Climate Action Plan

Eastern Municipal Water District

September 2022

emwd EASTERN MUNICIPAL WATER DISTRICT

Contents

CLIMATE ACTION PLAN

APPENDIX

FIGURES

TABLES

Acknowledgements

The preparation of the Eastern Municipal Water District Climate Action Plan was developed using internal staff and outside consultant Environmental Science Associates (ESA).

EASTERN MUNICIPAL WATER DISTRICT

Lanaya Voelz-Alexander, P.E., Assistant General Manager of Planning, Engineering, and Construction
Al Javier, Director of Environmental and Regulatory Compliance
Jolene Walsh, Director of Policy and Governmental Affairs
John Dotinga, Water Operations Manager
Doug Edwards, Environmental Services Manager
Greg Kowalski, P.E., Engineering Manager
Sam Robinson, CEM, Energy Program Manager
Gordon Ng, P.E., Principal Water Resources Specialist
Alison Torres, Principal Environmental Compliance Analyst

ENVIRONMENTAL SCIENCE ASSOCIATES

Jeff Caton, P.E., LEED AP
Brian Schuster
Breanna Sewell
Tim Witwer
Marianne Aydil

Glossary of Terms and Acronyms

AB 32	Assembly Bill 32, also known as the California Global Warming Solutions Act of 2006; establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases for the state of California; makes the California Air Resources Board responsible for monitoring and reducing statewide greenhouse gas emissions, with a target to reduce emissions to 1990 levels by 2020
AB 1668	One of a pair of bills (along with SB 606) that were signed into law by Governor Brown in 2018 that require urban and agricultural water suppliers to enact new urban efficiency standards for indoor use, outdoor use, and water lost to leaks
ACC	CARB's Advanced Clean Cars (ACC) program
Adjusted BAU	An adjusted emissions forecast that includes the effects of state-wide emissions reductions measures such as updates to building energy standards and implementation of programs to decrease emissions from on-road vehicles
AHSC	Affordable Housing and Sustainable Communities Program; a state program that funds land-use, housing, transportation, and land preservation projects to support infill and compact development that reduce greenhouse gas emissions
ARRA	American Recovery and Reinvestment Act
Baseline Inventory	The base year for assessment of GHG trends against which future progress can be measured for a single calendar year (e.g., 2010)
BAU	Business-as-usual; a scenario that assumes that no new local actions will be taken to reduce energy usage or associated greenhouse gas emissions from current and future residents and businesses within the City
BMP	Best management practice
C&D	Construction and demolition; C&D debris is waste generated during construction activities
CDFW	California Department of Fish and Wildlife
CAFE	Corporate Average Fuel Economy; federal fuel efficiency standards enacted in 1975 to improve the average fuel economy of cars and light trucks produced for sale in the United States
CAP	Climate action plan
CalEPA	California Environmental Protection Agency
CalEnviroScreen	CalEnviroScreen; a mapping tool that helps identify California communities that are most affected by many sources of pollution, and where people are often especially vulnerable to pollution's effects
CALGreen	Refers to CALGreen component of the California Building Code; see California Building Code
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation

California Building Code	California Code of Regulations Title 24, also known as the California Building Standards Code (composed of 12 parts); Title 24, Part 6, sets forth California's energy efficiency standards for residential and nonresidential buildings and was established in 1978 in response to a legislative mandate to reduce California's energy consumption; the standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods
CARB	California Air Resources Board
CAPCOA	California Air Pollution Control Officers Association; an association of air pollution control officers that represents all thirty-five local air quality control agencies in California
CAPG	California Adaptation Planning Guide; includes a step-by-step process for local and regional climate vulnerability assessment and adaptation strategy development
CCA	Community Choice Aggregation; sometimes referred to as Community Choice Energy (CCE), a type of energy supply program that allows cities and counties to aggregate the buying power of individual customers within a jurisdiction to secure alternative energy supplies
CCE	Community Choice Energy; sometimes referred to as Community Choice Aggregation (CCA)
CCI	California Climate Investments; a statewide initiative that puts the state's Cap-and-Trade revenue to work reducing greenhouse gas emissions
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CFL	Compact fluorescent light
CH_4	Methane
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent; a metric measure used to compare the emissions of various greenhouse gases based upon their global warming potential (GWP). The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP factor. For example, the GWP factor for methane is 25. This means that emissions of one million metric tons (MT) of methane are equivalent to emissions of 25 million $MTCO_2e$.
ClearPath	An online application that calculates, tracks, and manages GHG emissions at the government operations (i.e., municipal) and community scales
Community-wide	Refers to all activities within a community or city's geographic boundary
CPA	LA County Clean Power Alliance
CPUC	California Public Utilities Commission
DAC	Disadvantaged community
Demand Response	Mechanism for managing end-user electricity consumption in response to energy supply conditions, especially during summer periods when electricity demand on the California power grid is high
District	Eastern Municipal Water District
DOE	United States Department of Energy
DOF	California Department of Finance

EEM	Energy efficiency measures
EIR	Environmental impact report
EJ	Environmental justice; refers to the equitable distribution of environmental benefits and burdens
EMP	Energy management plan
EMWD	Eastern Municipal Water District
ENERGY STAR	A joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy to provide consumers with energy efficiency information and incentives to purchase the most energy-efficient products available
ESA	Environmental Science Associates
ESCO	Energy service company
EV	Electric vehicle; a vehicle that uses an electric battery to operate
FCEV	Fuel cell electric vehicle; a vehicle that is powered by hydrogen fuel cell technology
FEMA	Federal Emergency Management Agency; a part of the U.S. Department of Homeland Security (DHS)
First Cost	Immediate purchase and installation cost; first costs do not include lifecycle or long-term operating costs, which may result in long-term cost savings from increased efficiency, reduced maintenance, and other factors
FY	Fiscal year
GGRF	Greenhouse Gas Reduction Fund; an account established by the State of California to receive Cap-and-Trade auction proceeds to support programs that reduce greenhouse gas emissions; funds are administered by the California Climate Investments (CCI) program
GHG	Greenhouse gases; cause heat to be trapped in the atmosphere, resulting in warming effects for Earth
GIS	Geographic information system; designed to capture, store, analyze, manage, and present spatial or geographic data
gpcd	gallons per capita-day
Green Building	Sustainable or “green” building is a holistic approach to design, construction, and demolition that minimizes the building’s impact on the environment, the occupants, and the community
Greenhouse Gas Inventory	Provides estimates of the amount of greenhouse gases emitted to and removed from the atmosphere by human activities; a city or county that conducts an inventory looks at both community emissions sources as well as emissions from government operations
GWh	Gigawatt hour; a unit of electricity
GWP	Global warming potential is a relative measure of how much heat a greenhouse gas traps in the atmosphere
HCD	California Department of Housing and Community Development
HFCs	Hydrofluorocarbons
HOA	Homeowner’s association

HOV	High-occupancy vehicle; an HOV lane is a restricted traffic lane reserved for the exclusive use of vehicles with a driver and one or more passengers, including carpools, vanpools, and transit buses
HPS	High-pressure sodium; a type of lamp commonly used for street lighting
HVAC	Heating, ventilation, and cooling
ICLEI	International Council for Local Environmental Initiatives; an international association of local governments and national and regional local government organizations that have made a commitment to sustainable development
IPCC	Intergovernmental Panel on Climate Change; a scientific intergovernmental body under the auspices of the United Nations
JPA	Joint Powers Agency/Authority
kWh	Kilowatt-hour; a unit of energy equivalent to 1 kilowatt (kW) of energy used for an hour; for example, if an appliance requires a kW of energy to function, leaving the appliance on for 1 hour would consume 1 kWh of energy
LADWP	Los Angeles Department of Water and Power
LCFS	Low-carbon fuel standard; requires fuel providers in the State to decrease lifecycle fuel carbon intensity by 2030
LED	Light-emitting diode
LEED	Leadership in Energy and Environmental Design; an internationally recognized green building certification system that provides third-party verification that a building or community was designed and built using sustainable approaches, with particular regard to energy savings, water efficiency, CO_2 emissions reductions, and improved indoor environmental quality, among others
LHMP	Local hazard mitigation plan
LID	Low-impact development
LiHEAP	Low-Income Home Energy Assistance Program; a state program that provides assistance with energy costs to families in California
MGD	million gallons per day
mpg	miles per gallon
MPO	Metropolitan Planning Organization
Municipal	Refers to energy use and greenhouse gas emissions from City-owned and operated facilities and equipment
MT CO_2e	Metric tons of carbon dioxide equivalent
MWD	Metropolitan Water District
N_2O	Nitrous oxide
NAS	National Academy of Sciences
NOAA	National Oceanic and Atmospheric Administration
NREL	National Renewable Energy Laboratory

OED	Office of Economic Development; serves as California's single point of contact for economic development and job creation efforts
OPR	California Governor's Office of Planning and Research
PACE	Property-Assessed Clean Energy; a form of long-term financing that creates municipal finance districts to provide loans to homeowners and businesses for energy-efficient retrofits and renewable energy system installations; loans are repaid through an annual surcharge on property tax assessments
PEV	Plug-in-battery electric vehicle
PFCs	Perfluorocarbons
POU	Publicly owned utility
PPA	Power Purchase Agreement
ppm	Parts per million; a measurement unit of concentration
PV	Photovoltaic; refers to method of converting solar energy into direct current electricity using semiconducting materials
REC	Renewable energy credit
Renewable Energy	Energy from sources that regenerate and are less damaging to the environment, such as solar, wind, biomass, and small-scale hydroelectric power
RNG	Renewable natural gas
RPS	California's Renewable Portfolio Standard requires utility providers to increase the portion of generated energy that comes from renewable sources
RTP/SCS	Regional Transportation Plan/Sustainable Community Strategy; a plan that identifies transportation projects across an entire region, with the aim of reducing vehicle trips and associated GHG emissions
RTPA	Regional Transportation Planning Agency
RWRF	Regional water reclamation facility
SBX7-7	The Water Conservation Act of 2009
SB 32	California Senate Bill 32; passed in 2016, expands upon AB 32 to mandate statewide GHG emissions reduction of 40 percent below 1990 levels by 2030
SB 97	Senate Bill 97; requires the Governor's Office of Planning and Research (OPR) to develop and adopt CEQA guidelines for the mitigation of GHG emissions
SB 100	Senate Bill 100; passed in 2018, increases the California RPS requirement to 60 percent eligible renewables by 2030 and 100 percent by 2045
SB 350	Senate Bill 350; requires California to (1) generate half of its electricity from renewable energy sources; (2) double energy efficiency for both electricity and natural gas end uses in all buildings by 2030; and (3) substantially improve the infrastructure for electric vehicle transportation
SB 375	Senate Bill 375; enhances California's ability to reach its AB 32 goals by planning more sustainable communities
SB 379	Senate Bill 379; requires that climate adaptation be addressed in the safety element of a city's general plan and/or in the Local Hazard Mitigation Plan (LHMP)

SB 535	Senate Bill 535; requires 25 percent of the Greenhouse Gas Reduction Funds to go to projects that provide benefits to disadvantaged communities, and requires CalEPA to identify such communities
SB 606	One of a pair of bills (along with AB 1668) that were signed into law by Governor Brown in 2018 that require urban and agricultural water suppliers to enact new urban efficiency standards for indoor use, outdoor use, and water lost to leaks
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
Scope 1	In a greenhouse gas inventory, emissions from sources owned or controlled by the entity, including combustion in furnaces, vehicles, pumps, or boilers, etc.
Scope 2	In a greenhouse gas inventory, the indirect emissions associated with an entity's purchased energy electricity, steam, and/or other forms of heating/cooling) that are generated by another entity (e.g., a utility)
Scope 3	In a greenhouse gas inventory, the indirect emissions associated with an entity's supply chain or activities not under the direct operational control of the entity
SCE	Southern California Edison
SCS	Sustainable Community Strategy
SEEC	California Statewide Energy Efficiency Collaborative
SF_6	Sulfur hexafluoride, a powerful greenhouse gas
SGC	Strategic Growth Council
SGMA	Sustainable Groundwater Management Act of 2014
SLCP	Short-Lived Climate Pollutant, a greenhouse gas that persists for a relatively short time in the atmosphere but has a significant atmospheric warming impact
SoCalGas	Southern California Gas Company
SoCalREN	Southern California Regional Energy Network
SOI	Sphere of influence
SOVs	Single-occupancy vehicles
TCR	The Climate Registry
TDM	Transportation demand management, which is the application of strategies and policies to reduce travel demand
Title 24	California Code of Regulations Title 24, also known as the California Building Standards Code (composed of 12 parts); Title 24, Part 6 established California's energy efficiency standards for residential and nonresidential buildings; see California Building Standards
UWMP	Urban water management plan
U.S. EPA	United States Environmental Protection Agency
VMT	Vehicle miles traveled
WFP	Water filtration plant

WRCOG	Western Riverside Council of Governments
WWTP	Wastewater treatment plant
ZEV	Zero-emissions vehicle
ZNE	Zero net energy; for buildings, it is the use of no more energy over the course of a year than can be generated on site through renewable resources such as solar, wind, or geothermal power

CHAPTER 1

Introduction

Agency Profile

Our Mission

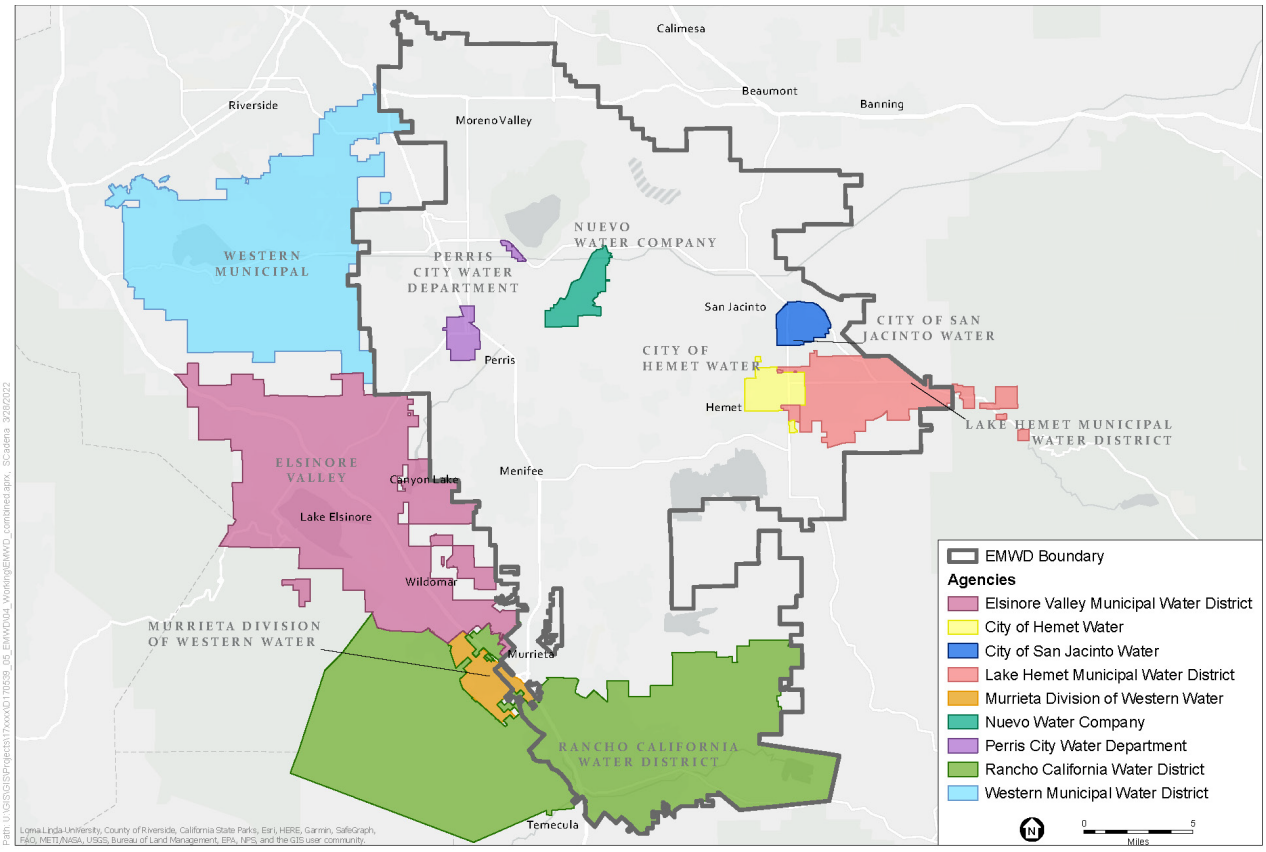
The mission of the Eastern Municipal Water District (EMWD, or the District) is to deliver value to its diverse customers and the communities it serves by providing safe, reliable, economical and environmentally sustainable water, wastewater and recycled water services. As outlined in the District's Triennial Strategic Plan (2019–2021), one of EMWD's strategic priorities is to plan and implement cost-effective energy projects and programs to optimize its energy use portfolio while minimizing the District's carbon footprint. Endeavoring to develop a Climate Action Plan is consistent with this priority. This Climate Action Plan outlines the measures EMWD can implement in the coming years to reduce the greenhouse gas (GHG) emissions associated with its operations over the next several decades.

