SCV WATER

Santa Clarita Valley Water Agency

SUSTAINABILITY PLAN

March 2023

Public Review Draft

Valencia Bridgeport Lake

Table of Contents

ACRONYMS, ABBREVIATIONS, AND GLOSSARY

Below is a list of acronyms, abbreviations, and glossary terms used in the Sustainability Plan

A

AB – Assembly Bill

Action – The act, policy, or measure that will be implemented and achieved to reduce greenhouse gases

Anthropogenic – Made by people or resulting from human activities

Atmosphere – The envelope of gases surrounding the earth. These gases include nitrogen (78.1%), oxygen (20.9%), and argon, helium, GHGs, ozone, and water vapor in trace amounts

B

BAU – Business-as-Usual Forecast. This forecast estimates emissions into the future if no additional actions were taken.

Biofuels – A renewable fuel source derived from biomass such as algae or animal waste

C

CARB – California Air Resources Board

CCA – Community Choice Aggregation. A CCA is a nonprofit electricity provider.

Carbon dioxide (CO_2) – A gas produced by burning organic compounds containing carbon and by respiration

Carbon dioxide equivalent (CO_2e) – A metric measure used to directly compare emissions from various GHGs based on their global warming potential conversion factor

Carbon footprint – The total emissions caused in a year by an individual, event, organization, or product, expressed in carbon dioxide equivalent

Carbon Neutrality – Achieving a balance between emitting carbon and atmospheric carbon removal

Cal Recycle – California Department of Resources, Recycling, and Recovery

Climate – The usual condition of temperature, humidity, atmospheric pressure, wind, rainfall, and other meteorological elements in an area of the earth's surface over a long period of time (typically 30 years or more)

Climate Change – A change in the average conditions – such as temperature and rainfall – in a region over a long period of time

Co-benefit – The secondary benefits that occur due to implementation of a program, measure or policy.

CPA – Clean Power Alliance. A CCA in the Los Angeles region

CR – Construction

D

DC – Direct Combustion

Decarbonization – The reduction or removal of carbon dioxide

E

E – Electricity

EE – Energy Efficiency

EF – Emissions Factor

EO – Executive Order

Electrification – The process of generating power from electricity, and in many contexts, the transition to such power from an earlier power source

Emissions – The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere

EV(s) – Electric Vehicle(s)

F

FL – Fleet

Fossil fuel – A general term for fuel formed from decayed plants and animals that have been converted to crude oil, coal, natural gas, or heavy oils by exposure to heat and pressure in the earth's crust

G

Greenhouse gas (GHG) – A gas that absorbs infrared radiation, traps heat in the atmosphere, and contributes to the greenhouse effect

Greenhouse Effect – A process that occurs when gases in Earth's atmosphere traps the Sun's heat

GWP – Global Warming Potential – total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1

H

I

ICLEI – International Council for Local Environmental Initiatives

IPCC – United Nations Intergovernmental Panel on Climate Change – prepares comprehensive Assessment Reports about the stat of scientific, technical and socio-eco nomic knowledge on climate change, its impact and future risks, and options for reducing the rate at which climate change is taking place

J

K

L

M

Methane (CH_4) – A hydrocarbon that is a greenhouse gas that is produced through anaerobic (without oxygen) decomposition of waste in landfills, wastewater treatment plants, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion

Metric Ton (MT) – common international measurement for the quantity of greenhouse gas emissions – one metric ton is equal to 2,204.6 pounds or 1.1 short tons

MT CO_2e – Metric tons of carbon dioxide equivalent is the standard units to measure GHG emissions.

N

Nitrous oxide (N_2O) – A powerful greenhouse gas with a high global warming potential; major sources of nitrous oxide include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning

O

Offroad Equipment – Any non-stationary device powered by an internal combustion engine or electric motor used primarily off roadways such as agricultural, landscaping or construction equipment

P

PV – Photovoltaic (solar energy)

Q

R

Renewable Diesel – Direct substitute for diesel fuel refined from lower carbon and renewable source material

Rincon – SCV Water's technical consultant on the Sustainability Plan development

S

SB – Senate Bill

Scope – Categorization of GHG-generating activities based on the level of the entity's operational control of the source

SCV Water – Santa Clarita Valley Water Agency

Service population – Residents served

T

TR – Transportation

U

U.S. EPA – United States Environmental Protection Agency

V

VMT – Vehicle miles traveled

W

W – Waste Generation

WC – Water Conservation

X

Y

Z

ZEV – Zero emission vehicle

1.

INTRODUCTION

VISION

The Santa Clarita Valley Water Agency's (SCV Water) vision is to provide "exemplary water management for a high quality of life in the Santa Clarita Valley". Central to this vision is providing a cost effective, high quality, and reliable water supply to the community, which in recent years has become increasingly complex. Current and future environmental conditions, such as prolonged drought and fire, as well as the numerous State and federal requirements and corresponding funding opportunities are altering the operational landscape. This Sustainability Plan provides a comprehensive assessment of SCV Water's current sustainability initiatives, creates a baseline for measuring progress, and provides a roadmap to improve operational sustainability, which reflects SCV Water's strategic goals. The development and implementation of this Sustainability Plan will help SCV Water align with state initiatives, better position for funding, mitigate future climate change impacts, and meet its core mission of providing responsible water stewardship to the Santa Clarita Valley. Through the Sustainability Plan, SCV Water is committing to working towards achieving greenhouse gases (GHG) reduction goals through a focus on its core mission as well as six strategic goals which are consistent throughout SCV Water's current planning processes.

Goal A: **Customer/Community –** Implement and communicate policies supporting the social, quality of life, and environmental values of the community.

Goal B: **Infrastructure Reliability –** Implement, operate, and maintain water infrastructure to ensure sustainable water service provision.

Goal C: **Water Supply and Resource Sustainability –** Implement programs to ensure the service area has reliable and sustainable supplies of water.

Goal D: **Water Quality and Environmental Compliance –** Protect the quality of our water supplies and environment and ensure our drinking water quality is consistent and meets or surpasses all water quality requirements.

Goal E: **Financial Resilience –** Maintain a long-range, transparent, stable, and well-planned financial condition, resulting in current and future water users receiving fair and equitable rates and charges.

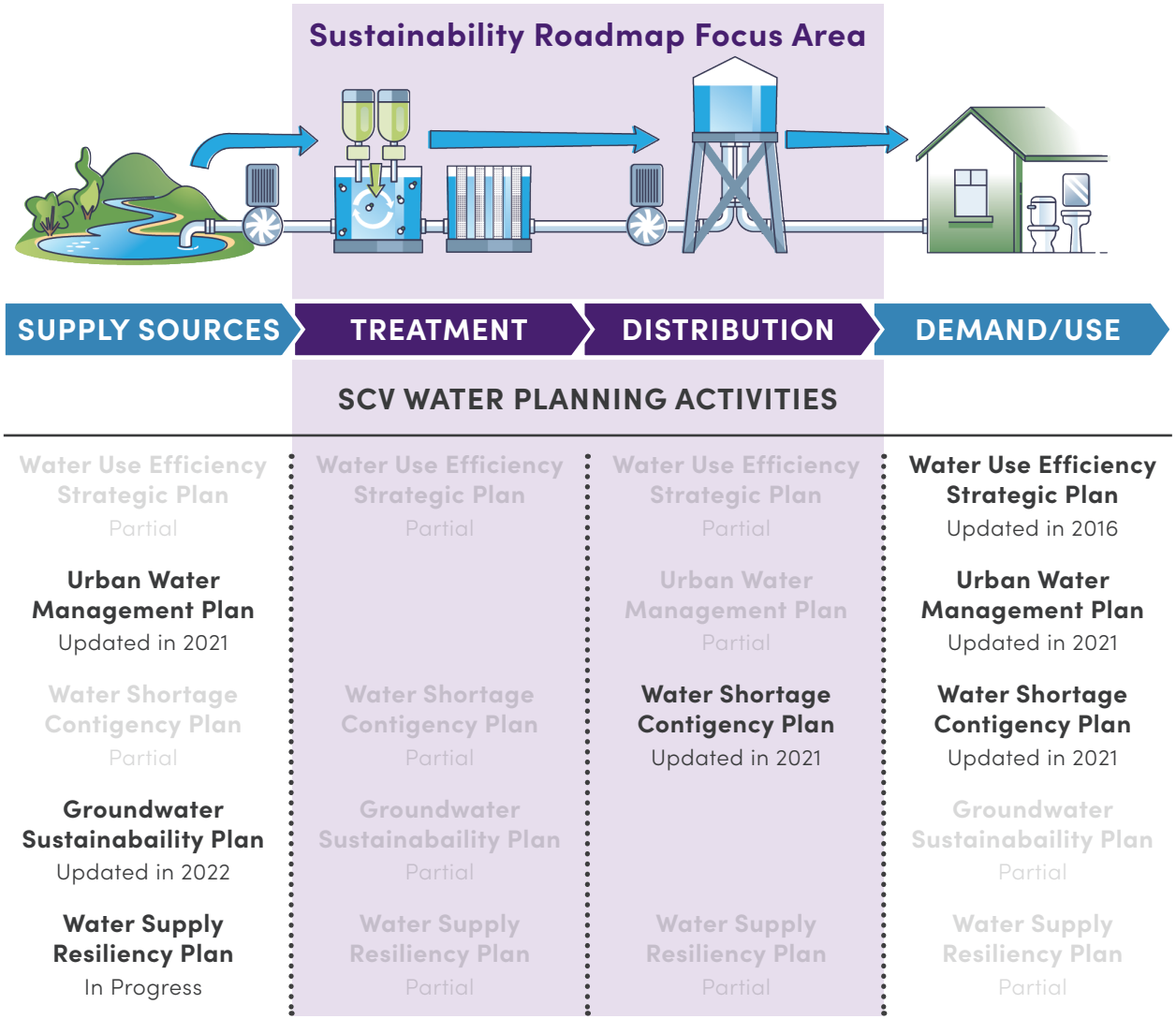
Goal F: **High Performance Team –** Grow a culture of continuous improvement that fosters SCV Water's values.

The Sustainability Plan will improve future project eligibility for State and federal grant and loan application packages to support SCV Water's capital improvement and general operating programs. The Sustainability Plan will assist SCV Water's efforts to identify actions and projects that improve efficiency, reduce GHG emissions, and support funding procurement to implement improvement projects. The Sustainability Plan and associated actions complement SCV Water's long-range and short-range planning efforts, existing sustainability strategies, and ongoing water conservation programs. SCV Water understands the role of sustainability and the impacts of climate on the management, operations, and planning of its water supply. SCV Water's sustainability actions and projects will work to improve the sustainability of its operations to continue to meet its goals and vision in a changing world.

SUSTAINABILITY PLAN PURPOSE

The Sustainability Plan is a long-range planning document that will guide SCV Water's operational sustainability actions through 2045, in alignment with the State's current goals, legislation, and mandates. The Sustainability Plan aligns with SCV Water's long-term plans and fills a gap in sustainability planning across SCV Water's four primary areas of operations which include: Water Supply, Water Treatment, Water Distribution, and Water Demand Management. While the Sustainability Plan will guide SCV Water's operational sustainability strategy, the Water Resilience Initiative ensures the resilience and reliability of the Agency's water supplies. Additionally, the Water Use Efficiency Plan provides SCV Water with a framework to increase water demands sustainability. Figure 1-1 highlights the major planning initiatives undertaken by SCV Water and its analysis of sustainability across its primary operational areas. As a result of this analysis, water treatment and water distribution, i.e., the core operational infrastructure of SCV Water, were identified as operational areas without an existing sustainability plan.

Figure 1-1. SCV Water's Primary Operational Areas and Sustainability Planning Initiatives



SCV Water will use the Sustainability Plan to guide planning and policy development of capital investment, operations, water resources, and conservation programs. Development of the Sustainability Plan will increase the potential for SCV Water to obtain grant or loan funding for projects and programs which contribute to sustainability of its operations.

Sustainability Plan Goals and Benefits

The Sustainability Plan serves as a guide for SCV Water to reduce GHG emissions associated with its operational practices and resource consumption over time. The Sustainability Plan identifies specific actions with GHG emission reduction capabilities and outlines implementation strategies and considerations. Chapter 2 outlines several goals and metrics which will allow SCV Water to align with current State and federal goals and allow the continued advancement of its mission and vision. Aligning with these external goals must fit within the core function of SCV Water and its mission. To develop a plan that meets all of these important criteria, a sustainability framework was created to guide the development of the strategies and actions.

SCV Water's Sustainability Framework

The Sustainability Plan was developed to follow SCV Water's mission and align with SCV Water's strategic goals and long-range planning efforts, while providing strategies for reducing GHG emissions over time. SCV Water's six strategic goals, as outlined previously, were assessed and distilled into four core operational pillars which support SCV Water's mission, while reaching GHG emission reduction targets over the life of the plan. The core operational pillars are as follows:

Reliable and Resilient Operations

Encompasses Goal B for Infrastructure Reliability and Goal C of Water Supply and Resource Sustainability. Developing sustainability solutions and planning for issues such as energy shortage, power safety shutoffs, and drought allows SCV Water to make its operations more resilient and continue to provide water reliability and affordability to the community.

High Quality Water and Resource Sustainability

Encompasses Goal C of Water Supply and Resource Sustainability and Goal D of Water Quality and Environmental Compliance. Implementation of programs that manage resources and demand will allow for SCV Water to continue to provide high quality water. Goal C specifically includes objectives such as implementing energy reduction strategies, optimizing value of solar contracts, assessing and reducing SCV Water's carbon footprint.

Cost Effective and Efficient

Encompasses Goal E of Financial Resilience. To maintain a long-range, transparent, stable, and well-planned financial condition, resulting in current and future water users receiving fair and equitable rates, it will be important to implement projects and programs that reduce financial risk through resource management, increased operational efficiencies, and operational resilience.

Transparency and Accountability

Encompasses Goal A of Customer/Community. As part of SCV Water's commitment to make sure its values algin with the values of its customers and community, SCV Water must transparently demonstrate its decisions protect the water resources for the community. Setting goals and demonstrating achievement of those goals shows SCV Water is taking accountability.

These pillars form the framework through which the Sustainability Plan and its actions were developed and prioritized.

Sustainability Plan Benefits

The Sustainability Plan will serve as a guide for SCV Water as it implements various operationally feasible and cost-effective strategies and actions to improve operational sustainability and align with State goals. This alignment will also provide additional benefits beyond the cost savings, operational resiliency and other benefits identified above. These include:

- Identifying cost-effective resources conservation and decarbonization measures
- Providing co-benefits of increased resource efficiency, operational resilience, accountability, and transparency
- Integrating State, federal, and international legislation and guidance
- Aligning with SCV Water's long-term planning efforts
- Avoiding redundant investments or double counting of GHG emissions

Timeframe for Implementation

Implementation of SCV Water's Sustainability Plan is intended to occur between 2023 and 2045. Strategies, measures, and actions outlined in the Sustainability Plan may evolve over time as SCV Water manages changing technologies, best practices, legislation, and funding.

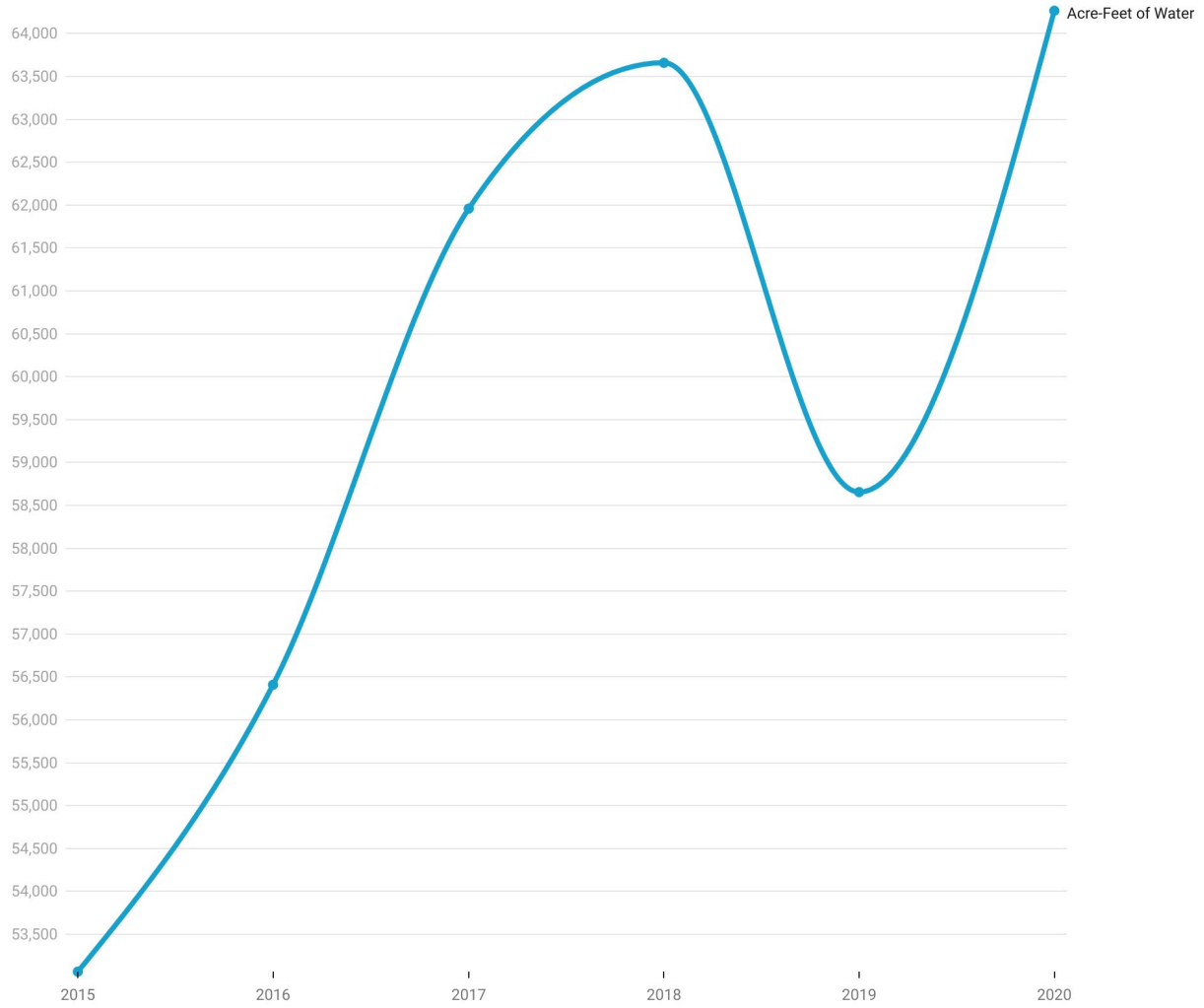
Castaic Lake.

A HISTORY OF SUSTAINABILITY

SCV Water Overview

SCV Water sells, manages, and delivers surface water, groundwater, and recycled water for municipal, industrial, domestic, and agricultural customers in the Santa Clarita Valley. SCV Water serves a population of 286,300 through 75,000 retail water connections with a service area of 195 square miles. The Agency has 101 local water storage tanks, 821 miles of pipeline, 216 million gallons of water storage capacity, and 114,000 acre-feet water stored in Kern County. The change in total acre-feet of water deliveries for SCV Water, from 2015-2020, is shown in Figure 1-2. SCV Water's GHG emissions associated with these water deliveries are mostly from the purchase and consumption of electricity used for water treatment, conveyance, and delivery of water throughout its service area.

Figure 1-2. Change in Water Deliveries for SCV Water



Source: Santa Clarita Valley Water Agency • Created with Datawrapper

SCV Water Sustainability History and Leadership

Since its formation in 2018, SCV Water's GHG emissions have remained relatively stable. SCV Water's GHG emissions are associated with electricity purchased and consumed to treat and deliver water to customers in its service area. In the future, SCV Water's service population is expected to increase, leading to a total increase in water demand and a commensurate increase in GHG emissions. SCV Water has implemented several programs and projects around renewable energy, energy efficiency, water conservation, and vehicle fleet decarbonization to reduce GHG emissions, increase operational resiliency, and increase cost-effectiveness. Additionally, SCV Water launched the Green Team in 2019 to coordinate sustainability activities via cross-organizational collaboration and management.

Infrastructure Energy Efficiency and Renewable Energy

SCV Water has continually invested in projects intended to improve energy efficiency of its operations and increase renewable energy usage. In March 2021, SCV Water purchased solar panels that had been operating on its property since 2011 and under a power purchase agreement since 2013. SCV Water estimates the on-site solar will lead to around $5 million in savings over the life of the lease, which ends in 2039. The on-site solar currently provides around 17 percent of SCV Water's total electricity needs, producing 10,800 megawatt hours (MWh) in 2020. Additionally, SCV Water recently conducted a feasibility study for the California Public Utilities Commission's Self-Generation Incentive Program (SGIP), which provides incentives to support existing, new and emerging distributed energy resources. Based on this study, SCV Water plans to procure and install battery storage at two of its facilities (Rio Vista Water Treatment Plan and Earl Schmidt Filtration Plant). SCV Water also plans to assess feasibility of additional on-site solar to further decrease costs, increase operational resilience, and decrease GHG emissions. Other planned energy initiatives include regular facility-wide energy audits, operational energy efficiency improvements, and adopting energy management software into new and existing buildings.

SCV Water PV Array.

Water Conservation

All water utilities in California are required to meet specific water conservation targets. SCV Water has developed several water conservation programs to reduce water deliveries and successfully met the State's requirements, reducing 2020 water use by more than 20% below its 2010 baseline. SCV Water has water conservation programs around funding, engagement, and education. Residential programs center around lawn replacement, irrigation control and efficiency, water conservation home check-ups, and WaterSMART workshops. SCV Water also runs a school retrofit program where employees conduct a water use assessment analyzing historical consumption, current equipment, and fixtures, and make cost-effective recommendations for improvements to conserve water. Through its programs, SCV Water provides a variety of rebates for water efficiency equipment and appliances including toilets, sprinkler nozzles, and weather-based irrigation controllers. Information on SCV Water's water conservation programs and efforts can be found online at **https://yourscvwater.com/save-water-money/**. In 2020, SCV Water conserved 68 gallons per capita per day compared to its 2010 baseline demand. Water conserved has the co-benefit of also reducing GHG emissions associated with the energy needs for treatment, delivery, and import of water supplies and wastewater.

Drought-resistant garden.

Vehicle Fleet

SCV Water is dedicated to reducing GHG emissions associated with its vehicle fleet. In 2022, the Agency procured its first electric vehicle, a Ford E-Transit Van. SCV Water's IT department is using the electric van to manage equipment across five locations in its service area. SCV Water has plans to procure zero-emission vehicles and install electric charging infrastructure at its facilities to support both the operational and commuter fleet. Additionally, as of December 2021, SCV Water began using renewable diesel in some of its fuel storage tanks, which can reduce GHG emissions by up to 80% in certain equipment. SCV Water has plans to continue to replace existing vehicles with zero-emission options when operationally, technologically, and financially feasible. Recently, SCV Water acquired a fleet management information system to manage its fleet use and assess total cost of ownership and potential opportunities for decarbonization.

Electric vehicle fleet charging.

2.

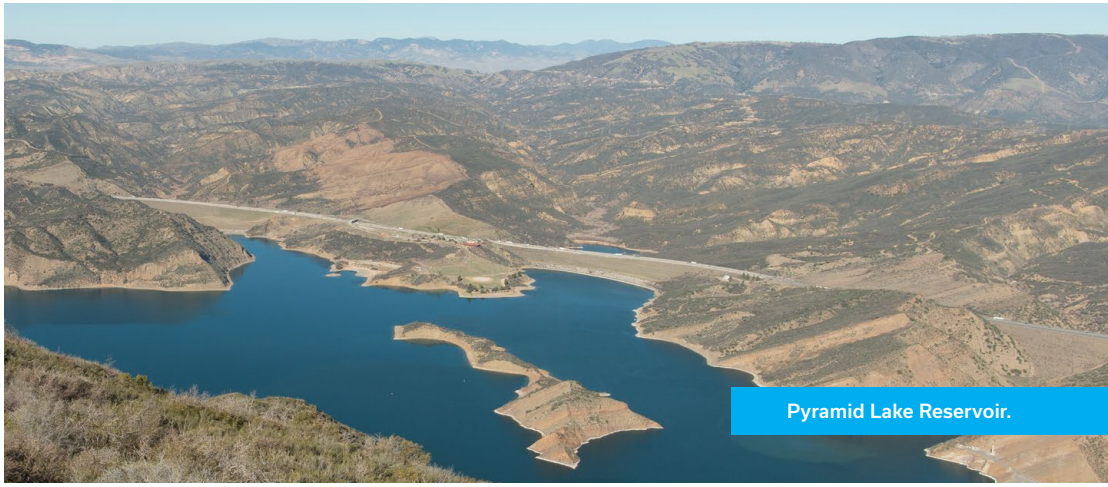
CONTEXT FOR SUSTAINABILITY

In many ways, the conversation around sustainability, especially in California has become synonymous with climate change. The State of California, and more recently the federal government, have developed sweeping climate change programs meant to both mitigate the effects of climate change while also adapting to the climatic changes already being experienced across the country. Climate change impacts and the associated legislation meant to address it, have the capacity to change the way in which SCV Water provides water services to its customers.

This chapter describes the scientific and legislative context of climate change and includes an overview of the greenhouse effect, GHG emissions data in California, the State of California's sustainability efforts, and impacts of climate change on SCV Water's operations.

GLOBAL ENVIRONMENTAL AND CLIMATE CHANGE ISSUES

The gases in Earth's atmosphere act as a blanket, allowing high-energy light from the Sun to pass through to the Earth's surface, while absorbing and reflecting lower energy heat radiating back from the surface. Trapped heat within the atmosphere is known as the greenhouse effect, because atmospheric gases function similar to windows in a greenhouse, which trap the Sun's rays and create a much warmer space inside as compared to the outside air. Earth's atmospheric conditions are maintained by the greenhouse effect, which regulates the climate to be suitable for life. However, a rapid increase in GHG emissions can cause excess heat to be trapped, impacting global surface temperatures and Earth's climate. This process is depicted in Figure 2-1.

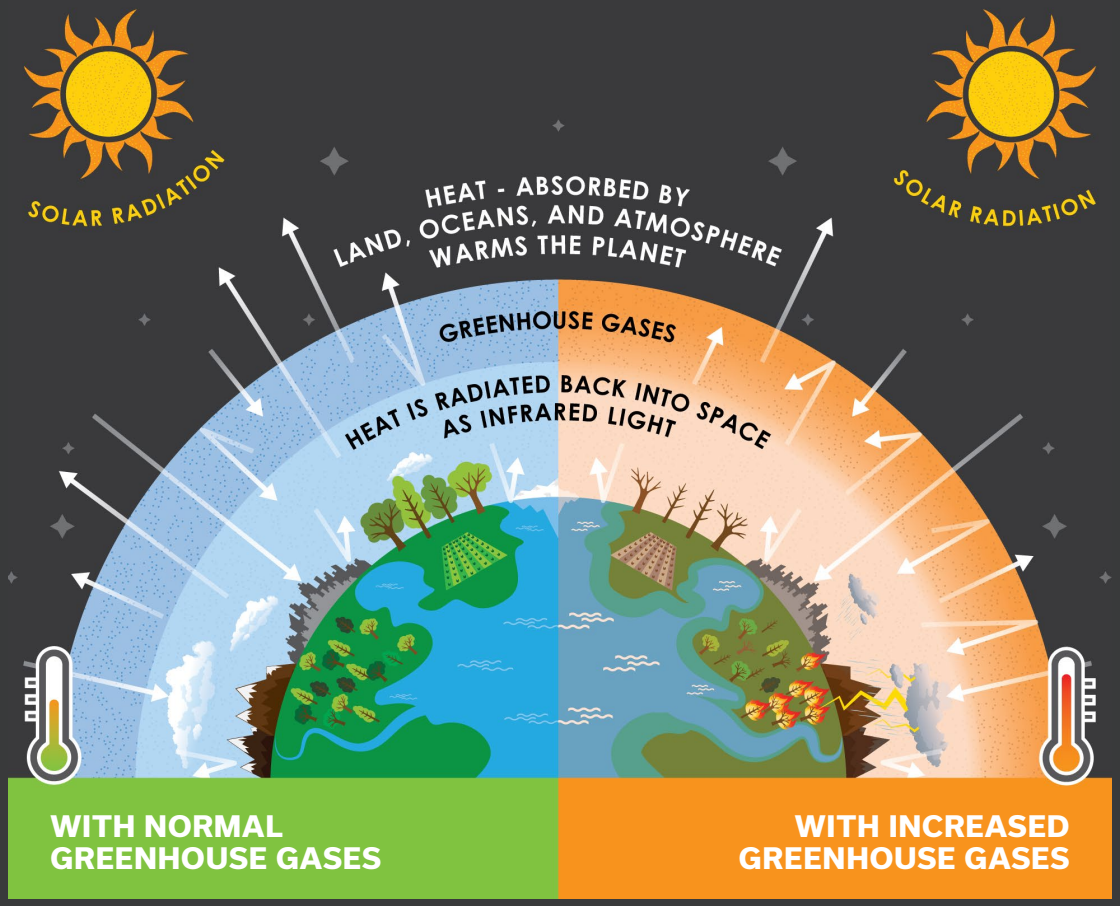


Pyramid Lake Reservoir.

Figure 2-1. Greenhouse Gas Effect

In the last century, human activities such as burning fossil fuels and deforestation have caused a jump in the concentration of GHGs in the atmosphere.

THE RESULT:
Excess trapped heat, higher global temperatures, and increasing hazards.



Anthropogenic emission of large quantities of GHGs into the atmosphere has increased significantly since the dawn of the industrial revolution in the mid-nineteenth century. Human activities such as the combustion of fossil fuels for energy generation and fuel use release GHGs including carbon dioxide (CO_2), methane (CH_4), and nitrous oxides (N_2O) into the atmosphere. Each GHG has its own global warming potential (GWP), which refers to the extent to which the GHG traps energy in the atmosphere. In alignment with the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report,[1] which provides the most current and comprehensive peer-reviewed assessment of climate change, GHGs are normalized based on their global warming potential and are referred to as carbon dioxide equivalents or CO_2e. SCV Water quantified GHG emissions in terms of metric tons (MT) CO_2e emitted per year, as is common practice.

1. *Intergovernmental Panel on Climate Change. 2021. Sixth Assessment Report. Accessed October 2022.* ***https://www.ipcc.ch/report/sixth-assessment-report-cycle/***

State of California's Climate Change Sustainability Efforts

California serves as a national as well as global leader in innovation and progress around climate change mitigation and sustainability efforts. The State has set the first economy-wide greenhouse gas limit, first emissions standards for vehicles, and adopted the first 100% carbon neutrality goal in the nation. Most recently, the California Air Resources Board (CARB) developed the 2022 Scoping Plan Update to assess progress towards the State's statutory target of reducing GHG emissions by 40% below 1990 levels by 2030 and the current trajectory of achieving carbon neutrality no later than 2045.[2] The Plan update details the State's long-term climate objectives and assesses pathways for improving renewable energy deployment, clean technology, natural and working lands, environmental justice, energy security, and public health and wellbeing.

The California Department of Water Resources regularly assesses and forecasts water resource reliability throughout the state. Every two years, a State Water Project Delivery Capability Report is developed to assess delivery capability over a range of hydrologic and climate conditions.[3] The Report provides water suppliers and the public information on the capability of the State Water Project to deliver water in the future. This is of particular concern for SCV Water as it currently relies on the State Water Project for nearly 50 percent of its water needs in normal operating years and as much as 75 percent during dry and critically dry years.

