and compare to the jurisdiction's baseline GHG emissions in 2016. If Participating Jurisdictions were interested, a combined inventory effort could be conducted through SBCOG similar to the inventory preparation that was done for this Regional Plan. The CIT or CIC would consolidate information in a database or spreadsheet that can be used to evaluate the effectiveness of individual reduction measures. If feasible at a reasonable cost/effort, annual GHG inventory monitoring may be conducted starting in 2014, but this would not be a commitment of the jurisdiction until funding mechanisms and resource availability were better understood.
- **Track State Progress**—For many jurisdictions, the CAP will rely heavily on state-level measures. The CIT or CIC would be responsible for tracking the state's progress on implementing state-level programs. Close monitoring of the real gains being achieved by state programs would allow the jurisdiction to adjust its CAP, if needed.
- **Track Completion of GHG Reduction Measures**—The CIT or CIC would keep track of measures implemented as scheduled in the CAP, including progress reports on each measure, funding, and savings. This will allow at least a rough attribution of gains when combined with regular GHG inventory updates.
- **Regular Progress Reports**—The CIT or CIC may report annually (or semi-annually or at other intervals) to the jurisdiction council on CAP implementation progress. If annual reports, periodic inventories, or other information indicates that the GHG reduction measures are not as effective as originally anticipated, the CAP may need to be adjusted, amended, or supplemented. At a minimum, the jurisdiction may conduct a four-year review of CAP effectiveness as part of annual reporting in 2017, which would allow making mid-course adjustments in the CAP if needed to effect change prior to 2030.

5.2.3.3 Regional Cooperation

There are substantial opportunities to enhance the effectiveness of the CAP through regional collaboration. Partnership jurisdictions would explore the potential to leverage resources through regional cooperation. Potential opportunities and partners include the following.

SBCOG: As the regional council of governments and the regional transportation agency, SBCOG is a logical communication hub for Participating jurisdictions to use to share the progress of their CAPs. Further, SBCOG will be the responsible implementing agency for many transportation-

related measures that result in local GHG reductions. SBCOG is also administering telework and rideshare programs for participating jurisdictions.

Air Districts: The South Coast and Mojave Air Districts are the local agencies responsible for developing and implementing air quality plans. The agencies also sponsor various air quality programs that may support implementation of several energy-efficiency, transportation, and renewable energy measures.

Energy Providers: SCE and other local energy providers offer numerous incentives and rebate programs to encourage energy efficiency. Resources offered by the energy providers may reduce the costs of program implementation and administration. There may also be opportunities for cooperation on community-scale alternative energy installations (e.g., wind, solar).

Transportation Agencies (Omnitrans, Mountain Area Regional Transit, Foothill Transit Agency, et al.): Continued coordination with regional transportation agencies would be necessary to fully implement the transportation reduction measures that promote mixed use development. With SB 375 and its linkage to transportation funding, it would also be crucial for the jurisdiction and transportation agencies to develop a shared vision of how land use and transportation can be consistent with the next RTP and the required SCS.

San Bernardino County: The County operates the landfills that receive most of the jurisdictions' waste and has committed as part of its own CAP to improve methane control for its landfills which will help reduce emissions associated with jurisdiction landfilled waste. Coordination with the county to provide the necessary facilities, programs, and incentives would help ensure this goal can be achieved by 2030, as waste services are often shared across several jurisdictions, including the unincorporated portions of the county.

Local Water Providers: The jurisdictions can work with both the wholesalers and retailers of water in each jurisdiction to promote reductions in indoor and outdoor water use from existing developments.

Regional and Local Wastewater Agencies. Jurisdictions can partner with IEUA or their local wastewater treatment authority in promoting reduction of emissions associated with WWTP operations and to reduce wastewater generations through reduction of stormwater runoff through land use measures promoting infiltration and other non-WWTP treatment methods.

5.2.3.4 Reducing GHG Emissions after 2030

In order to assess whether implementing this Reduction Plan achieves the state's long-term climate goals, one must look beyond 2030 to see whether the emissions reduction measures included for the 2030 milestone set the region on the trajectory toward future greater reductions in the post-2030 period.