EMWD Service Area

EMWD provides potable water, recycled water, and wastewater services to an area of approximately 555 square miles in western Riverside County, which includes a variety of socioeconomic conditions, geographies, and microclimates. EMWD is both a retail and wholesale agency. As of 2020 EMWD serves a customer base of 871,000, which includes a retail population of approximately 610,000 people and a wholesale population of 261,000 people. The agency was initially formed in 1950 to bring

imported water to the area and in 1951 was annexed into the Metropolitan Water District of Southern California (MWD). EMWD is now one of MWD's 26 member agencies. EMWD's service area boundary and the intersecting and adjacent water agencies within that boundary are shown in **Figure 1-1**.

Figure 1-1 EMWD Service Area in Relation to Other Water Agencies



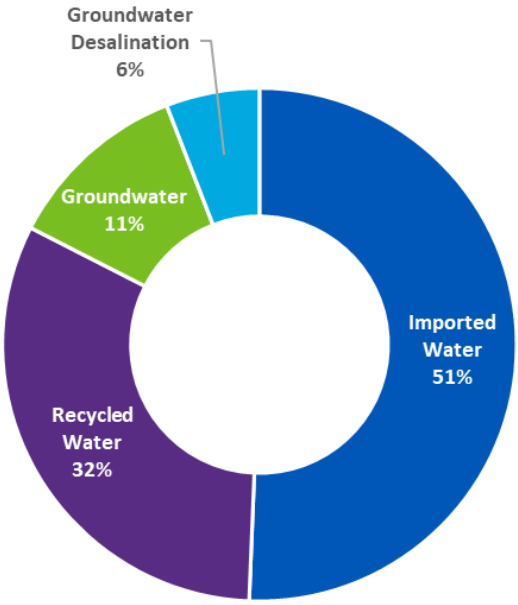
SOURCE: EMWD; ESRI; ESA, 2022.

EMWD CAP

Figure 1-2, below, depicts the sources of EMWD's retail water supply. Approximately half of EMWD's retail water demand is supplied by imported water purchased through MWD from the State Water Project (SWP) and the Colorado River Aqueduct (CRA). Imported water is delivered to EMWD either as potable water treated by MWD, or as raw water that EMWD can either treat at one of its two local filtration plants or deliver as raw water for non-potable uses.

EMWD's local supplies include groundwater, desalinated groundwater, and recycled water. Groundwater is pumped from the Hemet/San Jacinto and West San Jacinto areas of the San Jacinto Groundwater Basin. Groundwater in portions of the West San Jacinto Basin is high in salinity and requires desalination for potable use. EMWD owns and operates three desalination plants that convert brackish groundwater from the West San Jacinto Basin into potable water. EMWD also owns, operates, and maintains its own recycled water system that consists of four Regional Water Reclamation Facilities and storage ponds spread throughout EMWD's service area that are all connected through the recycled water system. Since 2014, EMWD has generally used almost all of the recycled water it produces. Recycled water is a significant portion of EMWD's water supply portfolio, offsetting potable demand.

Figure 1-2 Sources of EMWD's 2020 Retail Water Supply



Note: *Groundwater in the graph above includes imported water used to recharge the San Jacinto Groundwater Basin to fulfill the Soboba Tribe's groundwater rights.*

EMWD is a member agency of the Western Riverside Council of Governments (WRCOG), a regional agency that seeks to facilitate cooperative planning, coordination, and technical assistance on issues of mutual concern among its member agencies. WRCOG has been an innovator in implementing programs that are environmentally, economically, and socially beneficial to the subregion, including a regional climate action planning effort that has been in place since 2014.

Purpose and Scope

This Climate Action Plan outlines strategies, goals, and actions that can reduce the District's operational GHG emissions. It is designed to ensure that EMWD does its part to meet the GHG reduction goals of California's Global Warming Solutions Act of 2006 (Assembly Bill 32), and its successor bill Senate Bill 32, while remaining consistent with the region's vision for future growth, as articulated by the region's local governments and the regional planning agency WRCOG.

AB 32 directs the state to reduce state-wide GHG emissions to 1990 levels by 2020, while SB 32 deepens that commitment to 40 percent below 1990 levels by 2030. To achieve these reductions, the California Air Resources Board (CARB) and the State Office of Planning and Research (OPR) recommend that local planning agencies develop reduction targets that are consistent with these statewide targets.

As is further described in Chapter 3, *Greenhouse Gas Emissions, Forecasts, and Reduction Target*, the District's GHG emissions inventory for calendar year 2006 (emissions baseline) amounted to 74,647 metric tons of CO2 equivalent (MT CO2e), decreasing to 59,051 MT CO2e by the year 2017. Under business-as-usual (BAU) conditions, the District's annual GHG emissions are forecasted to increase to 75,702 MT CO2e by 2030. To be consistent with SB 32, EMWD must reduce its annual emissions to approximately 58,218 MT CO2e by the year 2030. This represents a reduction of 50 percent below 2006 levels on a per-customer (i.e., retail service population) basis.

Workers at the Temecula Valley Regional Water Reclamation Facility

This Climate Action Plan outlines the GHG reduction strategies and actions EMWD needs to take to reach its 2030 target. It also considers the years beyond 2030, when deeper reductions in global GHG emissions will be needed to be consistent with the State's longer term GHG targets. Several initiatives at the state and regional level will reduce EMWD's operational emissions in the coming years, substantially helping the District meet its 2030 target.

In developing this Climate Action Plan, EMWD considered many potential GHG-reduction strategies and actions. Best-suited measures were chosen primarily based on their applicability to EMWD's facilities and operations and their cost-effectiveness, as well as additional considerations regarding funding availability and feasibility of implementation.

EMWD is dedicated to the responsible use and protection of the natural environment through groundwater management, water use efficiency and various other sustainable practices. In recent years EMWD has become an industry leader in environmental stewardship through water conservation and groundwater management programs, solar energy projects and energy efficiency programs, and by annually reporting GHG emissions to The Climate Registry. EMWD also promotes water conservation through investments in infrastructure, technology, education, and community outreach programs.

In addition to reducing GHG emissions, the Climate Action Plan will help EMWD streamline its review process for future capital improvement projects. As is further described in *Regulatory Setting*, per guidance by the Governor's Office of Policy and Research (OPR) a lead agency may determine that an individual project's incremental contribution to a cumulative effect on climate change is not cumulatively considerable if the project complies with the requirements of a previously adopted plan to reduce GHGs that meets certain minimum requirements. This Climate Action Plan will serve as such a plan. See Chapter 5, *Implementation*, for additional information on the benefits this Climate Action Plan provides for California Environmental Quality Act (CEQA) project review.

Relationship to Other Plans

The Climate Action Plan is aligned with several key planning documents relevant to EMWD's service area.

EMWD 2020 Urban Water Management Plan

The Urban Water Management Planning Act (Act), adopted in 1983, requires water suppliers to conduct long-term water resources planning. In response to ongoing water shortages, the Act sought to minimize susceptibility to supply shortages by requiring a minimum level of long-term resource assessment and planning by water suppliers. Under the Act, EMWD must prepare and adopt an Urban Water Management Plan (UWMP) every five years and submit it to California Department of Water Resources (DWR). Under the California Water Code, UWMPs must:

- Assess the reliability of water sources over a 20-year planning time frame
- Describe demand management measures and water shortage contingency plans
- Report progress toward meeting a targeted 20 percent reduction in per-capita (per-person) urban water consumption by the year 2020
- Discuss the use and planned use of recycled water

The planning requirements established by the Act and subsequent legislation encourage regional coordination and focus on water use efficiency.

EMWD's 2020 UWMP, completed in July 2021, addresses the water supply sources, projected demands, and supply reliability for Eastern Municipal Water District's (EMWD) service area. The GHG forecasts in the EMWD CAP were derived from the customer growth and water supply mix projected in the 2020 UWMP.

EMWD 2014 Energy Management Plan

EMWD's 2014 Energy Management Plan (EMP) identifies identify a portfolio of potential projects to reduce the District's existing and future energy use and cost, and prioritizes the projects based on return on investment. The EMP's recommended projects, represented as energy efficiency measures (EEMs), were used as the basis for several of the GHG reduction measures in the CAP, including the decommissioning or conversion of some of EMWD's internal combustion engines (ICEs) to electric engines, various lighting and appliance replacement projects, installation of occupancy sensors, and locking of HVAC temperature ranges (see Chapter 3 for more details).

Western Riverside Council of Governments (WRCOG) Subregional Climate Action Plan

The Western Riverside Council of Governments (WRCOG) adopted a Subregional Climate Action Plan in 2014, representing one of the state's first multi-jurisdictional approaches to reducing GHG emissions. An update of that plan is currently underway to align with the State of California's current targets and goals for reducing GHG emissions through the year 2050. The update provides a policy framework and a quantitative basis for the Subregion and participating jurisdictions to fulfill their regulatory obligations with respect to emissions reduction and climate change. The Subregional CAP update enables participating jurisdictions to efficiently develop feasible targets that make sense for their communities, while staying abreast of rapidly evolving climate science, regulations, and stakeholder concerns. The scope included developing community wide GHG inventories for 19 jurisdictions, creating a community engagement and public outreach toolbox, establishing reduction targets

and a common set of measures, and a developing a Plan that leads to more livable, equitable, and economically vibrant communities through the reduction of GHG emissions.

Many of the jurisdictions that participated in the WRCOG Subregional CAP are within EMWD's service boundary, and emissions associated with their water supply are included in their inventories and reduction plans. Although EMWD is itself a member of WRCOG, it did not participate in the Subregional CAP update; however, the District's CAP complements and strengthens WRCOG's effort because reducing the carbon intensity of EMWD's water supply reduces the emissions of each jurisdiction its serves, as well as the subregion as a whole.

Document Content

The Climate Action Plan is organized into the following chapters, as described below:

- **Chapter 1: Introduction.** This chapter provides a profile of the agency, the purpose and scope of the CAP, a summary of climate change hazards and vulnerabilities expected in EMWD's service territory. This chapter also presents a brief overview of regulations, policies and programs being implemented statewide and regionally that are most relevant to EMWD's efforts to reduce GHG emissions.
- **Chapter 2: EMWD's Greenhouse Gas Emissions.** This chapter presents EMWD's annual inventory of GHG emissions from its 2006 baseline year through the year 2017. An analysis of GHG emissions associated with EMWD's energy use is also provided.
- **Chapter 3: Greenhouse Gas Forecasts and Targets.** This chapter provides forecasts of EMWD's emissions through the year 2050 using projections of operational and customer growth and estimates the cumulative effect of implementing state-wide and regional measures to reduce GHG emissions over that time period. This chapter also establishes a 2030 reduction target for EMWD's GHG emissions.
- **Chapter 4: Greenhouse Gas Reduction Measures.** This chapter describes the strategies and implementing actions EWMD plans to take to reduce emissions. Emissions reduction estimates are provided for EMWD's Core Measures that will enable the agency to achieve its 2030 target. This chapter also presents a discussion of Additional Measures that will enable the District to achieve deeper reductions and contribute its fair share to meeting California's longer-term climate stabilization goals.
- **Chapter 5: Implementation.** This chapter outlines the steps for implementing the GHG reduction measures described in Chapter 4, and for monitoring the progress of implementation. Chapter 5 also describes how the Climate Action Plan relates to the CEQA and how EMWD intends to use the Climate Action Plan to streamline CEQA review of future capital improvement projects.

Climate Change Vulnerabilities

Climate change is described as a significant and lasting change in the planet's weather patterns over a long time period. While the anticipated effects of climate change are likely to vary regionally, it is anticipated to have the following global effects:[1]

- Higher maximum temperatures and more hot days over most land areas;

[1] IPCC, *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* (2007), http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm.

- Higher minimum temperatures, fewer cold days, and frost days over most land areas;
- Reduced diurnal temperature range over most land areas;
- Increased heat index over land areas; and
- More intense precipitation events.

Many secondary effects are anticipated to result from climate change in California, including: loss in snow pack; sea level rise and inundation of coastal areas; increased flooding of low-lying areas; more extreme heat days per year; high ozone days; increased incidence of large forest fires and associated smoke that can impact large areas; and more frequent and severe drought years.

Fox Tank potable water storage

In the region of Western Riverside County, the most likely and impactful climate change-related hazards are expected to include agricultural pests and diseases, worsening air quality, drought (both local and statewide impact), extreme heat, human health hazards, landslides, severe weather, and wildfire.[2] In the recently completed 2020 UWMP, EMWD has considered the impacts of climate change on water demands as part of long-term strategic planning. The rising temperatures associated with climate change are expected to increase evapotranspiration and water demand. This is particularly true for EMWD's agricultural sector. Additionally, in urbanized areas with limited vegetation, climate change can exacerbate the heat island effect and result in increased energy and cooling demands. Future changes in snowmelt patterns may also make it difficult to balance water demands.

As noted in the 2020 UWMP, climate change could result in more frequent limitations on imported supplies. To limit the impact of climate change, EMWD's long-term planning focuses on the development of reliable local resources and the implementation of water use efficiency. This includes the full utilization of recycled water, which is a highly resilient supply source, and the

[2] WRCOG, *Western Riverside Adaptation and Resiliency Strategy: Part 1, Vulnerability Assessment* (2020), https://wrcog.us/285/Resilient-IE.

proactive management, monitoring, and recharge of local groundwater basins to ensure supply reliability even during potential periods of severe hydrologic conditions. EMWD is also focused on reducing demand for water supplies, especially outdoors. Increasing the use of local resources and reducing the need for imported water has the dual benefit of not only improving water supply reliability, but reducing the energy required to import water to EMWD's service area.

Regulatory Setting

Many strategies for monitoring and addressing climate change have emerged at the international, national, and state levels. California remains a leader in the effort to reduce GHG emissions through mitigation and adaptation strategies. With the Global Warming Solutions Act (AB 32 and SB 32), California is the first state in the U.S. to mandate GHG emissions reductions across its entire economy. To meet its statewide target, California has been developing policy and passing legislation that seeks to control emissions of gases that contribute to climate change. These have included regulatory approaches such as mandatory reporting for significant sources of GHG emissions and caps on emission levels, as well as market-based mechanisms, such as cap-and-trade. Although climate action planning by water and wastewater agencies is a relatively new endeavor, voluntary local actions by public agencies and local jurisdictions is increasingly common, including conducting emissions inventories, implementing practices to reduce emissions, and purchasing carbon offsets and renewable energy certificates.

The following section highlights the primary state legislation and policy guidance that is most relevant to the Climate Action Plan.

Relevant Water Policy and Legislation

California's water system is energy intensive, particularly in Southern California where a good portion of supply is imported from long distances. Water accounts for approximately 12 percent of the state's energy use, according to DWR. Although most of this energy is associated with end-customer uses that require heating, cooling, and industrial processing, much is required for the conveyance, treatment and distribution of water by agencies like EMWD. Actions that improve water-use efficiency reduce EMWD's energy use and the GHG emissions associated with producing that energy.

Water Conservation Act of 2009

In November of 2009, the California Legislature passed Senate Bill (SB) 7, referred to as SBX7-7 or the Water Conservation Act of 2009. SBX7-7 set the goal of achieving a 20 percent reduction in urban per capita water use statewide by 2020. Retail water agencies were required to set targets and track progress toward decreasing daily per capita urban water use in their service areas, in order to assist the State in meeting its 20 percent reduction goal by 2020. This law required that every UWMP include:

- Baseline per capita water use;
- Urban water use target for 2020; and
- Compliance daily per capita water use.

SB606/AB1668

SB 606 and AB 1668 are a pair of bills signed into law by Governor Brown in 2018 that established several water conservation and drought planning requirements for the state's water suppliers. One component of the legislation of relevance to the Climate Action Plan is the establishment of a supplier-specific water use objective based on a range of efficiency-based standards targeting elements such as indoor use, outdoor use, and water lost to leaks. The new indoor water use standard

proposes an initial target of 55 gallons per person per day (GPCD) until January 2025, a 47 GPCD target until January 2030, and a final target of 42 GPCD. The outdoor water use standard will be based on irrigable area, climate, and other factors determined by the DWR and the SWRCB. The water loss standard will be based on factors including physical characteristics of individual water systems as well as economic modeling completed by the state. The state has indicated that each water supplier's water use objective will be enforced in aggregate rather than by the individual components.

In Southern California, energy costs and GHG emissions associated with the transport, treatment, and delivery of water from outlying regions can be high. Therefore, compliance with the SB 606 and AB 1668 measures will also support the reduction of GHG emissions targeted in the Climate Action Plan.