2. *Draft Scoping Plan Update. 2022.* ***https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf****. Accessed October 2022.*
3. *State Water Project Delivery Capability Report. 2019.* ***https://data.cnra.ca.gov/dataset/state-water-project-delivery-capability-report-dcr-2021****. Accessed October 2022.*

California State Capitol, Sacramento.

Climate Change Impacts on SCV Water Operations

This section outlines the expected climate change impacts relevant to SCV Water, impacts of State legislation, and the incorporation of sustainability into long-term planning, resiliency, and climate change adaptation in SCV Water operations.

Regional Impacts

Climate change is already creating impacts on public health, natural and managed resources, infrastructure, services, and facilities in California. SCV Water's service area falls into the Los Angeles Region region, as described in California's 2018 Fourth Climate Change Assessment Los Angeles Region Report. SCV Water's service area is currently experiencing:

- Longer and more extreme drought periods
- Increased intensity of extreme heat days
- Increased wildfire risk as climate change creates hotter and drier landscapes
- Worsened air quality due to increased smoke from more frequent wildfires, drier and dustier conditions, and increased rates of smog, also known as ozone
- Increased heavy precipitation events leading to potential increased flooding risk in low-lying areas

SCV Water's operations and water resources are already experiencing strain from climate change impacts. Particularly, increased periods of drought are leading to reductions in water supply availability. Prolonged drought periods decrease the natural recharge of local aquifers from which SCV Water draws groundwater. Changing precipitation patterns are also causing increased rain and decreased snowfall, which is having significant impacts on snowpack. Decreased snowpack in California means there is less natural storage of water, decreasing the availability of water during the dry summer months. This has significant impacts on SCV Water, as it currently relies on imported water from northern California.

Upper Castaic Lake.

State Legislation Impacts

California has developed several key climate change action legislation, policies, and programs aimed at reducing GHG emission across the state over the last couple of decades. Assembly Bill (AB) 23, Senate Bill (SB) 32, and Assembly Bill (AB) 1279 serve as primary drivers of climate action in California. Detailed descriptions of key State legislation are included in Chapter 4.

Assembly Bill 32

AB 32 established a statewide goal of reducing GHG emissions to 1990 levels by 2020. It required CARB to prepare a Scoping Plan, adopted in 2014, outlining the key strategies needed to meet the 2020 target.

Senate Bill 32

SB 32 was established in 2016, extending AB 32 by requiring the State to further reduce GHG emissions to 40 percent below 1990 levels by 2030. It required an update of the Scoping Plan, which was adopted in 2017.

Assembly Bill 1279

AB 1279, adopted in 2022, codifies the statewide carbon neutrality goal into a legally binding requirement for California to achieve carbon neutrality no later than 2045 and ensure 85% GHG emissions reduction under that goal. AB 1279 builds upon EO B-55-18 which originally established California's 2045 goal of carbon neutrality.

Senate Bill 1020

SB 1020, adopted in 2022, advances the state's trajectory to 100 percent clean energy procurement by 2045 by creating clean energy targets of 90 percent by 2035 and 95 percent by 2040. SB 1020 builds upon SB 100, which accelerated California's Renewable Portfolio Standard Program, which requires electricity providers to increase procurement from eligible renewable energy resources to 60 percent by 2030 and 100 percent by 2045.

Benefits to Aligning with State Goals

While SCV Water is not required to conform with AB 32, SB 32, or AB 1279, the State recognizes water agencies are one of the largest contributors to GHG emissions in California.[4] Furthermore, it is likely as the State works towards reaching carbon neutrality by at least 2045, additional regulation and legislation applying to SCV Water will be developed. Developing reduction targets in the Sustainability Plan will lay a foundation for SCV Water's GHG reduction efforts for future years. Aligning with State targets will make SCV Water more competitive in grant applications and other funding sources.

4. *Draft 2022 Scoping Plan Update. CARB.* ***https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf****. Accessed October 2022.*

MEASURING SUSTAINABILITY PROGRESS

Common Sustainability Metrics

Measuring resource consumption can be used as a metric to assess sustainability progress. This may include assessing the consumption of energy use, fuel use or water to understand if resources are being consumed in a sustainable manner, with consideration to economic, social, and environmental impacts. Financial metrics such as the cost/benefit ratio and return on investment can measure the economic benefits from sustainability efforts. Metrics around employee and customer engagement and satisfaction and staff time reductions may also be utilized to understand sustainability achievements.

In the Sustainability Plan, SCV Water uses the following metrics to set goals and measure progress.

- kWh of Electricity Used
- Therms of Natural Gas Used
- Gallons of Diesel, Gasoline, Propane Used
- Short Tons of Waste Disposed
- Population Served
- Acre-Feet of Water Delivered

GHG Emissions as a Metric

Many of the metrics described above, can also be translated into GHG emissions, the most ubiquitous metric used to track sustainability progress in today's sustainability landscape. Measuring sustainability progress with GHG emissions as a metric opens opportunities for funding and grants requiring the tracking of GHG emissions to be eligible. For example, several clean transportation and energy programs managed by CARB require the tracking of GHG emissions as a criterion in the application process. The Sustainability Plan will increase SCV Water's competitiveness for funding because the agency will have shown commitment to the sustainability planning process. As an example, Diablo Water District was awarded a contract by the California Governor's Office of Emergency Services of $300,000 to install on-site solar and battery storage at its facilities. In 2021, the District adopted regulations committing to reach carbon neutrality by the end of 2027 and has been tracking GHG emissions to meet this goal. GHG emissions provide a single metric to quantify and compare past and current sustainability efforts, which can also aid in winning grant funding. GHG emissions produced from the consumption of resources including water, energy, and fuel, can be assessed as MT of CO_2e produced.

Quantifying and tracking GHG emissions allows SCV Water to identify operational sources and activities with excessive energy usage and/or inefficiency. Strategies that decrease GHG emissions typically increase operational efficiency and cost-effectiveness. Furthermore, tracking GHG emissions provides SCV Water with an opportunity to improve transparency and ensure its customers are aware of the steps it is taking to align with State targets, other industry leaders, and customer concerns.

Many leading California water agencies such as The Metropolitan Water District of Southern California, Coachella Valley Water District, Irvine Ranch Water District, Diablo Water District, and East Bay Municipal Utility District, have developed sustainability and climate action plans to align with the State's GHG reduction goals and mitigate climate change impacts. Through the development of the Sustainability Plan, SCV Water will be leading sustainability planning among other California water agency leaders. Assessing sustainability progress through GHG emissions exhibits to the community SCV Water is prepared to collaborate in local and regional sustainability planning efforts. Additionally, as California continues to develop legislation around climate action and sustainability goals, SCV Water may be required in future to quantify and report progress on GHG reduction targets. By tracking GHG emissions now, SCV Water is ahead of the curve and on track to meet future State requirements.

SCV Water PV Array.

3.

SCV WATER GHG EMISSIONS LEVEL

GHG EMISSIONS AS A METRIC FOR MEASURING SUSTAINABILITY

As described in Chapter 2, quantifying and tracking GHG emissions, starting with a GHG emissions inventory, is common practice as a first step in the GHG reduction planning process. The GHG emissions inventory defines SCV Water's operational boundaries, measures key operational metrics (e.g., fuel consumption, energy consumption, water delivered), estimates the associated GHG emissions, and provides a description of the data and methodology used to complete the GHG emissions inventory. This chapter also outlines the purpose, methodologies, and results of the forecast scenarios used to estimate future operational emissions. More detailed descriptions of the inventory and forecast analysis and methodology can be found in Appendix A.

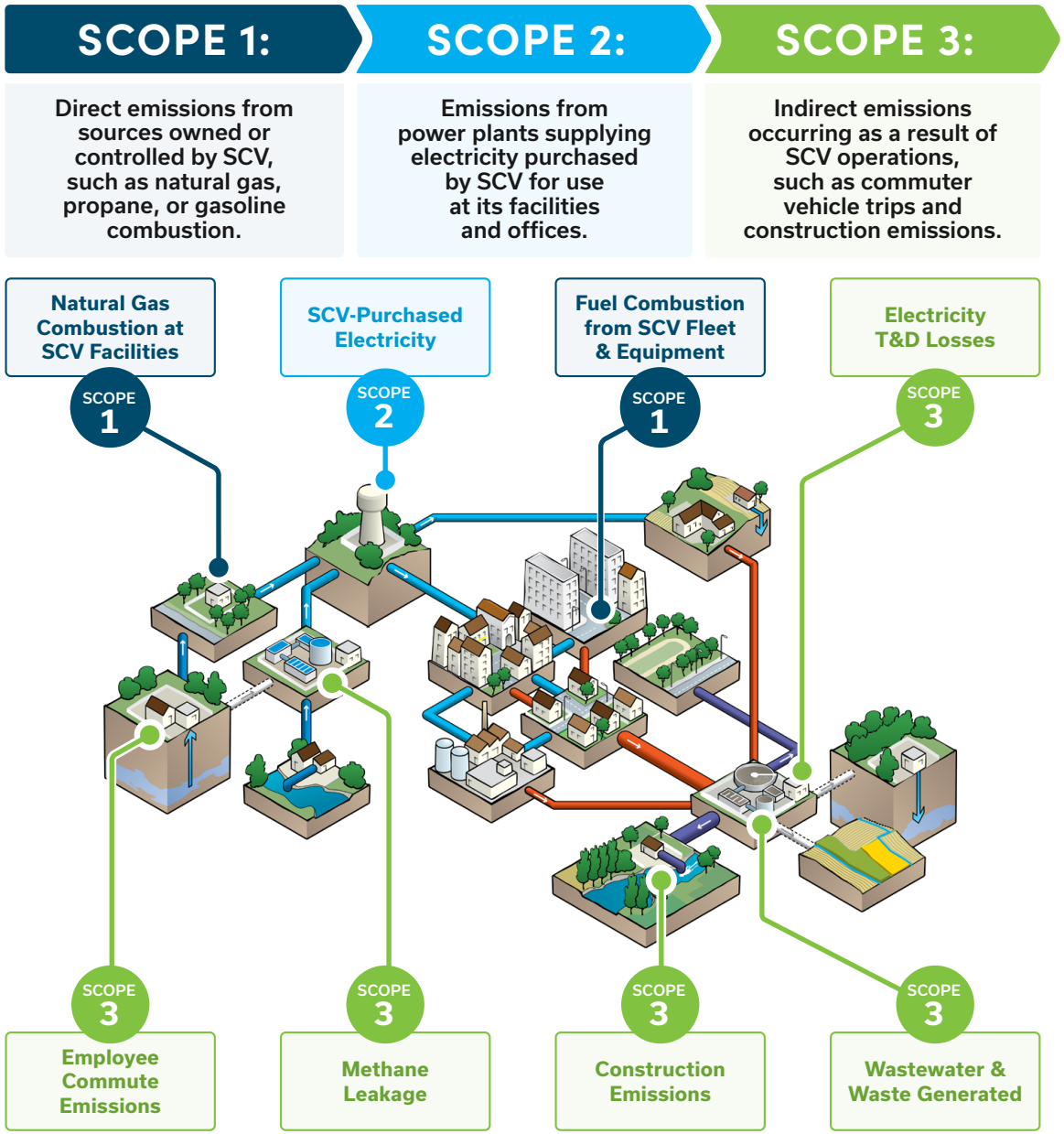
Santa Clarita Valley Water Agency water tank.

GHG Emissions Sources and Scopes

SCV Water's 2020 GHG emissions inventory was prepared in accordance with standard protocols from The Climate Registry[5] and the International Council for Local Environmental Initiatives.[6] Standard protocols require an inventory quantify emissions from all GHG emissions generating activities that fall under some level of the organization's operational control. Therefore, GHG emissions generating activities are categorized into three scopes to describe three levels of operational control. Scope 1 includes activities directly controlled by the organization. Scope 2 includes activities associated with the consumption of purchased electricity. Scope 3 includes all other GHG generating activities not directly controlled by the organization, but which are fundamental to the organization's operations.

SCV Water's GHG generating activities included in the GHG emission inventory, are categorized by scope in Figure 3-1.

Figure 3-1. SCV Water's GHG Emission Sources by Scope



The GHG emissions inventory used activity data for each emission source to calculate emissions. Data for each emissions source was obtained from billing history, internal reports, and surveys.

5. *The Climate Registry.* ***https://www.theclimateregistry.org/tools-resources/reporting-protocols/general-reporting-protocol/****. Accessed October 2022.*
6. *International Council for Local Environmental Initiatives. 2010. Local Government Operations Protocol.* ***http://icleiusa.org/ghg-protocols/****. Accessed October 2022.*

EXISTING SCV WATER GHG EMISSIONS

- The activity data for the 2020 GHG emissions inventory is summarized in Table 3-1.
- The results of the 2020 GHG emissions inventory are summarized in Table 3-2. Major sources of emissions are electricity usage (84 percent), T&D losses (4 percent) and employee commute (3 percent).
- GHG emissions inventory by source is shown in Figure 3-2.

Table 3-1. SCV Water 2020 Operational GHG Emissions Inventory – Activity Data

Emissions Sector	Activity Data	Units
Natural Gas	35,931	therms
Methane Leakage	1,006	therms
Diesel	10,816	gallons
Gasoline	27,200	gallons
Propane	150	gallons
Electricity	57,085,480	kWh
Electricity T&D Losses	3,025,530	kWh
Mixed Municipal Solid Waste	630	short tons disposed
Mixed Recyclables	135	short tons disposed
Green Waste	260	short tons disposed
Scrap Metal	18.6	short tons disposed
Employee Commute (Hybrid)	99,921	VMT
Employee Commute (Electric)	49,961	VMT
Employee Commute (Gasoline)	1,282,324	VMT
Employee Commute (Diesel)	83,268	VMT
Wastewater	218	population served

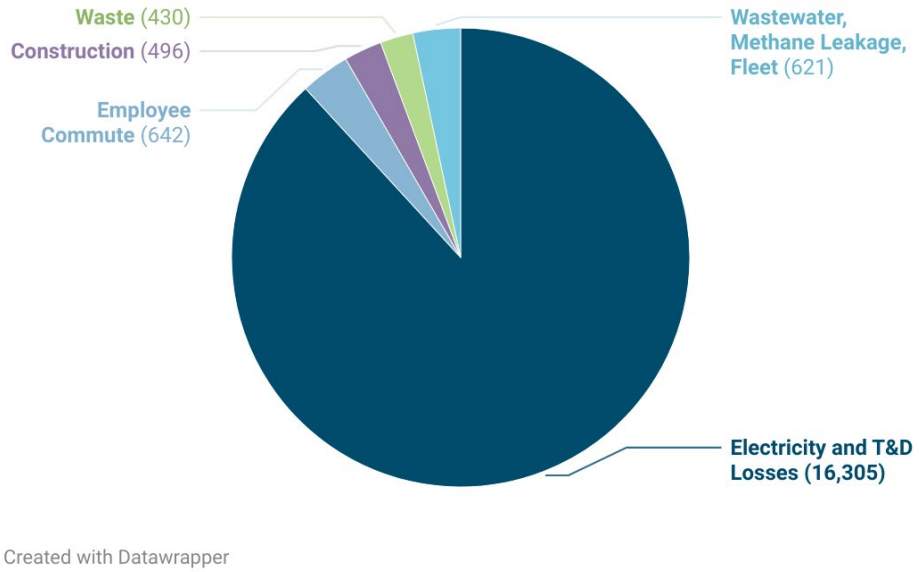
Notes: Construction emissions were estimated using data from historical SCV Water capital improvement projects including metrics such as linear feet of pipeline and acres of demolition.
kWh = kilowatt hour; VMT = vehicle miles traveled

Table 3-2. 2020 Operational GHG Emissions Inventory Summary

Emissions Source	Scope	GHG Emissions (MT CO_2e)	% Contribution
Vehicle Fleet and Equipment	Scope 1	353	2%
Natural Gas	Scope 1	191	1%
Scope 1 Subtotal		**544**	**3%**
Electricity	Scope 2	15,484	84%
Scope 2 Subtotal		**15,484**	**84%**
Methane Leakage	Scope 3	47	<1%
Electricity T&D Losses	Scope 3	821	4%
Employee Commute	Scope 3	642	3%
Waste	Scope 3	430	2%
Construction	Scope 3	496	3%
Wastewater	Scope 3	30	<1%
Scope 3 Subtotal		**2,465**	**13%**
Total Emissions		**18,493**	**100%**

Notes: Values have been rounded herein and therefore may not add up exactly.
All values shown are in units of MT CO_2e
MT CO_2e = metric tons carbon dioxide equivalent; T&D = transmission and distribution

Figure 3-2. SCV Water GHG Emissions Inventory by Source: 2020 (MT CO_2e)



The largest portion of SCV Water emissions comes from grid electricity consumption. Electricity emissions will decrease over time as electricity sources become carbon-free by 2045 and 50 percent carbon-free by 2030, due to California's Renewables Portfolio Standard.

GHG Emissions Reduction Estimation from SCV Water Sustainability Efforts

SCV Water's past and current sustainability efforts have resulted in quantifiable GHG emissions reductions. In 2020, water conservation efforts saved 68 gallons per capita per day in comparison to SCV Water's baseline 2010 demand, which was developed in alignment with SB X7-7.[7] SCV Water's 2020 water conservation efforts yielded 4,936 MT of CO_2e avoided. Additionally, in 2020, SCV Water's on-site solar panels produced 10,800 MWh, yielding 2,506 MT CO_2e avoided.

7. *SB X7-7 (2009), also known as the Water Conservation Act, requires all water suppliers to increase water use efficiency. The legislation sets an overall goal of reducing per capita urban water use by 20 percent by 2020.*

FUTURE SCV WATER GHG EMISSIONS

Purpose of GHG Emissions Forecast

SCV Water's GHG emissions are projected to change over time due to changes in water demand resulting in the need for increased water production and conservation efforts. Forecasting annual GHG emissions accounts for these projected changes by using service population and water use growth rate. The emissions forecast uses these factors to extrapolate from the inventory to estimate GHG emissions in future years. Assessing future GHG emissions compared to the reduction targets quantifies the GHG emissions gap, which the GHG reduction measures and actions included in Chapter 5 seek to address.

GHG Emission Reduction from State Regulations

Forecasted emissions were developed for years 2025, 2030, 2035, 2040, and 2045, in alignment with the State's GHG emissions reduction goals. The GHG emissions forecast accounts for GHG emissions reduction impacts from State legislation. SB 1020 (2022) is the primary driver of emissions reductions in the forecast because it accelerates the State's Renewables Portfolio Standard Program. SB 1020 requires electricity providers to increase procurement from eligible renewable energy resources to 90 percent by 2035, 95 percent by 2040, and 100 percent by 2045.

California State Capitol, Sacramento.

GHG Emissions Forecast Results

Two forecast scenarios were developed: a business-as-usual (BAU) forecast scenario and an adjusted forecast scenario. The BAU forecast scenario projects the expected growth for all GHG emissions sources based on water demand changes alone. The results of the BAU forecast are shown in Table 3-2 and Figure 3-3. Electricity use is expected to increase over time due to projected increases in water demand, as discussed in the 2020 Santa Clarita Valley Water Agency Urban Water Management Plan.[8]

Table 3-3. Business-as-Usual Forecast GHG Emissions Summary (MT CO_2e)*

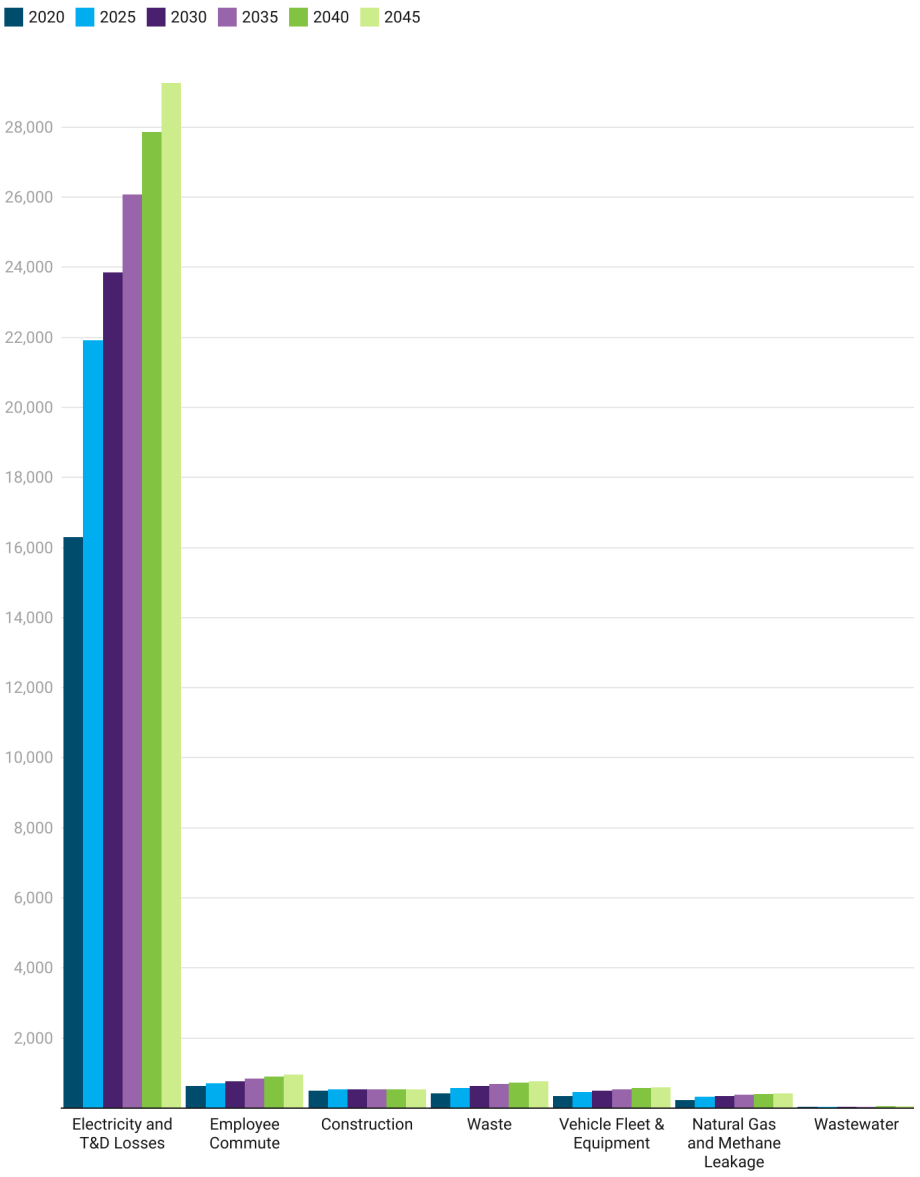
Emissions Source	2025	2030	2035	2040	2045
Natural Gas	256	279	305	326	343
Methane Leakage	63	69	75	81	85
Vehicle Fleet and Equipment	452	492	538	575	604
Wastewater	40	43	47	50	53
Electricity	20,811	22,652	24,757	26,456	27,795
Electricity T&D Losses	1,103	1,201	1,312	1,402	1,473
Employee Commute	713	776	848	906	952
Waste	578	629	687	734	772
Construction	541	541	541	541	541
Total	**24,557**	**26,683**	**29,112**	**31,072**	**32,618**

Notes: Values have been rounded and therefore may not add up exactly.
MT CO_2e = metric tons carbon dioxide equivalent; T&D = transmission and distribution
**Based on the single-dry year scenario, which is the "worst case" scenario for GHG emissions.*

8. *Santa Clarita Valley Water Agency. 2020. Urban Water Management Plan.* ***https://yourscvwater.com/wp-content/uploads/2021/06/SCVWA-2020-UWMP-Volume-I_FINAL.pdf****. Accessed October 2022.*

Figure 3-3. Business-as-Usual (BAU) GHG Emissions Forecast (MT CO_2e)

These graphs show SCV Water's BAU forecast between 2020 and 2045 based on the Urban Water Management Plan (UWMP) water deliveries projections both by sector (left) and overall (right) in MT CO_2e. Increased electricity usage is the major driver for the BAU forecast's GHG emissions increases.



The adjusted forecast accounts for water demands as well as quantifies and incorporates State legislation expected to reduce GHG emissions through 2030 and 2045. The adjusted forecast, which includes GHG reductions associated with SB 1020, represents a more accurate picture of future GHG emissions, compared to the BAU forecast. Data used to generate growth factors for the forecast are shown in Table 3-4. The results of the adjusted forecast are shown in Table 3-5 and Figure 3-4. A more robust description of the data, methodology, and factors considered for the emission forecasts are included in Appendix A.

Table 3-4. Activity Data for Forecasting

Data	Unit	Source
Water demand	Acre-feet	2020 Urban Water Management Plan
Renewables Portfolio Standard energy mix changes	Percent	SB 100

Table 3-5 Adjusted Forecast GHG Emissions Summary (MT CO_2e)[1]

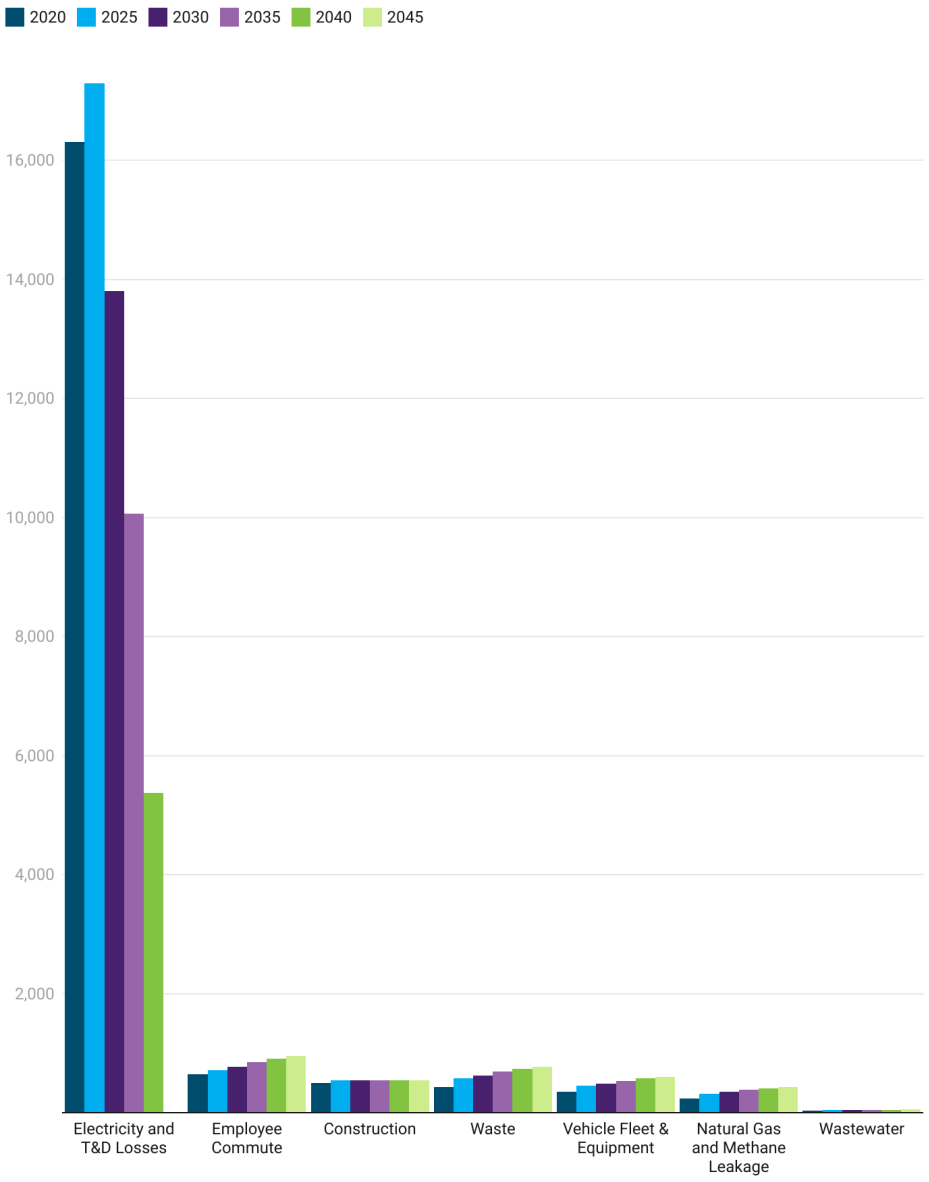
Emissions Source	2025	2030	2035	2040	2045[2]
Natural Gas	256	279	305	326	343
Methane Leakage	63	69	75	81	85
Vehicle Fleet and Equipment	452	492	538	575	604
Wastewater	40	43	47	50	53
Electricity	16,429	13,113	9,554	5,105	0
Electricity T&D Losses	871	695	506	271	0
Employee Commute	713	776	848	906	952
Waste	578	629	687	734	772
Construction	541	541	541	541	541
Total	**19,942**	**16,637**	**13,103**	**8,589**	**3,349**

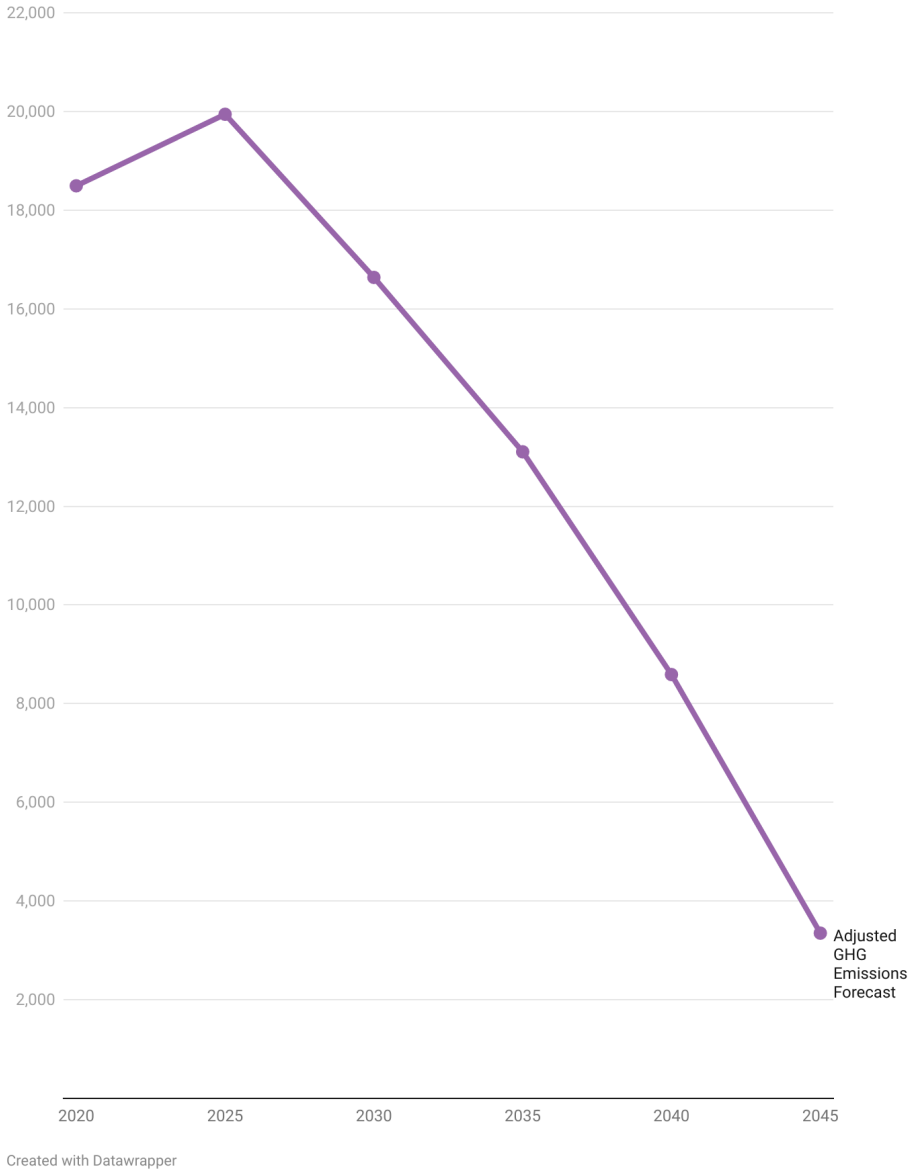
Notes: Values have been rounded herein and therefore may not add up exactly.
1. *Based on the single-dry year scenario, which is the "worst case" scenario for GHG emissions.*
2. *Emissions associated with electricity are anticipated to be zero in 2045 due to SB 100.*

MT CO_2e = metric tons carbon dioxide equivalent; T&D = transmission and distribution

Figure 3-4. Adjusted GHG Emissions Forecast (MT CO_2e)

These graphs show SCV Water's Adjusted forecast between 2020 and 2045 based on the UWMP water deliveries projections both by sector (left) and overall (right) in MT CO_2e. SB 100 (Renewable Portfolio Standard) is the major driver of SCV Water's GHG emissions reductions over time.