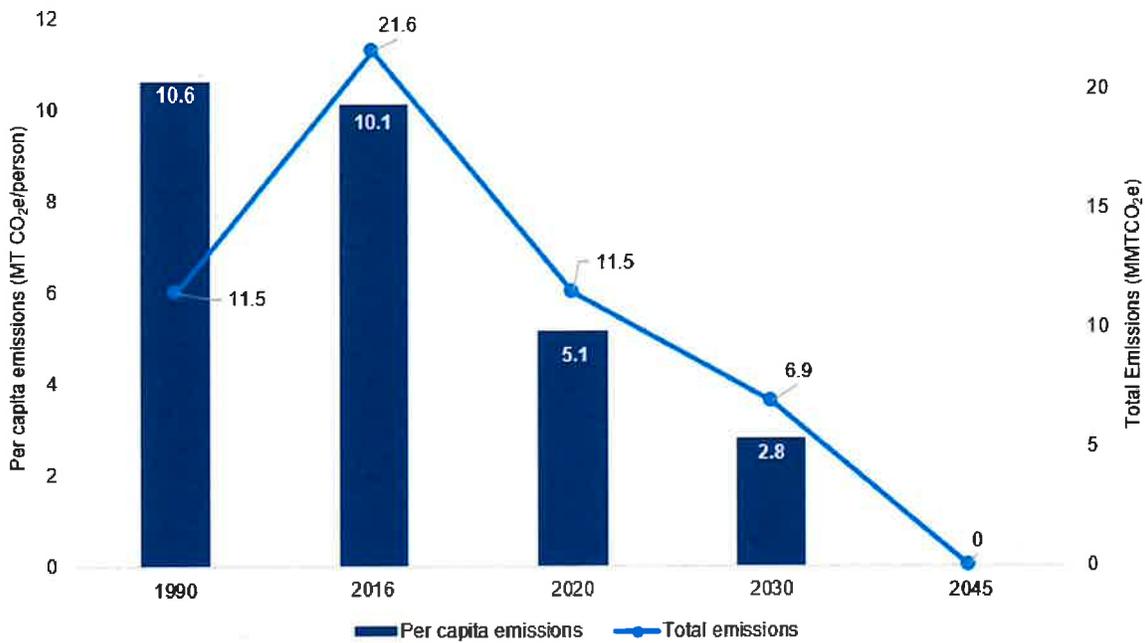
To date, there is no state or federal mandate requiring reduction of GHG emissions after 2030. SB 32 contains no post-2030 reduction target but it does provide CARB with the authority to maintain GHG reductions post 2030. SB 375, while it contains requirements for transportation planning for the MPO (SCAG in this region) to promote reductions in the passenger and light duty vehicle sector, does not contain mandatory requirements for local jurisdictions to reduce their GHG emissions overall.

Governor Brown's Executive Order B-55-18 calls for California to be carbon neutral by 2045. Although not a legal mandate, the goal in this order is an indication of the additional effort needed beyond 2030 to address climate change.

As noted earlier in this report, an executive order is only binding on state agencies, and does not represent a legal mandate for local governments or the private sector. Nevertheless, B-55-18 contains a reduction target that is based on a rough agreement on the basis of scientific understanding of the level of reduction needed in developed countries of the world in order to avoid the more catastrophic effects of climate change that could result from unabated rise in anthropogenic GHG emission. However, there is currently (as of December 2020), there is no state or federal plan as to how to achieve carbon neutrality by 2045. The CARB 2017 SB 32 Scoping Plan did discuss a general scenario of potential reductions. CARB is continuing to develop pathways for the post-2030 period. Similar to the SB 32 Scoping Plan, this Reduction Plan shows a potential trajectory of GHG emissions reductions due to expansion of measures after 2030.

Figure 5-3 depicts what an emissions trajectory might look like, assuming the region follows a linear path from the 2030 reduction target to a 2045 carbon neutral goal matching that in B-55-18. While the specific measures needed to meet the 2045 goal are too far in the future to define in detail, one can examine the level of achievement that would be needed to keep the region on track through 2030. Table 5-3 examines a continuation and strengthening of measures already identified through 2030.

Figure 5-3. Required GHG Reductions in the Region to Meet the State’s 2045 Target



It is reasonably foreseeable that as California approaches the 2030 milestone, focus would shift to the 2045 target. A detailed plan for how the state would meet this target is expected accordingly. Partnership jurisdictions will monitor developments at the national and state levels.