Sustainable Groundwater Management Act of 2014

The Sustainable Groundwater Management Act of 2014 (SGMA) establishes a new structure for managing California's groundwater. A central feature of the SGMA is the recognition that groundwater management in California is best accomplished locally. The SGMA defines sustainable groundwater management as "the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results." Undesirable results include, but are not limited to, chronic lowering of groundwater levels, reduction of groundwater storage, seawater intrusion, degraded water quality, and land subsidence that interferes with surface land uses. The California Legislature recently passed legislation that requires 2020 UWMPs to include a Water Reliability Assessment for five consecutive dry years and to coordinate groundwater supply planning with agency plans to address the SGMA.

Sustainable management of groundwater in the San Jacinto Groundwater Basin helps secure the reliability of EMWD's local water supplies and allows the District to import less water. EMWD produces groundwater from the Hemet/San Jacinto and West San Jacinto areas of the San Jacinto Groundwater Basin. The utilization of groundwater, both potable and brackish, is a key element of EMWD's supply portfolio and from a full lifecycle perspective provides the benefit of a lower carbon footprint relative to imported water.

Other State Legislation and Guidance

AB 32 and SB 32, collectively known as the Global Warming Solutions Act of 2006, direct public agencies in California to support the statewide goal of reducing GHG emissions to 40 percent below 1990 levels by 2030. Preparing a CAP supports SB 32 at the local level. While compliance with SB 32 is not a requirement for local jurisdictions, demonstrating consistency with statewide reduction goals can significantly assist WRCOG jurisdictions with CEQA review of new development, and help them qualify for incentives such as grant funding. Efforts to address climate change, reduce consumption of resources, and improve energy efficiency led by state legislation or programs are briefly described below and identified in **Figure 1-3**.

Executive Order S-3-05

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05, which identified the California Environmental Protection Agency (CalEPA) as the lead coordinating state agency for establishing climate change emission reduction targets in California, and established the following GHG emission reduction goals:

- by 2010, California shall reduce GHG emissions to 2000 levels;
- by 2020, California shall reduce GHG emissions to 1990 levels; and
- by 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

Executive Order B-55-18

In September 2018, the Governor of California signed Executive Order B-55-18, calling for the state to achieve carbon neutrality—the point at which carbon removal of carbon pollution from the atmosphere meets or exceeds emissions—as soon as possible, and no later than 2045.

California Global Warming Solutions Act (AB 32 and SB 32)

The California Global Warming Solutions Act (AB 32) was approved by the legislature and signed by Governor Schwarzenegger in 2006. The landmark legislation required CARB to develop mechanisms for reducing statewide GHG emissions to 1990 levels by 2020, through technologically feasible and cost-effective measures. In response, CARB developed is first Climate Change Scoping Plan in 2008, identifying a variety of measures for reducing emissions that included direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and market-based cap-and-trade program.

In 2016, the California State Legislature amended the Global Warming Solutions Act with the adoption of SB 32, establishing a new GHG emissions reduction target of 40 percent below 1990 levels by 2030. A companion bill, AB 197, includes provisions to ensure the benefits of state climate policies reach into disadvantaged communities. In response to SB 32 and the 2030 GHG reduction target, CARB developed *California's 2017 Climate Change Scoping Plan*, adopted in December 2017.[3] The 2017 Scoping Plan Update's strategy for meeting the 2030 GHG target incorporates the full range of legislative actions and state-developed plans that have relevance to the year 2030. These include regulations for extending the state Cap-and-Trade Program through 2030 (AB 398); increasing the low carbon fuel standard (LCFS) to 18 percent, improved vehicle, truck and freight movement emissions standards, increasing renewable energy, improving energy efficiency, and strategies to reduce methane emissions from agricultural and other wastes by using it to meet the State's energy needs.

Advanced Clean Cars (ACC), Low Carbon Fuel Standard (LCFS), and the California Mobile Source Strategy

Assembly Bill 1493 (2002), known as the Pavley Bill, directed CARB to adopt regulations to reduce emissions from new passenger vehicles. The federal Clean Air Act ordinarily preempts state regulation of motor vehicle emission standards; however, California is allowed to set its own standards with a federal waiver from the USEPA, granted in 2009. Known as the Pavley Clean Car Standards, AB 1493 regulated GHG emissions from new passenger vehicles (light duty automobiles and medium duty vehicles) from 2009 through 2016.

In January 2012, CARB approved the Advanced Clean Cars (ACC) program, a new emissions-control program for model years 2015 through 2025. The program includes components to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars. The zero-emissions vehicle (ZEV) program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles (PHEV) in the 2018 to 2025 model years.

Executive Order S-1-07, known as the Low Carbon Fuel Standard (LCFS), requires the carbon-intensity of California's transportation fuel to be reduced by at least 10% by 2020. In September 2018, CARB extended the LCFS program to 2030,

[3] California Air Resources Board, *The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California's 2030 Greenhouse Gas Target* (January 20, 2017), https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.

making significant changes to the design and implementation of the Program including a doubling of the carbon intensity reduction target to 20 percent by 2030.

In May 2016, CARB released its updated Mobile Source Strategy, which demonstrates how the State can simultaneously meet air quality standards, achieve GHG emission reduction targets, decrease health risk from transportation emissions, and reduce petroleum consumption over the next fifteen years, through a transition to ZEVs, cleaner transit systems and reduction of vehicle miles traveled. The Mobile Source Strategy calls for 1.5 million ZEVs (including plug-in hybrid electric, battery-electric, and hydrogen fuel cell vehicles) by 2025 and 4.2 million ZEVs by 2030. It also calls for more stringent GHG requirements for light-duty vehicles beyond 2025 as well as GHG reductions from medium-duty and heavy-duty vehicles and increased deployment of zero-emissions trucks primarily for class 3–7 "last mile" delivery trucks in California. Statewide, the 2016 Mobile Source Strategy would result in a 45 percent reduction in GHG emissions, and a 50 percent reduction in the consumption of petroleum-based fuels. A 2020 update to the Mobile Source Strategy, which is expected to be adopted and incorporated into CARB's 2022 Scoping Plan Update, addresses new goals and mandates for ZEVs including Governor Newsom's Executive Order N-79-20 calling for 100 percent of California sales of new passenger cars and trucks be zero-emission by 2035.

Renewables Portfolio Standard

SB 1078 established California's Renewables Portfolio Standard (RPS) in 2002, which requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from eligible renewable sources by 2017. SB 107 changed the target date to 2010. In November 2008, Executive Order S-14-08 expanded the state's RPS goal to 33 percent renewable power by 2020. In September 2009, Executive Order S-21-09 directed CARB (under its AB 32 authority) to enact regulations to help the state meet the 2020 goal of 33 percent renewable energy. The 33 percent by 2020 RPS goal was codified in April 2011 with SB X1-2. This new RPS applies to all electricity retailers in the state, including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. SB 350 was signed in October 2015, which requires retail sellers and publicly owned utilities to procure 50 percent of their electricity from eligible renewable energy resources by 2030. Most recently, SB 100, signed by Governor Brown on September 10, 2018, increases the RPS requirement to 60 percent eligible renewables by 2030 and 100 percent by 2045.

All electricity-providing utilities in California, including those that serve EMWD, must meet these targets:

- 33% of retail sales from renewables by 2020
- 44% of retail sales from renewables by 2024
- 52% of retail sales from renewables by 2027
- 60% of retail sales from renewables by 2030
- 100% of retail sales from renewables by 2045

Meeting these goals will lead to reduced GHG emissions associated with EMWD's use of electricity, as more electricity will be generated by sources with zero or lower carbon intensity.

California Building Code

Title 24, of the California Code of Regulations, Part 6 sets forth California's energy efficiency standards for residential and nonresidential buildings and was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically (typically every three years) to allow for the consideration and inclusion

of new energy efficiency technologies and methods. The current standards (2019), made effective on January 1, 2020, require new residential building to install rooftop solar photovoltaic (PV) systems. The next iteration of the energy standard, which will go into effect January 2023, is expected include new prescriptions and performance standards for building electrification.

The California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CALGreen Code, requires new residential and commercial buildings to comply with mandatory measures under five topical areas: planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt which encourage or require additional measures in the five green building topics.

Relationship to the California Environmental Quality Act

In 2007, California state lawmakers identified the need to analyze GHG emissions in the CEQA process through the adoption of SB 97. The bill required Governor's Office of Planning and Research (OPR) to develop, for adoption by the Natural Resources Agency, amendments to the CEQA Guidelines that clarified several points about the analysis and mitigation of GHG emissions. Aside from establishing the need for lead agencies to analyze and mitigate for a project's potentially significant impacts relating to GHG emissions, the amendments, which became effective in 2010, also provided that a lead agency may streamline the analysis of GHG emissions for projects that follow a programmatic GHG emissions reduction plan, or climate action plan, meeting certain criteria.

A CEQA analysis for a CAP, like for other long-term planning documents, may offer streamlining benefits to future implementing projects, as long as specific criteria are met. CEQA provides several ways for a project-level evaluation to rely on programmatic environmental review of climate impacts, including "tiering" (CEQA Guidelines § 15385 tiering), use of master EIRs, and incorporation by reference (CEQA Guidelines § 15183.5(a)). Streamlining is a way for lead agencies to reduce project-level environmental review by ensuring robust evaluation at the programmatic level. Projects that are consistent with a CAP, for example, may be found to cause a less than significant GHG impact under CEQA. (CEQA Guidelines § 15064(h)(3)).

More information on CEQA and the use of the EMWD CAP for streamlining project-level environmental review is provided in Chapter 5 on *Implementation*.

CHAPTER 2

EMWD's GHG Emissions

Greenhouse gas (GHG) inventories generally represent emissions occurring over a single calendar year. Evaluation of EMWD's GHG emissions starts with a baseline inventory of the emissions associated with EMWD facilities and operations as they existed in the year 2006. The baseline inventory is a quantification of the annual GHG emissions resulting from: electricity use, natural gas use, digester gas use, fuel use, and treatment/processing of wastewater. It provides an understanding of where GHG emissions are originating and forms the basis for target setting.

EMWD has been reporting its operational GHG emissions inventory to the Climate Registry (TCR) since 2006 and has each annual report third-party verified to ensure its accuracy and completeness. The inventories reported to TCR for the years 2006 through 2017 served as the starting point for analyzing EMWD's emissions over time and informed development of effective strategies and actions to reduce emissions.

Emission Sources

The emission sources and activities included in the EMWD GHG inventory for the CAP are determined largely by TCR's General Reporting Protocol, but also include construction emissions associated with capital improvements and maintenance. As such, emissions in the inventory are from sources that are under EMWD's operational control and for which the agency has significant influence to reduce.

Emissions from Operations

The biggest contributor to EMWD's emissions is the use of electricity and natural gas for conveyance, treatment, and delivery of water throughout its service area. Emissions from EWMD's operations include direct emissions from sources that are owned or leased by the agency (i.e., buildings, vehicles, and equipment) as well as indirect emissions associated with the purchased electricity that is used by these sources. These direct and indirect emissions are referred to as Scope 1 and Scope 2 emissions, respectively. EMWD also reports indirect emissions from the transportation of biosolids to out-of-state agricultural and compositing facilities in Arizona. These are referred to as Scope 3 emissions and are from sources not under the direct operational control of EMWD.

EMWD compiled its TCR-reported inventories from 2006 to 2017 to analyze emissions trends and to identify opportunities for reducing emissions associated with its operations.[4] **Table 2-1** lists the emissions sources included in the annual EMWD inventory.

What is a metric ton of CO_2e?

GHG emissions are reported as metric tons (MT) of carbon dioxide equivalent (CO_2e). Emitting 1 $MTCO_2e$ is approximately equal to the following:

- 113 gallons of gasoline
- 41 propane cylinders used for home barbecues
- Six weeks' worth of energy used in a house

In contrast, reducing 1 $MTCO_2e$ would require:

- Growing 16 tree seedlings for 10 years
- Recycling 680 pounds of waste instead of throwing it away

Note: Equivalencies are approximate and are adapted from the US EPA's Greenhouse Gas Equivalencies Calculator: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Moreno Valley Regional Water Reclamation Facility

[4] The District has recently reported its GHG emissions for the years 2018, 2019 and 2020 to TCR, but the inventories for these years have not yet been third-party verified. Thus, the results did not inform the development of the CAP.

In compiling the emissions data, adjustments were made to some years to maintain methodological consistency and to account for sources that were not reported for all years. For example, process emissions[5] were not included in TCR reporting, but they are included here. Process emissions were not reported from 2006 through 2008, but, because they were reported as constant from 2010 to 2016, the same estimates were also applied to the 2006 through 2008 inventories. Biogenic emissions resulting from digester gas were not reported to TCR for the first four years; however, they were estimated at the time these past inventories were conducted and are included here. Additionally, emissions of methane (CH_4) and nitrous oxide (N_2O) were not captured in TCR reporting but are now estimated for the purposes of the CAP. Additional detail regarding these inventory adjustments is provided in **Appendix A – GHG Inventory and Forecast Methods**. All emissions reported herein are in units of metric tons of carbon dioxide equivalents ($MTCO_2e$).[6]

Table 2-1 Operational Emissions Sources in the EMWD GHG Inventory

SCOPE	SOURCE CATEGORY	SOURCE(S)
Scope 1 - Direct	Mobile Combustion	Vehicle fuels: Diesel, gasoline, propane and natural gas
	Stationary Combustion	Fuels used in pumps and generators: natural gas, diesel and propane
	Process Emissions	Treatment plant N_2O
		Effluent discharge N_2O
Scope 1 - Biogenic	Stationary Biomass Combustion	Digester gas
Scope 2 - Indirect	Purchased Electricity	Electricity
Scope 3 – Indirect (Biosolids Transport)	Mobile Combustion	Diesel use by transport trucks

Emissions from Construction

Construction emissions associated with EMWD capital improvement infrastructure projects planned over an approximately ten-year period between 2020 and 2030 were estimated using emission factors derived from previously completed projects. ESA compiled a list of relevant, complete EMWD projects with publicly available CEQA documentation. The projects list included project background information, which was used to determine the project type and to calculate GHG emissions using the emission factors derived from the background projects. Projects were categorized as pipelines, wells, tanks, booster stations, lift stations, brine facilities, water treatment facilities, miscellaneous, or general construction projects. The general construction projects category included projects that could not be attributed any of the other categories. GHG emissions from the identified projects were taken from available CEQA documentation and populated into a spreadsheet.

Emission factors were determined using the background projects' provided information on pipeline length, pipeline diameter, flow rate (million gallons per day), and construction duration. Emission factors were calculated in $MTCO_2e$ per foot for pipelines, $MTCO_2e$ per million gallons per day (MGD) for storage tanks, and $MTCO_2e$ per construction day for all categories. The pipeline- and storage-tank-specific emission factors were applied if future projects had specific data related to pipeline length, diameter, and flow rate. Otherwise, the $MTCO_2e$ per day factor specific to each project type was applied to the future projects. More complete details regarding construction emissions estimates are provided in Appendix A – GHG Inventory and Forecast Methods.

[5] Process emissions are those that result from physical or chemical processes other than from fuel combustion.

[6] $MTCO_2e$ is an aggregated measure of reported GHGs, derived by multiplying the mass of each reported GHG (CO_2, N_2O, CH_4) by its global warming potential. Converting non-CO_2 gases to units of carbon dioxide equivalent (CO_2e) emissions allows GHGs to be compared on a common basis.

Table 2-2 summarizes the total emissions by project type and the number of projects categorized under each project type. Total GHG emissions from construction were divided by 10 to derive an average annual estimate for construction emissions over the 10-year period represented by the project list.

Table 2-2 EMWD Capital Improvement Project Count and GHG Emissions, 2020 to 2030

PROJECT TYPE	PROJECT COUNT	EMISSIONS ($MTCO_2E$)	PERCENT OF TOTAL
Pipeline	101	22,881	34.6%
General Construction	32	9,642	14.6%
Wells	7	7,703	11.7%
Lift Station	14	7,646	11.6%
Pipeline + Other	5	4,891	7.4%
Booster Station	31	4,019	6.1%
Tank	10	3,736	5.7%
Brine Facility	6	2,096	3.2%
Water Treatment Facility	3	1,830	2.8%
Miscellaneous	4	1,605	2.4%
TOTAL	213	66,049	100.0%
AVERAGE ANNUAL EMISSIONS	—	6,605	—

Construction for Desalter Operations

Baseline Inventory

EMWD's baseline GHG inventory represents emissions associated with EMWD facilities and operations as they existed in the year 2006, the earliest year for which the District has sufficient data to compile a complete inventory. The baseline inventory quantifies the annual GHG emissions resulting from stationary combustion (natural gas use and diesel generators), electricity use, mobile combustion (fuel use for on-road and off-road transportation), process emissions (treatment plant off-gassing), biosolids hauling, and construction. It provides an understanding of where GHG emissions are originating and forms the basis for target setting and for identifying emissions reduction opportunities.