SCV Water's diesel, gasoline, propane, and natural gas fuel use is expected to grow through 2045, as seen in Figure 3-5. Electricity use is also expected to grow through 2045, as seen in Figure 3-6. However, due to California's Renewables Portfolio Standards, electricity emissions will decrease over time as electricity becomes carbon-free by 2045 as demonstrated by the adjusted GHG emissions forecast (Figure 3-4). Energy consumption is a major operational cost for SCV Water. By identifying the projected growth of these metrics, SCV Water will be better able to manage these costs, increase efficiency, and continue to provide cost effective water for its service area.

Figure 3-5. Adjusted Energy Use Forecast – Fuels (MMBtu)

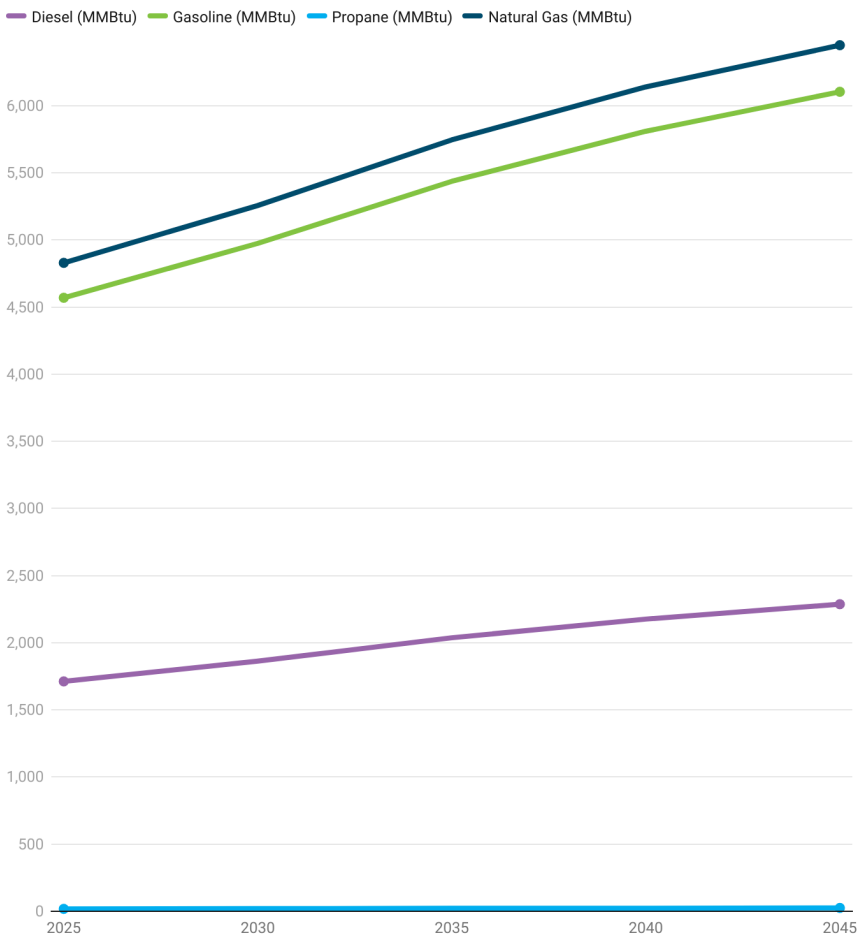
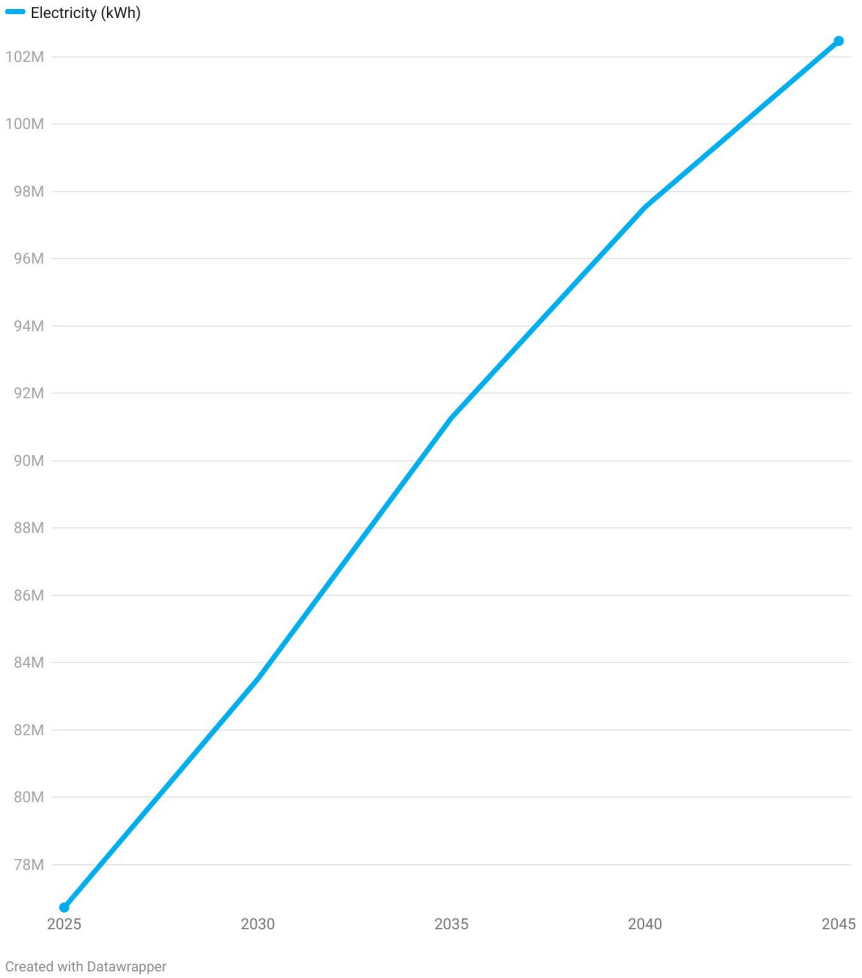


Figure 3-6. Adjusted Energy Use Forecast – Electricity (kWh)



4.

SCV WATER SUSTAINABILITY GOALS AND GHG EMISSIONS TARGETS

SCV Water Service Area.

GHG EMISSIONS TARGETS

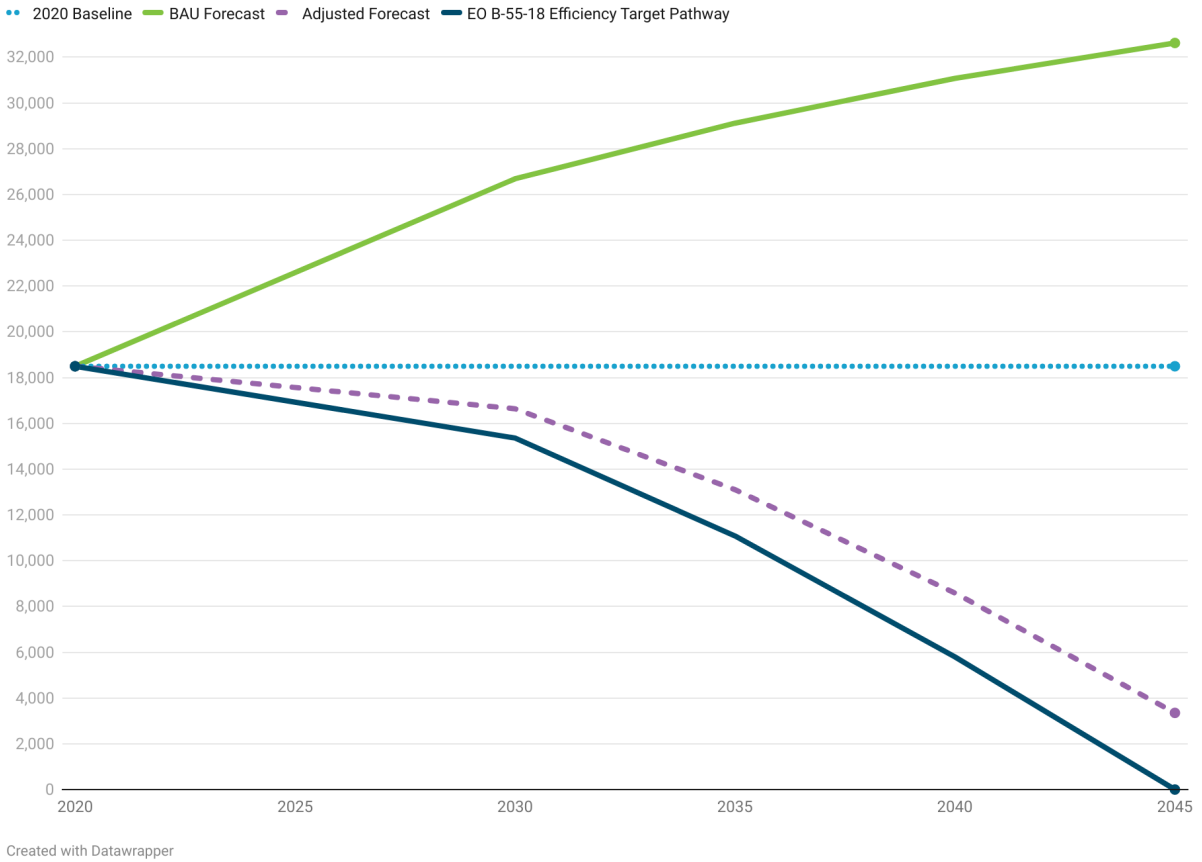
GHG targets were developed relative to baseline emission levels from 2020, in consideration of future emission forecasts and the effects of current and future legislation. SCV Water's GHG emissions reduction targets define measurable benchmarks to guide its sustainability and GHG emissions reduction efforts. The Sustainability Plan establishes a 2030 GHG emissions target in alignment with the annual reduction rate needed to eventually meet the State's 2045 carbon neutrality goal, set forth by Executive Order B-55-18.3. SCV Water's GHG emissions reduction targets and estimated reductions needed to achieve those targets are shown in Table 4-1. Figure 4-1 visually displays SCV Water's target pathway. The target pathway outlines the GHG emissions levels that SCV Water must meet for 2025, 2030, 2035, 2040, and 2045 in order to eventually reach carbon neutrality by 2045. The gap, or the total reductions needed, for the target years quantifies the amount of emissions SCV Water intends to eliminate through the application of reduction measures in each timeframe to meet the target.

Table 4-1. GHG Forecast, Reduction Targets, and Estimated Gaps for SCV Water (MT CO_2e)

	2025	2030	2035	2040	2045
Adjusted Forecast	19,943	16,637	13,103	8,589	3,349
Target Pathway developed from 2020 levels*					
EO B-55-18 Efficiency Target Pathway from 2020 levels	18,822	15,357	11,079	5,798	-
Emissions Gap	1,121	1,281	2,024	3,349	3,342

** The target pathway is calculated as 40 percent reduction from 2020 levels conservatively assumed to be equivalent to 1990 levels.*

Figure 4-1. Target Pathways



In addition to the mass emission targets shown in Table 4-1, SCV Water also developed per capita targets that help account for population changes that drive water demand and therefore, emissions at SCV Water. The translated per person targets are shown below in Table 4-2. The use of per capita emissions targets reflects the guidance found in the State's Scoping Plan. SCV Water will utilize these per capita emissions targets to determine success over time.

Table 4-2. Per Person Emissions Target

	2025	2030	2035	2040	2045
Adjusted Forecast	0.06	0.05	0.03	0.02	0.01
Target Pathway developed from 2020 levels (MT CO_2e/person)*					
EO B-55-18 Efficiency Pathway from 2020 levels	0.06	0.04	0.03	0.01	-
Emissions Gap (MT CO_2e)	0.00	0.01	0.00	0.01	0.01

** The target pathways is calculated as 40 percent reduction from 2020 levels conservatively assumed to be equivalent to 1990 levels.*

SUSTAINABILITY TARGETS

As discussed in Chapter 2, developing and tracking achievement of targets around sustainability metrics other than GHG emissions provides a holistic understanding of SCV Water's progress towards sustainability and alignment with its mission. Tracking and assessing resource consumption will allow SCV Water to identify operational inefficiencies and identify the economic benefits associated with resource conservation efforts. SCV Water's resource consumption efforts are tracked in kWh of electricity, therms of natural gas, gallons of diesel/gasoline/propane, short tons of disposed waste, and acre-feet of water delivered.

Through implementation of the Sustainability Plan, SCV Water will aim to achieve the following metrics by 2030. Each metric is defined as the reduction compared to the forecasted usage in 2030.

- **26,282 therms of natural gas reduced**
- **1,170 gasoline gallons equivalent reduced**
- **3 MW solar added**
- **13,395 acre-feet water reduced**
- **274,813 vehicle miles traveled reduced**

Other metrics which SCV Water will track during implementation:

- **Dollars invested**
- **Dollars saved**
- **Tons of waste reduced**

5.

GREENHOUSE GAS EMISSIONS REDUCTION IMPLEMENTATION PLAN

SCV Water has identified GHG emissions reduction measures that both align with SCV Water's strategic goals (Chapter 1) and reduce GHG emissions consistent with the targets identified in Chapter 4. When fully implemented, the measures and actions identified in this chapter will close the gap between SCV Water's forecasted GHG emissions and its emission reduction target. In the future, measures may need to be added or augmented to adjust to technological, legislative, or organizational shifts. However, SCV Water's sustainability measures will form the foundation for achieving GHG reductions and aligning with State programs and goals.

During the development process, SCV Water created a suite of sustainability measures aligned with the strategic goals and vision of the Agency, as well as State and federal targets and goals. This initial suite of measures was analyzed against the strategic goals to determine which measures should be prioritized in the short term. Several priority measures were selected based on their performance in the areas of resource conservation, cost-effectiveness, and operational resiliency, as well as GHG emissions reduction potential. Additional measures and actions not included in the short-term priorities can be found in Appendix C. These measures may be implemented by SCV Water as resources allow.

Castaic Lake.

CO-BENEFITS OF GHG REDUCTION MEASURES

Along with reducing GHG emissions, the measures identified in the Sustainability Plan provide additional benefits that align with the sustainability framework and SCV Water's core operational pillars outlined in Chapter 1. Measures that align with these co-benefits were prioritized for implementation. The co-benefits prioritized by SCV Water are shown here.

Reliable and Resilient Operations

Ensuring reliable and resilient operations is a critical part of SCV Water's mission. As climate change impacts increase strain on water supplies as well as the likelihood of power outages and energy shortages, increased operational resilience and water supply reliability will allow SCV Water to continue to provide reliable and affordable water services.

High Quality Water and Resource Sustainability

Retaining a high quality and sustainable water supply is a key component of SCV Water's mission. As climate change impacts become more extreme and SCV Water's service population grows, water conservation and recovery efforts will become even more critical.

Cost-Effective and Efficient

Improving cost effectiveness and efficiency of SCV Water's operations will allow the Agency to better serve customers and provide fair and equitable rates. While the upfront costs associated with implementing some of the sustainability measures may be high, many measures provide a return on investment and long-term cost savings attributed to reduced transportation costs, avoided waste, reduced utility usage, and decreased total cost of ownership. Notably, procuring a zero-emissions fleet, as described in Measure FL-1, may lead to total lifecycle costs savings for SCV Water (and is required by the State's Advanced Clean Fleets Rule). While replacing vehicles with electric options may have higher upfront costs, over time, the fuel savings and decreased maintenance needs of electric vehicles, compared to internal combustion vehicles, lead to decreased lifecycle costs.[9] Additionally, studies have found electric vehicle lifecycle costs are not greatly impacted by electricity costs and even a doubling of electricity costs does not change the relative cost differences between electric vehicles and internal combustion vehicles.[10]

Transparency and Accountability

Enhancing transparency and accountability of efforts to increase overall resource sustainability and to protect the water resources for the community is a key component of SCV Water's mission, vision, and values. SCV Water can continue to show accountability by setting sustainability goals and ensuring achievement of those goals, in alignment with State requirements and the community's long-term needs.

Table 5-1 outlines the potential GHG emissions reduction that can be achieved through the implementation of SCV Water's measures. Calculated GHG reduction potentials assume full implementation of each measure. Therefore, measures and actions partially implemented will have lower GHG emissions reductions. Specific actions for each measure are outlined and described in this Chapter.

SCV Water's Priority Measures and Actions would result in a reduction of per capita emissions of over 50% by 2030.

9. *Carbon Counter. 2021.* ***https://www.carboncounter.com/****. Accessed November 2022.*
10. *Miotti et. al. 2016. Personal vehicles evaluation against climate change mitigation targets.* ***https://pubs.acs.org/doi/suppl/10.1021/acs.est.6b00177/suppl_file/es6b00177_si_001.pdf****. Accessed November 2022.*

Table 5-1 GHG Reduction Measures by Scope

Measure Code	GHG Reduction Measure	2030 GHG Reduction Potential (MT CO_2e)
Scope 1 -Direct Combustion and Process Emissions		
DC-1	Phase out natural gas combustion at SCV Water facilities to reduce natural gas consumption by 50% by 2030	139
DC-2	Decarbonize SCV Water equipment, reducing fossil fuel use and replacing with all-electric or alternative fuels when feasible	5
FL-1	Decarbonize SCV Water vehicle fleet through procurement of zero-emission vehicles to decarbonize 50% of the fleet by 2030	62
FL-2	Use alternative fuels to bridge the technology gap to zero-emission vehicles	94
Scope 2 – Electricity Consumption		
E-1	Utilize low-carbon and carbon-free electricity by 2030[1]	1,756
EE-1	Improve energy efficiency at SCV Water facilities and buildings	Supportive[2]
Scope 3 – Indirect Emissions		
WC-1	Implement water conservation to reduce demand 15% by 2030	1,602
CR-1	Reduce construction emissions 15% by 2030 through decarbonization of construction machinery	81
W-1	Reduce landfilled waste, with a focus on reducing organic waste 75% by 2025	472
TR-1	Reduce employee commute emissions 15% by 2030	116
GHG Emissions Reduction Summary		
Total GHG reduction potential with full implementation of all measures		**4,327**
Total GHG reductions needed to meet SCV Water's 2030 Emissions Reduction Goal[3]		**1,281**

MT CO_2e = metric tons of carbon dioxide equivalent; GHG = greenhouse gas; VMT = vehicle miles traveled
DC = Direct Combustion; FL = Fleet; E = Electricity; EE = Energy Efficiency; W = Waste Generation; TR = Transportation; WC = Water Conservation; CR = Construction

Notes

GHG emissions reduction potential is based on all electricity switching to a 50% green rate option (at least 71% carbon-free electricity) through SCE or CPA as part of Measure E-1. The GHG emissions reduction potential would increase to 11,929 MT CO_2e by 2030 with all electricity switched to 100% carbon-free electricity as part of Measure 1.

1. *Supportive measures are those that are not quantifiable as a standalone action but may support quantifiable actions through providing opportunities for studying technologies, establishing policies, etc.*
2. *As described in Chapter 4, SCV Water established a GHG reduction goal in alignment with a EO B-55-18 Efficiency Target Pathway.*

HOW TO READ THIS SECTION

SCV Water's measures each include a set of actions and are organized by scope.

Scope: As described in Chapter 3, scope refers to the level of operational control SCV Water has over a GHG emissions generating activity.

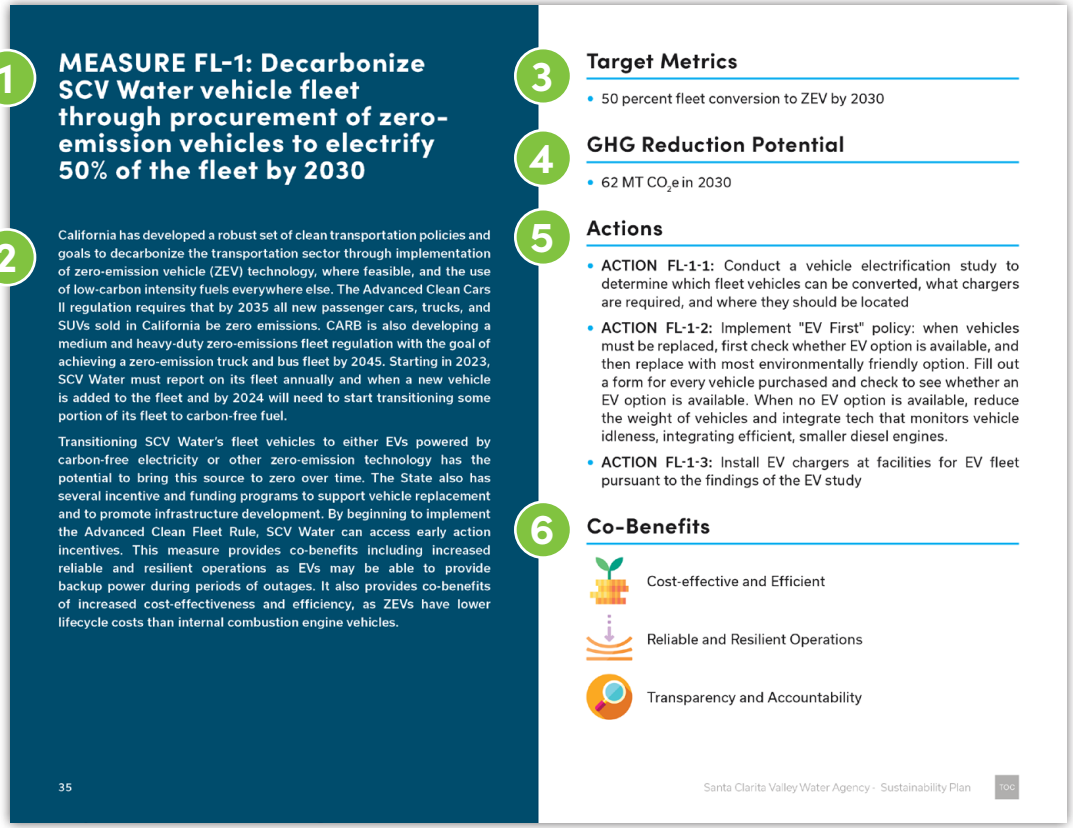
- Scope 1 refers to activities associated with direct combustion or process emissions (Direct/Internal).
- Scope 2 refers to emissions associated with electrical consumption. (Direct/External).
- Scope 3 refers to indirect emissions generating activities (Indirect/External).

Measures: Measures define quantitative goals within each scope that reduce GHG emissions from SCV Water activities.

Actions: Actions outline specific activities SCV Water will complete to accomplish the goal of each measure.

In the Sustainability Plan, measures and actions can either be quantifiable, meaning they have specific GHG emissions potential, or supportive, meaning they contribute to the realization of GHG emissions reductions of other measures and actions but do not directly have the potential alone. Measures and actions establish a pathway for SCV Water to reduce GHG emissions and achieve its 2030 reduction goal.

Co-Benefits: The co-benefit icons identify which co-benefits the measure supports.



1. **Measure:** Overarching goal
2. **Measure Overview:** Detailed explanation of why the measure is important, how it will be implemented, and general background information
3. **Target Metrics:** Quantifiable goal used to measure progress over time.
4. **GHG Reduction Potential:** Emissions reduced by 2030 and 2035 – supportive measures do not directly result in quantitative GHG emission reductions, although they support the overall goals of the CAP
5. **Measure Actions:** Action established to reduce GHG emissions
6. **Co-Benefits:** Additional benefits/advantages of a specific action

SCOPE 1 MEASURES AND ACTIONS

Electric Vehicle Charging.

MEASURE DC-1: Phase out natural gas combustion at SCV Water facilities to reduce natural gas consumption by 50% by 2030

By phasing out natural gas equipment for electric equipment, while using carbon-free electricity, SCV Water's GHG emissions associated with this equipment will fall to zero. Replacing natural gas equipment at SCV Water should be completed over time as existing natural gas infrastructure needs to be replaced. When replacing items like hot water heaters and HVAC units, SCV Water will look to replace natural gas combustion units with heat pumps that can operate at nearly 400 percent efficiency.[11] Phasing out natural gas backup generators is lower priority in the near term, as they provide critical resilience benefits.

Building electrification is promoted by several State-level programs, including SB 350 and AB 3232, which require reductions in energy usage in buildings and a transition to a low-carbon building stock. SB 350 requires the state double the energy efficiency savings in natural gas usage by 2030. AB 3232 requires the California Energy Commission evaluate strategies to reduce the state's building stock GHG emissions by 40 percent below 1990 levels by 2030. This measure provides co-benefits including increased reliable and resilient operations because electrification, when paired with energy generation (solar) and battery storage, allows for continued operations even when the grid is down. Natural gas appliances largely do not work when they do not have electricity. This measure also provides co-benefits of increased cost-effectiveness and efficiency, as higher efficiency of electric appliances can lead to overall cost savings.

11. Tri-State. 2021. Advantages of Energy Efficient Heat Pumps. ***https://tristate.coop/advantages-heat-pumps-energy-efficiency#:~:text=What's%20the%20efficiency%20performance%20of,coefficient%20of%20performance%2C%20or%20COP***. Accessed November 2022.

Target Metrics

- 50 percent reduction (26,282 therms[12]) in natural gas by 2030

GHG Reduction Potential

- 139 MT CO_2e in 2030

Actions

- **ACTION DC-1-1:** Conduct a survey to identify aging equipment due for replacement and identify operationally and financially viable electric alternatives
- **ACTION DC-1-2:** Develop a policy requiring new appliances to achieve EnergyStar Certification
- **ACTION DC-1-3:** Electrify equipment at time of replacement to reduce natural gas consumption

Co-Benefits

Reliable and Resilient Operations

Cost-effective and Efficient

12. One therm is the energy content of approximately 100 cubic feet of natural gas at standard temperature and pressure.

MEASURE DC-2: Decarbonize SCV Water equipment, reducing fossil fuel use and replacing with all-electric or alternative fuels when feasible

Equipment used by SCV Water includes forklifts and generators. Decarbonizing SCV Water's equipment by replacing fossil fuels, such as diesel and propane with low-carbon intensity fuels, like renewable diesel or by replacing with electric options, will bring the emissions of this source to zero. Electric-powered equipment options often are more efficient than those powered by diesel and propane, increasing long-term cost-effectiveness. SCV Water may opt to utilize low-carbon intensity fuels in the short-term, while electric equipment becomes financially feasible and SCV Water identifies funding for procurement of new zero-emission equipment. Replacing equipment with electric options will allow SCV Water to decrease its direct emissions and align with State GHG emissions reduction goals. This measure provides co-benefits including increased reliable and resilient operations because electrification, when paired with energy generation (solar) and battery storage allows for continued operations even when the grid is down. This measure also provides co-benefits of increased cost-effectiveness and efficiency, as higher efficiency of electric equipment and decreased maintenance requirements can lead to overall cost savings.

Target Metrics

- 50 percent reduction (1,170 gasoline gallon equivalent) by 2030

GHG Reduction Potential

- 5 MT CO_2e in 2030

Actions

- **ACTION DC-2-1:** Conduct a survey of natural gas, diesel, and propane consuming devices used in operations
- **ACTION DC-2-2:** Develop plans for replacing fossil fuel combustion equipment with electric or carbon-free equipment

Co-Benefits

Cost-effective and Efficient

Reliable and Resilient Operations

MEASURE FL-1: Decarbonize SCV Water vehicle fleet through procurement of zero-emission vehicles to electrify 50% of the fleet by 2030

California has developed a robust set of clean transportation policies and goals to decarbonize the transportation sector through implementation of zero-emission vehicle (ZEV) technology, where feasible, and the use of low-carbon intensity fuels everywhere else. The Advanced Clean Cars II regulation requires that by 2035 all new passenger cars, trucks, and SUVs sold in California be zero emissions. CARB is also developing a medium and heavy-duty zero-emissions fleet regulation with the goal of achieving a zero-emission truck and bus fleet by 2045. Starting in 2023, SCV Water must report on its fleet annually and when a new vehicle is added to the fleet and by 2024 will need to start transitioning some portion of its fleet to carbon-free fuel.

Transitioning SCV Water's fleet vehicles to either EVs powered by carbon-free electricity or other zero-emission technology has the potential to bring this source to zero over time. The State also has several incentive and funding programs to support vehicle replacement and to promote infrastructure development. By beginning to implement the Advanced Clean Fleet Rule, SCV Water can access early action incentives. Transitioning to ZEV heavy duty vehicles will be prioritized closer to 2045, as options become technologically and financially feasible. This measure provides co-benefits including increased reliable and resilient operations as EVs may be able to provide backup power during periods of outages. It also provides co-benefits of increased cost-effectiveness and efficiency, as ZEVs have lower lifecycle costs than internal combustion engine vehicles.

Target Metrics

- 50 percent fleet conversion to ZEV by 2030

GHG Reduction Potential

- 62 MT CO_2e in 2030

Actions

- **ACTION FL-1-1:** Conduct a vehicle electrification study to determine which fleet vehicles can be converted, what chargers are required, and where they should be located
- **ACTION FL-1-2:** Implement "EV First" policy: when vehicles must be replaced, first check whether EV option is available, and then replace with most environmentally friendly option. Fill out a form for every vehicle purchased and check to see whether an EV option is available. When no EV option is available, reduce the weight of vehicles and integrate tech that monitors vehicle idleness, integrating efficient, smaller diesel engines.
- **ACTION FL-1-3:** Install EV chargers at facilities for EV fleet pursuant to the findings of the EV study

Co-Benefits

Cost-effective and Efficient

Reliable and Resilient Operations

Transparency and Accountability

MEASURE FL-2: Use alternative fuels to bridge the technology gap to zero-emission vehicles

SCV Water's fleet currently uses diesel and gasoline fuels. Switching to using low-carbon intensity fuels, such as renewable diesel, will provide short-term GHG emissions reductions without requiring equipment alterations. Using alternative fuels in the short-term allows time for SCV Water to pilot and/or assess zero-emission technologies to ensure feasibility and improve return on investment. The State's Low Carbon Fuels Standard program is increasing the availability and decreasing the cost of alternative fuels in the marketplace. In 2021, SCV Water started using renewable diesel and has identified it as a viable fuel to bridge the technology gap to zero-emission vehicles. Using renewable diesel in existing vehicles can decrease the costs of maintaining equipment over traditional diesel due to a decreased need for diesel particulate filter services, as renewable diesel has less impurities such as sulfur, oxygen, and other aromatic compounds.[13] This measure provides the co-benefits of increased reliable and resilient operations, as using low-carbon intensity fuels in the short-term may increase operational resilience to power outages and grid shutdowns, which can impact electrified equipment and vehicles that are not sufficiently supported by on-site solar and battery storage.

Target Metrics

- 100 percent replacement of diesel with renewable diesel by 2030

GHG Reduction Potential

- 94 MT CO_2e in 2030

Actions

- **ACTION FL-2-1:** Expand use of renewable diesel when vehicle electrification is not available; evaluate use of other alternative fuels like hydrogen and hybrid-electric vehicles

Co-Benefits

Reliable and Resilient Operations

13. *Neste. Fueling Renewed Trust in Public Fleets.* ***https://www.neste.us/neste-my-renewable-diesel/industries/public-fleets****. Accessed November 2022.*

SCOPE 2 MEASURES AND ACTIONS

Clean Energy Sources.