Beginning in Phase 3, it is recommended that the Partnership jurisdictions and SBCOG commence planning for the post-2030 period. At this point, the Partnership jurisdictions would have a better understanding of the effectiveness and efficiency of different reduction strategies and approaches. The new post-2030 reduction plan should include a specific target for GHG reductions for at least 2040 and if supported by long-term planning at the state level, should also include preliminary

planning for 2045. The targets should be consistent with broader state and federal reduction targets and with the scientific understanding of the reductions needed by 2045.

Partnership jurisdictions can do their part to be on track to meet the 2045 goal by implementing the following.

- Increase energy efficiency and green building efforts (for jurisdiction municipal buildings as well as private buildings in the region) to reach full zero net energy for both new development and existing development between 2030 and 2045.
- Continue to implement land use and transportation measures to lower VMT and shift travel modes.
- Capture all methane from landfills receiving regional waste, move toward zero waste and utilize landfill gas further as an energy source.
- Continue to improve local water efficiency and conservation.
- Continue to support and leverage incentive and rebate and other financing programs for residential and commercial energy efficiency and renewable energy installations to shorten payback period and costs and to develop programs that encourage increased use of small-scale renewable power as it becomes more economically feasible.

The conceptual effects of these strategies are presented in Table 5-3 and would represent an approximate doubling of effort for most jurisdictions from that planned at the state and jurisdiction level for 2030. While the potential mix of future GHG reduction measures presented in this section is only an example, it serves to demonstrate that the current measures in the CARB Scoping Plan and the Reduction Plan can not only move the region to its 2030 goal, but can also provide an expandable framework for much greater long-term GHG emissions reductions beyond 2030.

Table 5-3. Potential Regional Reduction Measures to Reach 2045 Goal

Sector	Reductions by 2030 (This Plan)				Scenario for Reductions by 2045		
	State	Local	TOTAL	% below 2016	Additional Reductions Needed for 2030-2045	Effort Relative to 2020-2030	
	MTCO ₂ e	MTCO ₂ e	MTCO ₂ e	%	MTCO ₂ e	%	
Building Energy (Residential, Commercial, Industrial)	2,618,157	931,841	3,549,998	63%	3,097,785	87%	
On-Road Transportation	2,690,435	246,072	2,936,507	36%	6,018,701	205%	
Off-Road Transportation and Equipment	NA	13,526	13,526	8%	328,111	2,426%	
Solid Waste Management	584,621	356,035	940,655	91%	293,807	31%	
Agriculture	NA	3,754	3,754	<1%	81,005	2,158%	
Wastewater Treatment	NA	15,551	15,551	6%	78,835	507%	
Water Conveyance	NA	90,025	90,025	50%	146,037	162%	
GHG Performance Standard for New Development	NA	230,315	230,315	NA	Not estimated	Not estimated	
TOTAL	5,893,212	1,919,770	7,812,982	64%	9,861,470	126%	

Notes:
NA indicates "not applicable."

Chapter 6

References

- California Air Pollution Control Officers Association (CAPCOA). 2009. Model Policies for Greenhouse Gases in General Plans. Available: <http://www.capcoa.org/wpcontent/uploads/downloads/2010/05/CAPCOA-ModelPolicies-6-12-09-915am.pdf> . Accessed: June 27, 2012.
- California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures. Available: <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf> . Accessed: May 31, 2012.
- California Air Resources Board (CARB). 2008. Climate Change Scoping Plan. December. Available: <<http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>>. Accessed: May 18, 2011.
- California Air Resources Board (CARB). 2010. Documentation of California's 2000–2008 GHG Inventory—Index. Last revised: January 24, 2011. Available: http://www.arb.ca.gov/cc/inventory/doc/doc_index.php Accessed: January 18, 2011.
- California Air Resources Board (CARB). 2011. California Greenhouse Gas Emissions Inventory: 2000-2009. December 2011. Available: http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-09_report.pdf Accessed: May 29, 2012.
- California Air Resources Board (CARB). 2013. California Greenhouse Gas Inventory for 2000–2011- by Category as Defined in the Scoping Plan. Last Revised: August 1, 2013. Available: <http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-11_2013-08-01.pdf>. Last accessed: February 6, 2014.
- California Air Resources Board (CARB). 2015. Cap and Trade Overview: ARB Emissions Trading Program. Available at: https://ww3.arb.ca.gov/cc/capandtrade/guidance/cap_trade_overview.pdf
- California Air Resources Board (CARB). 2017a. The 2017 Climate Change Scoping Plan Update. Available at: https://ww3.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf
- California Air Resources Board (CARB). 2017b. California Greenhouse Gas Emissions for 2000 to 2017: Trends of Emissions and Other Indicators. Available at: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2017/ghg_inventory_trends_00-17.pdf
- California Air Resources Board (CARB). 2018a. Mandatory Greenhouse Gas Reporting Program. Available at: <https://ww2.arb.ca.gov/mrr-regulation>
- California Air Resources Board (CARB). 2018b. Updated Informative Digest: Proposed Amendments to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. Available at: https://ww3.arb.ca.gov/regact/2018/ghg2018/uid.pdf?_ga=2.120302024.1147618376.1578923251-1728525694.1568064611
- California Air Resources Board (CARB). 2018c. Cap and Trade Greenhouse Gases: Updated Informative Digest. Available at:

- https://ww3.arb.ca.gov/regact/2018/capandtradeghg18/uid.pdf?_ga=2.166439550.1147618376.1578923251-1728525694.1568064611
- California Air Resources Board (CARB). 2019. Low Carbon Fuel Standard (LCFS): Background. Available at: <https://ww3.arb.ca.gov/fuels/lcfs/background/basics-notes.pdf>
- California Air Resources Board (CARB). 2020. Advanced Clean Cars Program. Available at: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program>
- California Air Resources Board (CARB). 2020b. California Greenhouse Gas Emissions for 2000 to 2018: Trends of Emissions and Other Indicators. Available at: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2018/ghg_inventory_trends_00-18.pdf
- California Attorney General's Office. 2010. 2010 California Green Building Standards Code: Nation's First Mandatory Statewide Standards Code to Green Construction and Fight Climate Change. Available: <http://images.emaildirect.com/clients/govpressoffice847/GreenBuildingCodeOnepager.pdf>. Accessed: October 29, 2010.
- California Department of Finance. 2012. Interim Population Projections for California and Its Counties 2010-2050. Available: <http://www.dof.ca.gov/research/demographic/reports/projections/interim/view.php>. Accessed August 27, 2012.
- California Department of General Services. 2019. Building Standards Commission: Calgreen. Available at: <https://www.dgs.ca.gov/BSC/Resources/Page-Content/Building-Standards-Commission-Resources-List-Folder/CALGreen#@ViewBag.JumpTo>
- California Energy Commission (CEC). 2019. Building Energy Efficiency Standards for Residential and Nonresidential Buildings: For the 2019 Building Energy Efficiency Standards. Available at: <https://ww2.energy.ca.gov/2018publications/CEC-400-2018-020/CEC-400-2018-020-CMF.pdf>
- California Governor's Office of Planning and Research (OPR). 2018. Current CEQA Guidelines Update. Available at: <http://www.opr.ca.gov/ceqa/updates/guidelines/>
- California Legislative Information. 2006. AB-32: California Global Warming Solutions Act of 2006. Available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200520060AB32
- California Legislative Information. 2016a. SB-32: California Global Warming Solutions Act of 2006: emissions limit. Available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32
- California Legislative Information. 2016b. AB-19 State Air Resources Board: greenhouse gases – regulations. Available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB197
- California Legislative Information. 2016c. SB-1383 – Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste: landfills. Available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB1383
- California Natural Resources Agency. 2019. CEQA: The California Environmental Quality Act. Available at: <http://resources.ca.gov/ceqa/>
- California Office of the Governor. 2005. Executive order S-3-05. Available at: <https://web.archive.org/web/20060922231000/http://gov.ca.gov/index.php?/executive-order/1861/>