Biogenic GHG Emissions

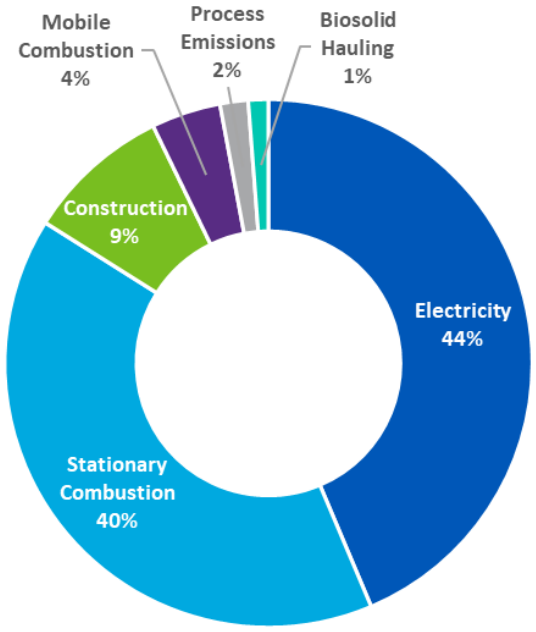
Under GHG accounting protocols, biogenic GHGs are accounted for and reported separately. Biomass combustion is considered a biogenic emissions source; therefore, it was removed from the baseline inventory, which will be the bases for target setting and GHG reduction measures.

Table 2-3 summarizes the baseline inventory by source category. In 2006, EMWD's electricity use was the greatest contributor to total emissions, accounting for approximately 44 percent of the inventory. Stationary source emissions, predominantly from natural gas combustion, contributed 40 percent, followed by construction emissions (9 percent), fleet vehicle (on-road and off-road) emissions (4 percent), wastewater treatment plant process emissions (2 percent), and truck transport of biosolids (1 percent). **Figure 2-1** provides a graphical depiction of each source category's contribution to the baseline inventory.

Table 2-3 EMWD 2006 Baseline GHG Inventory ($MTCO_2e$)

SOURCE CATEGORY	SCOPE	EMISSIONS	PERCENT OF TOTAL
Stationary Combustion	1	30,093	40.3%
Mobile Combustion	1	3,177	4.3%
Process Emissions	1	1,283	1.7%
Purchased Electricity	2	32,571	43.6%
Biosolids Hauling	3	919	1.2%
Construction	3	6,605	8.8%
TOTAL	—	74,647	100.0%

Figure 2-1 2006 Baseline EMWD GHG Emissions by Source Category



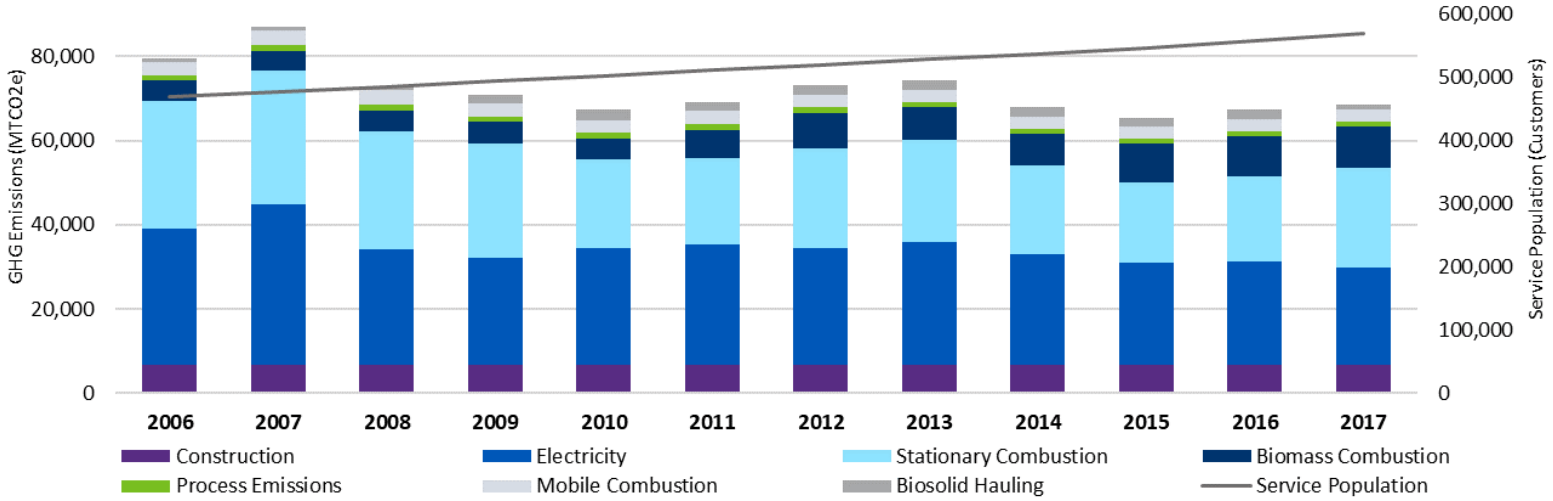
Historical Emissions

Table 2-4 summarizes EMWD's from 2006 to 2017, which includes TCR-reported GHG emissions sources (adjusted as described earlier) as well as annual construction emissions estimates. The results are also presented graphically in **Figure 2-2**. As the data indicates, EMWD's emissions increased from 2006 to 2007 but have generally trended downwards since then. Total emissions in 2017 were approximately 14 percent lower than in 2006, despite a significant (22 percent) increase in EMWD's retail service population as shown in the graph in Figure 2-2.

Table 2-4 EMWD's GHG Emissions, 2006 to 2017 ($MTCO_2e$)

SOURCE	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Purchased Electricity	32,571	38,370	27,623	25,425	27,782	28,639	27,785	29,305	26,241	24,362	24,696	23,279
Stationary Combustion	30,093	31,501	28,050	27,337	21,124	20,693	23,708	24,320	21,160	18,989	20,249	23,710
Mobile Combustion	3,177	3,484	3,616	3,065	3,036	3,269	2,979	2,813	2,829	2,801	2,771	2,755
Biomass Combustion	4,899	4,838	4,873	5,013	5,013	6,621	8,505	7,610	7,567	9,191	9,415	9,620
Process Emissions	1,283	1,283	1,283	1,322	1,283	1,283	1,283	1,283	1,283	1,283	1,283	1,283
Biosolid Hauling	919	968	747	2,212	2,563	2,032	2,298	2,448	2,355	2,200	2,335	1,418
Construction	6,605	6,605	6,605	6,605	6,605	6,605	6,605	6,605	6,605	6,605	6,605	6,605
TOTAL	79,547	87,048	72,797	70,978	67,406	69,143	73,162	74,384	68,040	65,432	67,354	68,670

Figure 2-2 EMWD's GHG Emissions by Source and Retail Service Population, 2006 to 2017



Emissions from Energy Use

The great majority of EMWD's emissions come from energy use. As indicated above, electricity and natural gas use combined contribute 84 percent of total emissions in the 2006 baseline year and, over the period of 2006 through 2017, have represented approximately 80 percent of the total on average. Examining the energy use by EMWD's various operations and service offerings helps identify opportunities for energy savings and emissions reductions.

Embodied Energy in Imported Water

Imported water from the Metropolitan Water District (MWD) contains energy embodied from the pumping and conveyance of the water that occurs upstream of EMWD's operational boundary. Thus, the GHG emissions associated with that embodied energy are not counted in EMWD's GHG inventory.

EMWD's operations were broken into 11 operational categories based on the end product or service provided and the water supply source, as summarized in **Table 2-5**. Electricity and natural gas use (using data from the three most recent verified inventory years 2014 to 2016) was allocated to each operation, where feasible. Because EMWD's systems are not always exclusive to a single operation or service, assumptions were made regarding the primary use of each facility or system. Where detailed characterization of energy use was not feasible, the energy use was attributed to a more general energy use category (e.g., it was not possible to distinguish between the energy used to transmit water to retail customers versus wholesale customers, so the energy was allocated to the general category of water distribution). This process of energy use allocation resulted in seven distinct energy use categories, as shown in Table 2-5 below, providing insights into the relative energy and carbon intensities of EMWD's operations and services.

Desalter Trains

Table 2-5 **Allocation of EMWD Operations to Energy Use Category**

OPERATION	DESCRIPTION	ENERGY USE CATEGORY
Water Supply		
Imported Treated	Potable Supply: pumping of purchased, imported water that has already been treated	Water Distribution
Imported Raw	Potable Supply: pumping of purchased, imported, raw water and systems associated with EWMD's treatment of the imported, raw water	Water Supply – Imported Raw
Local	Potable Supply: pumping and treatment of local groundwater, including brackish	Water Supply - Local
Recycled	Recycled Supply: tertiary treatment of wastewater and subsequent pumping of recycled water	Wastewater Treatment
Water Transmission		
Retail	Distribution: transmission of water to retail customers	Water Distribution
Wholesale	Distribution: transmission of water to wholesale customers	Water Distribution
Wastewater / Recycled Water System		
Wastewater Treatment	Wastewater: primary and secondary treatment of wastewater	Wastewater Treatment
Wastewater Conveyance	Wastewater: pumping and conveyance of wastewater	Wastewater Conveyance
Recycled Water - Retail	Recycled Water: delivery of recycled water to retail customers	Recycled Water Delivery
Recycled Water - Wholesale	Recycled Water: delivery of recycled water to wholesale customers	Recycled Water Delivery
Other		
Other	Buildings and Other Facilities: energy use not associated with pumping or treatment	Other Facilities & Operations

Figure 2-3 and **Figure 2-4** show average annual electricity use and natural gas use by the seven energy use categories defined above, while **Figure 2-5** depicts the average annual GHG emissions by the same categories. The results indicate that wastewater treatment is the biggest user of both electricity and natural gas, and generates more GHG emissions than any other category (roughly half of all EMWD's energy-related emissions). Water distribution, as the second largest source of energy-related emissions, is also a heavy user of both electricity and natural gas. Emissions associated with local water supply, which is the third largest source of energy-related emissions, are largely due to electricity use.

Figure 2-3 **Average Annual Electricity Consumption, 2014 to 2016 (kWh)**

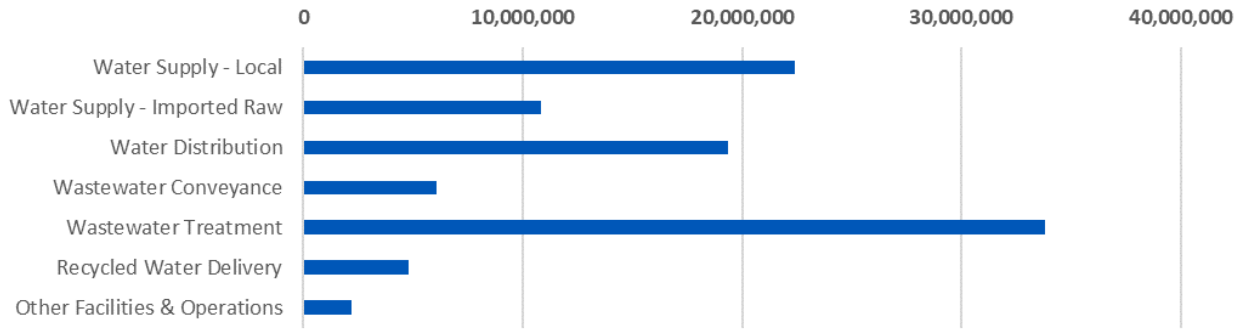


Figure 2-4 **Average Annual Natural Gas Consumption, 2014 to 2016 (therms)**

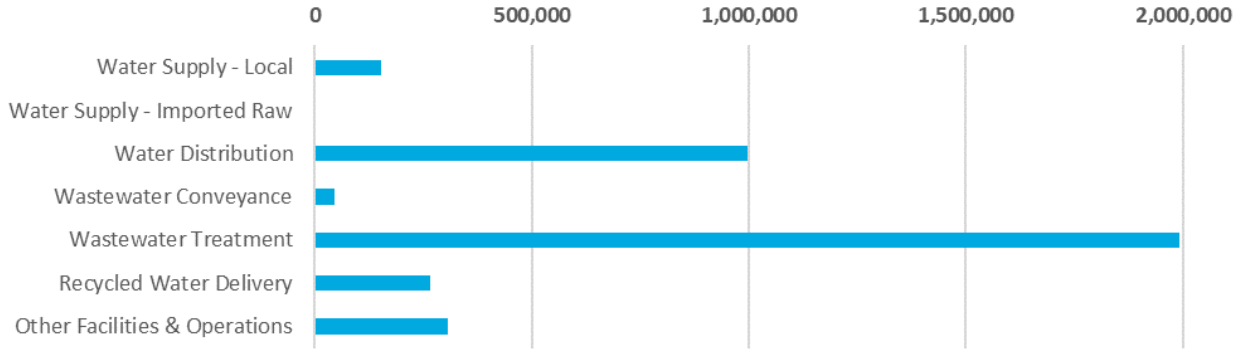
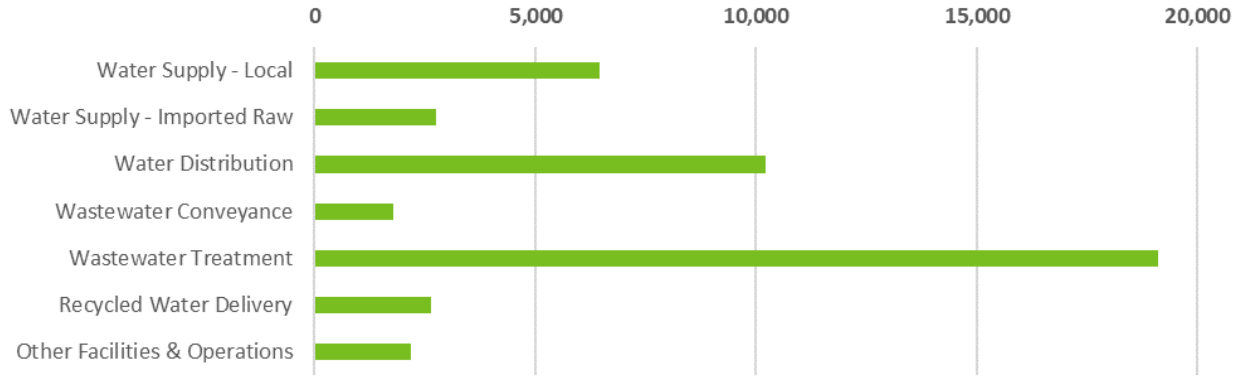


Figure 2-5 **Average Annual GHG Emissions, 2014 to 2016 ($MTCO_2e$)**



It is important to note that Figures 2-3 through 2-5 reflect the energy demand and associated GHG emissions that occur within EMWD's operational boundary. For example, the Imported Raw Water Supply category indicates a lower energy intensity compared to Local Water Supply. However, much of the energy use associated with the pumping and conveyance of Imported Raw Water occurs upstream within the Metropolitan Water District's operational boundary, prior to reaching EMWD's operations. if assessed at a statewide scale as opposed to the district scale, Imported Raw Water would likely have a higher embodied energy intensity than Local Water.

The results indicate that Wastewater Treatment should be a target of EMWD's energy conservation and GHG reduction measures. Water Distribution, the second largest source of energy-related emissions, should also be a focus. Figure 2-5 indicates that Recycled Water Delivery has a carbon intensity similar to that of Imported Raw Water but lower than Local Water Supply (with the caveat that the results for Imported Raw Water do not include energy and emissions occurring outside of EMWD's operational boundary). In terms of minimizing EMWD's operational GHG emissions, Recycled Water remains a preferred source of future water supply, since the GHG intensity of its distribution and delivery is relatively low and EMWD must continue its wastewater treatment operations regardless of whether or not the resultant recycled water is used as a supply.

Recycled Water in the Region

GHG Reduction Benefits

At the District scale, recycled water appears to have a similar carbon intensity of imported raw water; however, accounting for the embodied energy of imported water, recycled water has a lower GHG emissions intensity.

EMWD's Goal for Recycled Water

Implement ongoing treatment, storage and distribution system projects and programs to allow 100 percent utilization of treated effluent for the highest beneficial and sustainable uses possible. (from *EMWD Triennial Strategic*

INTENTIONALLY BLANK

CHAPTER 3

GHG Forecast and Target

Business-As-Usual Forecast

A business-as-usual (BAU) emissions forecast allows EMWD to understand the type and amount of emissions that are likely to occur in the future without implementation of GHG-reducing measures. EMWD's BAU forecast projects future emissions using the most current emissions data available (i.e., 2017 emissions inventory) and the expected growth in EMWD operations, which in turn is based on projected growth in customers and employees, and the facilities and fleets that will be needed to support that growth. BAU forecasts are useful in climate action planning because they provide the basis against which GHG reduction programs can be quantified.

Emissions were forecast for the years 2030, 2045, and 2050 to align with three important statewide planning milestones: the 2030 GHG emissions target established by SB 32, the 2045 carbon neutrality goal established by Governor Brown's Executive Order B-55-18, and the 2050 target established by Governor Schwarzenegger's 2006 Executive Order S-3-05. Although EMWD's long-term planning horizon extends beyond 2050, as described in the 2015 Water Facilities Master Plan (WFMP) and 2015 Wastewater Collection System Master Plan, emissions forecasts beyond 2050 are inherently speculative due to unknowns regarding future technologies and customer water use behavior.