MEASURE E-1: Utilize 50% low-carbon and carbon-free electricity by 2030

SCV Water's electricity consumption produces the majority of its GHG emissions. Procuring low-carbon and carbon-free electricity will significantly reduce SCV Water's GHG emissions. SB 1020 will ensure SCV Water receives 60 percent clean energy by 2030, 90 percent by 2035, 95 percent by 2040, and 100 percent by 2045. The use of carbon-free electricity will be a key component of achieving long term decarbonization for SCV Water. For example, electrification of equipment, building, and vehicles will achieve a greater GHG emissions reduction if electricity sources are low-carbon or carbon-free. Currently, SCV Water receives electricity from Southern California Edison (SCE). SCE offers a 50 percent green rate option and 100 percent green rate option to its customers, which provide 71 percent and 100 percent carbon-free electricity, respectively. SCV Water may also consider procuring electricity from Clean Power Alliance (CPA), a non-profit community choice aggregation (CCA) entity providing customers in Los Angeles and Ventura counties carbon-free electricity. CPA provides options of 40 percent, 50 percent, and 100 percent carbon-free electricity. SCV Water can achieve the GHG emissions reductions required to meet its 2030 emission target by procuring at least 71 percent carbon-free electricity before 2025.

In addition to changing its electricity procurement strategy, developing additional on-site solar and battery storage will both reduce GHG emissions and increase resilience to disturbances such as power outages. GHG reduction potential calculated based on switching to the 50 percent green rate option at either SCE or CPA. Additional reductions would be achieved by switching to the 100 percent green rate option. This measure provides co-benefits including increased reliable and resilient operations because on-site energy generation (solar) and battery storage allows for continued operations even when the grid is down. It also provides co-benefits of increased cost-effectiveness and efficiency, as on-site solar and battery storage will reduce SCV Water's utility costs over time.

Target Metrics

- Procure at least 71 percent carbon-free electricity by 2025
- Install an additional 2 MW of solar by 2030 with at least 1 MW online by 2025
- Install battery storage to support all on-site solar generation
- Conduct a study determining sizing of battery storage needed to offset non-solar producing energy use and/or meet resilience needs during power outages

GHG Reduction Potential

- 1,756 MT CO_2e in 2030

Actions

- **ACTION E-1-1:** Switch electrical accounts to a green rate program (e.g., SCE 50 percent and 100 percent Green Rate Programs or Clean Power Alliance 40 percent, 50 percent, of 100 percent Carbon-Free Programs)
- **ACTION E-1-2:** Install an additional 1 MW of solar generation by 2025; and 2 MW of solar generation by 2030
- **ACTION E-1-3:** Include battery storage at critical facilities to improve resilience

Co-Benefits

Reliable and Resilient Operations

Cost-effective and Efficient

MEASURE EE-1: Improve energy efficiency at SCV Water facilities and buildings

Improving energy efficiency at SCV Water's facilities and buildings will reduce electricity demand, save money, and reduce GHG emissions. Increasing energy efficiency will also align SCV Water with the California Building Energy Efficiency Standards (Title 24). Utilizing heat pumps in new SCV Water buildings can increase efficiency by nearly 400 percent and reduce peak electricity demand. Efficient HVAC systems paired with on-site solar and battery storage will also limit peak system demands. Additional energy efficiency actions on time-of-use programs, energy audits, and other energy savings efforts are outlined in Appendix C. This measure provides co-benefits of increased cost-effectiveness and efficiency because increased energy efficiency directly leads to reduced energy consumption and increased cost savings. This measure also provides co-benefits of transparency and accountability as SCV Water develops policies and publishes reports that commit to and disclose energy improvements.

Target Metrics

- 100 percent of new buildings are all-electric and utilize heat pumps

GHG Reduction Potential

- Supportive

Actions

- **ACTION EE-1-1:** Conduct facility wide energy audits annually and track energy improvements due to energy efficiency upgrades and report annually
- **ACTION EE-1-2:** Develop a policy requiring any new building to be all-electric and utilize heat pumps for space and water heating
- **ACTION EE-1-3:** Optimize facility operations to minimize power, supplies, chemicals, and labor consumption, including adding on-site online chlorine generation and using SCE efficiency tests to determine what to replace
- **ACTION EE-1-4:** Utilize an energy management system, such as ENERGY STAR Portfolio Manager, to track and improve energy use intensity[14] to measure energy efficiency improvements and savings over time

Co-Benefits

Cost-effective and Efficient

Transparency and Accountability

14 Energy use intensity refers to the amount of energy used per square foot.

SCOPE 3 MEASURES AND ACTIONS

Drought-resistant Landscaping.

MEASURE WC-1: Implement water conservation reducing demand 15% by 2030

SCV Water is a proven leader in implementing water conservation efforts and achieving measurable reductions in water usage. Through water conservation, SCV Water has seen Scope 2, indirect reduction of GHG emissions associated with the energy needs for treatment, delivery, and import of water supplies. As outlined in Chapter 1, SCV Water has several successful water conservation programs, such as water-efficient appliance and landscape rebates. As required by the Water Conservation Act of 2009, SCV Water has achieved a 20 percent reduction in per capita water use compared to its 2010 baseline demand. Additional water conservation efforts and programs are being implemented and planned to continue to meet new State regulations and water demands of a growing population, while reducing operational GHG emissions. This measure provides co-benefits of increased cost-effectiveness and efficiency due to decreases in water consumption and lessened need for investments by SCV Water to procure additional water supplies. This measure also provides co-benefits of increased reliability, resilience, and sustainability of water resources because water conservation efforts increase supplies for future periods of drought or other shortages.

Target Metrics

- Reduce water demand by an additional 15 percent by 2030

GHG Reduction Potential

- 1,602 MT CO_2e in 2030

Actions

- **ACTION WC-1-1:** Continue water conservation and recycling efforts and programs by implementing the Water Use Efficiency Strategic Plan, Water Shortage Contingency Plan, Urban Water Management Plan, and Groundwater Sustainability Plan

Co-Benefits

Reliable and Resilient Operations

Cost-effective and Efficient

High **Q**uality and Resource Sustainability

MEASURE CR-1: Reduce emissions from construction 15% by 2030 through decarbonization of construction machinery

Emissions from SCV Water's construction activities are estimated to contribute up to 3 percent of its overall GHG emissions profile. Future emissions from constructions are expected to vary depending on the funding approved for Capital Investment Projects. While SCV Water does not directly control emissions associated with construction activities, it can use the procurement process to select vendors with more efficient vehicles and equipment. Therefore, SCV Water can opt to development internal policies to ensure contracted vendors meet or exceed current regulations requiring newer engines be phased in and thereby decrease GHG emissions. SCV Water's construction emissions are expected to decrease in alignment with State goals to decarbonize off-road equipment as technology improves. With this, technological innovation is expected to drive down the cost of decarbonized off-road equipment over time. Additional actions around decarbonization of construction machinery are outlined in Appendix C. This measure provides co-benefits of increased cost-effectiveness and efficiency, as decarbonized off-road equipment is expected to have lower lifecycle costs in the long-term.

Target Metrics

- Reduce construction emissions by 15 percent by 2030

GHG Reduction Potential

- 81 MT CO_2e in 2030

Actions

- **ACTION CR-1-1:** Include electric and zero emission equipment in the preferred procurement policy for all applicable off-road equipment

Co-Benefits

Cost-effective and Efficient

MEASURE TR-1: Reduce employee commute emissions 15% by 2030

SCV Water can support reducing employee commuter emissions through two pathways. The first is to reduce the amount of driving by employees in single occupancy vehicles. SCV Water currently tracks employee commuting habits and provides telecommute options for employees. Promoting full or partial telecommuting and flexible work schedules will both support California's sustainable transportation goals, while reducing SCV Water's employee commute emissions.

The second pathway to reduce emissions is through the use of ZEVs. The employee commuter fleet will inevitably transition to ZEV with the establishment of the Zero-Emissions Vehicle Regulation and Executive Order N-79-20, which requires 100 percent of sales of new passenger vehicles to be ZEV by 2035. To support this transition SCV Water will work to provide additional EV charging infrastructure for employees. Available state and regional ZEV and charging infrastructure incentive/rebate through entities, such as CARB, should support the increased use of ZEVs by SCV Water employees. Additional actions around incentives, credit generating opportunities, and partnerships are outlined in Appendix C. This measure provides the co-benefits of increased cost-effectiveness and efficiency due to decreased consumption of fossil fuels and utilities at SCV Water facilities. This measure also provides co-benefits of increased reliability and resilience of operations because promoting telecommuting and flexible work options increases business continuity during hazards events or operationally disruptive scenarios.

Target Metrics

- Reduce commuter VMT by 15 percent by 2030
- Install additional EV charging infrastructure and other ZEV fueling infrastructure (e.g., hydrogen fueling infrastructure)

GHG Reduction Potential

- 116 MT CO_2e in 2030

Actions

- **ACTION TR-1-1:** Allow for continued benefits of a full or partial work-from-home policy where employees telecommute or utilize flexible schedule to reduce transit time, VMT, and GHG emissions
- **ACTION TR-1-2:** Install additional parking spaces with EV chargers for employees commuting and/or visitors

Co-Benefits

Cost-effective and Efficient

Reliable and Resilient Operations

MEASURE W-1: Reduce landfilled waste, with a focus on reducing organic waste 75% by 2025

Most of the GHG emissions from SCV Water's waste generation is associated with the decomposition of organic waste in landfills. Diverting organic waste can lead to a significant reduction in overall waste emissions. SB 1383 requires California to implement strategies to reduce organic waste sent to landfills by 75 percent by 2025 from 2014 baseline levels and achieve zero-waste sent to landfills by 2045. Additional actions around waste reduction practices are outlined in Appendix C. This measure provides the co-benefits of increased cost-effectiveness and efficiency as waste reduction efforts can conserve resources and reduce disposal costs.

Target Metrics

- 75 percent organic waste reduction by 2025 from a 2014 baseline[15]

GHG Reduction Potential

- 472 MT CO_2e in 2025

Actions

- **ACTION W-1-1:** Implement program to separate organic waste from other materials. Contract with local waste disposal companies to route organic waste to food recovery centers, anaerobic digestion, or composting facilities

Co-Benefits

Cost-effective and Efficient

15. *SB 1383, effective 2022, sets statewide emission reduction targets to 40% below 2013 levels by 2030 for methane, 75% reduction in organic material disposed in landfills from 2014 levels by 2025 and required jurisdictions to adopt ordinances or other enforceable mechanisms to impose penalties for non-compliance. SCV Water will be required to comply with local ordinances established to meet SB 1383 requirements.*

6.

IMPLEMENTATION AND MONITORING STRATEGY

The most important part of any planning effort is the subsequent implementation of the measures and actions. The Sustainability Plan's implementation will require cooperation across several SCV Water departments. Throughout the implementation phase, SCV Water's Sustainability Manager will coordinate with relevant departments on the priority actions identified in the Sustainability Plan. Next, involved parties will present the items to SCV Water management and its Board of Directors to assess funding options, gain approval, and track implementation metrics. To reach the 2030 GHG emissions reduction target, SCV Water will begin implementing measures and actions upon the adoption of the Sustainability Plan.

STEPS FOR IMPLEMENTATION: ACTION PRIORITIZATION

The Sustainability Plan will take a phased approach to action implementation.

PHASE 1 will occur in the near-term (beginning of 2023–2026)

PHASE 2 will include the implementation of mid-term actions (2026–2029)

PHASE 3 will include the implementation of long-term actions (2029–2045)

Near-term actions with the greatest return for the least amount of investment, such as facility energy and water efficiency projects, often provide opportunities for early sustainability progress from which future capital or time-intensive actions can build. Furthermore, feasibility studies and surveys can often be completed in the near-term to set a foundation for long-term capital investments or infrastructure developments that will provide SCV Water with significant GHG emissions reduction and lifecycle cost savings.

Table 6-1 provides a summary of the priority measures and actions, as well as their identified phase, responsible department, and metrics for tracking. The Sustainability Plan focuses on Phase 1 measures and actions. Over time additional actions (like those identified in Appendix C) will need to be adopted to achieve the long-term goal of carbon neutrality. New technologies and approaches should be monitored and incorporated into future planning initiatives.

RESPONSIBLE PARTIES

Several SCV Water departments will be responsible for Sustainability Plan implementation. Responsible parties are listed and described below.[16]

SCV Water Green Team

The SCV Water Green Team is a cross-departmental staff group developed in 2019. With leadership from SCV Water's Sustainability Manager and Water Conservation Specialist, the Green Team will support sustainability engagement efforts for SCV Water employees. For example, the Green Team may continue to be involved in employee commute planning through issuing the employee commute survey for future GHG emission inventories. The Green Team may also look to be involved in employee engagement efforts around waste reduction and diversion, water conservation, and energy conservation practices.

Finance and Administration

SCV Water's Finance and Administration Services Department will be involved in purchasing processes for sustainability capital investments. Additionally, they will be involved in promoting the voluntary use of rideshare programs and education campaigns.

Water Resources, Watershed, and Outreach

The Water Resources, Watershed, and Outreach Department is responsible for managing SCV Water's water resources. This team will be responsible for implementing water conservation measures. It will also be responsible for leading outreach, education, and engagement efforts to employees and customers around resource conservation efforts. SCV Water's Sustainability Manager will lead overall implementation, monitoring, and updating of the Sustainability Plan.

Engineering Services

SCV Water's Engineering Services Department manages capital improvement projects, construction procurement, and will oversee GHG reduction capital improvements, such as on-site renewables and battery storage installation as well as construction emission reduction efforts.

Operations and Maintenance

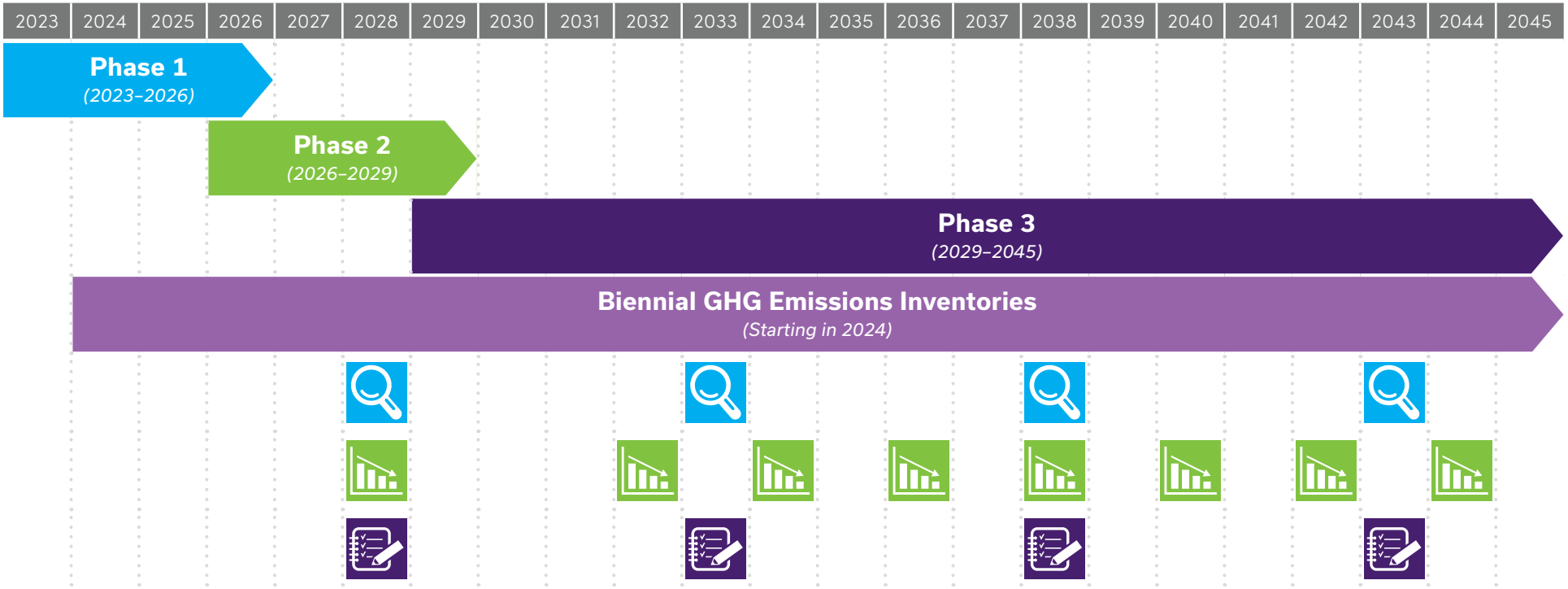
SCV Water's Operations and Maintenance Department will play a critical role in implementing waste, energy, and other resource reduction measures at SCV Water facilities. The operations and maintenance team will also be responsible for identifying opportunities to decarbonize on-road, off-road and stationary equipment. Along with the Engineering Services Department, the Operations and Maintenance Department will lead the implementation of SCV Water's building electrification and energy-efficiency projects.

16. *SCV Water. 2022. Organizational Chart.* ***https://yourscvwater.com/careers/#orgchart2****. Accessed October 2022.*

Timeline

The Sustainability Plan's measures and actions were developed to reach the 2030 GHG emissions reduction target. Over time, new technologies, State legislation, Agency priorities, and funding opportunities will change. Therefore, SCV Water will conduct comprehensive updates of the Sustainability Plan every 5 years at a minimum.

Figure 6.1 Sustainability Plan Implementation Timeline



LEGEND

GHG Emissions Forecast
(Every 5 years, starting 2028)

Implementation Status Report
(Every other year, starting 2028)

Revised Measures and Actions
(Every 5 years, starting 2028)

Table 6-1 Implementation Timeline by GHG Reduction Action

Action	Phase	Implementing Department	Implementation Metric
MEASURE DC-1: Phase out natural gas combustion at SCV Water facilities reduce natural gas consumption by 50% by 2030			
DC-1-1	1	Operations & Maintenance	Survey completed
DC 1-2	1	Operations & Maintenance, Engineering Services	Policy implemented
DC-1-3	1-3	Operations & Maintenance, Engineering Services	Natural gas usage reduced
MEASURE DC-2: Decarbonize SCV Water equipment, reducing fossil fuel use and replacing with all-electric or alternative fuels when possible			
DC-2-1	1	Operations & Maintenance	Survey completed
DC-2-2	1-2	Operations & Maintenance	Plans developed and adopted
MEASURE FL-1: Decarbonize SCV Water vehicle fleet through procurement of zero-emission vehicles to electricity 50% of the fleet by 2030			
FL-1-1	1	Operations & Maintenance	Study completed
FL-1-2	1	Operations & Maintenance, Water Resources, Watershed & Outreach	Policy implemented
FL-1-3	1-2	Engineering, Operations & Maintenance, Finance and Administration	EV chargers installed
MEASURE FL-2: Use alternative fuels to bridge the technology gap to zero-emission vehicles			
FL-2-1	1-2	Operations & Maintenance	Diesel usage reduced
MEASURE E-1: Utilize 100% low-carbon and carbon-free electricity by 2030			
E-1-1	1	Operations & Maintenance, Water Resources, Watershed & Outreach	Switch to low carbon or carbon-free electricity completed
E-1-2	1-2	Engineering Services, Operations & Maintenance, Finance & Administration	Solar PV installed
E-1-3	1-2	Engineering Services, Operations and Maintenance, Finance & Administration	Battery storage installed
MEASURE EE-1: Improve energy efficiency at SCV Water facilities and buildings			
EE-1-1	1-3	Operations & Maintenance	Energy audits completed; Energy improvements made
EE-1-2	1	Operations & Maintenance, Water Resources, Watershed & Outreach	Policy implemented
EE-1-3	1-3	Operations & Maintenance	Energy usage reduced, Cost savings
EE-1-4	1-3	Operations & Maintenance	Energy use intensity reduced, Cost savings
MEASURE WC-1: Implement water conservation and recycling, reducing demand 15% by 2030; Increase local water supply			
WC-1-1	1-3	Water Resources, Watershed, & Outreach	Water conserved, Cost savings
MEASURE CR-1: Reduce construction emissions 15% by 2030 through electrification of construction machinery (as feasible)			
CR-1-1	1	Engineering Services	Policy implemented
MEASURE TR-1: Incentivize sustainable commutes to reduce VMT 15% by 2030			
TR-1-1	1	Finance & Administration, SCV Water Green Team	Employee commute VMT reduced
TR-1-2	1-2	Operations & Maintenance, Engineering Services	EV parking spaces expanded; EV chargers installed
MEASURE W-1: Reduce landfilled waste, with a focus on reducing organic waste 75% by 2025			
W-1-1	1	Operations & Maintenance, SCV Water Green Team	Waste program implemented and waste reduced

MONITORING AND REPORTING ON PROGRESS

SCV Water Inventory and Sustainability Plan Update Timeline

SCV Water's Sustainability Manager will report results on monitoring and implementation of each action, develop an updated GHG inventory, and report findings to SCV Water's Board of Directors annually. Every 5 years, SCV Water should update the Sustainability Plan to include an updated GHG emissions forecast, implementation status, and/or revised measures and actions.

Targets will be re-evaluated and assessed on a periodic basis to assess progress made and SCV Water's ability to achieve GHG emissions reduction through the measures and actions outlined in Chapter 5. Targets should be adjusted as more data and information become available to SCV Water. They should also be tracked congruently with future State GHG reduction legislation, to ensure alignment.

Data review for plan updating.

Annual Monitoring of SCV Water GHG Reduction Measures Status

SCV Water will continually monitor sustainability progress and implementation of the Sustainability Plan. Furthermore, SCV Water will annually evaluate measure and action metrics outlined in the Sustainability Plan to track progress and prepare for future GHG inventory updates. Technology, State legislation, funding, and operational changes over time may impact the rate of implementation and need for modification of SCV Water's measures and actions. Therefore, SCV Water's Sustainability Manager will work with responsible department leaders to re-evaluate sustainability progress and factors influencing implementation. Through the evaluation process, SCV Water may consider revising measures and actions in future Sustainability Plan updates.

Annually tracking implementation metrics and key performance indicators will allow SCV Water to quantitatively assess and report on sustainability progress. As described in Chapter 2, along with direct GHG emissions reductions, metrics around resources consumption, long-term cost savings, and employee and customer engagement and satisfaction can be used to understand SCV Water's sustainability achievements. Table 6-1 outlines implementation metrics specific to each action identified in Chapter 5. Several of SCV Water's near-term actions center around the adoption, development, and implementation of policies, studies, and surveys, which can set the foundation for GHG emissions reductions, resource conservation, long-term cost savings, and increased operational resiliency and reliability.

SCV Water will facilitate transparent monitoring and reporting of the Sustainability Plan through CAPDash, a cloud based GHG inventory monitoring and reporting tool. CAPDash will be updated on an annual basis with inventory data and measure implementation metrics.

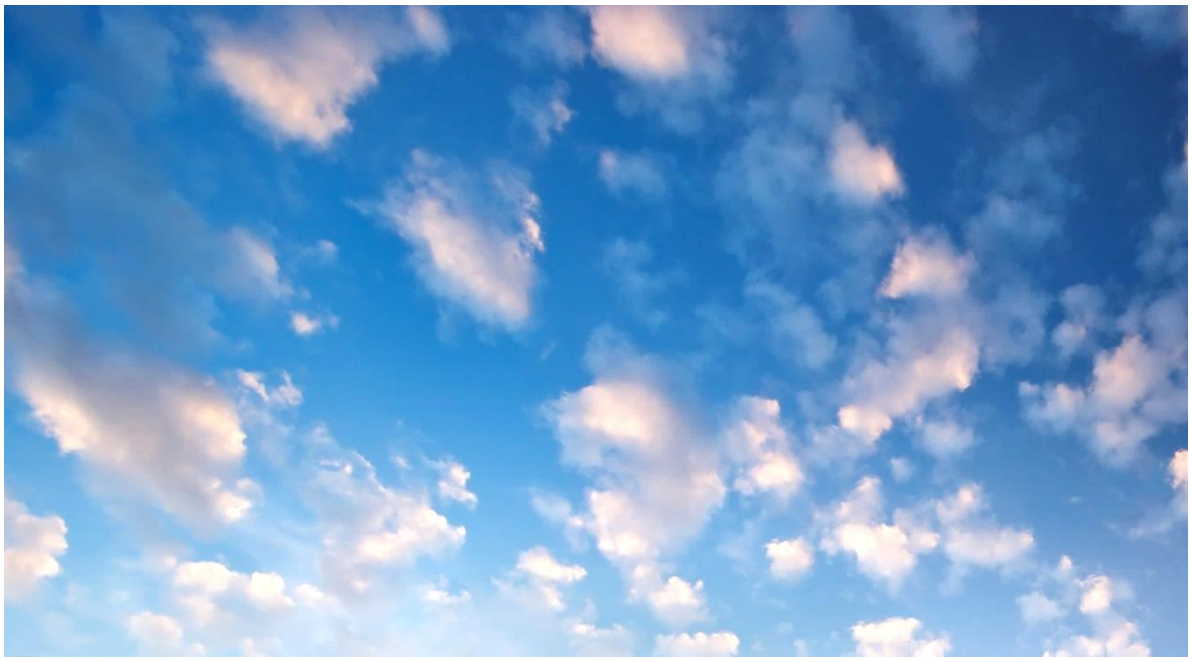
A.

APPENDICES

APPENDIX A -
GHG Inventory and Forecast

APPENDIX B -
Regulatory Context

APPENDIX C -
Measures and Actions



SCV Water Sustainability Plan – Appendix A

Greenhouse Gas Inventory and Forecast

prepared by

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Santa Clarita, California 91350

prepared with the assistance of

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January 2023

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Environmental Scientists | Planners | Engineers
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1 Introduction

This Greenhouse Gas Inventory and Forecast Report presents the data, methods, and results of a greenhouse gas (GHG) emissions inventory and forecast for the Santa Clarita Valley Water Agency (SCVWA). Included, is an analysis of findings and trends based on SCVWA's operations which will support the development of potential GHG emissions reduction strategies, implementation benefits, and opportunities for mission success in support of SCVWA's Sustainability & Climate Action Plan.

The State of California has set state-wide GHG emissions reduction goals to mitigate negative climate change[1] impacts and transition the state to a low-carbon economy. The State's Climate goals align with the Paris Agreement (2015) goal to limit global warming to 1.5 degrees Celsius (°C) compared with pre-industrial levels.[2] These goals were reiterated in the Glasgow Climate Pact (2021). According to the International Panel on Climate Change (IPCC), limiting global warming to 1.5°C will require global emissions to reduce by 50% by 2030 and hit carbon neutrality by mid-century. The International Counsel for Local Environmental Initiatives (ICLEI) recently developed climate goals in line with the latest climate science known as Science-based Targets (SBTs) that set a goal of a 50% reduction in per capita emissions compared with baseline years ranging from 2016 to 2019.

The State has established goals to reduce state-wide GHG emissions to 1990 levels by 2020, (Assembly Bill [AB] 32), and 40 percent below 1990 levels by 2030, (Senate Bill [SB] 32). The 2020 goal of AB 32 was achieved in 2016.[3] Executive Order (EO) B-55-18 establishes a state-wide goal of carbon neutrality by 2045. The California Air Resources Board (CARB) is the agency responsible for addressing and implementing these goals. In response, many local jurisdictions, including water districts, are completing their own GHG inventories, forecasts, and climate action plans to align with SB 32 and EO B-55-18 and contribute their fair share of GHG emissions reduction.

Water and wastewater districts play a fundamental role in reducing local GHG emissions and preparing for a more resilient future. SCVWA exercises direct and indirect control over its GHG emissions-generating activities (see Section 3.2 for a definition of GHG emissions by Scope). In accordance with standard reporting protocols, such as the ICLEI, SCVWA GHG emissions included in the inventory are those that fall under some level of the entity's operational control meaning SCVWA has full authority to introduce and implement policies at an operational level which impact emissions. For example, SCVWA can reduce or offset energy consumption by using renewable energy to power its buildings and facilities and reduce or mitigate fuel consumption in its vehicle fleet. Estimating GHG emissions in an inventory enables SCVWA to quantify the major sources of GHG emissions produced by its operations and programs and establish an emissions baseline for developing a GHG emissions forecast. The forecast allows SCVWA to estimate future emissions trends and facilitate target setting for future reductions.

[1] The National Aeronautics and Space Administration defines climate change as "a change in the usual weather found in a place" and "a change in the earth's climate." See https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-climate-change-k4.html

[2] The Paris Agreement is the first universal, legally binding global climate agreement that was adopted in 2015 and has been ratified by 191 countries worldwide. The Paris Agreement establishes a roadmap to keep the world under 2°C of warming with a goal of limiting an increase of temperature to 1.5°C.

[3] CARB. (2018, July 11). *Climate pollutants fall below 1990 levels for first time.* Accessed October 2021 from https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time

The inventory conducted for SCVWA includes GHG emissions from activities under the operational control of SCVWA for 2020.[4] The following GHG-generating activities were included in the inventory: natural gas combustion, vehicle fleet and equipment usage, electricity usage, out-of-boundary waste processing, construction projects, electricity transmission and distribution, employee commute, and wastewater process emissions associated with employee generation at SCVWA facilities. From the inventory, Rincon developed a forecast of SCVWA's GHG emissions to 2025, 2030, 2035, 2040, and 2045 based on forecasted water delivery demand as defined by the 2020 Urban Water Management Plan (UWMP) Volume 1.[5]

The forecast provides an up-to-date projection of how GHG emissions are expected to change for SCVWA based on identified capital improvement program (CIP) projects, changes in employee telecommute frequency, changes in water demand, and existing State and federal legislation aimed at reducing GHG emissions through 2045. As with all GHG inventories and forecasts, the analysis in this document relies on the best available data and calculation methodologies.

Once the inventory and forecast are finalized, Rincon will work with SCVWA to establish GHG emissions reduction targets consistent with State goals. GHG reduction targets help to define measurable benchmarks to guide the operational commitment to achieve emissions reductions in the future. GHG targets are developed relative to baseline emissions levels, and in consideration of future emission forecasts and the effects of ongoing and future legislative actions. This document introduces target setting and provides recommendations for targets for SCVWA.

1.1 SCVWA Operations

Santa Clarita Valley Water Agency (SCVWA) was formed in 2018 when the Castaic Lake Water Agency (CLWA) including its Santa Clarita Water Division (SCWD), and Newhall County Water District (NCWD) merged pursuant to State legislation (SB 634, Chapter 833 2017) to form a special act entity. When Valencia Water Company (VWC) dissolved, also in 2018, VWC assets were transferred to SCVWA. At present SCVWA is made up of three water divisions: Newhall Water Division (NWD), Santa Clarita Water Division (SCWD) and Valencia Water Division (VWD).

In the year 2020, SCVWA delivered over 65,000 acre-feed (AF) of water to over 289,000 customers.[6] As the home of three water divisions, SCVWA operates an extensive water infrastructure system. NWD produces over 9,675 gallons of potable water per minute, has four connections to the State Water Project (SWP), 15 booster stations and 23 reservoirs with a storage capacity of 25.56 million gallons. SCWD operates and maintains approximately 300 miles of pipeline, 48 water tanks with a storage capacity of approximately 74 million gallons, 29 pump stations, and 15 groundwater production wells The VWD provides potable water to approximately 31,000 customers.[7]

SCWVA water resources include imported water, local groundwater, recycled water, and water from existing groundwater banking and exchange programs.[8] Imported water is provided by the SWP,

[4] Santa Clarita Valley Water Agency elected to conduct an inventory using the 2020 data year as this was the most recent year for which reliable data was available due to merging of the three water districts. See further discussion of this in Section 4.3.