- California Public Utilities Commission (CPUC). 2020. Renewables Portfolio Standard (RPS) Program. Available at: <https://www.cpuc.ca.gov/Renewables/>
- Carbon Dioxide Information Analysis Center. 2012. Recent Greenhouse Gas Concentrations. Last Updated February 2012. Available: http://cdiac.ornl.gov/pns/current_ghg.html Accessed June 1, 2012.
- City of Adelanto. 1994. City of Adelanto General Plan Update. Available: <http://www.ci.adelanto.ca.us/vertical/sites/%7BB5D4A1FE-8A01-4BEF-B964-5A44B9339C72%7D/uploads/%7BDEAB7F4C-C029-4FDE-A927-C895BBE67A87%7D.PDF>. Accessed: January 24, 2013.
- City of Barstow. 2015. City of Barstow General Plan. Available: <https://www.barstowca.org/departments/community-development-department/planning/general-plan-and-master-environmental-impact-report>. Accessed: April 12, 2020.
- City of Big Bear Lake. 1999. City of Big Bear Lake General Plan. Big Bear Lake, California.
- City of Chino. 2010. City of Chino General Plan 2025 Public Review Draft. Available: <http://www.cityofchino.org/index.aspx?page=69>. Accessed: January 24, 2013.
- City of Chino. 2013. City of Chino Climate Action Plan. Available: https://www.cityofchino.org/city_hall/departments/community_development/planning/plans/climate_action_plan_c_a_p. Accessed: November 12, 2020.
- City of Chino Hills. 2015. City of Chino Hills General Plan 2015. Available: <https://www.chinohills.org/DocumentCenter/View/11275/General-Plan---Final-approved-by-CC-2-14-15-4-21?bidId=/>. Accessed: April 12, 2020.
- City of Colton. 2013. Colton General Plan. Available: <https://www.ci.colton.ca.us/778/Planning-Documents>. Accessed: April 12, 2020.
- City of Fontana. 2003. City of Fontana General Plan. Available: <https://www.fontana.org/DocumentCenter/Home/View/2031>. Accessed: January 24, 2013.
- City of Grand Terrace. 2010. City of Grand Terrace General Plan. Available: <http://www.cityofgrandterrace.org/DocumentView.aspx?DID=709>. Accessed: January 24, 2013.
- City of Hesperia. 2010. Hesperia General Plan. Available: <http://www.cityofhesperia.us/DocumentCenter/Home/View/1615>. Accessed: January 24, 2013.
- City of Hesperia. 2010. City of Hesperia Climate Action Plan. Available: [http://www.cityofhesperia.us/DocumentCenter/View/1291/23660023-Hesperia-CAP-July-20?bidId=#:~:text=The%20Climate%20Action%20Plan%20\(CAP,levels%20by%20the%20year%202020](http://www.cityofhesperia.us/DocumentCenter/View/1291/23660023-Hesperia-CAP-July-20?bidId=#:~:text=The%20Climate%20Action%20Plan%20(CAP,levels%20by%20the%20year%202020). Accessed: November 12, 2020.
- City of Highland. 2006. City of Highland General Plan. Available: <http://www.ci.highland.ca.us/GeneralPlan/>. Accessed: January 24, 2013.
- City of Loma Linda. 2009. City of Loma Linda General Plan. Available: <http://www.lomalindaca.gov/pdfs/General%20Plan/May%2009/GP-Adopted-May09.pdf>. Accessed: January 24, 2013.
- City of Montclair. 1999. City of Montclair General Plan. Available: http://www.cityofmontclair.org/depts/cd/planning/general_plan.asp January 24, 2013.