Electricity and natural gas consumption associated with each of EMWD's services were forecasted using the energy use categories identified in Chapter 2 and methods specific to each service and its anticipated growth profile. Forecasts specific to

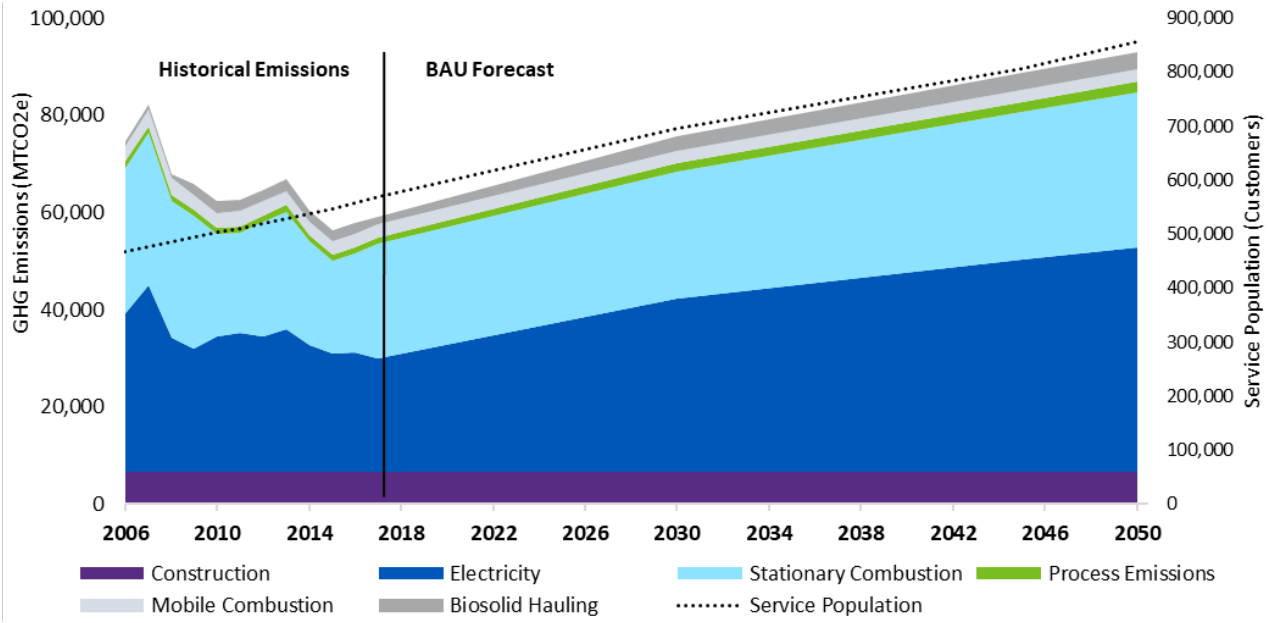
EMWD's services were based on flow projections and service population projections identified in EMWD's 2020 Urban Water Management Plan (UWMP). The energy consumption associated with the 'Other Facilities and Operations' category and mobile emissions associated with EMWD's fleet were assumed to remain constant in the future, as they are not directly dependent on expansion of EMWD's service population or service demand. Process emissions and emissions from biosolids hauling were forecasted using service population projections.

Table 3-1 summarizes EMWD's BAU forecasts for each of the inventory source categories. Under BAU conditions, EMWD's total emissions are expected to increase in the coming years as its service population grows, as shown in **Figure 3-1**. The BAU forecast does not account for the future effects of federal, state, and regional programs that are designed to reduce emissions, nor does it account for the actions that EMWD is taking to reduce emissions.

Table 3-1 EMWD BAU Emissions Forecasts (MTCO2e)

SOURCE	2006	2017	2030	2045	2050
Purchased Electricity	32,571	23,279	35,714	43,670	46,322
Stationary Combustion	30,093	23,710	26,109	30,371	31,792
Mobile Combustion	3,177	2,755	2,650	2,650	2,650
Process Emissions	1,283	1,283	1,707	2,036	2,145
Biosolid Hauling	919	1,418	2,917	3,420	3,588
Construction	6,605	6,605	6,605	6,605	6,605
TOTAL	74,647	59,051	75,702	88,752	93,102

Figure 3-1 EMWD Historical Emissions and BAU Emissions Forecasts



Reductions from State Measures

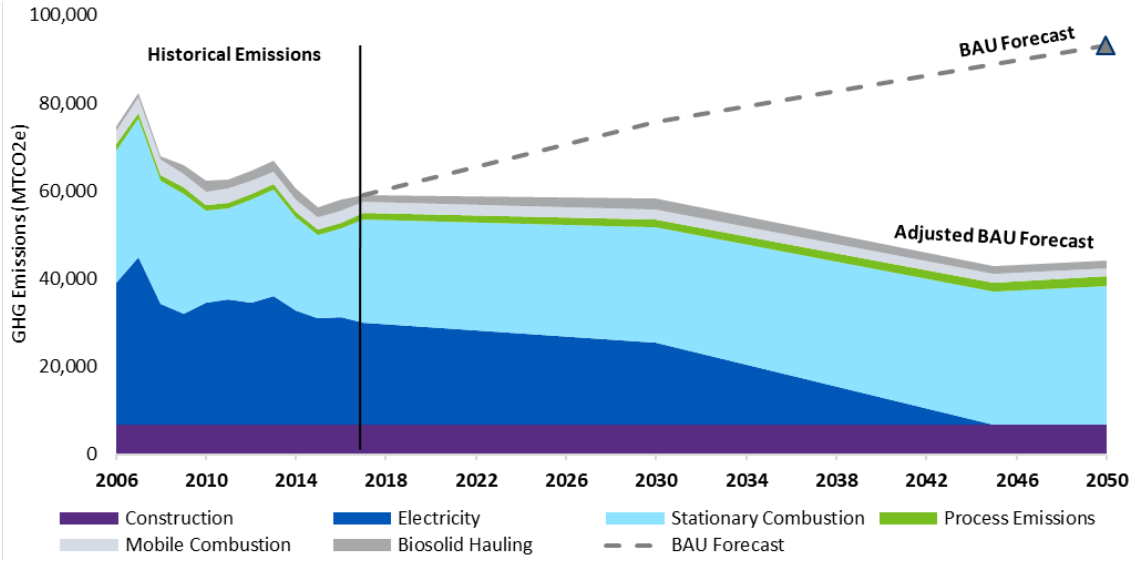
Statewide, emissions reductions are primarily achieved through many of the regulations introduced in Chapter 1, including fuel efficiency standards for passenger vehicles (e.g., California's Advanced Clean Cars initiative), a reduction in the carbon content of transportation fuels (e.g., California's Low Carbon Fuel Standard), and minimum renewable energy sourcing requirements for utilities (e.g., California's Renewables Portfolio Standard). Measures regulated and implemented by the State and federal governments achieve reductions without additional action by local agencies. For example, even if EMWD continued its vehicles to travel the same distance each year, resulting GHG emissions would decrease as the agency's fleet is replaced with electric or more fuel-efficient vehicles. In addition, State-mandated water conservation rules will reduce the amount of energy needed for EMWD's water treatment and conveyance operations on a per customer basis.

Table 3-2 summarizes the reductions from the State measures described above and includes the Adjusted BAU emissions estimates, projections that account for existing state policies and regulations. State measures are expected to reduce emissions by almost 18,000 MTCO2e by 2030 and 49,000 $MTCO_2e$ by 2050. As seen in Table 3-2, the Renewables Portfolio Standard will have a large impact on EMWD's future emissions. The Adjusted BAU forecast is represented in **Figure 3-2** below.

Table 3-2 EMWD GHG Reductions Anticipated from State Measures and Adjusted BAU ($MTCO_2e$/yr)

STATE MEASURES BY SECTOR	2030	2050
Energy		
Renewables Portfolio Standard (RPS)	-16,790	-46,322
Transportation & Land Use		
Pavley/Advanced Clean Cars; Low Carbon Fuel Standard (LCFS)	-695	-2,592
Total	-17,484	-48,914
Adjusted BAU Forecast	58,403	44,191

Figure 3-2 EMWD Adjusted BAU Emissions Forecasts ($MTCO_2e$)



GHG Reduction Target

As outlined by the California Air Resources Board (CARB) in its Climate Change Scoping Plan (CARB, 2017),[7] local governments and government agencies are encouraged to reduce their GHG emissions in line with statewide goals. EMWD has aligned its GHG reduction target with the goals of AB 32 and SB 32, which together mandate a statewide GHG reduction to 40 percent below 1990 levels by 2030. Meeting this target will help keep California on track for achieving its long-term climate stabilization goal of reducing statewide GHG emissions to "net zero" across all economic sectors by the year 2045, as directed by Executive Order B-55-18 (2018).

1990 emissions data is generally difficult to obtain or can be unreliable or incomplete if it can be obtained. The earliest GHG emission data compiled by EMWD is for the year 2006. As such, the District's GHG target is set at 50 percent below 2006 levels, to account for emissions growth that occurred between 1990 and 2005. This is consistent with the State's Scoping Plan recommendation to local governments to demonstrate consistency with California's state-wide GHG reduction targets.[8]

To account for the expected growth in EMWD's customer base, the 2030 emissions target is determined on a per capita basis using retail service population. This approach supports the intent of SB 32 to accommodate population and economic growth in California, while also achieving a lower rate of GHG emissions and meeting the statewide target for 2030. It is also consistent with case law regarding the evaluation of GHG emission impacts under the California Environmental Quality Act (CEQA).[9] Longer term, EMWD is committed to contributing its fair share toward achieving California's long-term GHG goals to reduce emissions 80 percent below 1990 levels by 2050 (Governor's Orders S-3-05) and achieve statewide carbon neutrality by 2045 (Governor's Order B-55-18).

EMWD's 2030 target is represented as an efficiency metric, which normalizes the SB 32 target to a per capita basis to account for the expected growth in our retail service population.[10] As shown in **Table 3-3**, the 2030 target is equivalent to 0.08 $MTCO_2e$ per service population (SP). On a gross emissions basis, the 2030 target represents 55,412 $MTCO_2e$. Achieving the 2030 target will put EMWD on a feasible pathway to helping the State achieve its longer-term GHG reduction goals. **Figure 3-3**, below, depicts EMWD's adjusted BAU emissions forecast in comparison to its 2030 target. To achieve the 2030 target, EMWD must reduce its annual operational emissions by a minimum of 2,991 $MTCO_2e$, through the measures described in the next chapter.

---

[7] CARB, *California's 2017 Climate Change Scoping Plan* (November 2017).

[8] CARB's 2014 Scoping Plan recommends that local governments set their targets at 15 percent below an annual baseline established for the period 2005–2008. Taking an additional 40 percent below that level equates to a 49 percent reduction from the baseline.

[9] In *Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming* (2015), also known as the "Newhall Ranch" case, the California Supreme Court acknowledged GHG efficiency metrics as a superior approach for CEQA evaluation of and use projects, based on the recognition that California population will continue to grow, while at the same time GHG emissions must be reduced.

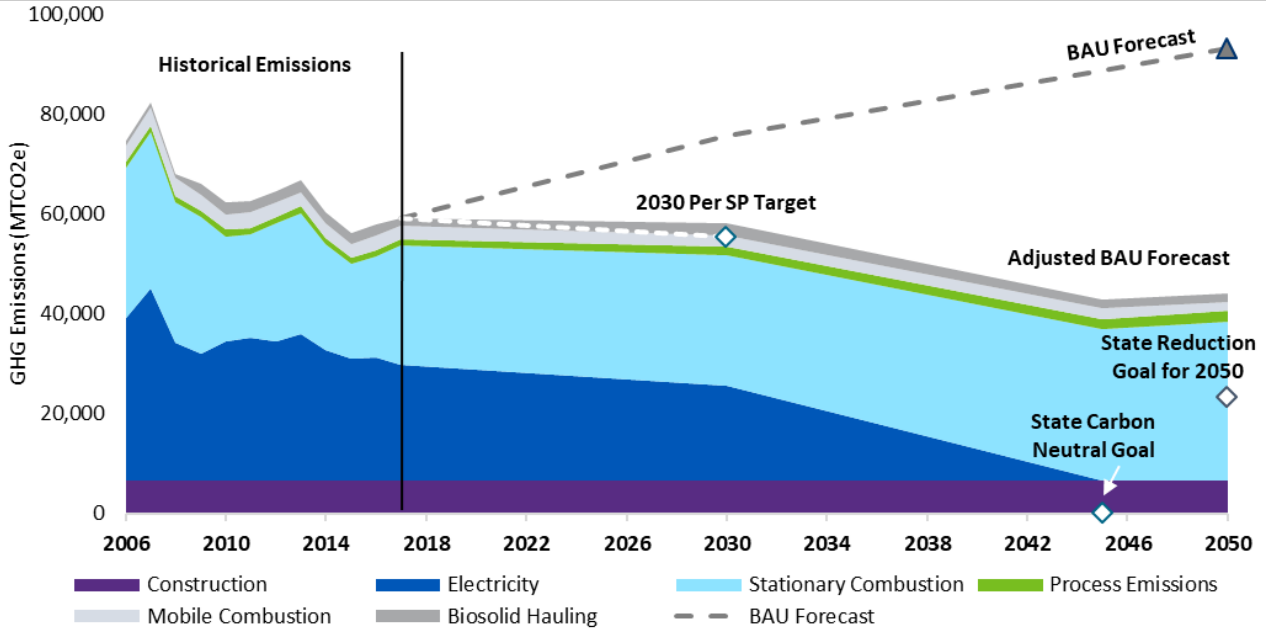
[10] This approach is similar to how the subregional target was derived for the WRCOG Subregional Climate Action Plan update completed earlier this year. For EMWD, using retail customers as the service population rather than wholesale customers is seen as more directly aligned with the District's operations and energy uses. In addition, EMWD supplies some wholesale customers with just a portion of their supply, so including wholesale customer populations in the service population would misrepresent EMWD's average per-person emissions.

Table 3-3 Derivation of 2030 GHG Target for the EMWD CAP

DATA/METRIC	$MTCO_2E$
2030 Per Service Population Target	
2006 Baseline GHG Emissions	74,647
2006 Retail Service Population[A]	468,467
2006 Baseline GHG Emissions Per Service Population	0.16
50% Reduction Consistent with SB 32[B]	-0.08
2030 Target GHG Emissions Per Service Population	0.08
2030 Projected Service Population[A]	695,500
2030 Target (Gross Emissions)	**55,412**
2030 Adjusted BAU Forecast (from Table 3-2)	58,403
Annual Reduction from BAU Needed by 2030 to Achieve Target	-2,991

Notes:
A – From 2020 UWMP, based on SCAG growth forecasts
B – Equivalent to 40% below 1990 levels

Figure 3-3 EMWD Adjusted BAU Forecast in Comparison to Emissions Target ($MTCO_2e$)



INTENTIONALLY BLANK

CHAPTER 4

GHG Reduction Measures

This chapter outlines the specific measures EMWD plans to implement in order to achieve its 2030 GHG emissions target. The chapter is divided into two groups of measures: Core Measures that the District is implementing over the next 8 years in order to achieve its 2030 target and Additional Measures that the District will be evaluating as State policy evolves, new technologies are developed, and potential new legislative mandates are issued for the purpose of achieving the State's longer term climate stabilizations goals. The Additional Measures also provide a roadmap for going beyond the reductions that can be achieved by the Core Measures, and they provide the District with vision for what will be needed to reduce emissions in the long term.

The further one looks to the future, the more speculative emissions estimates become; thus, implementation of the CAP should include a tracking and monitoring program that includes regular inventory updates and assessments of GHG reduction measure effectiveness to determine progress towards targets and identify additional measures that may be needed to achieve them. More information on implementation is provided in Chapter 5.