[5] SCVWA. (2021). *2020 Urban Water Management Plan for Santa Clarita Valley Water Agency Volume 1 Final.* Accessed October 2021 from https://yourscvwater.com/wp-content/uploads/2021/06/SCVWA-2020-UWMP-Volume-I_FINAL.pdf

[6] Ibid

[7] SCVWA. (n.d.). *Our History*. Accessed October 2021 from https://yourscvwater.com/history/

[8] SCVWA. (2021). *2020 Urban Water Management Plan for Santa Clarita Valley Water Agency Volume 1 Final.* Accessed October 2021 from https://yourscvwater.com/wp-content/uploads/2021/06/SCVWA-2020-UWMP-Volume-I_FINAL.pdf

Buena Vista-Rosedal, and Yuba Accord Water. SCVWA currently participates in a number of water conservation efforts and offers numerous water conservation educational programs such as school programs, gardening classes, newsletters, and online conservation tips and resources.

2 Legislative Context

GHG emissions are a cumulative global issue. For example, the emissions from a refinery in California will contribute to global warming and climate change impacts across the planet. Thus, addressing climate change requires a global effort. Due to this international significance and acknowledgement of the anthropogenic impacts on climate, the United Nations convened in 1992 to create a global strategy to tackle climate change. Since the 1990s, nations across the world have gathered to strategically address rising GHG emissions and climate change impacts. Despite the U.S. wavering on its international commitments to reduce emissions, California has been a steadfast climate leader, upholding the commitments to the Paris Agreement to limit global warming to 1.5°C compared with pre-industrial levels and creating actionable strategies to achieve carbon neutrality. To limit global warming to 1.5°C, the IPCC has determined global emissions must be reduced by 50% by 2030 and hit carbon neutrality by 2050. In response, ICLEI established the SBTs for all local governments which set a goal of a 50% reduction in per capita emissions compared with 2018 levels. The ICLEI adjusts SBTs for different local governments, with jurisdictions in countries with higher socio-economic development pursuing larger reductions compared with jurisdictions in developing countries. These international agreements and the significance thereof are detailed below in Section 3.1, International Climate Action.

The State of California has developed state-wide legislation and programs to reduce GHG emissions in alignment with the Paris Agreement goals and IPCC scientific findings. The State of California, via CARB, has issued several guidance documents addressing establishing GHG emissions reduction targets for local climate action plans to comply with legislated GHG emissions reductions goals. In the first *Climate Change Scoping Plan* (hereafter referred to as the 2008 Scoping Plan)[9], CARB encouraged local jurisdictions to adopt a reduction target for community emissions paralleling the State commitment to reduce GHG emissions to 1990 levels by 2020 as set by AB 32. In 2017, CARB published *California's 2017 Climate Change Scoping Plan* (hereafter referred to as the 2017 Scoping Plan Update)[10] outlining the strategies the State will employ to reach the additional State targets set by SB 32 in 2016 to reduce emissions 40% below 1990 levels by 2030.

Publication of the next Climate Change Scoping Plan in 2022 is expected to include recommendations for complying with the carbon neutrality goal established by EO B-55-18 in 2018. While currently no State plan exists to achieve the goal set by EO B-55-18, the EO directs CARB to ensure future Scoping Plan updates identify and recommend measures to achieve the carbon neutrality goal. EOs are binding only on State agencies and are not binding on local water districts. However, detailing progress toward this goal demonstrates consistency with the State's goals and that the entity recognizes its fair share to reduce GHG emissions to meet the Paris Agreement commitment. In the 2017 Scoping Plan Update, CARB encouraged local governments, including special entities, to evaluate and adopt goals which align with the State's goals.

9 CARB. (2008). *Climate Change Scoping Plan a framework for change pursuant to AB 32 The California Global Warming Solutions Act of 2006*. Accessed October 2021 from https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/document/adopted_scoping_plan.pdf

10 CARB. (2017). *California' 2017 Climate Change Scoping Plan the Strategy for achieving California's 2030 greenhouse gas target*. Accessed October 2021 from: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf

2.1 International Climate Action

1992 United Nations Framework Convention on Climate Change

The primary international regulatory framework for GHG reduction is the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC is an international treaty adopted in 1992 with the objective of stabilizing atmospheric GHG concentrations to prevent disruptive anthropogenic climate change. The framework established non-binding limits on global GHG emissions and specified a process for negotiating future international climate-related agreements.[11]

1997 Kyoto Protocol

The Kyoto Protocol is an international treaty adopted in 1997 to extend and operationalize the UNFCCC. The protocol commits industrialized nations to reduce GHG emissions per country-specific targets, recognizing they hold responsibility for existing atmospheric GHG levels. The Kyoto Protocol involves two commitment periods during which emissions reductions are to occur, the first of which took place between 2008-2012. The second commitment period set new targets and other changes but has not been entered into force (meaning it has not gone into effect).[12]

2015 The Paris Agreement

The Paris Agreement, adopted in 2015, is the first universal, legally binding global climate agreement and has been ratified by 191 countries worldwide.[13] The Paris Agreement establishes a roadmap to keep the world under 2°C of warming with a goal of limiting the global increase in temperature to 1.5°C. The Paris Agreement does not dictate one specific reduction target, instead relying on individual countries to set Nationally Determined Contributions or reductions based on gross domestic product and other factors. According to the IPCC, limiting global warming to 1.5°C will require global emissions to reduce through 2030 and achieve carbon neutrality by mid-century.[14]

2.2 California Regulations and GHG Emissions Targets

The State of California has adopted legislation and policies to address climate change, the most relevant of which are summarized below. The legislative targets discussed below are further supported by sector specific legislation discussed further in the next section. The State's climate goals, as detailed below, were developed to be consistent with the IPCC analysis of global emissions trajectory needed to stabilize atmospheric carbon dioxide concentrations at 350 parts per million

[11] UNFCCC. (1992). *United Nations Framework Convention on Climate Change.* Accessed October 2021 from: https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf

[12] UNFCCC. (n.d.). *What is the Kyoto Protocol?* Accessed October 2021 from: https://unfccc.int/kyoto_protocol

[13] UNFCCC. (n.d.). *Paris Agreement - Status of Ratification.* Accessed October 2021 from: https://unfccc.int/process/the-paris-agreement/status-of-ratification

[14] Allen M.R., Dube O.P., Solecki W., Aragón-Durand F., Cramer W., Humphreys S., Kainuma M., Kala J., Mahowald N., Mulugetta Y., Perez R., Wairiu M., and Zickfeld K. (2018): Framing and Context. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte V., Zhai P., Pörtner H.-O., Roberts D., Skea J., Shukla P.R., Pirani A., Moufouma-Okia W., Péan C., Pidcock R., S. Connors S., Matthews J.B.R., Chen Y., Zhou X., Gomis M.I., Lonnoy E., Maycock T., Tignor M., and Waterfield T. (eds.)]. In Press. Accessed October 2021 from: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter1_Low_Res.pdf

(ppm) or less.[15] As such the State's goals also align with the Paris Agreement goal to limit the increase in global temperature to 1.5°C.

- **AB 32,** signed by former Governor Schwarzenegger in 2006, known as the Global Warming Solutions Act of 2006, requires California's GHG emissions be reduced to 1990 levels by the year 2020 (which California achieved early in 2016). The 2008 Scoping Plan identified mandatory and voluntary measures to achieve the statewide 2020 GHG emissions limit.
- **SB 32,** signed by former Governor Brown in 2016, continues the efforts of AB 32 by establishing a statewide mid-term GHG emissions reduction goal of 40 percent below 1990 levels by 2030. CARB formally adopted the 2017 Scoping Plan Update in December 2017, laying the roadmap to achieve 2030 goals and giving guidance to achieve substantial progress toward 2050 State goals.
- **EO B-55-18,** signed by former Governor Brown in 2018, created a statewide GHG emissions goal of carbon neutrality by 2045. Executive Order S-55-18 identifies CARB as the lead agency to develop a framework for implementation and progress tracking toward this goal in the next Climate Change Scoping Plan Update.

The SBTs developed by the ICLEI for the United States are based on a baseline year range of 2016-2019 and are applicable for jurisdictions without established climate change targets. As California has established and been working towards climate goals aligned with the IPCC analysis since 2006, California's climate goals are more conservative than the SBTs.

2.3 Legislative Reduction Programs

In line with California's legislative goals, the State has established additional legislation and programs to reduce GHG emissions in various sectors, such as California's Cap-and-Trade Program[16], SB 100 (Renewables Portfolio Standard)[17], Clean Car Standards, Advanced Clean Fleet Rule[18], and the Title 24 Building Standards[19]. Some of these legislated programs are not directly relevant to SCVWA and will not affect SCVWA's forecasted emissions. For instance, the Cap-and-Trade Program and Title 24 are anticipated to have minimal impact on SCVWA emissions because SCVWA does not plan on constructing new residential or commercial buildings and is not part of the Cap-and-Trade Program. The Clean Car Standards would have some impact on SCVWA emissions associated with use of fleet vehicles. As such, the emissions relating to the SCVWA fleet will conservatively be accounted for during the measure development stage. The Advanced Clean Fleets Rule, developed by CARB to transition heavy-duty fleet vehicles to zero-emission vehicles by 2045, will affect SCVWA once the Rule goes into effect in 2024.

The legislative program considered most relevant to SCVWA's future emissions is California's Renewables Portfolio Standard (RPS) program. Established in 2002 under SB 1078, enhanced in 2015 by SB 350, and accelerated in 2018 under SB 100, California's RPS is one of the most ambitious

[15] CARB. (2014). *First Update to the Climate Change Scoping Plan Building the Framework Pursuant to AB 32 The California Solutions Act of 2006*.Accessed October 2021 from: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf

[16] CARB. (n.d.). *Cap-and-Trade Program*. Accessed December 2021 from: https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program/about

[17] California Energy Commission (CEC). (n.d.). *SB 100 Joint Agency Report*. Accessed December 2021 from: https://www.energy.ca.gov/sb100

[18] CARB. (2021, August 17). *Advanced Clean Fleets Fact Sheet.* Accessed December 2021 from: https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-fleets-fact-sheet

[19] CEC. (n.d.). *Building Energy Efficiency Standards – Title 24*. Accessed December 2021 from: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards

renewable energy standards in the country. The RPS program requires investor-owned utilities, publicly owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 50 percent of total procurement by 2026 and 60 percent of total procurement by 2030. The RPS program further requires these entities to increase procurement from GHG emissions-free sources to 100 percent of total procurement by 2045. The RPS program was incorporated into SCVWA's GHG forecast by adjusting the electricity emission factors based on forecasted procurement for each electricity provider.

3 GHG Emissions Inventory

This GHG emissions inventory is a significant step to understanding SCVWA's GHG emissions and was specifically developed to serve the following purposes:

- Provide an understanding of the largest sources of emissions by SCVWA and identify the greatest opportunities for emissions reductions
- Create a GHG emissions baseline from which SCVWA can establish an emissions forecast, GHG emissions reduction targets, and evaluate future progress against those targets
- Develop improved GHG emissions accounting and reporting principles

The methodology for calculating SCVWA's inventory is consistent with standard reporting protocols from the World Resources Institute, the World Business Council for Sustainable Development, and the ICLEI. These protocols are the most widely used methodologies that standardize the quantification and reporting of GHG emissions based on operational control by the entity allowing for comparison with other entities utilizing these methods. They also include steps to evaluate the relevance, completeness, consistency, transparency, and accuracy of data used in the inventory and forecast. As SCVWA is a water resource management and water supply entity, only applicable emission sources were included in the inventory. For water agencies it is important to consider the water-energy nexus and the operational control of the entity to avoid double counting of emissions sources. For SCVWA, energy use to convey and distribute water to its customers is captured in utility bills the entity is responsible for and does not need to be accounted for seperately as that would cause double-counting of emissions from the same source. The following sections contain further information on the inventory approach, methods and data used, and results.

3.1 Greenhouse Gases

The ICLEI-Local Governments for Sustainability organization suggests inventories assess GHG emissions associated with the six internationally-recognized GHGs. This inventory focuses on the three GHGs most relevant to SCVWA operations: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The other gases (hydrofluorocarbons, perfluorocarbons, and sulfur hexafluorides) are emitted primarily in private sector manufacturing and electricity transmission and are therefore, omitted from this inventory. Table 1 also includes the global warming potential (GWP) for each of these GHGs. The GWP refers to the ability and degree of each gas to trap heat in the atmosphere.[20] For example, one pound of methane gas has 25 times more heat trapping potential than one pound of carbon dioxide gas when quantified over a one-hundred-year residence time. GWPs are used to equate all GHGs to a CO_2 equivalent (CO_2e). GHG emissions for the SCVWA GHG inventory and forecast are reported in metric tons (MT) of CO_2e. This inventory was developed to be consistent with the current published State inventories and therefore uses the 100-year GWP values published in the IPCC Physical Science Basis of the Fourth Assessment Report.[21]

[20] According to the United States Environmental Protection Agency, the GWP was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of one ton of a gas will absorb over a given period, relative to the emissions of one ton of carbon dioxide (EPA 2017).

[21] IPCC. (2007). *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp Accessed October 2021 via online: https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full_report.pdf

Table 1 Greenhouse Gases

Greenhouse Gas	Source of Emission	Global Warming Potential
Carbon Dioxide (CO_2)	Combustion	1
Methane (CH_4)	Combustion, anaerobic decomposition of organic waste (landfills, wastewater treatment plants), fuel handling	25
Nitrous Oxide (N_2O)	Combustion and wastewater treatment	298

Source: IPCC. (2007). *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp Accessed October 2021 via online: https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full_report.pdf

3.2 GHG Emissions Sources by Scope

Standard protocols for organization-focused inventories use a framework that categorizes GHG emissions into scopes (i.e., Scope 1, Scope 2, and Scope 3), which account for GHG emissions based on the level of operational control the organization has over each GHG emissions source. The operational control methodology is well documented by established protocols, such as the Local Government Operations Protocol developed by the ICLEI.[22] This protocol is widely used and helps entities avoid double-counting of GHG emissions and accurately quantify reduction efforts.

- **Scope 1** is defined as direct GHG emissions generated from sources that are owned or directly controlled by SCVWA.
- **Scope 2** refers to GHG emissions indirectly generated due to the consumption of purchased electricity, steam, heating, or cooling.
- **Scope 3** refers to other indirect GHG emissions not covered under Scope 2 which are associated with sources not directly owned or controlled by SCVWA but are fundamental to the organization's operation.

A visualization of each Scope category is provided in Figure 1. For consistency with standard accounting and reporting protocols, each of the SCVWA GHG emissions sources were categorized by scope and included in the inventory:

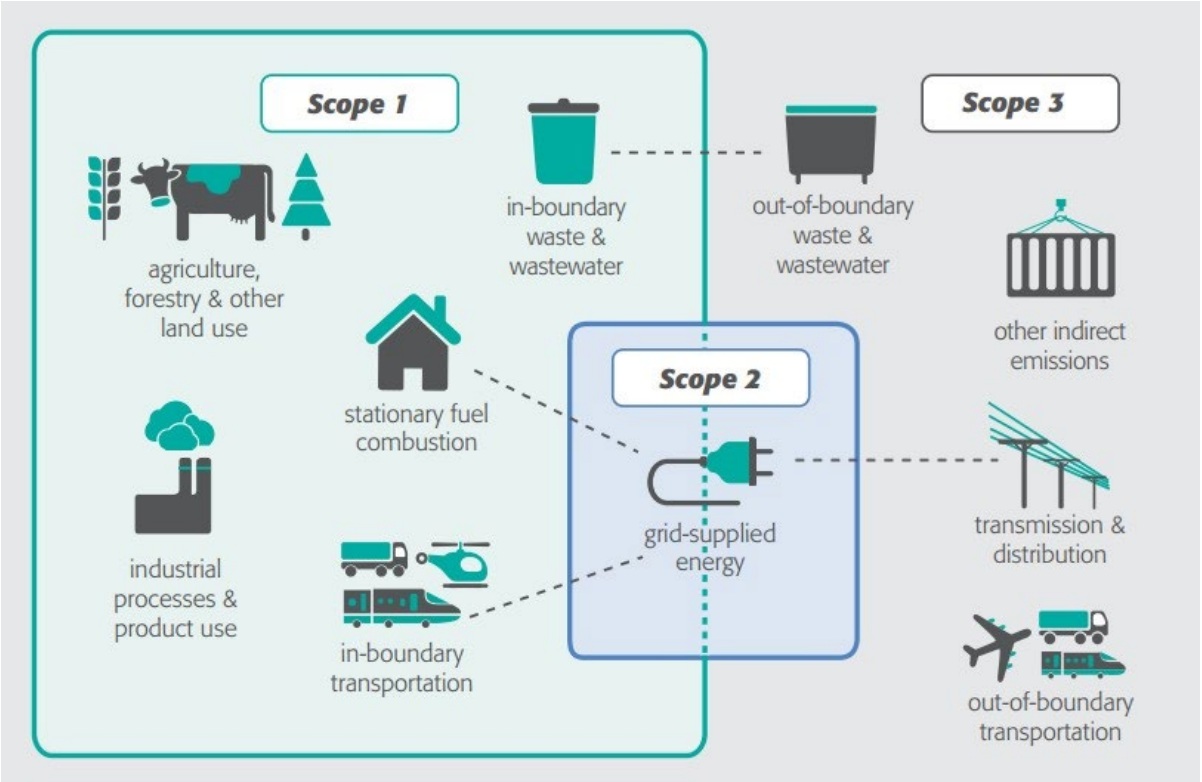
- **Scope 1**
  - Natural gas – emissions from natural gas delivered by Southern California Gas Company (SCG)
  - SCVWA vehicle fleet and equipment – vehicle fleet emissions from diesel, gasoline, and propane usage
  - SCVWA generators – emissions from diesel-fueled generators
- **Scope 2**
  - Electricity – emissions from electricity delivered by Southern California Edison (SCE)

[22] ICLEI. (2010). Local Government Operations Protocol for the quantification and reporting of greenhouse gas emissions inventories. Version 1.1. Accessed November 2021 from: https://ww3.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf.

- **Scope 3**
  - Methane leakage – methane leakage associated with the delivery of natural gas from SCG
  - Electricity transmission and distribution (T&D) losses– T&D losses associated with delivered electricity from SCE
  - Waste – emissions from waste generated by all SCVWA office buildings and facilities
  - Employee commute – emissions from vehicles used by employees to commute to and from SCVWA campuses or facilities
  - Construction – emissions associated with historical construction projects affecting SCVWA facilities during 2020
  - Wastewater—process emissions and indirect electricity emissions associated with wastewater treatment from wastewater generation by employees at SCVWA facilities[23]

[23] Since SCVWA does not directly control the wastewater treatment plants treating the water, wastewater emissions are included in Scope 3. Emissions include process emissions from treatment and indirect emissions from electricity use.

Figure 1 Example GHG Emissions by Scope[24]



Excluded GHG Emissions Sources

The inventory excludes some GHG emissions sources from consideration, as they were not considered relevant for SCVWA operations, or were accounted for in other sectors. Refrigerants and fire suppressants are an insignificant source of GHG emissions for SCVWA and, therefore, were excluded from the inventory. Since SCVWA does not have control over wastewater treatment plants, industrial process emissions associated with wastewater treatment were captured under Scope 3 sources for wastewater; thereby including only wastewater process, collection, and treatment emissions associated with wastewater generated at SCVWA facilities. Production emissions (i.e., water produced and supplied) was not differentiated into its own category but captured under the Scope 1 and Scope 2 sources, due to its electricity and fuel use. Emissions associated with water treatment or conveyance of imported water is not under the operational control of SCVWA and, therefore, was not included in the inventory. Because no agricultural activities exist under SCVWA operational control, agricultural emissions (including enteric fermentation and manure management) were not considered relevant for SCVWA and are also excluded. Forestry and other land emissions potentially associated with SCVWA properties were also excluded since the SCVWA service territory is mostly in urban areas.

[24] Figure obtained from the Cambridge Community Development Department website. Accessed October 2021 from: https://www.cambridgema.gov/CDD/climateandenergy/greenhousegasemissions. This figure is provided for illustrative purposes only and may not directly correspond to operations at SCVWA (e.g., agriculture, forestry, and land use emission do not apply to SCVWA operations).

3.3 Inventory Years

A complete dataset of annual operations and usage is required to conduct a GHG inventory. Due to the merger in 2018 creating SCVWA, 2020 is the most recent complete data year and was, therefore, used to calculate this GHG inventory and forecast. While 2020 was the start of the COVID-19 pandemic, through conversations with SCVWA staff it was determined the COVID-19 pandemic had relatively little impact on SCVWA operations due to its position as an essential service provider. During the data analysis, particularly analysis of transportation emissions, COVID-19 impacts were considered and addressed. Additional information can be found in the following sections.

Generally, methodologies for setting GHG emissions targets at a minimum establish a percent reduction from 1990 emissions levels consistent with the State targets in SB 32 and EO-B-55-18. Establishing a 1990 baseline GHG inventory for SCVWA is not feasible since SCVWA as it operates today did not exist in 1990. SCVWA was created by the merger of multiple districts that joined at various times. Therefore, sufficient data to establish an activity-based inventory for the year 1990 does not exist. Also, the State's 2020 GHG emissions value is not yet published and is anticipated to be significantly impacted by COVID-19. Therefore, in the absence of 1990 activity data, Rincon utilized the state-wide California 2019 emissions and the SCVWA 2020 inventory to back-cast emissions and establish an estimated 1990 baseline. As SCVWA did not exist in 1990 as it does today, the 1990 baseline established is representative of SCVWA emissions had SCVWA existed in 1990. The 1990 baseline will aid in the development of a 2030 target which is reasonably aligned with State goals. More details on the back-casting methods and assumptions are provided in Section 3.7.

3.4 Activity Data and Emission factors

In general, emissions are calculated using activity data and emission factors according to the following equation:

$$Activity\ Data\ \times Emissions\ Factor = GHG\ Emissions$$

Activity data refer to the relevant measured or estimated energy use or other GHG emissions-generating process such as fuel consumption or metered annual electricity consumption. Activity data for each year of the inventory are geographically and temporally bounded by the location (SCVWA operational boundary) and year of operation (2020). Emission factors are observation-based conversion factors used to equate activity data to generated emissions. Emission factors are activity-specific, and are usually expressed in terms of emissions per unit of activity data (e.g., pounds of CO_2e per megawatt-hour). The data sources used to complete this inventory are summarized by Scope and source in Table 2. Unless otherwise specified, data used was for the year 2020 and within SCVWA's operational control. Emission factors used and their sources are detailed under the following sections.

Table 2 Activity Data and Sources

Scope and Source	Activity Data	Unit	Data Source
Scope 1: Direct Emissions			
Natural gas	Annual natural gas usage for all SCVWA buildings and facilities	therms	SCG billing history
Vehicle fleet and equipment (including generators and forklifts)	Annual fuel usage (diesel, gasoline, and propane)	gallons	Fuel usage reports provided by SCVWA
Scope 2: Indirect Emissions			
Grid Supplied Electricity	Annual electricity usage for all SCVWA buildings and facilities	kWh	SCE billing history
Scope 3: Indirect Emissions			
Methane Leakage	Calculated as a percentage of natural gas delivered	%	Alvarez et al. 2018[25]; Fischer et al. 2018[26]
Electricity Transmission & Distribution losses	Calculated as a percentage of electricity usage	%	United States Environmental Protection Agency Emissions & Generation Resource Integrated Database (eGRID), SCE billing history
Waste	Annual waste generated by all SCVWA buildings and facilities	tons	SCVWA waste disposal report
Employee commute	Mileage by commute method	Miles	SCVWA commute surveys and employee zip code data
Construction	Activities and scale associated capital improvement projects approved by 2020 (projects occurring 2021-2026)	various	SCVWA list of construction projects, SCVWA-provided CEQA documents
Wastewater	Employee population	Persons	Employee commute survey and employee population data

kWh = kilowatt-hours; SCG = Southern California Gas; SCE = Southern California Edison; CEQA: California Environmental Quality Act

3.5 Calculation Methods and Results

Scope 1

Natural Gas

Emissions from natural gas were calculated by multiplying the activity data from the SCG billing history (therms of natural gas used by all SCVWA buildings and facilities) by the emission factor for

[25] Alvarez R., Zavala-Araiza D., Lyon D., Allen D. Barkley Z., Brandt A., Davis K., Herndon S., Jacob D., Karion A., Kort E.; Lamb B., Lauvaux T., Maasakkers J., Marchese A., Omara M., Pacala S., Peischl J., Robinson A., and Hamburg S. (2018). *Assessment of methane emissions from the U.S. oil and gas supply chain*. Accessed December 2021 from: Science. 361. eaar7204. 10.1126/science.aar7204.

[26] Fischer M.L., Chan W.R., Delp W., Jeong S., Rapp V., and Zhu Z. (2018). *An Estimate of Natural Gas Methane Emissions from California Homes*. Accessed December 2021 from: https://pubs.acs.org/doi/pdf/10.1021/acs.est.8b03217

natural gas (Table 3). The emission factor for natural gas (MT CO_2e/therm) was determined based on a United States Environmental Protection Agency (EPA) emission factor.[27]

Table 3 GHG Emissions from Natural Gas

Year	2020
Activity Data (therms)	35,931
EF (MT CO_2e/therm)[1]	0.00531
Emissions (MT CO_2e)	**191**

Notes: Values have been rounded herein and therefore may not add up exactly.

[1] U.S. Environmental Protection Agency. (April 2021). *Emissions Factors for Greenhouse Gas Inventories*. Accessed September 2021 from online: https://www.epa.gov/climateleadership/ghg-emission-factors-hub

EF = emission factor; MT CO_2e = metric tons carbon dioxide equivalent

Vehicle Fleet and Equipment

Emissions from the SCVWA vehicle fleet, portable equipment, generators, and forklifts were calculated by multiplying the activity data from the fuel usage reports (gallons of diesel, gasoline, and propane) by the emission factor for each fuel type (Table 4). If compressed natural gas or other liquified petroleum gases are to be used in the future this can be tracked and added to the inventory; however, current data did not include these fuels are in use and, therefore, were not included in this inventory. The emission factors for diesel, gasoline, and propane (MT CO_2e/gallon) were determined based on an EPA emission factor database.[28] This database provides mobile emission factors for fuel in grams per gallon for CO_2 but grams per mile for CH_4 and N_2O. Therefore, emission factors for CH_4 and N_2O were converted to grams per gallon based on the average fuel efficiency of each vehicle type. Each vehicle's model year was used to calculate average miles per gallon (MPG) for diesel heavy-duty and light-duty vehicles as well as gasoline powered passenger, light-duty, and heavy-duty vehicles. Average fuel economy (in MPG) was obtained from the U.S. Department of Energy's Alternative Fuels Data Center.[29] The fuel economy data was applied to the EPA's GHG emissions factors for mobile gasoline and diesel to calculate an emission factor for each vehicle class. Then, weighted emissions factors for each fuel type were calculated based on the percentage of each vehicle type found in the SCVWA fleet. The final weighted emission factors are found in Table 4 below.

[27] U.S. Environmental Protection Agency. (April 2021). *Emissions Factors for Greenhouse Gas Inventories*. Accessed September 2021 from: https://www.epa.gov/climateleadership/ghg-emission-factors-hub

[28] Ibid

[29] U.S. Department of Energy, Alternative Fuels Data Center. (2020). *Average Fuel Economy by Major Vehicle Category*. Accessed December 2021 from: https://afdc.energy.gov/data/10310

Table 4 GHG Emissions from Vehicle Fleet, Equipment, and Generators, and Forklifts

Year	2019
Diesel (stationary)	
Activity Data (gallons)	1,586
EF (MT CO_2e/gallon)[1]	0.0102
Emissions (MT CO_2e)	16
Diesel (mobile)	
Activity Data (gallons)	9,230
EF (MT CO_2e/gallon)[1]	0.0103
Emissions (MT CO_2e)	95
Gasoline (mobile)	
Activity Data (gallons)	27,200
EF (MT CO_2e/gallon)[1]	0.0089
Emissions (MT CO_2e)	241
Propane	
Activity Data (gallons)	150
EF (MT CO_2e/gallon)[1]	0.0057
Emissions (MT CO_2e)	0.86
Total Emissions (MT CO_2e)	**353**

Notes: Values have been rounded herein and therefore may not add up exactly.

[1] U.S. Environmental Protection Agency. (April 2021). *Emissions Factors for Greenhouse Gas Inventories*. Accessed September 2021 from online: https://www.epa.gov/climateleadership/ghg-emission-factors-hub.

EF = emission factor; MT CO_2e = metric tons carbon dioxide equivalent

Scope 2

Grid Supplied Electricity

Emissions from electricity were calculated by multiplying the activity data from the SCE billing history (kWh of electricity used by all SCVWA buildings and facilities) by the emission factor for SCE electricity for 2020 (Table 5). The emission factor for SCE electricity was determined based on SCE's 2020 Sustainability Report.[30]

Table 5 GHG Emissions from Electricity

Year	2020
SCE	
Electricity (kWh)	57,085,480
EF (MT CO_2e/kWh)[1]	0.000271
Total Emissions (MT CO_2e)	**15,484**

Notes: Values have been rounded herein and therefore may not add up exactly.

[1] Based on Edison International 2020 Sustainability Report.

kWh = kilowatt-hour; EF = emission factor; MT CO_2e = metric tons carbon dioxide equivalent

[30] Edison International. (2020). *2020 Sustainability Report*. Accessed October 2021 from: https://www.edison.com/home/sustainability/sustainability-report.html

Scope 3

Methane Leakage

In addition to direct natural gas consumption, emissions are also released from methane leakage both at the natural gas compressor stations and from leakage at the meter. Based on recent studies, there is a leakage rate of approximately 2.8% of natural gas delivered.[31,32] GHG emissions from methane leakage were calculated by multiplying the quantity of leaked natural gas by the emission factor for fugitive emissions from the natural gas distribution system (Table 6).

Table 6 GHG Emissions from Natural Gas Methane Leakage

Year	2020
Natural Gas (Therms)	35,932
Methane Leakage (Therms)[1]	1,006
EF (MT CO_2e/Therm)[2]	0.04689
Total Emissions (MT CO_2e)	**47**

Notes: Values have been rounded herein and therefore may not add up exactly.

[1] Based on peer reviewed studies, 2.8% of natural gas delivered is leaked from compressor stations and at the end user meter.

[2] Calculated by multiplying cubic meter of natural gas per therm (2.776) [source: https://www.abraxasenergy.com/energy-resources/toolbox/conversion-calculators/energy/] by density of natural gas (0.000712 MT/ cubic meter) [source: https://www.unitrove.com/engineering/tools/gas/natural-gas-density] by methane content of natural gas (94.9%) [source: North American Energy Standards Board]. Adjusted for GWP of CH_4.

EF = emission factor; MT CO_2e = metric tons carbon dioxide equivalent

Electricity T&D Losses

Electricity T&D losses were assumed to be 5.3% percent of total electricity usage in 2020, based on the U.S. EPA's Emissions & Generation Resource Integrated Database.[33] Emissions from T&D losses were calculated by multiplying the calculated activity data (kWh of electricity from T&D losses) by the electricity emission factor for 2020 (Table 7).

Table 7 GHG Emissions from Electricity T&D Losses

Year	2020
SCE Emissions	
Electricity (kWh)	57,085,480
T&D loss (kWh)[1]	3,025,530
EF (MT CO_2e/kWh)[2]	0.000271
Total Emissions (MT CO_2e)	**821**

Notes: Values have been rounded herein and therefore may not add up exactly.

[1] Based on EPA eGRID CAMX T&D loss factor of 5.3 percent in 2020.

[2] Based on Edison International 2020 Sustainability Report.