- City of Needles. 1986. Needles General Plan Policy Document. Adopted February 18, 1986. City of Needles, California.
- City of Ontario. 2010. The Ontario Plan. Available: <http://www.ontarioplan.org/>. Accessed: April 12, 2020.
- City of Ontario. 2014. City of Ontario Community Climate Action Plan. Available: <https://www.ontarioca.gov/sites/default/files/Ontario-Files/Planning/Applications/Community%20Climate%20Action%20Plan.pdf>. Accessed: November 12, 2020.
- City of Rancho Cucamonga. 2010. Rancho Cucamonga General Plan. Available: <http://www.cityofrc.us/cityhall/planning/genplan.asp> . Accessed: January 24, 2013.
- City of Redlands. 2017. City of Redlands 2035 General Plan. Available: <https://www.cityofredlands.org/post/planning-division-general-plan>. Accessed: November 11, 2020.
- City of Redlands. 2017. City of Redlands Climate Action Plan. Available: https://www.ca-ilg.org/sites/main/files/file-attachments/final_redlands_cap_with_appendices_011718.pdf?1591222345. Accessed: November 12, 2020.
- City of Rialto. 2010. Rialto Draft General Plan. Available: <http://www.rialtoca.gov/flip/General2010/> . Accessed: January 24, 2013.
- City of San Bernardino. 2005. City of San Bernardino General Plan. Available: <http://www.ci.sanbernardino.ca.us/pdf/DevSvcs/General%20Plan%20Document.pdf> . Accessed: January 24, 2013.
- City of Twentynine Palms. 2012. Twentynine Palms General Plan. Available: <https://www.ci.twentynine-palms.ca.us/generalplan>. Accessed: April 12, 2020.
- City of Upland. 2015. City of Upland General Plan. Available: <https://www.uplandca.gov/general-plan-map>. Accessed: April 12, 2020.
- City of Upland. 2015. City of Upland General Plan and Climate Action Plan. Available: <https://www.uplandca.gov/uploads/files/DevelopmentServices/Environmental%20Review%20Documents/FINAL%20GENERAL%20PLAN%20EIR%20with%20comments%20COMBINED.pdf>. Accessed: November 13, 2020.
- City of Victorville. 2008. City of Victorville General Plan. Available: <http://ci.victorville.ca.us/uploadedFiles/CityDepartments/Development/GeneralPlan.pdf>. Accessed: January 24, 2013.
- City of Yucaipa. 2016. City of Yucaipa General Plan. Available: http://www.yucaipa.org/wp-content/uploads/dev_svcs/general_plan/Yucaipa_General_Plan.pdf. Accessed: April 12, 2020.
- City of Yucaipa. 2015. City of Yucaipa Climate Action Plan. Available: http://www.yucaipa.org/wp-content/uploads/disaster_prep/Yucaipa_Climate_Action_Plan_Annex.pdf. Accessed: November 12, 2020.
- County of San Bernardino. 2011. Greenhouse Gas Emissions Reduction Plan. Available: <http://www.sbcounty.gov/Uploads/lus/GreenhouseGas/FinalGHGFull.pdf>. Accessed November 12, 2020.
- Georgetown Climate Center. 2012. Summary of the Federal District Court’s Order Enjoining California’s Low Carbon Fuel Standard. January 19, 2012. Available:

- http://www.georgetownclimate.org/sites/default/files/Summary_of_Court_Enjoining_CA_L_CFS.pdf. Accessed: June 27, 2012.
- InfraConsult. 2011. Big Bear Modal Alternatives Analysis, Final Report. Page 21. Available: <http://www.scag.ca.gov/corridor/pdf/bigbear/BigBear_FinalReport_12092011.pdf>. Accessed: January 16, 2013.
- Intergovernmental Panel on Climate Change. 1996. 1995: Science of Climate Change. (Second Assessment Report). Cambridge, U.K.: Cambridge University Press.
- Intergovernmental Panel on Climate Change. 2001. Atmospheric Chemistry and Greenhouse Gases. In Climate Change 2001: Working Group I: The Scientific Basis. Available: <http://www.ipcc.ch/ipccreports/tar/wg1/pdf/TAR-04.PDF> Accessed: September 22, 2009.
- Intergovernmental Panel on Climate Change. 2007a. Introduction. In B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer, (eds.), Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007. Cambridge, U.K. and New York, NY, USA: Cambridge University Press. Available: <http://www.ipcc.ch/pdf/assessmentreport/ar4/wg3/ar4-wg3-chapter1.pdf> Accessed: August 11, 2009.
- Intergovernmental Panel on Climate Change. 2007b. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.). Available: <http://www.ipcc.ch/ipccreports/ar4-wg1.htm> Accessed: September 22, 2009.
- Intergovernmental Panel on Climate Change. 2013. Climate Change 2013. The Physical Science Basis. Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 2013. Cambridge, U.K. and New York, NY, USA: Cambridge University Press. Available: https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf. Accessed: November 11, 2020.
- Intergovernmental Panel on Climate Change. 2014a. Introduction. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 2014. Cambridge, U.K. and New York, NY, USA: Cambridge University Press. Available: <http://www.ipcc.ch/pdf/assessmentreport/ar4/wg3/ar4-wg3-chapter1.pdf> Accessed: August 11, 2009.
- Intergovernmental Panel on Climate Change. 2014b. Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 2014. Victor D.G., D. Zhou, E.H.M. Ahmed, P.K. Dadhich, J.G.J. Olivier, H-H. Rogner, K. Sheikho, and M. Yamaguchi. Available: https://archive.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter1.pdf
- Intergovernmental Panel on Climate Change. 2014c. Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 2014. Cambridge, U.K. and New York, NY, USA: Cambridge University Press. Available: https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_full.pdf. Accessed: November 11, 2020.