Core Measures

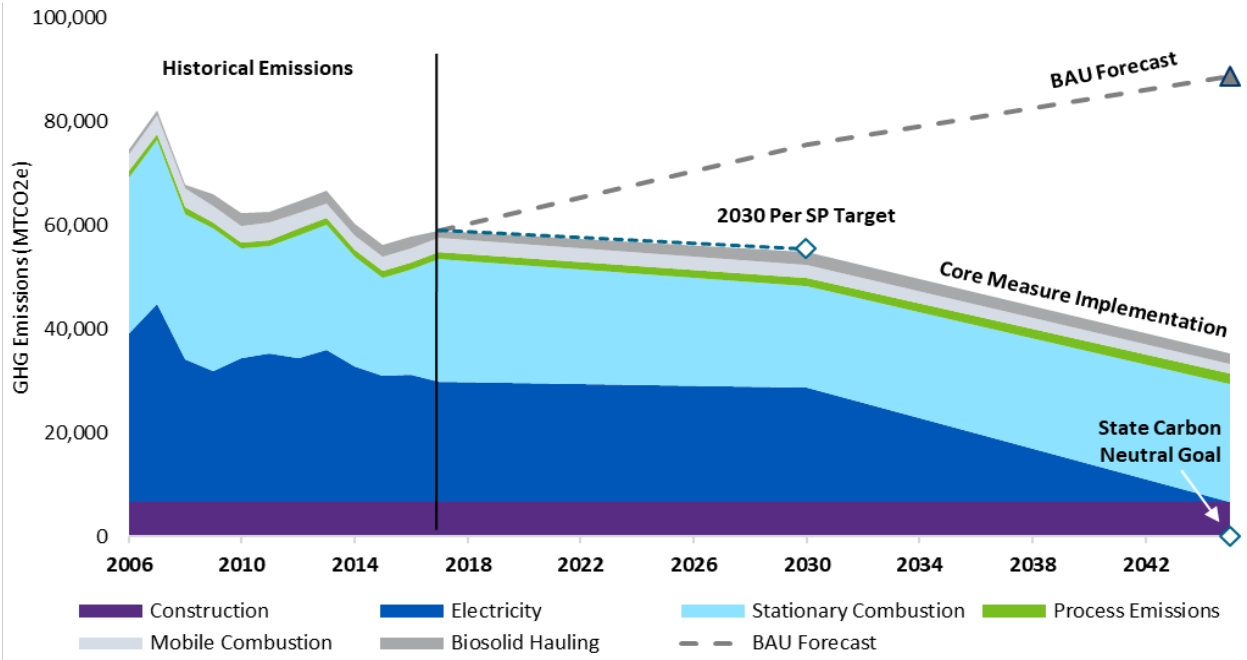
The following three Core Measures are the primary means by which EMWD is expected to achieve its 2030 target that is aligned with SB 32. A description is provided for each measure, along with the assumptions and key performance goals that form the basis for quantifying the reductions that result from their implementation. As shown in **Table 4-1**, implementation of these three measures would result in a total annual reduction of 3,341 $MTCO_2e$ by the year 2030, which would enable EMWD to achieve its 2030 target. Even greater annual reductions would occur by the year 2045. **Figure 4-1** depicts graphically the effect these Core Measures would have on future emissions.

Table 4-1 GHG Reduction Potential of Core Measures vs. Target ($MTCO_2e$/year)

CORE MEASURES	2030	2045
Measure 1: ICE Conversion	1,516	6,769
Measure 2: Energy Efficiency Improvements	710	0
Measure 3: Water Conservation	1,115	858
Total Reductions	3,341	7,628
Reductions Required to Achieve Target	2,806	N/A
2030 Target Achieved?	Yes	N/A

Note: Totals may not add up due to rounding.

Figure 4-1 EMWD Adjusted BAU GHG Forecast with Core Measures Implemented ($MTCO_2e$)



Core Measure 1: ICE Conversion

EMWD's 2014 Energy Management Plan (EMP)[11] identified an array of energy efficiency measures (EEMs), a cost-benefit analysis of each, and a recommendation for whether or not each should be implemented. The EEMs include the decommissioning or conversion of some of EMWD's internal combustion engines (ICEs). The energy load associated with decommissioned ICEs would be transitioned to electric motors. The transition of ICEs to electric motors has a GHG emission reduction benefit, as the carbon intensity of electricity is lower than that of natural gas in providing an equivalent amount of energy. Since California has a mandate to decarbonize the electricity supply over time, while the carbon intensity of natural gas will remain unchanged, the emission reduction benefit of this measure will increase accordingly.

Assumptions & Basis for Quantification:

- The energy load associated with decommissioned ICEs would be transitioned to electric engines.
- All EMP-prescribed decommissioning and conversion will be carried out by 2030.
- Any pumps not listed in Table 3D-1 of the EMP were assumed to run on electricity. The following ICEs are assumed to be decommissioned or converted to electric engines by 2030:[12]
    - Ellis Avenue Booster – Pumps 1 & 2
    - Vista Booster – Pump 1
    - Murrieta Road Booster – Pumps 1 - 3
    - Heacock/Pettit Booster – Pumps 1 - 4
    - Redlands and Cottonwood Booster – Pump 4
    - Redlands & Ironwood Booster – Pump 1
    - Elder Booster – Pump 1
    - Oleander Booster – Pump 1
    - Diamond Valley III Booster – Pumps 1 & 4
    - Cienega Well 34
    - Sanderson Lift Station
    - Moreno Valley RWRF – Blowers 1 & 2
    - Perris Valley RWRF – Blowers 1 – 3
    - San Jacinto Valley RWRF – Blower

Annual GHG Reduction Potential:

- 2030: 1,516 $MTCO_2e$
- 2045: 6,769 $MTCO_2e$

[11] EMWD, *Eastern Municipal Water District: Final Energy Management Master Plan* (August 2014), prepared by Kennedy/Jenks Consultants.

[12] This list of ICEs includes those that have been decommissioned or converted since 2017 (EMWD's most current inventory year).

Pumps at Hemet Water Filtrations Plant

Core Measure 2: Energy Efficiency Improvements

As the result of facility audits, the EMP recommended EEMs to be implemented at EMWD's regional water reclamation facilities (RWRFs) and water filtration plants (WFPs). These include replacement of interior and exterior lighting with high-efficiency bulbs, installation of occupancy sensors, replacement of appliances with more efficient units, and locking of HVAC temperature ranges. The improvements reduce the facilities' electricity demand, which reduces emissions as long as EMWD's electricity supply is generated at least partially by fossil fuels. Because of California's mandate to decarbonize electricity over time, the emission reduction benefit of this measure will decrease accordingly.

Assumptions & Basis for Quantification

- Any EEMs with undetermined implementation timing were assumed to be implemented prior to 2017, i.e., the emissions reductions were assumed to be captured in the documented inventories through the year 2017 and not included in this measure.
- Emission reduction calculations were based on the EMP-identified electricity savings of each measure. EEMs without quantified electricity savings were excluded.
- Electricity savings resulting from implementation of the EEMs at the Moreno Valley RWRF, Temecula Valley RWRF, and San Jacinto Valley RWRF were assumed to be equivalent to the reductions from implementation of the same EEMs at the Perris Valley RWRF.

- Electricity savings resulting from implementation of the EEMs at the Hemet WFP were assumed to be equivalent to the reductions from implementation of the same EEMs at the Perris WFP.
- Table 4-2, below, lists the EEMs that are accounted for in this measure, assumed to be implemented between 2017 and 2030. These EEMs are captured in the emissions reduction potential estimate below.

Table 4-2 EMP Energy Efficiency Improvements

FACILITY	EEM	EMP PAGE NUMBERS
PV, MV, TV & SJV RWRFs	Interior Lighting LED Replacement	3B1-6, 4H-1
PV, MV, TV & SJV RWRFs	Exterior Lighting LED Replacement	3B1-6, 4H-1
PV, MV, TV & SJV RWRFs	Replace Turblex Blowers with Neuros Blower	3B1-6, 4H-1
Perris & Hemet WFPs	Interior Lighting LED Replacement	3C-6, 4H-1
Perris & Hemet WFPs	Exterior Lighting LED Replacement	3C-6, 4H-1
Perris & Hemet WFPs	Bathroom & Kitchen Occupancy Sensors	3C-6, 4H-1
Perris & Hemet WFPs	Delamp Control Room	3C-6, 4H-1
Perris & Hemet WFPs	High Efficiency Appliance Replacements	3C-6, 4H-1
Perris WFP	New ZeeWeed 500d Modules	3C-6

Annual GHG Reduction Potential

- 2030: 710 $MTCO_2e$
- 2045: 0 $MTCO_2e$

Core Measure 3: Water Conservation Programs

Regional water conservation efforts are underway due to implementation of SB 606 and AB 1668. A number of policies have been established by the jurisdictions EMWD serves that require more efficient use of water, including landscape ordinances that require native or low-irrigation landscaping. Meanwhile, EMWD works closely with its wholesale customers to help fund, market, and implement a number of conservation programs. In addition, EMWD offers its retail customers and wholesalers a number of programs and incentivizes for conserving water, including a tiered water rate structure for residential customers, participation in MWD's turf removal rebate program, and partnering with local agricultural customers to better understand current irrigation practices and to incorporate programs that will further assist local farmers in managing their water use. In addition, EMWD is an industry leader in recycled water, one of the largest by volume recyclers in the nation and one of the few agencies that achieves 100 percent beneficial reuse in most years.

Through its water conservation programs, education, and outreach, EMWD conservatively expects to achieve a 10 percent reduction in per capita potable water usage amongst its retail customers (relative to the demands projected in the 2020 UWMP), which would offset the need to import water. Water conservation, which is anticipated to be achieved primarily through a reduction in outdoor water use, reduces emissions by reducing electricity and natural gas use associated with its distribution. Because of California's mandate to decarbonize electricity over time, the emission reduction benefit of this measure will decrease accordingly.

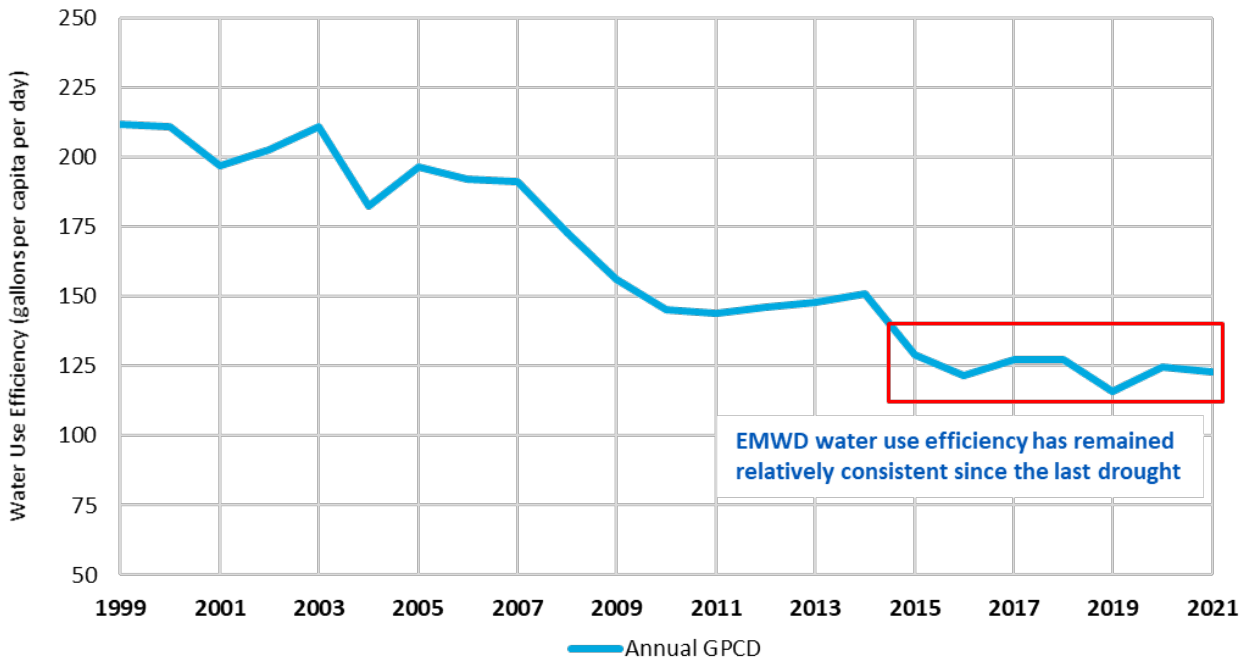
Recycled water being used at Scott Bros. Dairy in San Jacinto

Water Use Efficiency Programs

As **Figure 4-2** shows, EMWD customers are currently using approximately 40 percent less water per capita per day (GPCD) than they were using two decades ago in 2002. To a large extent, this has resulted from the District's water conservation efforts in response to the Water Conservation Act of 2009 (SBX7-7), which set the goal of achieving a 20 percent reduction in urban per capita water use statewide by 2020 and required retail water agencies to set targets and track progress toward decreasing daily per capita urban water use in their service areas. To achieve an additional 10 percent reduction in retail water use by 2030 (relative to the projections in the 2020 UWMP), EMWD will build on the success of its existing conservation programs.

- **WaterWise Programs and Rebates:** EMWD partners with MWD to promote a number of regional indoor and outdoor rebate opportunities for its residential, commercial and multi-family customers, to help them use water wisely and efficiently.
- **Landscapes for Living:** EMWD's outdoor water use efficiency program offers rebates and free installation of water saving equipment to help residential customers reduce outdoor water use and save money with low-maintenance, water-efficient landscaping. All EMWD residential customers with irrigated landscapes – areas in front and backyards currently being watered – are eligible to recover up to 100 percent of project costs. The program offers free step by step instructions, no-cost installation of water saving equipment, customer support and landscape design examples for inspiration. EMWD also offers a free online training program that helps landscape contractors gain technical skills and participate in the Landscapes for Living program.
- **WaterWise Landscape Toolbox**: Online tips and resources for saving water and using it wisely, including guidance on drought-tolerant landscaping; landscape design and irrigation concept plans; optimal watering schedules for spray-head irrigation systems; and a way to search for qualified and licensed landscape contractors.

Figure 4-2 **EMWD's Historic Water Use Since 1999**



Recycled Water

EMWD is widely viewed as an industry leader in recycled water, which is wastewater that has been treated so it can be used again for beneficial purposes. EMWD is one of the largest by-volume recyclers in the nation and one of the few agencies that achieves 100 percent beneficial reuse, a strategic objective established by its Board of Directors. EMWD has the ability to store more than two billion gallons of recycled water, which is equal to three to four months' worth of supply.

EMWD provides recycled water to schools, parks, cities and county streetscaping, HOA landscape areas, and golf courses. Additionally, recycled water is used for agricultural, sod farms, feed and fodder crops, and environmental purpose.

Water recycling supports conservation by offsetting demands on EMWD's potable water supply and, as discussed in Chapter 2, produces water with a relatively low carbon intensity compared to the local water supply.[13] EMWD uses less energy to provide recycled water than it does to provide water from local groundwater sources, and the energy demand is similar to that of imported raw water, when considering only EMWD's operations. If the upstream energy requirements are included, recycled water has a far lower carbon intensity than imported raw and treated water.

Assumptions & Basis for Quantification

- Conservation efforts reduce the need for imported water (both raw and treated).
- Conserving water reduces the energy needed to supply potable water; it would have no impact on wastewater conveyance or treatment.

Annual GHG Reduction Potential

- 2030: 1,115 $MTCO_2e$
- 2045: 858 $MTCO_2e$

Additional Measures

Additional Measures represent longer-term opportunities for EMWD to reduce the GHG emissions associated with its operations and with the construction of its capital projects. These Additional Measures will become increasingly important over time as EMWD strives to reduce emissions in line with the longer-term statewide goal of carbon neutrality by 2045. Although EMWD is not currently committed to implementing these measures, GHG reduction estimates are provided based on the assumptions and hypothetical performance goals outlined for each measure below.

As shown in Table 4-3, the Additional Measures have even greater reduction potential than EMWD's Core Measures. Implementation of these Additional Measures would help ensure achievement of the 2030 emissions target and better position EMWD to achieve carbon neutrality by 2045. Note that these estimates assume each measure is implemented in isolation. If all of the Additional Measures were implemented, the total reduction in emissions would be altered due to their interdependencies, with the reductions from some measures decreasing, and others increasing. Table 4-3 depicts the maximum reduction potential of each Additional Measure.

[13] Note that this comparison considers the emissions associated with tertiary wastewater treatment needed to produce recycled water, but not the primary and secondary wastewater treatment that would occur regardless of whether the treatment plant effluent is used as recycled water supply.

Table 4-3 GHG Reduction Potential of Additional Reduction Measures ($MTCO_2e$/year)

ADDITIONAL MEASURES	2030	2045
Measure 4: On-Site Solar Energy Generation	3,228	0
Measure 5a: Infrastructure Energy - Electrification	4,734	21,135
Measure 5b: Infrastructure Energy - Renewable Natural Gas	Not Quantified	Not Quantified
Measure 6: Clean Energy Procurement	3,172	0
Measure 7: ZEV Fleet Conversion	277	604
Measure 8: Construction Best Practices	Not Quantified	Not Quantified

Additional Measure 4: On-Site Solar Energy Generation

EMWD has the potential to reduce its electricity emissions through use of on-site solar energy generation. In 2020, EMWD began selling the renewable energy certificates (RECs) associated with its solar energy production. Retaining ownership of the RECs, rather than selling them, would significantly reduce the average carbon intensity of EMWD's electricity supply. There are plans to expand EMWD's existing solar generation capabilities, to roughly double current capacity by 2030. This expansion presents an opportunity for even greater reductions in the GHG emissions associated with EMWD's electricity consumption.

Assumptions & Basis for Quantification

- Solar array expansion projects would be complete by 2030.
- In order to estimate maximum potential for emissions reduction, it is assumed that all solar energy generated by EMWD would be utilized by EMWD and EMWD would retain the clean energy attributes (i.e., would not sell the RECs). Sales of RECs would lower the GHG reduction potential of this measure.
- Estimates for anticipated future solar production were provided by EMWD.