[31] Alvarez R., Zavala-Araiza D., Lyon D., Allen D. Barkley Z., Brandt A., Davis K., Herndon S., Jacob D., Karion A., Kort E.; Lamb B., Lauvaux T., Maasakkers J., Marchese A., Omara M., Pacala S., Peischl J., Robinson A., and Hamburg S. (2018). *Assessment of methane emissions from the U.S. oil and gas supply chain*. Accessed December 2021 from: Science. 361. eaar7204. 10.1126/science.aar7204.

[32] Fischer M.L., Chan W.R., Delp W., Jeong S., Rapp V., and Zhu Z. (2018). *An Estimate of Natural Gas Methane Emissions from California Homes*. Accessed December 2021 from: https://pubs.acs.org/doi/pdf/10.1021/acs.est.8b03217

[33] U.S. Environmental Protection Agency. (2020). Emissions & Generation Resource Integrated Database: eGRID Summary Tables 2020. Accessed January 2022 from: https://www.epa.gov/system/files/documents/2022-01/egrid2020_summary_tables.pdf

kWh = kilowatt-hour; T&D = transmission and distribution; EF = emission factor; MT CO_2e = metric tons carbon dioxide equivalent

Waste

GHG emissions associated with the waste sector result from the collection and transportation of waste to landfills, the decomposition of waste at a landfill, combustion of waste, and waste processing equipment. SCVWA provided annual waste data generated at its facilities characterized by waste type: trash, recycling, green waste, metal scrap, and oil waste. The following waste categories were respectively defined under the EPA's waste categorization terminology: mixed municipal solid waste, mixed recyclables, green waste, and scrap metal. Oil waste was not included in the calculations as this waste is not disposed of at a traditional waste facilities and data is limited on appropriate emissions factors due to various disposal methods. Emissions from waste were calculated by applying appropriate emissions factors from the EPA's *Scope 3 Category 5: Waste Generated in Operations* to the total short tons disposed of each respective waste type.[34] Table 8 contains the solid waste data and resulting GHG emissions values.

Table 8 GHG Emissions from Waste

Year	2020
Mixed Municipal Solid Waste	
Activity Data (short tons disposed)	630
EF (MT CO_2e/short ton)[1]	0.52
GHG Emissions (MT CO_2e)	328
Mixed Recyclables	
Activity Data (short tons disposed)	135
EF (MT CO_2e/short ton)[2]	0.09
GHG Emissions (MT CO_2e)	12
Green Waste	
Activity Data (short tons disposed)	260
EF (MT CO_2e/short ton)[3]	0.33
GHG Emissions (MT CO_2e)	86
Scrap Metal	
Activity Data (short tons disposed)	18.6
EF (MT CO_2e/short ton)[4]	0.23
GHG Emissions (MT CO_2e)	4
Total Waste GHG Emissions (MT CO_2e)	**430**

Notes: Values have been rounded herein and therefore may not add up exactly.

[1] Emissions factor for *Mixed MSW (landfilled)* from EPA GHG Emissions, Table 9.

[2] Emissions factor for *Mixed Recyclables (recycled)* from EPA GHG Emissions, Table 9.

[3] Emissions factor for *Greenwaste (yard trimmings, landfilled)* from EPA GHG Emissions, Table 9.

[4] Emissions factor for *Metal Scrap (recycled)* from EPA GHG Emissions, Table 9.

EF = emission factor; MT CO_2e = metric tons carbon dioxide equivalent

[34] EPA GHG Emission Factors Hub - Table 9 - Scope 3, Category 5 & 12: Waste Generated in Operations & End of Life Treatment of Sold Products. Accessed October 2021 from: https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf

Employee Commute

Emissions from employee commuting were calculated using the results from the SCVWA employee commute survey indicating the vehicle fuel type and one-way commute distance. The responses (93 responses) to the survey were scaled to the entire employee population in 2020 (218 employees) to estimate the number of employees using diesel-fueled, hybrid, gasoline-fueled or EV vehicles. The mean one-way commute distance from the survey results was assumed for all trips, 14.7 miles, and doubled to account for roundtrip commute distance. The CARB Emission Factor 2021 model (EMFAC2021) was used to estimate 2020 emissions factors (MT CO_2e per mile) by fuel type.[35] Table 9 contains the employee commute data, emissions factors, and the resulting GHG emissions.

Table 9 Employee Commute Data and GHG Emissions

	2020
Employee Commute Survey Statistics[1]	
Mean Commute (one-way, miles)	14.7
Average Days Commuted (pre-flexible work plan)	4.8
Days commuted (days)	241
Hybrid Vehicles	
Percent of employee commute (%)	6%
Vehicle Miles Traveled (miles/year)	99,921
EF (MT CO_2e/mile)	0.000317
Emissions (MT CO_2e)	32
Electric Vehicles	
Percent of employee commute (%)	3%
Vehicle Miles Traveled (miles/year)	49,961
EF (kWh/mile)	0.361432
Electricity Consumed (kWh)	18,057
EF (MT CO_2e/kWh)[2]	0.000271
Emissions (MT CO_2e)	5
Gasoline Vehicles	
Percent of employee commute (%)	83%
Vehicle Miles Traveled (miles/year)	1,282,324
EF (MT CO_2e/mile)	0.000384
Emissions (MT CO_2e)	492
Diesel Vehicles	
Percent of employee commute (%)	5%
Vehicle Miles Traveled (miles/year)	83,268
EF (MT CO_2e/mile)	0.00136
Emissions (MT CO_2e)	113
Total VMT (miles)	**1,515,474**
Total Emissions (MT CO_2e)[5]	**642**

35 CARB. (2021) Emissions Inventory, EMFAC 2021 model v1.01.1. Accessed October 2021 from: https://arb.ca.gov/emfac/emissions-inventory/43c4fb407b5290c4aa6bc403e03c79c39ed6224a

Notes: Values have been rounded herein and therefore may not add up exactly.

[1] Calculated based on an estimate of number of trips completed per fuel type per week (from employee commute survey) and average commute distance per employee per week. It is assumed that employees work 50 weeks a year to account for a 2-week vacation.

[2] Southern California Edison Emissions Factor. See Grid Supplied Electricity above.

EF = emission factor; EV = electric vehicle, VMT = vehicle miles traveled; MT CO_2e = metric tons carbon dioxide equivalent; kWh = kilowatt-hour

Construction

Emissions from construction were estimated using Capital Improvement Project (CIP) data provided by SCVWA for all historical projects occurring in 2019 through 2021. Relevant activity data (e.g., linear feet of pipeline, acres of demolition) was used to model construction emissions using the California Air Pollution Control Officers Association (CAPCOA) California Emissions Estimator Model (CalEEMod). Due to the smaller scale of many projects and the lack of a project-specific air quality/GHG emissions study, the calculation notes column in Table 10 includes various conservative assumptions used to quantify the GHG emissions of each project. Once total emissions were calculated for historical CIP projects over the three-year period an annualized emissions value was calculated by dividing the total by the three-year span; the resulting emissions totals are included in Table 10. Additionally, Table 10 includes the project type, SCVWA-assigned project name, calculated emissions, and calculation notes.

Table 10 Construction Calculation Data and GHG Emissions for the 2020 Inventory

Project Type	Project Name	Emissions (MT CO_2e)	Calculation Notes
Recycled Water Extension	West Ranch Recycled Water Main Extension (Phase 2D)	150	SCVWA provided the Final ISMND for the West Ranch Recycled Water Main Extension Project which included CalEEMod data using CalEEMod Version 2016.3.1. For Phase 2D of this project, the 2017 annual GHG Emissions totaled 37.4934 MT CO2e. Since the quantification in the ISMD only accounted for 2017, the estimated total GHG emissions were multiplied times four to account for the scheduled completion data of 2021 (four-year time span). It is understood that the activities will likely vary amongst these four years, but this methodology yields a conservative GHG emissions estimate to remain consistent with all CIP quantification.
Recycled Water Extension	Vista Canyon Recycled Water Main Extension (Phase 2B)	204	Project emissions were estimated using CalEEMod based on project information and type of activities the project would involve as provided by SCVWA. SCVWA indicated type of activities included on-site preparation activities and pipeline trenching, and required a maximum of two years. To maintain a conservative estimate and to account for the lack of trenching area data obtained, it was assumed the area trenched was 0.26 acre, as stated in the CIP data provided by SCVWA regarding pipeline replacement projects.
Treatment Upgrades	Valley Center Well PFAS Groundwater Treatment Improvements Material Purchase	NA	Project emissions for purchasing of materials are considered negligible and were not quantified. It was assumed the materials purchased as part of this project were used in the E Wells PFAS removal projects (included in Table 16).
Treatment Upgrades	Valley Center Well PFAS Groundwater Treatment Improvements Site Construction	8	Based on SCVWA information provided for the E Wells PFAS Removal Projects (discussed in Table 16), it was assumed that the Valley Center Well PFAS Groundwater Treatment site was of similar size. Project emissions were estimated using CalEEMod assuming site construction was associated with on-site preparation activities over 2 acres.
Pipeline Extensions and Upgrades	Commerce Center Drive Pipeline	204	Project emissions for "pipeline extension and upgrades project" were estimated using CalEEMod based on the type of activities the project would involve as provided by SCVWA. Based on the data provided by SCVWA, these projects involved the following types of activities: soil disturbance via excavation for vaults and open trenching for installation of new pipeline. After review of the provided CIP data, these pipeline extension and upgrade projects were calculated with the following conservative assumptions: 6 acres site preparation and 261,360 ft^2 of trenching for pipeline construction where the width was conservatively assumed to be 42".
Pipeline Extensions and Upgrades	Magic Mountain Pipeline Phase 4	204	
Pipeline Extensions and Upgrades	Magic Mountain Pipeline Phase 5	204	
Pipeline Extensions and Upgrades	Magic Mountain Pipeline Phase 6A	204	
Pipeline Extensions and Upgrades	Magic Mountain Pipeline Phase 6B	226	Project emissions were similarly quantified as described above. Based on the data provided by SCVWA, this project involved the following types of activities: soil disturbance via excavation for

Project Type	Project Name	Emissions (MT CO_2e)	Calculation Notes
			vaults, open trenching for installation of new pipeline, and paving of an access road. The project emissions were estimated using CalEEMod with the following conservative assumptions: 6 acres site preparation, 261,360 ft^2 of trenching for pipeline construction where the width was conservatively assumed to be 42", and 68,640 ft^2 access road paving (0.5-mile length, 26 feet wide).
Tank Additions and Replacement	Westridge Recycled Tank Upgrades Potable Make-up Above Ground Piping	83	Project emissions were estimated using CalEEMod based on project information and type of activities the project would involve as provided by SCVWA. Project phases included demolition, site preparation, grading, building construction, paving, and architectural coating. This project was calculated assuming 102 feet of 12-inch pipe installation and a 50-foot x 20-foot driveway, totaling 1,452 square fee^t of project area. The demolition of the masonry wall was calculated assuming a thickness of 1 foot, height of 5 feet and length of 102 feet, correlating with the length of the pipeline.
Historical CIP Projects Total Emissions		**1,487**	Total GHG emissions quantified from all historical projects that occurred from 2019-2021.
Annualized Emissions		**496**	Annualized construction emissions value obtained from dividing the total historical emissions by the three-year span (2019-2021).

Notes: Values have been rounded herein and therefore may not add up exactly.

Wastewater Processes

The wastewater from SCVWA campuses is treated by two wastewater reclamation plants (WRPs), the Saugus WRP and the Valencia WRP, both of which treat to tertiary levels with varying influent loads and Biochemical Oxygen Demand (BOD_5). To quantify GHG emissions from the WRPs (Table 11), Rincon used the activity data from SCVWA, National Pollutant Discharge Permits [36,37], and followed wastewater (WW) methods from ICLEI[38]:

- WW.7 to estimate process N_2O emissions from wastewater treatment plants with nitrification or denitrification
- WW.12.a to characterize fugitive N_2O emissions from effluent discharge to aquatic environments
- WW.15 to calculate upstream emissions associated with wastewater collection and treatment

Table 11 Employee GHG Emissions from Wastewater Generation

Year	2020
Population Served	218
N_2O Process Emissions (Nitrification/Denitrification) (MT $CO2_e$)[1]	0.57
N_2O Emissions from Effluent Discharge (MT CO_2e)[2]	3.39
Total Process Emissions (MT CO_2e)	**3.96**
Per Capita Use (gallon/day/capita)[3,4]	100
Collection Process Energy Intensity (kWh/MG)[5]	280
Wastewater Treatment Process Energy Intensity (kWh/MG)[6]	16,000
EF (MT CO_{2e}/kWh)[6]	0.000271
Collection & Treatment Emissions (MT CO_{2e})	**25.03**
Total Wastewater Emissions (MT CO_{2e})	**30**

Notes: Values have been rounded herein and therefore may not add up exactly.

[1].Calculated using ICLEI Method WW.7 and all applicable default values.

[2] Calculated using ICLEI Method WW.12.a and all applicable default values.

[3] ICLEI default factor for California, table WW.15.1.

[4] The annual per capita use was adjusted for the total days workers were using facilities in 2020 (260 days annually).

[5] ICLEI default for collection process energy intensity, median value used for a conservative estimate.

[6] ICLEI default for wastewater treatment facilities with an operation capacity of 20-50 MG.

[7] Emissions factor converted from SCE's 2019 grid emissions factor of 512 pounds CO_{2e}/MWh.

N_2O = nitrous oxide; EF = emission factor; MT CO_2e = metric tons carbon dioxide equivalent; kWh = kilowatt-hour; MG = million gallons

36 California Regional Water Quality Control Board, Los Angeles Region. (2015). Waste Discharge Requirements for The Santa Clarita Valley Sanitation District of Los Angeles County, Valencia Water Reclamation Plant. Accessed November 2021 from: https://www.waterboards.ca.gov/losangeles/board_decisions/tentative_orders/individual/npdes/Santa_Clarita_Valley_Sanitation_District_of_Los_Angeles_County/ValenciaWRP_Tentative_2-11-2015%20Mailout.pdf

37 California Regional Water Quality Control Board, Los Angeles Region. (2015). Waste Discharge Requirements for The Santa Clarita Valley Sanitation District of Los Angeles County, Saugus Water Reclamation Plant. Accessed November 2021 from: https://www.waterboards.ca.gov/losangeles/board_decisions/tentative_orders/individual/npdes/Santa_Clarita_Valley_Sanitation_District_of_Los_Angeles_County/Saugus_Water_Reclemation_Plant/SaugusWRP_Tentative2_03-26-2015_forMailout.pdf

38 ICLEI. (2013). U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions Appendix F: Wastewater and Water Emission Activities and Sources Version 1.1. Accessed October 2021 from: https://icleiusa.org/ghg-protocols/

3.6 Inventory Summary

Results for all GHG emissions sectors were added together to develop total GHG emissions for each year (Table 12). For all years in the inventory, electricity and construction were the highest contributors to SCVWA GHG emissions, (Figure 2). By Scope, Scope 2 emissions were the highest, followed by Scope 3 then Scope 1 emissions (Figure 3).

Table 12 GHG Emissions Inventory Summary

Emissions Source	Scope	GHG Emissions (MT CO_2e)	% Contribution
Vehicle Fleet and Equipment	Scope 1	353	2%
Natural Gas	Scope 1	191	1%
Scope 1 Subtotal		**544**	**3%**
Electricity	Scope 2	15,484	84%
Scope 2 Subtotal		**15,484**	**84%**
Methane Leakage	Scope 3	47	<1%
Electricity T&D Losses	Scope 3	821	4%
Employee Commute	Scope 3	642	3%
Waste	Scope 3	430	2%
Construction	Scope 3	496	3%
Wastewater	Scope 3	30	<1%
Scope 3 Subtotal		**2,465**	**13%**
Total Emissions		**18,493**	**100%**

Notes: Values have been rounded herein and therefore may not add up exactly. All values shown are in units of MT CO_2e

MT CO_2e = metric tons carbon dioxide equivalent; T&D = transmission and distribution

Figure 2 GHG Emissions Inventory by Source: 2020

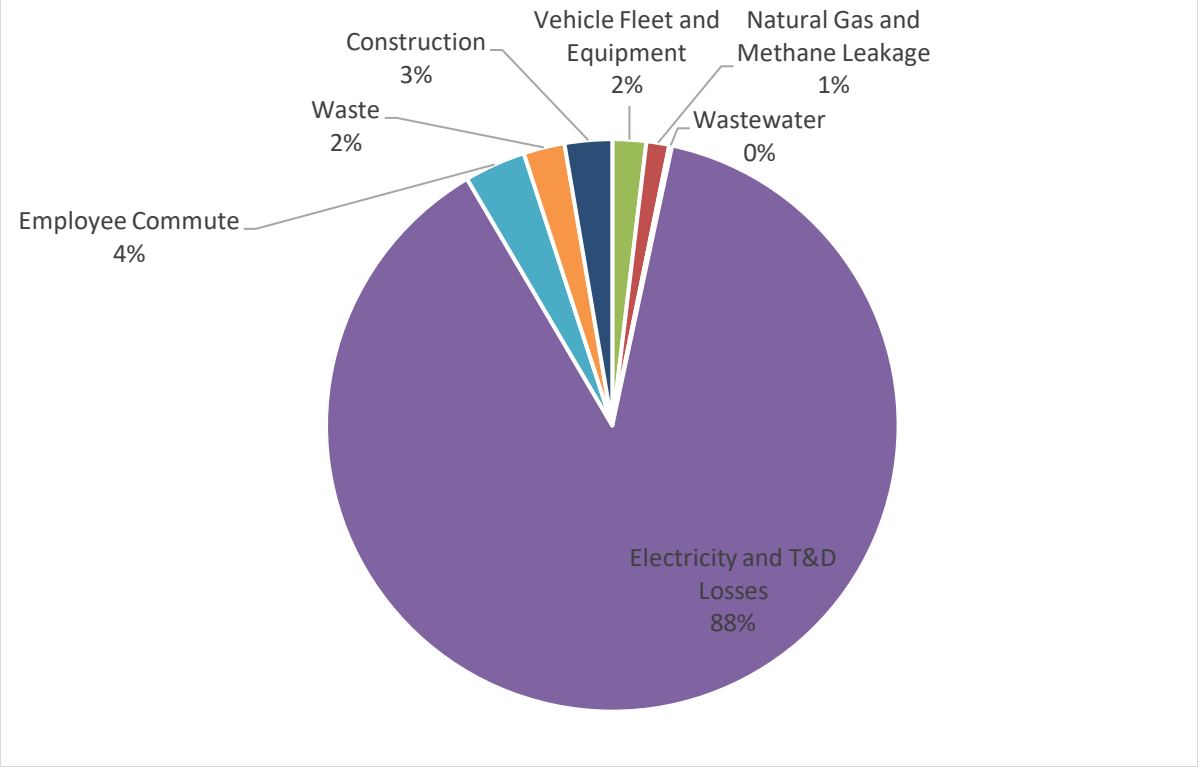
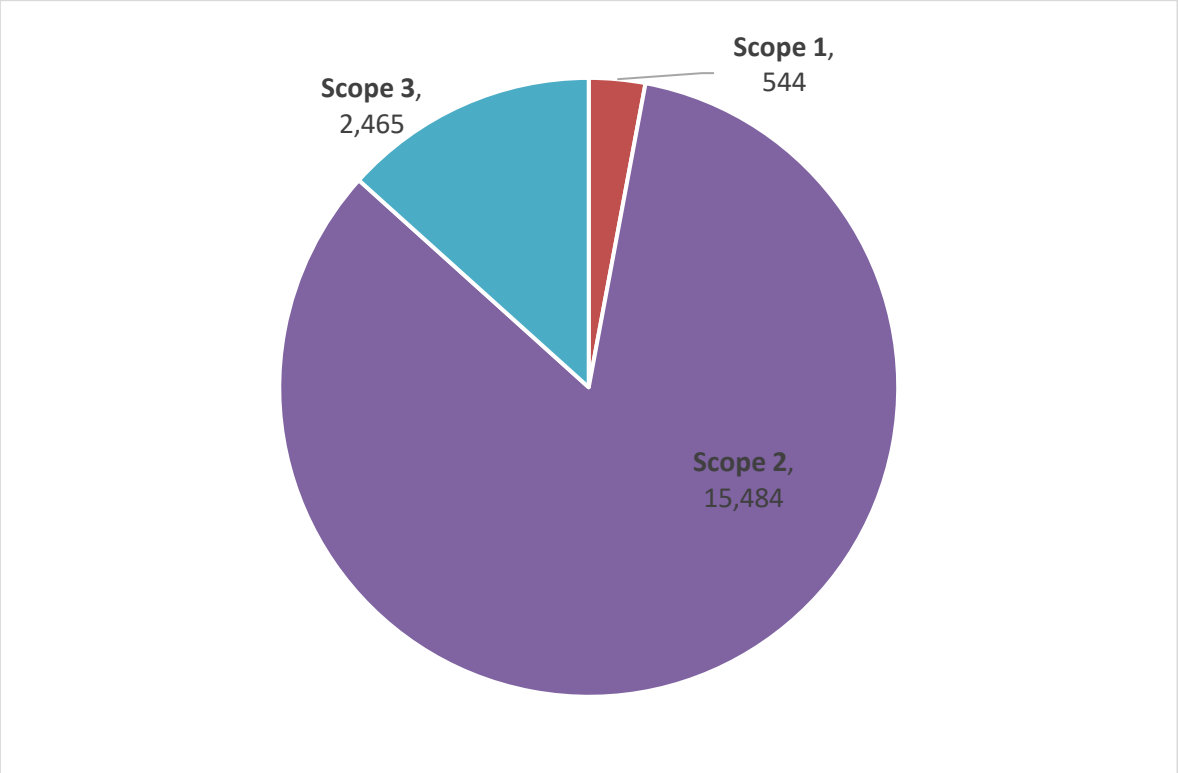


Figure 3 GHG Emissions Inventory by Scope: 2020



3.7 Back-cast to 1990

To aid in determining a 2030 emissions target for SCVWA, a back-cast of GHG emissions to 1990 was developed. Current defensible methodologies for setting GHG emissions targets establish a percent reduction from 1990 emissions levels consistent with the State goals in SB 32 and EO-B-55-18. However, most jurisdictions do not have a 1990 inventory. To address this, methods have been developed to establish a 1990 back-cast based on inventories from later years and an assumption about how much higher or lower the inventory year emissions are relative to 1990. CARB finds it an acceptable methodology to assume a jurisdiction's emissions for its later inventory year and the state-wide emissions for that same year have increased or decreased approximately the same percentage relative to 1990. Due to the recent merger, the only complete data year for SCVWA is 2020 and was thereby used to set the baseline. However, state-wide emissions for 2020 have not yet been published at the time of this report. Furthermore, state-wide activities during calendar year 2020 were impacted by COVID-19 and it is expected the 2020 state-wide emissions will likely be lower than 2019 state-wide emissions. Therefore, California's 2019 GHG emissions total was used to establish a 1990 baseline for SCVWA.[39] Using the 2019 state-wide emissions as a proxy for 2020 state-wide emissions yields a conservative estimate which more accurately represents the state-wide emissions under normal circumstances.

[39] CARB. (2021). *California Greenhouse Gas 2000-2019 Emissions Trends and Indicators Report*. Accessed November 2021 from: https://ww2.arb.ca.gov/our-work/programs/ghg-inventory-program

For example, SCVWA emitted 18,493 MT CO_2e in 2020. California emitted approximately 278 million MT CO_2e in 2019 state-wide compared to 312 million MT CO_2e in 1990, which represents a 11% decrease between 1990 and 2019.[40] This change factor was applied to SCVWA's 2020 inventory emissions total to back-cast to 1990 as shown below in (Table 13). Therefore, the best available data (i.e., the 2020 inventory) was used to determine a 1990 baseline from which to set GHG reduction targets consistent with State standards. The concept of "best available data" is referenced by both CARB in the 2017 Scoping Plan Update[41] and the GHG Protocol.[42]

Table 13 1990 GHG Emissions Back-cast

Emissions	Total
California 1990 Emissions (MMT CO_2e)	312
California 2019 Emissions (MMT CO_2e)	278
1990 Change Factor (%)	-11%
2020 SCVWA Emissions (MT CO_2e)	18,493
1990 SCVWA Emissions (MT CO_2e)	**20,516**

Notes: Values have been rounded herein and therefore may not add up exactly.
MMT CO_2e = million metric tons carbon dioxide equivalents

[40] State-level GHG emissions values used to establish a 1990 baseline exclude emissions from the industrial, agricultural, and high-GWP emissions sectors, to allow for comparison with SCVWA's emissions inventory, which also excludes these sectors.

[41] CARB. (2017). *California' 2017 Climate Change Scoping Plan the Strategy for achieving California's 2030 greenhouse gas target*. Accessed October 2021 from: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf

[42] World Resources Institute. (2015). *The Greenhouse Gas Protocol. A Corporate Accounting and Reporting Standards*. Accessed October 2021 from. https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf

4 Forecast

SCVWA's GHG emissions are expected to change over time due to expected changes in water demand and new projects allowing for increased water production and supply, as well as increased water conservation. Forecasting annual GHG emissions accounts for these projected changes using population and water demand growth rates and extrapolates from the inventory an estimate of GHG emissions in future years. The GHG forecast also accounts for projected GHG emissions reduction impacts from State legislation. Calculating the difference between the forecasted GHG emissions and the reduction targets determines the gap to be closed through a GHG reduction strategy and associated GHG emissions reduction measures.

This document presents two forecast scenarios: a business-as-usual (BAU) forecast scenario and an adjusted forecast scenario. The BAU forecast scenario projects the expected growth for all GHG emissions sources based on SCVWA water service changes alone.[43] The adjusted forecast accounts for water demand changes and additionally quantifies and incorporates State legislation expected to reduce SCVWA GHG emissions through 2030 and 2045, as discussed in Section 2.3. Specifically, the adjusted forecast prepared for SCVWA includes GHG reductions associated with SB 100, the primary driver of emissions for SCVWA due to State legislation. Based on review of other State legislation intended to reduce GHG emissions such as Title 24 and the Advanced Clean Cars program, they were found to have limited impact on SCVWA operations and therefore were not included in the adjusted forecast. The BAU forecast, when compared to the adjusted forecast, demonstrates the extent of State-level GHG emissions reductions from legislation. As such, the adjusted forecast represents a more accurate picture of future GHG emissions. Therefore, the adjusted forecast is used to determine the emissions gap between the forecast and the GHG reduction targets. This emissions gap will need to be bridged through actions and policies in the GHG reduction strategy.

4.1 Forecast Years

The forecast was developed for years 2025, 2030, 2035, 2040, and 2045, consistent with the State's current GHG emissions reduction goals. The 2030 forecast year is consistent with SB 32, the 2045 forecast year aligns with EO-B-55-18, and the 2025, 2035, and 2040 interim forecast years help identify a clear declining trend and milestone of progress toward the long-term State reduction goals.

4.2 Activity Data and Growth Factors

Activity data from the 2020 inventory and water demand data from SCVWA's 2020 UWMP Volume 1 and also renewable procurement projections from SCE were used to develop the BAU and adjusted forecasts.[44] The 2020 UWMP includes three projected water supply demand scenarios: average/normal year, single dry year, and five-year dry year (Tables 7-2, 7-3, 7-4 of the UWMP). Each of these projections included demands with passive conservation estimates in acre-feet for the years 2025, 2030, 2035, 2040, 2045, and 2050. To assess which UWMP water demand forecast

[43] Construction emissions sources were kept constant through 2045 since annual construction activity is expected to remain constant through 2045.

[44] SCVWA. (2021). *2020 Urban Water Management Plan for Santa Clarita Valley Water Agency Volume 1 Final.* Accessed October 2021 from https://yourscvwater.com/wp-content/uploads/2021/06/SCVWA-2020-UWMP-Volume-I_FINAL.pdf

scenario to use for GHG emissions forecasting and target-setting, a sensitivity analysis was performed using all three demand scenarios. Between the single-dry year and five-year dry year scenarios, both of which yield a more conservative GHG emissions estimate than the average/normal year, there was less than a 4% difference in forecasted GHG emissions. The single-dry year yielded slightly higher emissions values for the 2045 forecast year; therefore, this analysis used the passive conservation demand from the single-dry year scenario to calculate a conservative growth factor (as opposed to using the active conservation demand estimate which may overestimate the water reduction efforts implemented in future years, thereby underestimating future emissions). The table below, as shown in Table 14, contains data used to generate growth factors for the forecast.

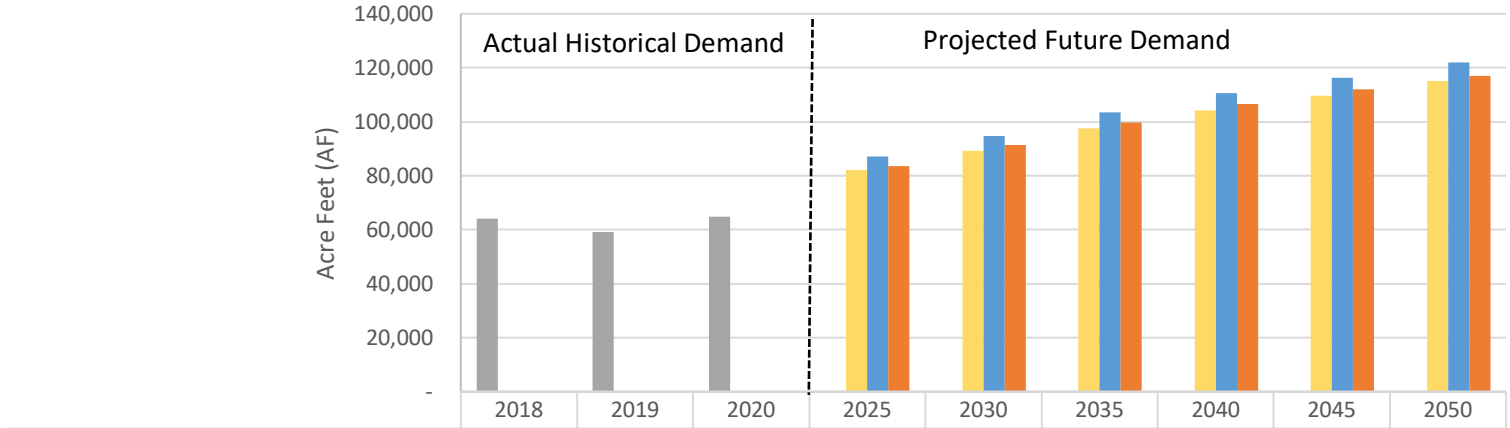
Table 14 Activity Data for Forecasting

Data	Unit	Source
Water demand	Acre-feet (AF) of water	SCVWA 2020 Urban Water Management Plan
RPS energy mix changes	Percent	SB 100

The forecasts are primarily driven by the anticipated water demands for SCVWA. For example, electricity usage by SCVWA is expected to increase in future years consistent with population growth in the service area and increased groundwater pumping and various groundwater replenishment activities. Historical and projected water demand data from the SCVWA 2020 UWMP is shown on the following page in Figure 4.[45] The graph displays the projected demands of all three projected scenarios in the SCVWA 2020 UWMP.

[45] Ibid

Figure 4 SCVWA Historical and Future Water Demand[46]



	2018	2019	2020	2025	2030	2035	2040	2045	2050
Historical Demand (AF)	64,011	59,098	64,734						
Project Average/Normal Year Demand (AF)				82,100	89,300	97,600	104,300	109,600	115,100
Projected Single Dry Year Deamand (AF)				87,000	94,700	103,500	110,600	116,200	122,000
Projected Multiple Dry Year Demand (AF)				83,570	91,380	99,670	106,660	112,100	117,010

[46] Ibid

To model growth in each emissions sector based on water demand projections, growth factors (e.g., electricity use per volume water demand, or kWh per AF) for each emissions sector were developed based on the 2020 inventory and the water demand data for those years (Table 15). Each growth factor was multiplied by the forecasted demand in the 2020 UWMP to estimate future activity data values. The projected activity data was then multiplied by an emissions factor to determine GHG emissions associated with the activity. While not all emissions sources (such as vehicle fleet) will scale directly with demand, this methodology provides a conservative estimate of future growth and associated SCVWA emissions.