- Intergovernmental Panel on Climate Change. 2018. Annex 1: Glossary. [Matthews, J.B.R. (ed.)]. Available: <https://www.ipcc.ch/sr15/chapter/glossary/>
- National Oceanic and Atmospheric Administration. 2020a. Earth System Research Laboratory: Global Monitoring System. Trends in Atmospheric Carbon Dioxide. Available: <https://www.esrl.noaa.gov/gmd/ccgg/trends/data.html>. Accessed: April 1, 2020.
- National Oceanic and Atmospheric Administration. 2020b. Earth System Research Laboratory: Global Monitoring System. Trends in Atmospheric Methane. Available: <https://www.esrl.noaa.gov/gmd/ccgg/trends/data.html>. Accessed: April 1, 2020.
- National Oceanic and Atmospheric Administration. 2020b. Earth System Research Laboratory: Global Monitoring System. Trends in Atmospheric Nitrous Oxide. Available: <https://www.esrl.noaa.gov/gmd/ccgg/trends/data.html>. Accessed: April 1, 2020.
- National Oceanic and Atmospheric Administration. 2020b. Earth System Research Laboratory: Global Monitoring System. Trends in Atmospheric Sulfur Hexafluoride. Available: <https://www.esrl.noaa.gov/gmd/ccgg/trends/data.html>. Accessed: April 1, 2020.
- New York Times (NYTimes). Bill Vlasic. 2012. U.S. Sets Higher Fuel Efficiency Standards. Available: <https://www.nytimes.com/2012/08/29/business/energy-environment/obama-unveils-tighter-fuel-efficiency-standards.html>
- New York Times (NYTimes). 2020. Trump Finalizes Rollback of Obama-Era Vehicle Fuel Efficiency Standards. Available: <https://www.nytimes.com/reuters/2020/03/31/world/asia/31reuters-usa-autos-emissions.html>
- San Bernardino Associated Governments. 2016. San Bernardino Regional Transportation Plan/Sustainable Communities Strategy. Available: <http://scagrtpsc.net/Documents/2016/final/f2016RTPSCS.pdf>. Accessed: March 10, 2020.
- San Bernardino Associated Governments. 2009. San Bernardino County Long Range Transit Plan, Interim Draft Report. Available: <http://www.sanbag.ca.gov/commuter/LRTP/LRTPdraft2009.pdf>. Accessed: June 27, 2012.
- San Bernardino Council of Governments. 2019. Personal Communication via email with ICF to transmit regional socioeconomic data.
- San Bernardino Council of Governments. 2019. Zero-Emission Vehicle Readiness and Implementation Plan. San Bernardino County. Prepared by the Center for Sustainable Energy. August. Available at: <https://www.gosbcta.com/plan/zero-emission-vehicle-readiness-and-implementation-plan/>
- San Bernardino County Transportation Authority. 2018. San Bernardino County Non-Motorized Transportation Plan March 2011 (Revised June 2018). Available: <https://www.gosbcta.com/plan/non-motorized-transportation-plan-2018/>
- San Diego Council of Governments (SANDAG). 2008. Sustainable Communities Strategy. Available at: <https://www.sandag.org/index.asp?projectid=360&fuseaction=projects.detail>
- Southern California Association of Governments (SCAG). 2012. Draft 2012 Regional Transportation Plan/Sustainable Communities Strategy Growth Forecast.
- Southern California Association of Governments (SCAG). 2016. The 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy. Available at: http://scagrtpsc.net/Documents/2016/final/f2016RTPSCS_ExecSummary_EnglishHandout.pdf