Annual GHG Reduction Potential

- 2030: 3,228 $MTCO_2e$
- 2045: 0 $MTCO_2e$

Additional Measure 5a: Infrastructure Energy – Electrification

The EMP plans for decommissioning and conversion of some of EMWD's ICEs. This measure aims to electrify all remaining ICE infrastructure, over and above what is accounted for under Core Measure 1 (ICE Conversion – EMP Implementation). As discussed under Core Measure 1, the emission reduction benefit would result from the reduced carbon intensity of electricity as compared to natural gas. Since electricity is mandated to decarbonize over time, while the carbon intensity of natural gas will remain unchanged, the emission reduction benefit of this measure will increase accordingly.

Assumptions & Basis for Quantification

- All ICEs are assumed to be electrified by 2030 in order to show maximum potential for emissions reduction.
- All new infrastructure (pumps, blowers, etc.) installed will be electric.

Annual GHG Reduction Potential

- 2030: 4,734 $MTCO_2e$
- 2045: 21,135 $MTCO_2e$

Additional Measure 5b: Infrastructure Energy – Renewable Natural Gas

EMWD acknowledges that conversion of all ICEs might not be feasible. For instances where EMWD's systems cannot be electrified, renewable natural gas (RNG), or biomethane, is an alternative. RNG is a pipeline-quality gas that is fully interchangeable with traditional natural gas, but there are still questions about future availability. Currently there is little regulation in place to support widespread use of RNG, and limited options for purchase. However, Southern California Gas (SCG) has made a commitment to providing 20 percent of its product as RNG by the year 2025. Assuming SCG achieves this goal and RNG becomes more commercially available, this measure could become a viable emission reduction opportunity for EMWD.

Assumptions & Basis for Quantification

- This measure is not quantified due to the uncertainties around source and supply of RNG.

Annual GHG Reduction Potential

- 2030: not quantified
- 2045: not quantified

Additional Measure 6: Clean Energy Procurement

Electricity is expected to contribute roughly 30 percent of EMWD's total emissions by 2030. Procuring clean electricity that goes beyond the State's RPS mandate has significant emissions reduction potential in the near future, before the statewide electricity portfolio becomes carbon-free. As a Southern California Edison (SCE) customer, EMWD can enroll in SCE's Green Rate program (currently offering 50% and 100% renewable options) to ensure their electricity comes from renewable sources. Under this measure, EMWD would purchase 100% carbon-free electricity from SCE, or from a community choice aggregator of renewable electricity, should one become available to service the region.

Assumptions & Basis for Quantification

- By 2030, 100 percent carbon-free energy is procured through SCE or community choice aggregator.

Annual GHG Reduction Potential

- 2030: 3,172 $MTCO_2e$
- 2045: 0 $MTCO_2e$

Additional Measure 7: ZEV Fleet Conversion

By 2030, EMWD's fleet will contribute approximately 4 percent of the annual emissions profile. This measure aims to convert gasoline- and diesel-powered fleet vehicles to ZEVs. Vehicles would be replaced over time as the fleet ages, and replacement vehicles will increasingly be ZEVs, driven by Governor's Executive Order N-79-20 (September 2020) to phase out gasoline-powered vehicle sales in the State of California by 2035. In addition, CARB's draft Advanced Clean Fleets (ACF) regulation, expected to become law, has a ZEV purchasing requirement for public fleets that would require the District to purchase 50 percent ZEVs beginning in 2024 and 100 percent ZEVs by 2027. Although electricity consumption would increase as a result of this measure, there is a net emissions reduction benefit because of the low carbon intensity of electricity as compared to gasoline and diesel fuel use Because of California's mandate to decarbonize electricity over time, the emission reduction benefit of this measure will increase accordingly.

Assumptions & Basis for Quantification

- All ZEVs added to the fleet will be all-electric vehicles (no hydrogen fuel cell vehicles or plug-in hybrid electric vehicles).
- The vehicles replaced by ZEVs are gasoline-powered.
- The fleet makeup will be 15 percent ZEVs by 2030 and 30 percent ZEVs by 2045.

Annual GHG Reduction Potential

- 2030: 277 $MTCO_2e$
- 2045: 604 $MTCO_2e$

Additional Measure 8: Construction Best Practices

Construction of capital improvement projects contributes significantly to EMWD's emissions profile (representing approximately 11 percent of forecasted emissions in 2030). The following are examples of construction best management practices (BMPs) that can be implemented during construction projects to achieve GHG emissions reductions; however, this is not an exhaustive list. Applicability to EMWD's construction projects should be taken into consideration before developing a final set of BMPs, and project-specific evaluations should be conducted to determine the suitability of each BMP for implementation.

- **BMP 1:** Limit idling of equipment to 5 minutes or less. Provide clear signage that posts this requirement and develop a plan for on-site enforcement.
- **BMP 2:** Provide temporary electric power to the construction site. If generators must be used, use alternative fuels to the maximum extent feasible.
- **BMP 3:** Use electric, hybrid, or alternative-fueled equipment, as availability allows or as future regulation requires.
- **BMP 4:** Perform on-site hauling using vehicles with on-road engines, where feasible and efficient.
- **BMP 5:** Limit material and equipment deliveries and hauling to off-peak traffic hours.
- **BMP 6:** Use high-efficiency lighting and Energy Star compliant heating and cooling units in temporary construction offices. Require development and implementation of procedures to ensure all office equipment, heating or cooling units, and lighting are turned off at the end of each work day.

Assumptions & Basis for Quantification

- This measure is not quantified because the specifics of future construction projects are unknown and the number and degree of implementation of BMPs would be considered on a case-by-case basis.

Annual GHG Reduction Potential

- 2030: not quantified
- 2045: not quantified

CHAPTER 5

Implementation and Monitoring

This chapter describes how EMWD will monitor the implementation of the Core Measures described in Chapter 4 and track progress towards meeting its 2030 GHG emissions target. The primary means of tracking progress towards the District's 2030 GHG emissions target will be through regular inventory updates supported by annual monitoring of Core Measure Implementation and an ongoing monitoring of the District's capital improvement infrastructure projects that are planned between now and 2030. Each of these components is discussed on more detail below.

Core Measure Implementation

Although the District is committed to implementing the Core Measures by 2030, many of the individual actions identified in those measures have already occurred, as noted below.

Measure 1: ICE Conversion – EMP Implementation

Implementation Lead: Engineering Department

Status/Timeline: With respect to CAP implementation, any decommissioning or conversion of internal combustion engines (ICEs) to electric engines since 2017 represents a reduction that was not accounted for when the District's inventory was last compiled in 2017. Many of the individual ICE conversions or decommissionings identified in Measure 1 have occurred since

2017, as noted in the list below. EMWD will continue to document ICE conversions on an annual basis and provide a summary in the annual CAP Implementation Status Report.

Table 5-1 ICE Conversions

ENGINE	ACTION	COMPLETED?	TARGET DATE
Ellis Avenue Booster – Pumps 1 & 2	Conversion	No	2026
Vista Booster – Pump 1[A]	Decommission	Yes	N/A
Murrieta Road Booster – Pumps 1–3	Conversion	No	2025
Heacock/Pettit Booster – Pumps 1–4	Conversion	Yes	N/A
Redlands and Cottonwood Booster – Pump 4	Conversion	No	2024
Redlands & Ironwood Booster – Pump 1	Decommission	Yes	N/A
Elder Booster – Pump 1	Decommission	No	2022
Oleander Booster – Pump 1	Conversion	Yes	N/A
Diamond Valley III Booster – Pumps 1 & 4	Conversion	Yes	N/A
Cienega Well 34	Conversion	No	TBD
Sanderson Lift Station	Conversion	Yes	N/A
Moreno Valley RWRF – Blowers 1 & 2	Conversion	Partial	TBD
Perris Valley RWRF – Blowers 1–3	Conversion	Yes	N/A
San Jacinto Valley RWRF – Blower	Conversion	Yes	N/A

Note: TBD = date to be determined; the District anticipates completing approximately 1 pump conversion annually.
A – The Vista Booster ICE is still available to EMWD as an emergency backup facility but is not used for regular operation.

Measure 2: Energy Efficiency Improvements – EMP Implementation

Implementation Lead: Engineering Department

Status/Timeline: With respect to CAP implementation, any energy improvement since 2017 represents a reduction that was not accounted for when the District's inventory was last compiled in 2017. With the exception of one item, all of the individual EEMs included in Measure 2 have occurred since 2017, as noted in the list below. EMWD will continue to document energy efficiency improvements on an annual basis and provide a summary in the annual CAP Implementation Status Report.

Table 5-2 Facility Energy Efficiency Measures (EEMs)

FACILTY	EEM	COMPLETED?	TARGET DATE
PV, MV, TV & SJV RWRFs	Interior Lighting LED Replacement	Yes	N/A
PV, MV, TV & SJV RWRFs	Exterior Lighting LED Replacement	Yes	N/A
PV, MV, TV & SJV RWRFs	Replace Turblex Blowers with Neuros Blower	Partial	2029
Perris & Hemet WFPs	Interior Lighting LED Replacement	Yes	N/A
Perris & Hemet WFPs	Exterior Lighting LED Replacement	Yes	N/A
Perris & Hemet WFPs	Bathroom & Kitchen Occupancy Sensors	Yes	N/A
Perris & Hemet WFPs	Delamp Control Room	Yes	N/A
Perris & Hemet WFPs	High-Efficiency-Appliance Replacements	Yes	N/A
Perris WFP	New ZeeWeed 500d Modules	Yes	N/A

Measure 3: Water Conservation

Implementation Lead: Conservation Department

Status/Timeline: Monthly and annual water usage reporting is mandated by AB 1668 and SB 606 to track Statewide water conservation efforts. Specifically, retail potable/raw water supply is the metric that will be used to assess water conservation progress as it relates to CAP implementation. Measure 3 progress will be summarized in the annual CAP Implementation Status Report.

Emissions Tracking

GHG Inventory Updates

The EMWD GHG Emissions Tracking Tool (Tracking Tool) allows the District to track progress towards meeting the CAP's 2030 reduction target using data from the District's GHG emissions inventory that is completed on an annual basis. For tracking annual construction emissions associated with EMWD's capital improvement projects, which are not included in the District's inventory as reported to Climate Registry (TCR), the Tracking Tool will be used to determine whether a given project is accounted for by the CAP; if a capital project's emissions are not already accounted for, they will be estimated and added through the Tracking Tool. Similarly, the Tracking Tool allows the District to remove a project and its associated emissions if it is determined that the project no longer occur.

For operational emissions, EMWD periodically verifies the accuracy of its inventory through an accredited third-party verifier and publicly reports the verified results to the Climate Registry's (TCR).

The Tracking Tool also provides checklists and note-taking capabilities to aid in tracking the District's implementation of both Core and Additional Reduction Measures.

Status Report

Using the results from the Tracking Tool, the District will periodically issue a CAP Implementation Status Report that includes the following:

- A summary of the progress made in implementing the CAP's Core Measures, as well as any progress developing programs or implementing the CAPs Additional Measures described in Chapter 4.
- Table and charts depicting the District's annual GHG emissions inventory by source, from 2006 through the most recently verified inventory (assumed to be the year preceding the Status Report year). Note that construction emissions are not verified or reported to TCR, but for the purposes of CAP progress tracking they must be included in the Status Report.
- A graph showing the District's progress towards its 2030 emissions target, up through the most recently verified inventory.
- A narrative describing the District's progress towards its 2030 emissions target, including any known reasons for deviations (unexpected increases or decreases) from the emissions forecast with Core Measure Implementation.

Relationship to the California Environmental Quality Act

Under California Environmental Quality Act (CEQA), GHG emissions are considered a potentially significant environmental impact. The CEQA Guidelines include a provision for streamlining the analysis of projects that are consistent with a comprehensive plan for the reduction of GHG emissions, such as the District's CAP. CEQA Guidelines Section 15183.5(b) allows lead agencies to analyze and mitigate the significant effects of GHG emissions at a programmatic level (i.e., CEQA review of the District's CAP), so that later project-specific environmental documents may tier from that programmatic review. Projects consistent with a so-called "CEQA-qualified" GHG reduction plan may be considered to have a less than significant impact with respect to GHG emissions.

Once the District's CAP has undergone CEQA review and is adopted in a public process, it will meet all of the requirements of Section 15183.5(b), which are described follows:

(A) Quantifies GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;

(B) Establishes a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;

(C) Identifies and analyzes the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area (or within the operational control of the agency);

(D) Specifies measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;

(E) Establishes a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and

(F) Is adopted in a public process following environmental review.

With a qualified CAP, project-specific environmental documents for the District's individual projects may tier from and incorporate by reference the CEQA document for the CAP in their cumulative GHG impact analysis. As long as an individual project under CEQA review is included in the Tracking Tool's project list, or it has been added manually with its emissions accounted for, and the Tracking Tool indicates that the District is on track to meet its 2030 GHG target, this type of CEQA streamlining for the project will be viable. Projects consistent with the CAP's measures and its assumptions regarding future projects and expansion of EMWD's operations, would not require additional GHG emissions analysis and mitigation under CEQA.

APPENDIX A

GHG Inventory and Forecast Methods

Historical Greenhouse Gas Emissions

Greenhouse Gas Emissions Inventories

EMWD has been reporting its operational GHG emissions inventory to the Climate Registry (TCR) since 2006 and has had each annual report third-party verified to ensure its accuracy and completeness. The inventories reported to TCR for the years 2006 through 2017 served as the starting point for analyzing EMWD's emissions over time. The emission sources and activities included in the EMWD GHG inventory for the CAP are determined largely by TCR's General Reporting Protocol, but also include construction emissions associated with capital improvements and maintenance, which are discussed in the following section, *Construction Emissions*.

In compiling the emissions data, adjustments were made to some years to maintain methodological consistency and to account for sources that were not reported for all years. For example, process emissions[14] were not included in TCR reporting, but they are included here. Process emissions were not reported from 2006 through 2008, but, because they were reported as constant from 2010 to 2016, the same estimates were also applied to the 2006 through 2008 inventories. Biogenic emissions resulting from digester gas were reported to TCR from 2010 to 2017; however, they were not included in the baseline, forecasts, or targets because under GHG accounting protocols, biogenic GHGs are accounted for and reported separately. Data on propane use from 2006 through 2009 was unavailable and, thus, was assumed to be negligible. This is a reasonable assumption because propane emissions from 2007 through 2017 never exceeded 15 MTCO2e. Additionally, emissions of methane (CH_4) and nitrous oxide (N_2O) were not captured in TCR reporting but are now estimated for the purposes of the CAP.

Electricity and stationary combustion emissions estimates from 2014 through 2016 were re-analyzed to ensure a reliable set of data to forecast from. Accuracy of these two source estimates is important, as they make up the majority of EMWD's emissions profile. Utility-specific (Southern California Edison, SCE) emission factors were applied to electricity use in place of TCR emission factors.

In addition to the inventory refinements described above, energy emissions were analyzed in depth to gain a better understanding of EMWD's energy source profile and the associated carbon intensity of each source. EMWD's operations were broken into 11 operational categories based on the end product or service provided and the water supply source, as summarized in **Table A-1**. Electricity and natural gas use (using data from the three most recent verified inventory years 2014 to 2016) was allocated to each operation, where feasible. Because EMWD's systems are not always exclusive to a single operation or service, assumptions were made regarding the primary use of each facility or system. Where detailed characterization of energy use was not feasible, the energy use was attributed to a more general energy use category (e.g., it was not possible to distinguish between the energy used to transmit water to retail customers versus wholesale customers, so the energy was allocated to the general category of water distribution). This process of energy use allocation resulted in seven distinct energy use categories, as shown in Table A-1, providing insights into the relative energy and carbon intensities of EMWD's operations and services.

[14] Process emissions are those that result from physical or chemical processes other than from fuel combustion.

Table A-1 Allocation of EMWD Operations to Energy Use Category

OPERATION	DESCRIPTION	ENERGY USE CATEGORY
Water Supply		
Imported Treated	Potable Supply: pumping of purchased, imported water that has already been treated	Water Distribution
Imported Raw	Potable Supply: pumping of purchased, imported, raw water and systems associated with EWMD's treatment of the imported, raw water	Water Supply – Imported Raw
Local	Potable Supply: pumping and treatment of local groundwater, including brackish	Water Supply - Local
Recycled	Recycled Supply: tertiary treatment of wastewater and subsequent pumping of recycled water	Wastewater Treatment
Water Transmission		
Retail	Distribution: transmission of water to retail customers	Water Distribution
Wholesale	Distribution: transmission of water to wholesale customers	Water Distribution
Wastewater / Recycled Water System		
Wastewater Treatment	Wastewater: primary and secondary treatment of wastewater	Wastewater Treatment
Wastewater Conveyance	Wastewater: pumping and conveyance of wastewater	Wastewater Conveyance
Recycled Water – Retail	Recycled Water: delivery of recycled water to retail customers	Recycled Water Delivery
Recycled Water – Wholesale	Recycled Water: delivery of recycled water to wholesale customers	Recycled Water Delivery
Other		
Other	Buildings and Other Facilities: energy use not associated with pumping or treatment	Other Facilities & Operations

Construction Emissions

Because construction emissions were not captured in EMWD's 2006 through 2017 GHG inventories, construction emissions were estimated separately and added to historical emissions. This section details the methods used to estimate future GHG emissions from construction of EMWD projects planned over an approximately ten-year period. These emissions were then amortized and assumed to be equivalent to annual construction emissions occurring each year between 2006 and 2017.