Table 15 Growth Factors for Forecasting

GHG Emissions Sector	Growth Factor	Units
Natural Gas	0.5551	Therms natural gas/AF potable water demand
Methane Leakage	0.0155	Therms of methane leaked/AF potable water demand
Diesel	0.1426	Gallons diesel/AF potable water demand
Gasoline	0.4202	Gallons gasoline/AF potable water demand
Propane	0.0023	Gallons propane/AF potable water demand
Wastewater	0.0005	MT CO_2e/AF potable water demand
SCE Electricity	881.8469	kWh/AF potable water demand
SCE T&D	46.7379	kWh/AF potable water demand
Employee Commute	19.3462	VMT/AF potable water demand
Waste	0.0066	MT CO_2e/AF potable water demand

AF = acre-foot; MT CO2e = metric tons carbon dioxide equivalents; SCE = Southern California Edison; T&D = transmission and distribution, kWh = kilowatt hour; VMT = vehicle miles traveled

The GHG emissions associated with construction are an exception to this methodology. Emissions from construction of future CIP projects planned for the next five years (2022-2026) were quantified using CAPCOA's CalEEMod based on data provided by SCVWA on the construction projects. Due to the smaller scale of many projects and the lack of a project-specific air quality/GHG emissions study, the calculation notes column below includes various conservative assumptions made to quantify the GHG emissions of each project. Once total emissions were calculated for future CIP projects over the five-year period, an annualized emissions value was calculated by dividing the total by the five-year span; the resulting emissions totals are included in Table 16. Additionally, Table 16 includes the project type, SCVWA-assigned project name, calculated emissions, and calculation notes. Based on the historical CIP projects conducted between 2019-2021 and the future CIP projects between 2022-2026, construction activity and associated emissions appear to remain relatively constant when annualized. As there is limited understanding of future construction needs in ten to thirty years, GHG emissions associated with construction were therefore kept constant through 2045, rather than scaling with water demand.

Table 16 Construction Calculation Data and GHG Emissions for Future CIP Projects

Project Type	Project Name	Emissions (MT CO_2e)	Calculation Notes
Treatment Upgrades	E Wells PFAS Removal Projects	253	Project emissions were estimated using CalEEMod based on the data and types of activities the project would involve as provided by SCVWA. Based on the data provided by SCVWA, this project involves the following types of activities: demolition of existing pavement, soil disturbance via open trenching for installation of new pipeline, and installation of new IX vessels. Emissions from the project were calculated using the following conservative assumptions: 2-year construction, 2 acres of site preparation, 500 ft^2 of existing pavement pads demolition, 87,120 ft^2 of trenching for installation of the new pipeline and IX vessels, and architectural coating of new IX vessels.
Treatment Upgrades	Santa Clara and Honby PFAS	255	Project emissions were estimated using CalEEMod based on the data and types of activities the project would involve as provided by SCVWA. Based on the data provided by SCVWA, this project involves the following types of activities: demolition of existing pavement, soil disturbance via open trenching for installation of new pipeline, and installation of new concrete pads. This project was calculated using CalEEMod results including demolition of existing pavement pad, soil disturbance (on-site prep), and trenching for the new pipeline. Emissions from the project were calculated using the following conservative assumptions: 2-year construction, 2 acres of site preparation, 500 ft^2 of existing pavement pads demolition, 87,120 ft^2 of trenching for installation of the new pipeline, and pavement of new concrete pads assuming a maximum of 20 well pads, each pad 10 square feet, yielding a conservative estimate of 500 square feet of pavement needed.
Treatment Upgrades	Well 201 VOC Treatment	126	Project emissions were estimated using CalEEMod based on the data and types of activities the project would involve as provided by SCVWA. Based on the data provided by SCVWA, involves the following types of activities: demolition of existing pavement and soil disturbance via open trenching for installation of new pipeline. This project was calculated using CalEEMod results including demolition of existing pavement pad, soil disturbance (on-site prep), and trenching for the new pipeline. Emissions from the project were calculated using the following conservative assumptions: 1-year construction, 1 acres of site preparation, 250 ft^2 of existing pavement pads demolition, and 43,560 ft^2 of trenching for installation of the new pipeline.
Pipeline Extensions and Upgrades	Honby Tanks Bootleneck Project	204	Project emissions for “pipeline extension and upgrades project” were estimated using CalEEMod based on the type of activities the project would involve as provided by SCVWA. Based on the data provided by SCVWA, these projects involve the following types of activities: soil disturbance via excavation for vaults and open trenching for installation of new pipeline. After review of the provided CIP data, this pipeline extension and upgrade projects were calculated with the following conservative assumptions: 6 acres of site preparation, and 261,360 ft^2 of trenching for pipeline construction where the width was conservatively assumed to be 42”.
Pipeline Extensions	Castaic Conduit	280	Project emissions for “pipeline extension and upgrades project” were estimated using CalEEMod based

and Upgrades	Pipeline Project		on the type of activities the project would involve as provided by SCVWA. Based on the data provided by SCVWA, these projects involve the following types of activities: demolition of existing pavement, soil disturbance via excavation for vaults and open trenching for installation of new pipeline. After review of the provided CIP data, these pipeline extension and upgrade projects were calculated with the following conservative assumptions: 6 acres of demolition and site preparation, and 261,360 ft^2 of trenching for pipeline construction where the width was conservatively assumed to be 42".
Pipeline Extensions and Upgrades	Honby Pipeline Phase 2 Project	280	
Pipeline Extensions and Upgrades	Magic Mountain Booster Station and V-9 Turnout Facility	280	
Pipeline Extensions and Upgrades	ESFP Washwater	280	
Tank Improvements	ESFP Tank No. 1 Improvements	26	Project emissions were estimated using CalEEMod based on data from SCVWA that there would be no soil disturbance and the project would involve only work inside the existing tank. It was conservatively assumed the entire tank interior will be re-coated. Given the tank's capacity of 5 MG, this equals a surface area of 1,336,806 ft^2. The activity emissions were quantified in two phases: site preparation and architectural coating.
Reservoir	Magic Mountain Reservoir 1	357	Project emissions were estimated using CalEEMod based on project information and type of activities the project would involve as provided by SCVWA. Project phases include the following phases: site preparation and reservoir excavation, grading, reservoir construction, lining of reservoir, paving, and trenching. Based on SCVWA provided data, the project site is 60,736 ft^2 and the project would take place over 2 years of construction.
Well Construction	Saugus #3 & #4 Wells Construction (Replacement Wells)	341	Emissions from the Saugus Well projects were quantified using one CalEEMod model to avoid double-counting of GHG emissions. Based on information provided by SCVWA, emissions were calculated from the following activities: site preparation, grading, installation of new equipment, construction of block wall chemical building, paving of concrete pads, architectural coating of interior of chemical building, and trenching for the 1-mile pipeline. These estimates assumed a project timeline of two years. The Agency provided data from the Draft Mitigated Negative Declaration for Castaic Lake Water Agency's Groundwater Contaminant Treatment & Restoration project. The metrics used to estimate GHG Emissions correspond with the data in this document; however, no GHG Emissions quantification was included in this Mitigated Negative Declaration document.
Well Construction	Saugus Wells 3 & 4 (Replacement Wells) Well Equipment and Site Improvements	NA	
Tank Additions and Replacement	RVWTP Diesel Underground Tank Replacement	23	Project emissions were estimated using CalEEMod based on project information and type of activities the project would involve as provided by SCVWA. Project phases include site preparation and demolition/removal of tank. Emissions were calculated based on a conservative demolition/soil disturbance estimate for a one-acre project.
Future CIP Projects Total Emissions		**2,705**	Total GHG emissions quantified from all future CIP projects for the next five years (2022-2026)
Annualized Emissions		**541**	Annualized construction emissions value obtained from dividing the total future emissions by the five-year span (2022-2026).

Notes: Values have been rounded herein and therefore may not add up exactly.

The following provides an overview of how each GHG emissions source was forecast:

- **Scope 1**
  - **Natural Gas**. The growth factor for natural gas was multiplied by water demand projection data for each year, then multiplied by the emission factor used in the inventory.
  - **Vehicle Fleet and Equipment.** The growth factors for diesel, gasoline, and propane were multiplied by water demand projection data for each year, then multiplied by the corresponding emission factors used in the inventory.
- **Scope 2**
  - **Electricity**. The electricity use growth factor for SCE was multiplied by the water demand projection data for each year, then multiplied by the corresponding emission factors. For the BAU forecast, Rincon used the electricity emission factor from 2020 for each year through 2045. For the adjusted forecast, Rincon used electricity emission factors adjusted according to the projected RPS for SCE.
- **Scope 3**
  - **Methane Emissions.** Growth factor assumes same percentage of Scope 1 natural gas emissions projected forward and was calculated by multiplying growth factor by the water demand projection date for each year.
  - **Electricity Transmission and Distribution Losses.** Established as a linear percentage of Scope 2 electricity and projected forward for the BAU and adjusted forecasts based on the BAU and adjusted electricity emissions projections, respectively.
  - **Waste.** The growth factor for waste was multiplied by the water demand projection data for each year.
  - **Employee Commute.** The growth factor for employee commute was multiplied by the water demand projection data for each year.
  - **Construction.** The annual average construction emissions for future CIP projects spanning the next five years was annualized and applied for all years through 2045.
  - **Wastewater.** The growth factor for wastewater was multiplied by the water demand projection data for each year.

4.3 Business-as-usual Forecast Methods and Results

The BAU forecast provides an estimate of how GHG emissions would change in the forecast years if consumption trends continued as in 2020, absent any new regulations or policies that would reduce GHG emissions under the single-dry year scenario. Under the BAU forecast, SCVWA emissions are projected to continue increasing through 2045 (Table 17), as SCVWA services expand to meet demand from population growth. This increase is the result of the overall projected increases in population driven water demand through 2045. The results of the BAU forecast are also shown in Figure 5. Under the BAU forecast scenario, electricity remains the highest contributor to SCVWA GHG emissions.

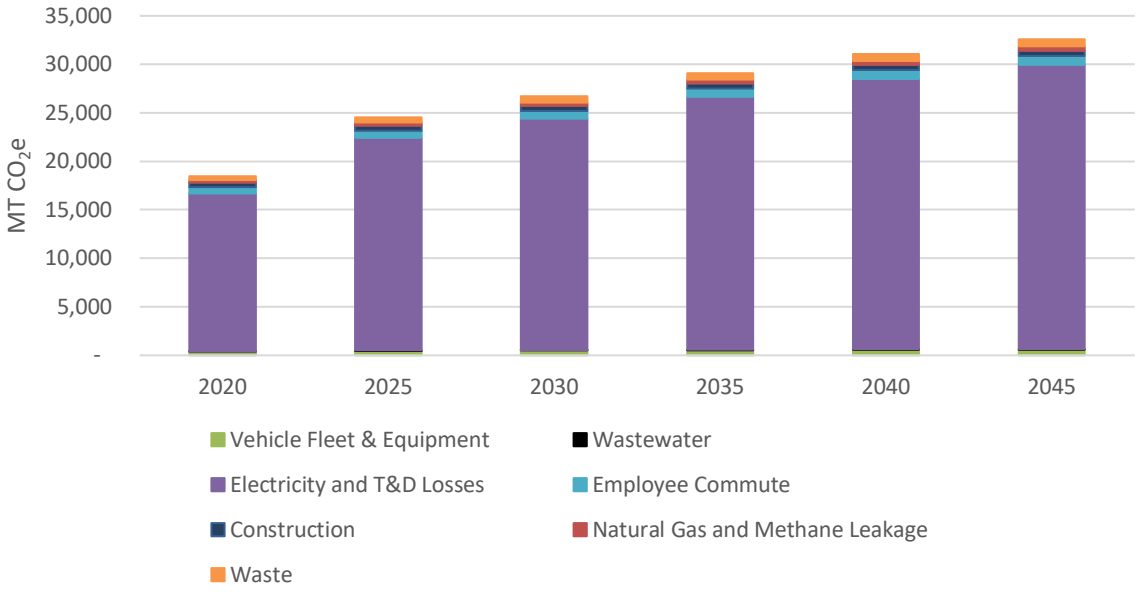
Table 17 Business as Usual Forecast GHG Emissions Summary (MT CO_2e)[47]

Emissions Source	2025	2030	2035	2040	2045
Natural Gas	256	279	305	326	343
Methane Leakage	63	69	75	81	85
Vehicle Fleet and Equipment	452	492	538	575	604
Wastewater	40	43	47	50	53
Electricity	20,811	22,652	24,757	26,456	27,795
Electricity T&D Losses	1,103	1,201	1,312	1,402	1,473
Employee Commute	713	776	848	906	952
Waste	578	629	687	734	772
Construction	541	541	541	541	541
Total	**24,557**	**26,683**	**29,112**	**31,072**	**32,618**

Notes: Values have been rounded and therefore may not add up exactly.

MT CO_2e = metric tons carbon dioxide equivalent; T&D = transmission and distribution

Figure 5 Business as Usual (BAU) GHG Emissions Forecast[48]



[47] Based on the single-dry year scenario which is the "worst case" scenario for GHG emissions.

[48] Ibid

4.4 Adjusted Forecast Methods and Results

The Adjusted Forecast adjusts the BAU forecast to include the legislative actions and associated emissions reductions occurring at the State level as summarized in Section 2.3 (e.g., California's RPS Program). The only emissions sectors that changed under the adjusted forecast are electricity and T&D losses; all other sectors remained the same in comparison to the BAU forecast. Under the Adjusted Forecast, GHG emissions are expected to decrease overall through 2045 due to the adjustments to electricity emissions factors (Table 18). The results of the Adjusted Forecast are also shown in Figure 6. Electricity use is expected to grow through 2045, however, due to California's RPS electricity emissions will decrease over time as electricity becomes carbon free by 2045, as seen in Figure 7.

Table 18 Adjusted Forecast GHG Emissions Summary (MT CO_2e)[49]

Emissions Source	2025	2030	2035	2040	2045[1]
Natural Gas	256	279	305	326	343
Methane Leakage	63	69	75	81	85
Vehicle Fleet and Equipment	452	492	538	575	604
Wastewater	40	43	47	50	53
Electricity	16,429	13,113	9,554	5,105	0
Electricity T&D Losses	871	695	506	271	0
Employee Commute	713	776	848	906	952
Waste	578	629	687	734	772
Construction	541	541	541	541	541
Total	**19,942**	**16,637**	**13,103**	**8,589**	**3,349**

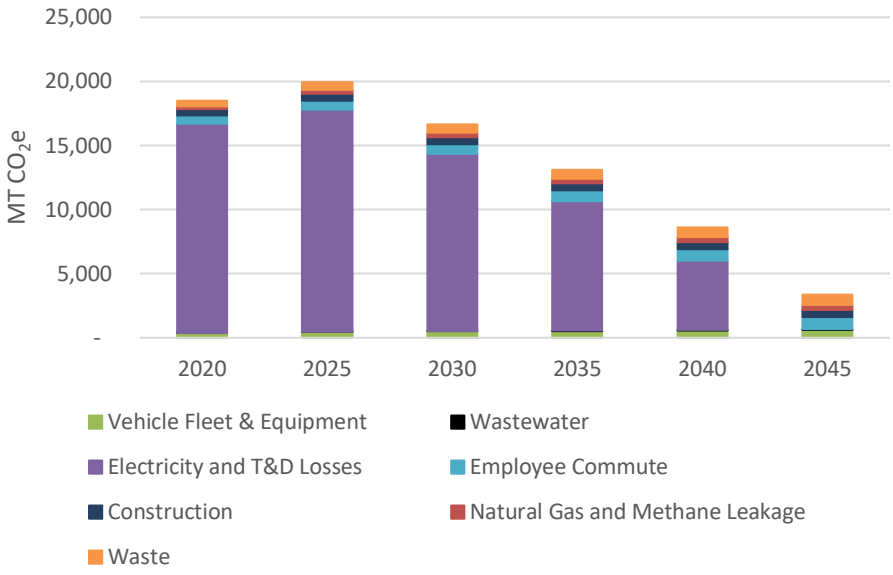
Notes: Values have been rounded herein and therefore may not add up exactly.

[1] Emissions associated with electricity are anticipated to be zero in 2045 due to SB 100.

MT CO2e = metric tons carbon dioxide equivalent; T&D = transmission and distribution

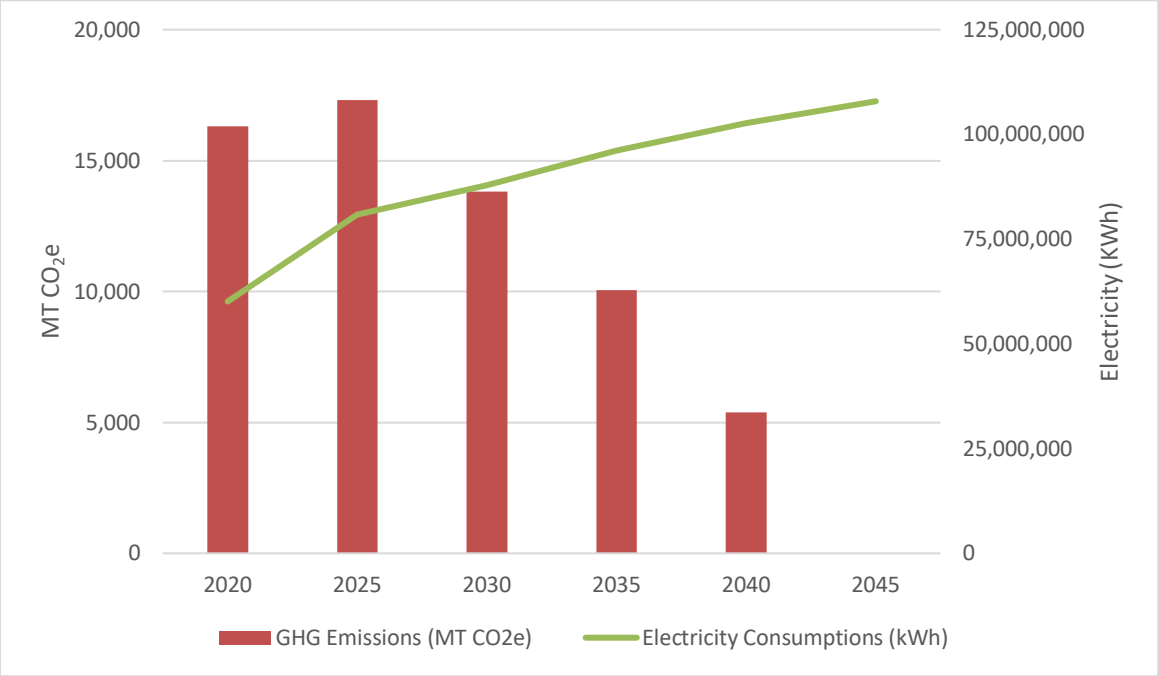
[49] Based on the single-dry year scenario which is the "worst case" scenario for GHG emissions.

Figure 6 Adjusted GHG Emissions Forecast[50]



50 Ibid

Figure 7 Adjusted Electricity Consumption and Emissions Forecast



California RPS Program Adjustments

Projected GHG emissions from electricity and electricity T&D losses were calculated by multiplying the electricity use growth factor for each electricity source by the corresponding water demand projection for each year, and again by the corresponding emission factor. Emission factors were calculated based on the most recent emission factor for each electricity source available, which were adjusted for future years based on the RPS requirements of SB 100, as shown in Table 19.

Table 19 California RPS-adjusted Electricity Emission factors

Electricity Source	2020	2025	2030	2035	2040	2045
Renewables Mix (%)						
SCE[1]	34.2%	50%	60%	73.3%	86.7%	100%
Emission Factor (pounds CO_2e/MWh)						
SCE	598	472	346	230	115	0.00

[1] The renewables mix and emission factor for 2020 are based on the Edison International 2020 Sustainability Report. https://www.edison.com/home/sustainability/sustainability-report.html

MWh = megawatt hour; CO_2e: carbon dioxide equivalent

5 Target Setting

Generally, GHG emissions reduction targets are developed, at a minimum, consistent with State goals (i.e., SB 32 and EO B-55-18). GHG targets are developed relative to baseline emissions levels and in consideration of future emission forecasts and the effects of ongoing and future legislative actions. SCVWA plans to adopt GHG reduction targets to define measurable benchmarks to guide SCVWA GHG emissions reduction efforts going forward.

Setting GHG reduction targets which align with SCVWA goals will facilitate SCVWA in developing its own emissions reduction trajectory and plan for implementation. Target setting is an iterative process which should ultimately be informed by SCVWA's realistic ability to achieve GHG emissions reductions through the Sustainability Plan's GHG reduction measures. As such, it is considered best practice to re-evaluate the targets on a periodic basis (every five years is recommended) and adjusted as more data and information become available to SCVWA.

Setting a Target

The State of California has codified a GHG reduction target of 40% below 1990 levels by 2030 and set a long term non-codified goal of carbon neutrality by 2045. The State's climate goals, as detailed previously, were developed to be consistent with the IPCC analysis of global emissions trajectory needed to stabilize atmospheric carbon dioxide concentrations at 350 ppm or less.[51] The IPCC determined global emissions must be reduced by 50% by 2030 and hit carbon neutrality by 2050 to limit global warming to 1.5°C, the goal set in the Paris Agreement. While SCVWA is not required to follow these goals at this time, the 2017 Scoping Plan does acknowledge water agencies as an emissions source that should begin working on reducing GHG emissions, as feasible.[52] Furthermore, aligning with State targets can make SCVWA more competitive in grant applications and other funding sources. Therefore, Rincon suggests SCVWA sets a GHG reduction target at least as stringent as the State's. Because SCVWA did not exist in 1990 as it exists today, the back-casted 1990 level is a proxy developed to be representative of SCVWA emissions had it existed in 1990. This allows targets to be developed to align with the State goals. For SCVWA this would mean reducing emissions by 40% below the back-casted 1990 levels (17,744 MT CO_2e) by 2030 which would equate to reducing emissions below 10,646 MT CO_2e by 2030. Alternatively, instead of back-casting to a 1990 level, targets can be developed directly off of the current 2020 levels assuming that SCVWA's 2020 levels are representative of 1990 levels.[53] This approach to target setting is more conservative and would be based on a 40% reduction from 2020 levels (15,994 MT CO_2e) by 2030, which would equate to reducing emissions below 9,597 MT CO_2e by 2030.

For a numerical comparison of mass emissions under the suggested target pathways, the forecasted emissions, the potential target pathway, and emissions gap SCVWA would need to close are shown in Table 20, and represented visually in Figure 8 for years 2025, 2030, 2035, and 2045.

Table 20 Minimum GHG Reduction Targets and Estimated Gaps for SCVWA

	2025	2030	2035	2040	2045

[51] CARB. (2014). *First Update to the Climate Change Scoping Plan Building the Framework Pursuant to AB 32 The California Solutions Act of 2006*. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf

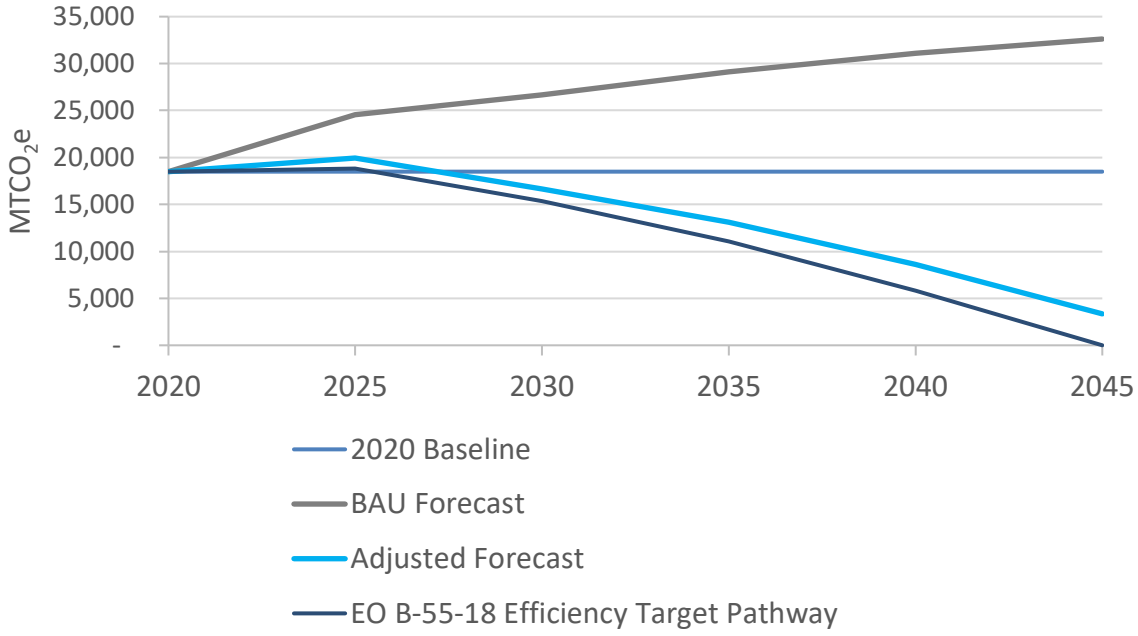
[52] CARB. (2017). *California' 2017 Climate Change Scoping Plan the Strategy for achieving California's 2030 greenhouse gas target*. Accessed October 2021 from: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf

[53] The 2020 goal set by AB 32 was achieved by the State in 2016. CARB. (2018, July 11). *Climate pollutants fall below 1990 levels for first time.* Accessed October 2021 from https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time

Adjusted Forecast	19,943	16,637	13,103	8,589	3,349
Quantified 2020 Levels	18,493	18,493	18,493	18,493	18,493
Target Pathway developed from 2020 levels (MT CO_2e)[1]					
EO B-55-18 Efficiency Target Pathway from 2020 levels	18,822	15,357	11,079	5,798	-
Emissions Gap (MT CO_2e)	1,121	1,281	2,024	2,792	3,349

[1]The target pathways is calculated as 40 percent reduction from 2020 levels conservatively assumed to be equivalent to 1990 levels.

Figure 8 Target Pathways



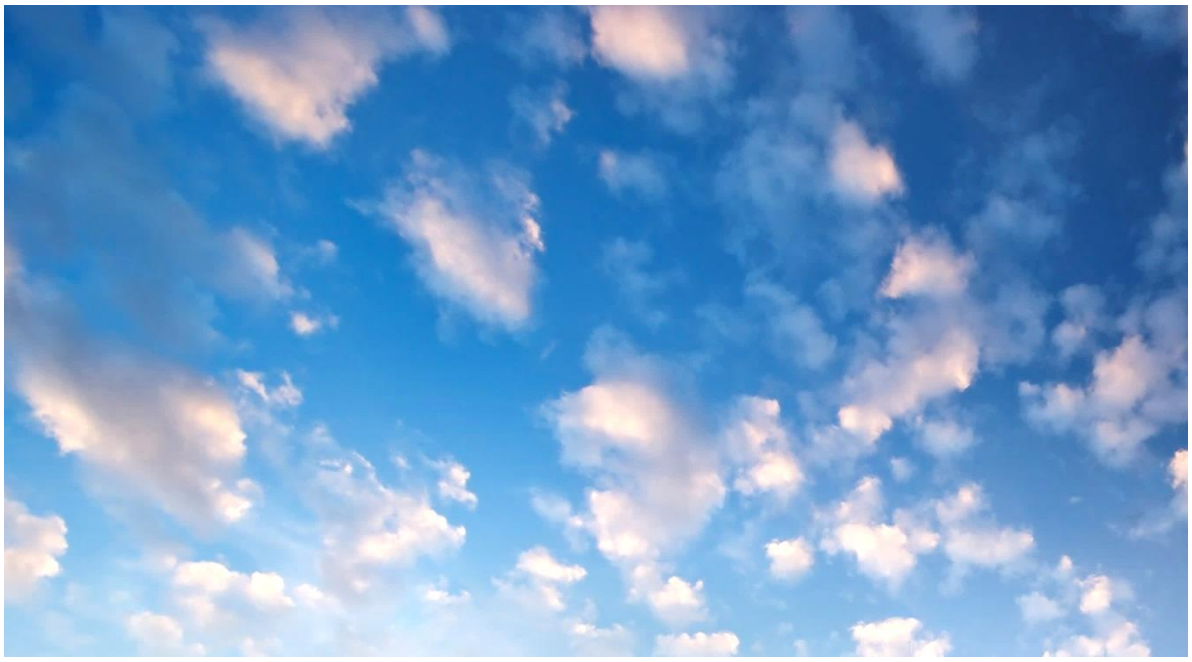
In addition to the mass emissions goals described in Table 20, SCVWA can also opt to set an efficiency target. Efficiency targets translate the mass emissions reductions into per capita or per acre-foot targets that help account for growth. This approach is outlined in the 2017 Scoping Plan.[54] Since SCVWA emissions are primarily driven by population growth and water demand, Rincon suggests translating the mass emissions targets into per person targets. The translated per person targets are shown below in Table 21.

54 CARB. (2017). *California' 2017 Climate Change Scoping Plan the Strategy for achieving California's 2030 greenhouse gas target*. Accessed October 2021 from: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf

Table 21 Per Person Emissions Targets

	2025	2030	2035	2040	2045
Adjusted Forecast	0.06	0.05	0.03	0.02	0.01
Quantified 2020 Levels	0.07	0.07	0.07	0.07	0.07
Target Pathway developed from 2020 levels (MT CO_2e/person)[1]					
EO B-55-18 Efficiency Target Pathway from 2020 levels	0.06	0.04	0.03	0.01	-
Emissions Gap (MT CO_2e)	0.00	0.01	0.00	0.01	0.01

[1]The target pathways is calculated as 40 percent reduction from 2020 levels conservatively assumed to be equivalent to 1990 levels.



SCV Water Sustainability Plan – Appendix B

Regulatory Context

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Table of Contents

Regulatory Context

As the impacts of climate change are becoming clearer, strategies to address climate change are emerging at all levels of government. This section provides an overview of the regulatory context at the international, state, and local levels relative to SCV Water's actions toward reducing GHG emissions.

International Climate Action Guidance

1992 United Nations Framework Convention on Climate Change

The primary international regulatory framework for GHG reduction is the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC is an international treaty adopted in 1992 with the objective of stabilizing atmospheric GHG concentrations to prevent disruptive anthropogenic climate change. The framework established non-binding limits on global GHG emissions and specified a process for negotiating future international climate-related agreements.[1]

1997 Kyoto Protocol

The Kyoto Protocol is an international treaty that was adopted in 1997 to extend and operationalize the UNFCCC. The protocol commits industrialized nations to reduce GHG emissions per country-specific targets, recognizing that they hold responsibility for existing atmospheric GHG levels. The Kyoto Protocol involves two commitment periods during which emissions reductions are to occur, the first of which took place between 2008-2012. The second commitment period set new targets and other changes but has not been entered into force (meaning it has not gone into effect).[2]

2015 The Paris Agreement

The Paris Agreement is the first universal, legally binding global climate agreement that was adopted in 2015 and has been ratified by 191 countries worldwide.[3] The Paris Agreement establishes a roadmap to keep the world under 2 degrees Celsius (°C) of warming with a goal of limiting an increase of temperature to 1.5°C. The Paris Agreement does not dictate one specific reduction target, instead relying on individual countries to set nationally determined contributions (NDCs) or reductions based on gross domestic product and other factors. According to the International Panel on Climate Change (IPCC), limiting global warming to 1.5°C will require global emissions to reduce through 2030 and hit carbon neutrality by mid-century.[4]

[1] United Nations Framework Convention on Climate Change (UNFCCC). United Nations Framework Convention on Climate Change. https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf
[2] UNFCCC. What is the Kyoto Protocol? https://unfccc.int/kyoto_protocol
[3] UNFCCC. Paris Agreement - Status of Ratification. https://unfccc.int/process/the-paris-agreement/status-of-ratification
[4] IPCC. Global Warming of 1.5 C. https://www.ipcc.ch/sr15/

California Regulations and State GHG Targets

California remains a global leader in the effort to reduce GHG emissions and combat climate change through its mitigation strategies. By the early 2000's, California was passing climate change bills including Senate Bill (SB) 1078 and Executive Order (EO) S-3-05 which began to require state agencies and utilities to address climate change. With the passage of Assembly Bill (AB) 32 in 2006, California became the first state in the nation to mandate GHG emission reductions across its entire economy. To support AB 32, California has enacted legislation, regulations, and executive orders (EO) that put it on course to achieve robust emission reductions and address the impacts of a changing climate. The following is a summary of executive and legislative actions most relevant to the Sustainability Plan.