- Southern California Association of Governments (SCAG). 2019. The 2019 Local Profiles for San Bernardino. Available at: <http://www.scag.ca.gov/DataAndTools/Pages/LocalProfiles.aspx>
- Southern California Association of Governments (SCAG), Caltrans, San Bernardino County Transportation Authority (SBCTA), and Riverside County Transportation Commission (RCTC), Inland Empire Comprehensive Multimodal Corridor Plan, October. Available: <https://www.gosbcta.com/plan/inland-empire-comprehensive-multimodal-corridor-plan/>
- Town of Apple Valley. 2009. Town of Apple Valley General Plan. Available: <https://www.applevalley.org/services/planning-division/2009-general-plan>. Accessed: April 12, 2020.
- Town of Apple Valley. 2016. Apple Valley Climate Action Plan. Available: <https://www.applevalley.org/home/showdocument?id=26449> Accessed: November 12, 2020.
- Town of Yucca Valley. 2014. Town of Yucca Valley General Plan. Available: http://www.yucca-valley.org/pdf/planning/General_Plan_web/2_FINAL_LUweb.pdf. Accessed: April 12, 2020.
- U.S. Census Bureau. 2012. State & County QuickFacts. Available: <http://quickfacts.census.gov/qfd/states/06000.html>. Accessed: December 5, 2012.
- U.S. Department of Transportation (US DOT). 2014. Corporate Average Fuel Economy (CAFE) Standards. Available at: <https://www.transportation.gov/mission/sustainability/corporate-average-fuel-economy-cafe-standards>
- U.S. Environmental Protection Agency. 2006. High Global Warming Potential (GWP) Gases. Available: <http://www.epa.gov/highgwp/scientific.html> Accessed: September 22, 2009.
- U.S. Environmental Protection Agency. 2010. eGRID2010 Version 1.1 Year 2007 GHG Annual Output Emission Rates. Available: http://www.epa.gov/cleanenergy/documents/egridzips/eGRID2010V1_1_year07_GHGOutputrates.pdf Accessed: December 22, 2011.
- U.S. Environmental Protection Agency. 2012. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010. EPA 430-R-12-001. April. Available: <http://epa.gov/climatechange/emissions/usinventoryreport.html> Accessed: June 12, 2012.
- U.S. Environmental Protection Agency. 2019a. New Source Review (NSR) Permitting: Clean Air Act Permitting for Greenhouse Gases. Available at: <https://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases#UARG>
- U.S. Environmental Protection Agency. 2019b. Laws & Regulations: EPA Deregulatory Actions. Available at: <https://www.epa.gov/laws-regulations/epa-deregulatory-actions>
- U.S. Environmental Protection Agency. 2019c. Laws & Regulations. Regulatory Reform. Available at: <https://www.epa.gov/laws-regulations/regulatory-reform>
- U.S. Environmental Protection Agency. 2019d. New Source Review (NSR) Permitting: "Ambient Air" Guidance. Available at: <https://www.epa.gov/nsr/ambient-air-guidance>
- U.S. Environmental Protection Agency. 2019e. National-Level U.S. Greenhouse Gas Inventory: Fast Facts. Available at: https://www.epa.gov/sites/production/files/2019-04/documents/2019_fast_facts_508_0.pdf
- U.S. Environmental Protection Agency. 2019f. Greenhouse Gas Emissions: Sources of Greenhouse Gas Emissions. Available at: <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

- U.S. Environmental Protection Agency. CERCLA and EPCRA Reporting Requirements for Air Releases of Hazardous Substances from Animal Waste at Farms. Available at: <https://www.epa.gov/epcra/cercla-and-epcra-reporting-requirements-air-releases-hazardous-substances-animal-waste-farms>
- U.S. Environmental Protection Agency. 2019b. Clean Air Markets: Final Update to NOx SIP Call Regulations. Available at: <https://www.epa.gov/airmarkets/final-update-nox-sip-call-regulations>
- U.S. Environmental Protection Agency. 2019c. News Releases: EPA Proposes Updates to Air Regulations for Oil and Gas to Remove Redundant Requirements and Reduce Burden. Available at: <https://www.epa.gov/newsreleases/epa-proposes-updates-air-regulations-oil-and-gas-remove-redundant-requirements-and>
- U.S. Environmental Protection Agency. 2020. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018. Available: <https://www.epa.gov/ghgemissions/draft-inventory-us-greenhouse-gas-emissions-and-sinks-1990-2018>. Accessed: April 1, 2020.