2002 Senate Bill 1078

In 2002, Senate Bill (SB) 1078 established the California Renewables Portfolio Standards (RPS) Program which requires that 20 percent of retail electricity sales be composed of renewable energy sources by 2017 and was accelerated in 2006 by SB 107,[5] which requires that 20 percent of retail electricity sales be composed of renewable energy sources by 2010, instead of 2017. EO S-14-08 was signed in 2008 to further streamline California's renewable energy project approval process and increase the state's RPS to the most aggressive in the nation requiring 33 percent renewable power by 2020.[6] SB 350, discussed further below, further accelerated the program which mandated a 50% RPS by 2030.

2002 Assembly Bill 1493

In 2002, AB 1493, also known as the Pavley Regulations, directed the California Air Resources Board (CARB) to establish regulations to reduce GHG emissions from passenger vehicles to the maximum and most cost-effective extent feasible. CARB approved the first set of regulations to reduce GHG emissions from passenger vehicles in 2004, with the regulations initially taking effect with the 2009 model year.

2005 Executive Order S-3-05

EO S-3-05 was signed in 2005, establishing statewide GHG emissions reduction targets for the years 2020 and 2050. The EO calls for the reduction of GHG emissions in California to 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050. The 2050 emission reductions target would put the state's emissions in line with the worldwide reductions needed to reach long-term climate stabilization as concluded by the IPCC *2007 Fourth Assessment Report*.

2006 Assembly Bill 32

California's major initiative for reducing GHG emissions is outlined in AB 32, the "California Global Warming Solutions Act of 2006," which was signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main state strategies for reducing GHG emissions to meet the 2020 deadline. In

[5] California Public Utilities Commission.2021. Renewables Portfolio Standard (RPS) Program. https://www.cpuc.ca.gov/General.aspx?id=6442463710
[6] Executive Order S-14-08. http://www.climatestrategies.us/library/library/view/292

addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions.

Based on this guidance, CARB approved a 1990 statewide GHG baseline and 2020 emissions limit of 427 million metric tons of CO_2 equivalent (MMT CO_2e). The Scoping Plan was approved by CARB on December 11, 2008 and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards,[7] and Cap-and-Trade) have been adopted since approval of the Scoping Plan.

In May 2014, CARB approved the first update to the AB 32 Scoping Plan. The 2014 Scoping Plan update defined CARB's climate change priorities for the next five years and set the groundwork to reach post-2020 statewide goals. The update highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the state's longer-term GHG reduction strategies with other state policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use (CARB 2014).

2007 Executive Order S-1-07

Also known as the Low Carbon Fuel Standard, EO S-1-07, issued in 2007, established a statewide goal that requires transportation fuel providers to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. EO S-1-07 was readopted and amended in 2015 to require a 20 percent reduction in carbon intensity by 2030, the most stringent requirement in the nation. The new requirement aligns with California's overall 2030 target of reducing climate changing emissions 40 percent below 1990 levels by 2030, which was set by SB 32 and signed by the governor in 2016.

2007 Senate Bill 97

Signed in August 2007, SB 97 acknowledges that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Natural Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG and climate change impacts.

2008 Senate Bill 375

SB 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPOs), to prepare a Sustainable Communities Strategy" that contains a growth strategy to meet these emission targets for inclusion in the MPO's Regional Transportation Plan.

[7] On September 19, 2019, the National Highway Traffic Safety Agency and the U.S. Environmental Protection Agency issued a final action entitled the One National Program on Federal Preemption of State Fuel Economy Standards Rule. This action finalizes Part I of the Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule. This rule states that federal law preempts State and local tailpipe GHG emissions standards as well as zero emission vehicle (ZEV) mandates. The SAFE Rule withdraws the Clean Air Act waiver it granted to California in January 2013 as it relates to California's GHG and zero emission vehicle programs.

In March 2018, CARB adopted updated regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035.[8] CVWD's operations span several of these regions.

2009 California Green Building Code

The California Green Building Standards Code (CALGreen) is Part 11 of the California Building Standards Code or Title 24 and is the first statewide "green" building code in the nation. The purpose of CALGreen is to improve public health, safety, and general welfare by enhancing the design and construction of buildings. Enhancements include higher energy efficiency, better air quality, and improved daylighting. The first CALGreen Code was adopted in 2009 and has been updated in 2013, 2016, 2019 and 2022. The CALGreen Code will have subsequent, and continually more stringent, updates every three years.

2009 Senate Bill X7-7

In 2009, SB X7-7, also known as the Water Conservation Act, was signed, requiring all water suppliers to increase water use efficiency. This legislation sets an overall goal of reducing per capita urban water use by 20 percent by2020.

2011 Senate Bill 2X

In 2011, SB 2X was signed, requiring California energy providers to buy (or generate) 33 percent of their electricity from renewable energy sources by 2020.

2012 Assembly Bill 341

AB 341 directed the California Department of Resources Recycling and Recovery (CalRecycle) to develop and adopt regulations for mandatory commercial recycling. As of July 2012, businesses are required to recycle, and jurisdictions must implement a program that includes education, outreach, and monitoring. AB 341 also set a statewide goal of 75 percent waste diversion from landfill by the year 2020.

2014 Assembly Bill 32 Scoping Plan Update

In 2014, CARB approved the first update to the Scoping Plan. This update defines CARB's climate change priorities and sets the groundwork to reach the post-2020 targets set forth in EO S-3-05. The update highlights California's progress toward meeting the near-term 2020 GHG emissions reduction target, defined in the original Scoping Plan. It also evaluates how to align California's longer-term GHG reduction strategies with other statewide policy priorities, such as water, waste, natural resources, clean energy, transportation, and land use.

2014 Assembly Bill 1826

AB 1826 was signed in 2014 to increase the recycling of organic material. GHG emissions produced by the decomposition of these materials in landfills were identified as a significant source of emissions contributing to climate change. Therefore, reducing organic waste and increasing composting and mulching are goals set out by the AB 32 Scoping Plan. AB 1826 specifically requires

8 https://ww2.arb.ca.gov/sites/default/files/2020-06/SB375_Final_Targets_2018.pdf

jurisdictions to establish organic waste recycling programs by 2016, and phases in mandatory commercial organic waste recycling over time.

2015 Senate Bill 350

SB 350, the Clean Energy and Pollution Reduction Act of 2015, has two objectives: to increase the procurement of electricity from renewable sources from 33 percent to 50 percent by 2030 and to double the energy efficiency of electricity and natural gas end users through energy efficiency and conservation.

2015 Executive Order B-30-15

EO B-30-15 was signed in 2015, establishing an interim GHG emissions reduction target to reduce emissions to 40 percent below 1990 levels by 2030. The EO also calls for another update to the CARB Scoping Plan to provide a pathway to achieve this goal.

2016 Senate Bill 32

In September 2016, the governor signed SB 32 into law, extending AB 32 by requiring the state to further reduce GHGs to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged).

2016 Senate Bill 1383

Adopted in September 2016, SB 1383 requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. SB 1383 requires achievement of the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 also requires CalRecycle, in consultation with CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills. SB 1383 further requires 20% of edible food disposed of at the time to be recovered by 2025.

2017 Scoping Plan Update

In December 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 goal set by SB 32. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently approved legislation, such as SB 350 and SB 1383.

The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2014 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with statewide per capita goals of six metric tons (MT) CO_2e by 2030 and two MT CO_2e by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (i.e., city, county, subregional, or regional level), but not for specific individual projects because they include all emissions sectors in the state (CARB 2017).

2018 Senate Bill 100

Adopted in September 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the state's RPS Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

2018 Executive Order B-55-18

In September 2018, the governor issued Executive Order B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

2020 Executive Order N-79-20

In September 2020, the governor issued Executive Order N-79-20, which established a new statewide goal that 100 percent of in-state sales of new passenger cars and trucks will be zero-emissions by 2035 and that 100 percent of medium- and heavy-duty vehicles in the State be zero-emissions by 2045 for all operations where feasible. The EO further sets goal for the State to transition to 100 percent zero-emission off-road vehicles and equipment by 2035 where feasible. The EO also calls for the establishment of regulations and strategies by the California Air Resources Board to provide a pathway to achieve this goal.

2022 Senate Bill 1020

Adopted in September 2022, SB 1020 advances the state's trajectory to 100 percent clean energy procurement by 2045 by creating clean energy targets of 90 percent by 2035 and 95 percent by 2040. SB 1020 builds upon SB 100, which accelerated the state's RPS, which requires electricity providers to increase procurement from eligible renewable energy resources to 60 percent by 2030 and 100 percent by 2045.

2022 Assembly Bill 1279

Adopted in September 2022, AB 1279, codifies the statewide carbon neutrality goal into a legally binding requirement for California to achieve carbon neutrality no later than 2045 and ensure 85 percent GHG emissions reduction under that goal. AB 1279 builds upon EO B-55-18 which originally established California's 2045 goal of carbon neutrality.

2022 Scoping Plan Update

In November 2022, CARB adopted the 2022 Scoping Plan, which provides a framework for achieving the 2045 carbon neutrality goal set forth by AB 1279. The 2022 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently approved legislation, such as AB 1279.

The 2022 Scoping Plan includes, for the first time, a robust discussion of the Natural and Working Lands (NWL) sectors as both sources of emissions and carbon sinks. The Plan also centers equity when outlining state climate investments and climate mitigation strategies. As with the 2014 and

2017 Scoping Plans, the 2022 Scoping Plan does not provide project-level thresholds for land use development. [9]

Advanced Clean Fleet

The California Air Resources Board is currently developing a medium and heavy-duty zero-emission fleet regulation with a goal of all California truck and bus fleets being zero-emission by 2045. The final rulemaking is anticipated to be completed and the regulation adopted in Spring 2023, with implementation following soon thereafter. Under the rule public fleets, including special districts, 50% of 2024-2026 model year vehicles added to the fleet must be ZEVs and 100% of 2027 and newer model years must be ZEVs. Compliance reporting would be required annually and within 30 days of adding vehicles to the fleet.[10]

Advanced Clean Trucks Regulation

The Advanced Clean Trucks Regulation was approved on June 25, 2020. The regulation establishes a zero-emissions vehicle sales requirement for trucks or on-road vehicles over 8,500 lbs gross vehicle weight and set a one-time reporting requirement for large entities and fleets. Under the regulation, manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines are required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 straight truck sales, and 40% of truck tractor sales. Additionally, the regulation established a one-time reporting requirement for large entities and fleets where fleet owners, with 50 or more trucks, are required to report about their existing fleet operations by March 15, 2021.[11]

Advanced Clean Cars II

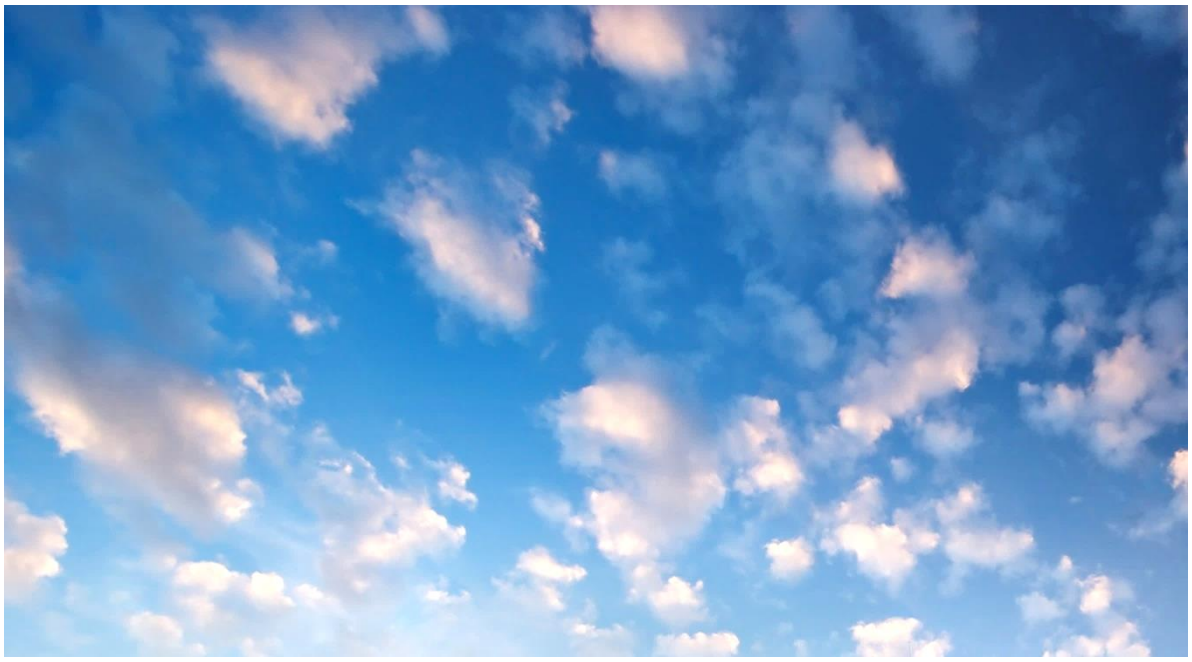
The Advanced Clean Cars II regulation was adopted in August 2022. The regulation amends the Zero-emission Vehicle Regulation to require an increasing number of zero-emission vehicles, and relies on advanced vehicle technologies, including battery electric, hydrogen fuel cell electric and plug-in hybrid electric-vehicles, to meet air quality, climate change emissions standards, and Executive Order N-79-20, which requires that all new passenger vehicles sold in California be zero emissions by 2035. The regulation also amends standards for gasoline cars and heavier passenger trucks to continue to reduce smog-forming emissions.[12]

9 https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents

10 https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-fleets-regulation-summary

11 https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks

12 https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii



SCV Water Sustainability Plan – Appendix C

Measures and Actions

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January 2023

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Measures and Actions

Measures and Actions Framework

In order to guide the development of measures and actions for the Sustainability Plan, the project team developed a suite of guiding criteria or pillars through outreach with the community. The following operational pillars were identified. A majority of these pillars are based on SCV Water's strategic plan and core mission to provide responsible water stewardship and high-quality water at a reasonable cost.

Cost-Effective and Efficient: Water resources continue to be strained due to growing population and environmental conditions such as drought. Water conservation and increased operational efficiencies allow for SCV Water to continue to provide water in a cost-effective manner.

High Quality Water: Responsible and sustainable stewardship of water resources allows for high quality water to be provided to SCV Water customers.

Reliable and Resilient Operations: Developing solutions to issues such as energy shortages, power safety shutoffs, fire, and drought allows SCV Water to make its operations more resilient and continue to provide water reliably and affordably to the community.

Transparency and Accountability: SCV Water recognizes its role as a steward of water, one of the most valuable natural resources in California, and understands its responsibility to protect water resources and make decisions in the best interest of the community it serves. SCV Water is transparent and accountable to the community through the plans it develops and implements to protect and manage water resources and by using public Board meetings and public outreach events to hear and answer the community's concerns and questions.

Measurable GHG reductions: As a water agency, SCV Water plays an important role in helping the State to achieve its climate goals and transition towards a low-carbon economy. Aligning with the State's goals provides increased funding opportunities for SCV Water.

Based on these pillars, the draft measures and actions in Table 1 were developed. The quantifiable actions have been developed to provide one possible pathway to achieve the needed GHG reductions. However, there are multiple ways for SCV Water to achieve its targets. While the priority actions have been listed in the main body of the SCV Water Sustainability Plan this appendix provides additional actions that SCV Water may pursue based on available resources.

Table 1 Summary of Measures and Supporting Actions

Measure; Actions and Targets	Timeframe	Emission/ Sustainability Impacts	SCVW Pillar
Scope 1 – Direct Combustion and Process Emissions			
DC-1: Phase out natural gas combustion at SCV Water facilities to reduce natural gas consumption by 50% by 2030			
Action DC-1-1: Conduct a survey to identify aging equipment due for replacement and identify operationally and financially viable electric alternatives	<5 years	Supportive	Cost Effective and Efficient
Action DC-1-2: Develop a policy requiring new appliances to achieve EnergyStar Certification	<5 years	Supportive	Cost Effective and Efficient
Action DC-1-3: Electrify equipment at time of replacement to reduce natural gas consumption	Present-2045	**2030:** 139 MT CO_2e	Measurable GHG Reduction
Action DC-1-4: Complete an ASHRAE Level II Energy Audit of facilities to identify gas uses and energy efficiency opportunities	<5 years	Supportive	Cost Effective and Efficient
Action DC-1-5: Work with an ESCO to implement suggested electrification and energy efficiency opportunities	Ongoing	Supportive	Cost Effective and Efficient
Action DC-1-6: Purchase renewable gas (biogas) for facilities and equipment that cannot be replaced by electric equipment to achieve 15% reduction in natural gas consumption (therms/year)	<5 years	Supportive	Reliable and Resilient Operations
Action DC-1-7: Perform retro-commissioning (RCx) on facilities to achieve a 10% reduction in natural gas use from 2017 levels	<5 years	Supportive	Cost Effective and Efficient
DC-2: Decarbonize SCV Water equipment, reducing fossil fuel use and replacing with all-electric or alternative fuels when feasible			
Action DC-2-1: Conduct a survey of natural gas, diesel, and propane consuming devices used in operations	<5 years	Supportive	Cost Effective and Efficient
Action DC-2-2: Develop plans for replacing fossil fuel combustion equipment with electric or carbon-free equipment	Ongoing	**2030:** 5 MT CO_2e	Measurable GHG Reduction Cost Effective and Efficient
Action DC-2-3: Identify available funding resources such as grants and rebates to replace fossil fuel consuming equipment with fossil free equipment	<5 years	Supportive	Cost Effective and Efficient
Action DC-2-4: Develop an electric first policy for new equipment	<5 years	Supportive	Cost Effective and Efficient
Action DC-2-5: For equipment without a feasible electric alternative utilize biofuels such as renewable diesel as a short-term drop-in fuel replacement	<5 years	Supportive	Cost Effective and Efficient

Measure; Actions and Targets	Timeframe	Emission/ Sustainability Impacts	SCVW Pillar
FL-1: Decarbonize SCV Water Vehicle Fleet through Procurement of Zero-Emission Vehicles to Electrify 50% of the Fleet aby 2030			
Action FL-1-1: Conduct a vehicle electrification study to determine which fleet vehicles can be converted, what chargers are required, and where they should be located	<5 Years	Supportive	Cost Effective and Efficient
Action FL-1-2: Implement "EV First" policy: when vehicles must be replaced, first check whether EV option is available, and then replace with most environmentally friendly option. Fill out a form for every vehicle purchased and check to see whether an EV option is available. When no EV option is available, reduce the weight of vehicles and integrate tech that monitors vehicle idleness, integrating efficient, smaller diesel engines.	Ongoing	**2030:** 62 MT CO_2e	Measurable GHG Reduction Reliable and Resilient Operations
Action FL-1-3: Install EV chargers at facilities for EV fleet pursuant to the findings of the EV study	<5 Years	Supportive	Cost Effective and Efficient
Action FL-1-4: Partner with Heavy Duty EV companies to conduct pilots and facilitate advancements in technology for vehicle classes which do not have currently viable options (may be grant opportunities for these projects)	<5 Years	Supportive	Cost Effective and Efficient Partnerships
Action FL-1-5: Re-invest life cycle maintenance savings from EV's back into vehicle procurement budgets to procure additional EV's	Ongoing	Supportive	Cost Effective and Efficient
Action FL-1-6: Evaluate potential to expand solar to generate low carbon fuel standard credits to fund EV conversion.	<5 years	Supportive	Cost Effective and Efficient
Action FL-1-7: Identify and apply for funding and financing opportunities to fund both EV and infrastructure purchases	<5 Years	Supportive	Cost Effective and Efficient
FL-2: Use Alternative Fuels to Bridge the Technology Gap to Zero-Equipment Vehicles			
Action FL-2-1: Expand use of renewable diesel when vehicle electrification is not available; evaluate use of other alternative fuels like hydrogen and hybrid-electric vehicles	Ongoing	**2030:** 94 MT CO_2e	Measurable GHG Reduction Reliable and Resilient Operations
FL-3: Reduce Vehicle Miles Traveled and Emphasize Right-size Vehicles for Non-ZEV/EV Fleet Vehicles			
Action FL-3-1: When vehicle electrification is not available, right-size use of trucks and powertrains, assess practicality of using V-6 engines where V-8 engines are currently used	Ongoing	Supportive	Cost Effective and Efficient
Action FL-3-2: Perform maintenance on vehicle fleets to improve performance, including the procurement of low rolling resistance tires, using the correct tire air pressure, regularly replacing air filters	Ongoing	Supportive	Cost Effective and Efficient
Action FL-3-2: Create a mandatory training module to inform employees with driving duties on ways to improve fuel economy. Techniques	<5 Years	Supportive	Cost Effective and Efficient

Measure; Actions and Targets	Timeframe	Emission/ Sustainability Impacts	SCVW Pillar
include slow acceleration, removing unnecessary loads from vehicles, limiting idling, reducing air conditioning use, using cool control, carpooling to project sites with colleagues			
Scope 2-Electricity Consumption			
E-1 Utilize 50% low-carbon and carbon-free electricity by 2030			
Action E-1-1: Switch electrical accounts to a green rate program (e.g., SCE 50 percent and 100 percent Green Rate Programs or Clean Power Alliance 40 percent, 50 percent, of 100 percent Carbon Free Programs)	Present-2040	**2030:** 1,605 MT CO_2e	Measurable GHG Reduction
Action E-1-2: Install an additional 1 MW of solar generation by 2025; and 2 MW of solar generation by 2030	Present-2030	**2030:** 151 MT CO2e	Measurable GHG Reduction Reliable and Resilient Operations Cost Effective and Efficient
Action E-1-3: Include battery storage at critical facilities to improve resilience	Present-2030	Supportive	Reliable and Resilient Operations
Action E-1-4: Switch pumping times to mid-day to best use solar power	Present-2030		
Action E-1-5: Evaluate SCV Water's solar power contracts and options to optimize cost and value	Ongoing	Supportive	Cost Effective and Efficient
Action E-1-6: Investigate opportunities to work with local CCAs to further reduce GHG emissions and save money	Present-2030	Supportive	Cost Effective and Efficient
EE-1: Improve Energy Efficiency at SCV Water Facilities and Buildings			
Action EE-1-1: Conduct facility wide energy audits annually and track energy improvements due to energy efficiency upgrades and report annually	Ongoing	Supportive	Cost Effective and Efficient Transparency and Accountability
Action EE-1-2: Develop a policy requiring any new building to be all-electric and utilize heat pumps for space and water heating	<5 years	Supportive	Cost Effective and Efficient
Action EE-1-3: Optimize facility operations to minimize power, supplies, chemicals, and labor consumption, including	Ongoing	Supportive	Cost Effective and Efficient

Measure; Actions and Targets	Timeframe	Emission/ Sustainability Impacts	SCVW Pillar
adding on-site online chlorine generation and using SCE efficiency tests to determine what to replace			
Action EE-1-4: Utilize an energy management system, such as ENERGY STAR Portfolio Manager, to track and improve energy use intensity to measure energy efficiency improvements and savings over time	Ongoing	Supportive	Cost Effective and
Action EE-1-5: Where not implemented already, utilize automated lighting for facilities in alignment with the current California Energy Commission Building Energy Efficiency Standards	<5 years	Supportive	Cost Effective and Efficient
Action EE-1-6: Implement energy savings guidelines for in-office operations, including turning off printers, lights, speakers and all other equipment at night, unplug USB chargers when not in use, always shut down the computer Friday before leaving for the weekend, turn off office lights when leaving the room for more than 15 minutes, use natural light in offices in windows, use stairs to avoid elevators	Ongoing	Supportive	Cost Effective and Efficient
Scope 3 – Indirect Emissions			
WC-1: Implement water conservation reducing demand 15% by 2030			
Action WC-1-1: Continue water conservation and recycling efforts and programs by implementing the Water Use Efficiency Strategic Plan, Water Shortage Contingency Plan, Urban Water Management Plan, and Groundwater Sustainability Plan	Ongoing	**2030:** 1,602 MT CO_2e	Measurable GHG Reduction High Quality Water and Resource Sustainability Cost Effective and Efficient
Action WC-1-2: Raise awareness of and demand for conservation programs (e.g., water conservation campaign(s) and related media buys, public and school educational programs, participation at public events, SCV Water web site, newsletter and social media, self-guided landscape tour, conservatory garden, etc.)	Ongoing	Supportive	High Quality Water and Resource Sustainability Reliable and Resilient Operations

Measure; Actions and Targets	Timeframe	Emission/ Sustainability Impacts	SCVW Pillar
Action WC-1-3: Increase use of recycled water by up to 9,600 AFY by 2030, consistent with health and environmental requirements	Ongoing	Supportive	High Quality Water and Resource Sustainability
Action WC-1-4: Construct additional infrastructure to support desalination of tertiary recycled water for evaluation of indirect potable reuse projects	<5 Years	Supportive	Reliable and Resilient Operations
Action WC-1-5: Work with NGOs to understand common goals within the community/watershed	Ongoing	Supportive	High Quality Water and Resources Sustainability Transparency and Accountability
Action WC-1-6: Provide funding for local stormwater capture programs, such as permeable paving, bioswales, etc., to increase local storage capacity	<5 Years	Supportive	High Quality Water and Resource Sustainability
Action WC-1-7: Identify and support local non-profits and community organizations working on native planting and other water reduction efforts.	<5 Years	Supportive	High Quality Water and Resources
Action WC-1-8: Analyze current water use reduction programs to identify which have the highest adoption rate and water use reduction impact. Expand programs which are found to be the most effective.	<5 Years	Supportive	Resilient and Reliable Operations
Action WC-1-9: Explore methods to reduce the rate of evaporation from water storage facilities	<5 Years	Supportive	Resilient and Reliable Operations
Construction			
CR-1: Reduce emissions from construction 15% by 2030 through decarbonization of construction machinery			
Action CR-1-1: Include electric and zero emission equipment in the preferred procurement policy for all applicable off-road equipment	Ongoing	**2030:** 81 MT CO_2e	Measurable GHG Reduction Reliable and Resilient Operations
Action CR-1-2: Develop a prioritized contracting selection/RFP process that provide higher scoring to contractors who generate fewer GHG emissions through the selection of local firms (less travel) and the use of electric equipment	<5 Years	Supporting	Reliable and Resilient Operations
Transportation			
TR-1: Reduce employee commute emissions 15% by 2030			
Action TR-1-1: Allow for continued benefits of a full or partial work-from-home policy where employees telecommute or utilize flexible schedule to reduce transit time, VMT, and GHG emissions	<5 Years	**2030:** 116 MT CO_2e	Measurable GHG Reduction Reliable and Resilient Operations
Action TR-1-2: Install additional parking spaces with EV chargers for employees commuting and/or visitors	<5 Years	Supporting	Cost Effective and Efficient

Measure; Actions and Targets	Timeframe	Emission/ Sustainability Impacts	SCVW Pillar
Action TR-1-3: Consider EV rebates for employees through partnerships	<5 Years	Supporting	Reliable and Resilient Operations
Action TR-1-4: Provide preferred parking for electric vehicles	<5 Years	Supporting	Cost Effective and Efficient
Action TR-1-5: Offer benefits to employees who use alternative modes of transportation (e.g., public transit, bikes)	<5 Years	Supporting	Cost Effective and Efficient
Action TR-1-6: Offer bike storage, showers, and changing facilities for bike commuters	<5 Years	Supporting	Cost Effective and Efficient
Action TR-1-7: Educate employees on commute options including public transportation, EVs, and Vanpools	<5 Years	Supporting	Cost Effective and Efficient
Waste			
W-1: Reduce landfilled waste, with a focus on reducing organic waste 75% by 2025			
Action W-1-1: Implement program to separate organic waste from other materials. Contract with local waste disposal companies to route organic waste to food recovery centers, anaerobic digestion, or composting facilities	Ongoing	**2025:** 472 MT CO_2e	Measurable GHG Reduction Cost Effective and Efficient
Action W-1-2: Conduct a waste assessment, including records examinations, facility walk-throughs, and waste sorting, across all facilities to identify waste sources generated, identify purchasing and management practices, examine current waste reduction practices and their effectiveness, and prioritize the most effective waste reduction efforts on an area and materials-focused basis	<5 Years	Supporting	Cost Effective and Efficient

Measure; Actions and Targets	Timeframe	Emission/ Sustainability Impacts	SCVW Pillar
Action W-1-3: Explore training, education and outreach programs, such as the California Green Builder program to offer training sessions to staff to certify individuals as green building professionals. Additional opportunities include Zero Waste Principles and Practices Certification issued by California Resource Recovery Association and Solid Waste Association of North America	<5 Years	Supporting	Cost Effective and Efficient
Action W-1-4: Implement a policy to duplicate all draft reports and make manual and personnel information available electronically to use less paper; make use of electronic agendas and e-signatures, encourage double-side printing and implement "print-free" Fridays program to avoid printing on Fridays as much as possible	Ongoing	Supporting	Cost Effective and Efficient
Action W-1-5: Develop and implement an environmentally preferred purchasing policy	<5 Years	Supporting	Cost Effective and Efficient
Planning and Education			
PE-1: Integrate Sustainability Planning into Organizational Decision Making			
Action PE-1-1: Develop and Document Mission, Vision, and Values: Identify mission, vision, mandates and key strategic values specific to SCV Water's sustainability goals; continue to update with most relevant climate science and policies	Ongoing	Supporting	Transparency and Accountability
Action PE-1-2: Develop and Disseminate Annual Report: Develop and Disseminate an Annual Sustainability Report to document agency efforts, successes, and overall performance	Ongoing	Supporting	Transparency and Accountability
PE-2: Engage with State and Regional Planning for Sustainability			
Action PE-2-1: Monitor climate change science and public policy. Incorporate climate change impacts on water demand and supplies into long-term plans and programs to maintain reliable and sustainable water supplies	Ongoing	Supporting	Reliable and Resilient Operations
Action PE-2-2: Regularly assess the carbon footprint of SCV Water	Ongoing	Supporting	Transparency and Accountability
Action PE-2-3: Describe, consider, and address the effects of climate change on the region and disclose, consider, and reduce, where feasible, GHG emissions when developing and implementing projects	Ongoing	Supporting	Reliable and Resilient Operations
Action PE-2-4: Coordinate legislative initiatives concerning Sacramento-San Joaquin Delta and water conservation with legislative analysts, Association of California Water Agencies, State Water Contractors and other necessary parties to enhance the reliability and cost effectiveness of SCV Water's SWP water supply.	Ongoing	Supporting	Reliable and Resilient Operations Partnerships

Measure; Actions and Targets	Timeframe	Emission/ Sustainability Impacts	SCVW Pillar
Action PE-2-5: Lead the implementation of the Sustainable Groundwater Management Act for the Santa Clarita Valley.	Ongoing	Supporting	Reliable and Resilient Operations