Background Projects

ESA compiled a list of relevant completed EMWD projects with publicly available CEQA documentation. The projects were then grouped into four different categories: pipelines, wells, tanks and facilities, and ponds. GHG emissions from the identified projects were taken from available CEQA documentation and populated into a spreadsheet. Emission factors were derived for each type of project and are explained in detail below.

Future Projects

EMWD provided ESA a list of future projects that are expected to be completed between 2020 and 2030. The projects list included project background information that ESA used to determine the project type and to calculate GHG emissions using the emission factors derived from the background projects. Projects were categorized as pipelines, wells, tanks, booster

stations, lift stations, brine facilities, or general construction projects. General construction projects included any project that could not be attributed to any of the other categories.

Pipelines

Eleven EMWD pipeline projects were identified as representative projects and formed the basis of the pipeline emission factors applied to future EMWD projects. Pipeline emission factors were calculated for four different subcategories based on pipe diameter. For projects where pipeline length was provided, an emission factor per foot was applied, otherwise an emission factor per active day was applied to the provided construction duration. The emission factors are presented in **Table A-2**.

Table A-2 Pipeline Emission Factors

PIPELINE DIAMETER (IN)	NO. OF PROJECTS	MTCO2E/FT	MTCO2E/DAY
Less than 30"	4	0.032	1.2
30"–60"	6	0.039	2.3
60"	1	0.050	2.5
Average Factor	11	0.040	2.0

Wells

One EMWD well project was identified as a representative project and formed the basis of the well drilling and equipping factors applied to future EMWD projects. The project chosen was EMWD Well 204, which shares similar characteristics to many of the planned well projects. **Table A-3** shows the emission factors derived from EMWD Well 204 and applied to future well projects.

Table A-3 Well Emission Factors

ACTIVITY	MTCO2E/DAY
Well Drilling	1.98
Well Equipping	2.05

Tanks and Facilities

Thirteen EMWD projects were identified as representative projects and formed the basis of the various emission factors applied to future EMWD projects. With the exception of tanks, an emission factor per active day of construction was applied for each type of facility. Tanks use either an emission factor per active day of construction or per million-gallon capacity depending on the project information available. **Table A-4** shows the emission factors used for each type of facility.

Table A-4 Tanks and Facilities Emission Factors

PROJECT TYPE	NO. OF PROJECTS	MTCO2E/DAY	MTCO2E/MGD
Brine Facility	2	1.72	—
Tanks	3	1.47	105.8
Water Treatment Facility	2	2.01	—
Lift Station	2	1.09	—
Booster Station	4	1.09	—
General Construction (Categories Averaged)	13	1.46	—

Ponds

One EMWD pond project was identified as a representative project and formed the basis of the pond emission factor applied to future EMWD projects. The project chosen was Alessandro Recycled Water Storage Ponds Optimization Project, which shares similar characteristics to the only identified pond project in the future projects list (Alessandro Pond Optimization Phase II). The emission factor derived from Phase I of the pond optimization project and applied to Phase II is 2.48 MTCO2e/day.

Projects with Pre-Existing Documentation

Many of the future projects listed had pre-existing CEQA documents with calculated emissions. In these instances, the total GHG construction emissions were taken directly from the CEQA document. Further, some future projects were part of larger programmatic EIRs (PEIRs) and were assumed to be included under the emissions of the PEIR (e.g. SARCCUP).

Greenhouse Gas Emissions Forecasts: 2030, 2045, and 2050

Business-As-Usual Forecasts

This section describes the approach for modeling business-as-usual (BAU) emissions, which represents future emissions based on current population and regional growth trends. The BAU scenario demonstrates the growth in GHG emissions that would occur if no further action were to be taken by the District, State, or Federal Government after 2016. The BAU forecast serves as a reference point for other forecasting scenarios, which include the Adjusted BAU that incorporates federal and State regulations, and the reductions from the Core Measures included in the CAP.

Because EMWD's GHG emissions are inherently tied to the amount of water used within their District, and because water use fluctuates significantly from year to year, an average of 2014 through 2016 data was used to forecast emissions. Each emission source and energy use category was forecasted separately to 2030 and 2050 using data on EMWD's predicted operations and services. 2030 and 2050 emissions estimates were then interpolated to obtain 2045 emissions. **Table A-5** presents the projection metrics used for the BAU forecasts, while **Table A-6** indicates which metrics were used to forecast each sector and energy use category. Construction emissions quantification and forecasts are described in the *Construction Emissions* section above.

Table A-5 EMWD Forecast Metrics

METRIC	2014–2016	2030	2050
Total local supply availability (AF)	29,453	36,153	44,153
Raw water supply (AF)	10,551	27,097	43,497
Total water in EMWD system (AF)	88,768	125,500	149,880
Wastewater influent flow (MGD)	43.59	57.99	72.86
Recycled water production (AF)	45,826	50,100	59,420
Retail service population	547,123	695,500	855,577

Table A-6 EMWD Forecasting Methods by Source

SOURCE	2014–2016 AVERAGE DATA FORECASTED	METRIC/METHOD USED
Energy – Local Water Supply	Energy consumption – electricity (kWh) and natural gas (therms)	Total local water supply availability (AF)
Energy – Imported Raw Water Supply	Energy consumption – electricity (kWh) and natural gas (therms)	Raw water supply (AF) [retail potable/raw water supply minus local supply availability minus imported treated water]
Energy – Water Distribution	Energy consumption – electricity (kWh) and natural gas (therms)	Total water moved through EWMD system (AF) [retail potable/raw water supply plus wholesale potable/raw water supply minus wholesale supply with dedicated MWD connections]
Energy – Wastewater Conveyance	Energy consumption – electricity (kWh) and natural gas (therms)	Wastewater influent flow (MGD)
Energy – Wastewater Treatment	Energy consumption – electricity (kWh) and natural gas (therms)	Wastewater influent flow (MGD)
Energy – Recycled Water Delivery	Energy consumption – electricity (kWh) and natural gas (therms)	Recycled water production (AF)
Energy – Other Facilities & Operations	Energy consumption – electricity (kWh) and natural gas (therms)	Assumed constant
Mobile Combustion	Emissions ($MTCO_2e$)	Assumed constant
Process Emissions	Emissions ($MTCO_2e$)	Wastewater influent flow (MGD)
Biosolid Hauling	Emissions ($MTCO_2e$)	Retail service population

Notes:
A – "Energy" applies to both electricity and stationary combustion source methods.

Adjusted Business-As-Usual Forecasts

Like the standard BAU forecast, the Adjusted BAU forecast provides an estimate of future emission levels based on the continuation of existing trends in growth, activity, or resource consumption (such as electricity use), technology changes, and regulation. Unlike the BAU forecast, the Adjusted BAU forecast accounts for expected outcomes of federal, state, and local measures. Specifically, the Adjusted BAU forecast includes the following programs and policies:

- California's Renewable Portfolio Standard (RPS), Senate Bill 350 (SB350), and SB100
- Advanced Clean Cars Initiative

Each of these adjustments are explained in the following sections.

Renewables Portfolio Standard (RPS)

To account for California's RPS targets under SB 350 and SB 100 in the Adjusted BAU forecast, the GHG emission factors for electricity consumption were adjusted. These emission factors represent indirect GHG emissions generated at power plants and are applied to electricity consumption in the City. The RPS has the effect of lowering indirect emissions associated with electricity consumption because it mandates increasing percentages of renewable sources of power supplied by electricity utilities in future years. The RPS requires 60% eligible renewables by 2030 and 100% RPS-eligible renewable resources by 2045.

To adjust for the RPS in future years, indirect electricity emission factors reported by SCE, along with the energy power mix, were collected for the years 2016–2019.[15] The California Energy Commission (CEC) reports power mix data in Power Content Labels; which were available through 2019 for SCE.[16] Based on data reported for 2016–2019, a composite "non-RPS" emission intensity factor was generated for each year. This factor is calculated based on the reported total emission factor and the non-RPS power mix. Then, for each forecast year (2030 and 2050), an emission factor for total delivered electricity was calculated based on these composite "non-RPS" emission intensity factors for each reported year and the projected RPS requirement for eligible renewables for each year. The 2030 and 2050 Adjusted BAU electricity emission factors used, which incorporate the RPS, are 295.0 lbs CO_2e/MWh and 0.0 lbs CO_2e/MWh, respectively.

Pavley/Advanced Clean Cars; Low Carbon Fuel Standard (LCFS)

In 2002, Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State." To meet the requirements of AB 1493, in 2004 CARB approved amendments to the California Code of Regulations, adding GHG emissions standards to California's existing standards for motor vehicle emissions. All mobile sources are required to comply with these regulations as they are phased in from 2009 through 2016. These regulations are known as the Pavley standards (named for the bill's author, State Senator Fran Pavley).

In January 2012, pursuant to Recommended Measures T-1 and T-4 of the Original Scoping Plan, CARB approved the Advanced Clean Cars Program, an emissions-control program for model year 2017 through 2025. The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero-emissions vehicles. By 2025, when the rules will be fully

[15] Edison International Sustainability Reports (2020), https://www.edison.com/home/sustainability/sustainability-report.html.

[16] California Energy Commission (CEC), Annual Power Content Labels (2022), https://www.energy.ca.gov/programs-and-topics/programs/power-source-disclosure/power-content-label.

implemented, the new automobiles will emit 34% fewer global warming gases and 75% fewer smog-forming emissions. The program also requires car manufacturers to offer for sale an increasing number of ZEVs each year, including battery electric, fuel cell, and plug-in hybrid electric vehicles. In December 2012, CARB adopted regulations allowing car manufacturers to comply with California's GHG emissions requirements for model years 2017–2025 through compliance with the EPA GHG requirements for those same model years.[17] The Adjusted BAU forecasts accounts for these vehicle fleet efficiency standards, as discussed below.

Mobile combustion emissions under the previously described regulations are calculated using BAU forecasted emissions and Riverside County light duty vehicle emission trends derived from EMFAC2021, which were weighted by fuel type (gasoline and diesel).[18] Therefore, it was assumed that EMWD fleet emissions would decrease at the same rate as the Countywide fleet.

Greenhouse Gas Core Reduction Measures

This section describes the calculation methods for estimating GHG emission reductions associated with the CAP's Core Measures. These emission reductions occur beyond the Federal and State regulations and policies accounted for in the Adjusted BAU forecast. The quantified strategies include:

- Measure 1: ICE Conversion
- Measure 2: Energy Efficiency Improvements
- Measure 3: Water Conservation

Measure 1: ICE Conversion

EMWD's 2014 Energy Management Plan (EMP)[19] identified an array of energy efficiency measures (EEMs), a cost-benefit analysis of each, and a recommendation for whether or not each should be implemented. The EEMs include the decommissioning or conversion of some of EMWD's internal combustion engines (ICEs). The energy load associated with decommissioned ICEs would be transitioned to electric motors. The transition of ICEs to electric motors has a GHG emission reduction benefit, as the carbon intensity of electricity is lower than that of natural gas in providing an equivalent amount of energy. Since California has a mandate to decarbonize the electricity supply over time, while the carbon intensity of natural gas will remain unchanged, the emission reduction benefit of this measure will increase accordingly.

Assumptions & Basis for Quantification:

- The energy load associated with decommissioned ICEs would be transitioned to electric engines.
- All EMP-prescribed decommissioning and conversion will be carried out by 2030.

---

[17] Advanced Clean Car program information available online at https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/about.
[18] California Air Resources Board (CARB), Emission Factor Model (EMFAC) 2021, v1.0.1 (2021), https://arb.ca.gov/emfac/
[19] EMWD, *Eastern Municipal Water District: Final Energy Management Master Plan* (August 2014), prepared by Kennedy/Jenks Consultants.

- Any pumps not listed in Table 3D-1 of the EMP were assumed to run on electricity. The following ICEs are assumed to be decommissioned or converted to electric engines by 2030:
    - Ellis Avenue Booster – Pumps 1 & 2
    - Vista Booster – Pump 1
    - Murrieta Road Booster – Pumps 1 - 3
    - Heacock/Pettit Booster – Pumps 1 - 4
    - Redlands and Cottonwood Booster – Pump 4
    - Redlands & Ironwood Booster – Pump 1
    - Elder Booster – Pump 1
    - Oleander Booster – Pump 1
    - Diamond Valley III Booster – Pumps 1 & 4
    - Cienega Well 34
    - Sanderson Lift Station
    - Moreno Valley RWRF – Blowers 1 & 2
    - Perris Valley RWRF – Blowers 1 – 3
    - San Jacinto Valley RWRF – Blower

Annual GHG Reduction Potential:

- 2030: 1,516 $MTCO_2e$
- 2045: 6,769 $MTCO_2e$

Measure 2: Energy Efficiency Improvements

As the result of facility audits, the EMP recommended EEMs to be implemented at EMWD's regional water reclamation facilities (RWRFs) and water filtration plants (WFPs). These include replacement of interior and exterior lighting with high-efficiency bulbs, installation of occupancy sensors, replacement of appliances with more efficient units, and locking of HVAC temperature ranges. The improvements reduce the facilities' electricity demand, which reduces emissions as long as EMWD's electricity supply is generated at least partially by fossil fuels. Because of California's mandate to decarbonize electricity over time, the emission reduction benefit of this measure will decrease accordingly.

Assumptions & Basis for Quantification

- Any EEMs with undetermined implementation timing were assumed to be implemented prior to 2017, i.e., the emissions reductions were assumed to be captured in the documented inventories through the year 2017 and not included in this measure.
- Emission reduction calculations were based on the EMP-identified electricity savings of each measure. EEMs without quantified electricity savings were excluded.

- Electricity savings resulting from implementation of the EEMs at the Moreno Valley RWRF, Temecula Valley RWRF, and San Jacinto Valley RWRF were assumed to be equivalent to the reductions from implementation of the same EEMs at the Perris Valley RWRF.
- Electricity savings resulting from implementation of the EEMs at the Hemet WFP were assumed to be equivalent to the reductions from implementation of the same EEMs at the Perris WFP.
- **Table A-7** lists the EEMs that are accounted for in this measure, assumed to be implemented between 2017 and 2030. These EEMs are captured in the emissions reduction potential estimate below.

Table A-7 EMP Energy Efficiency Improvements

FACILITY	EEM	EMP PAGE NUMBERS
PV, MV, TV & SJV RWRFs	Interior Lighting LED Replacement	3B1-6, 4H-1
PV, MV, TV & SJV RWRFs	Exterior Lighting LED Replacement	3B1-6, 4H-1
PV, MV, TV & SJV RWRFs	Replace Turblex Blowers with Neuros Blower	3B1-6, 4H-1
Perris & Hemet WFPs	Interior Lighting LED Replacement	3C-6, 4H-1
Perris & Hemet WFPs	Exterior Lighting LED Replacement	3C-6, 4H-1
Perris & Hemet WFPs	Bathroom & Kitchen Occupancy Sensors	3C-6, 4H-1
Perris & Hemet WFPs	Delamp Control Room	3C-6, 4H-1
Perris & Hemet WFPs	High Efficiency Appliance Replacements	3C-6, 4H-1
Perris WFP	New ZeeWeed 500d Modules	3C-6

Annual GHG Reduction Potential

- 2030: 710 $MTCO_2e$
- 2045: 0 $MTCO_2e$

Measure 3: Water Conservation

Regional water conservation efforts are underway due to implementation of SB 606 and AB 1668. A number of policies have been established by the jurisdictions EMWD serves that require more efficient use of water, including landscape ordinances that require native or low-irrigation landscaping. Meanwhile, EMWD works closely with its wholesale customers to help fund, market, and implement a number of conservation programs. In addition, EMWD offers its retail customers and wholesalers a number of programs and incentivizes for conserving water, including a tiered water rate structure for residential customers, participation in MWD's turf removal rebate program, and partnering with local agricultural customers to better understand current irrigation practices and to incorporate programs that will further assist local farmers in managing their water use. In addition, EMWD is an industry leader in recycled water, one of the largest by volume recyclers in the nation and one of the few agencies that achieves 100 percent beneficial reuse in most years.

Through its water conservation programs, education, and outreach, EMWD conservatively expects to achieve a 10 percent reduction in per capita potable water usage amongst its retail customers (relative to the demands projected in the 2020 UWMP), which would offset the need to import water. Water conservation, which is anticipated to be achieved primarily through a reduction in outdoor water use, reduces emissions by reducing electricity and natural gas use associated with its distribution. Because of California's mandate to decarbonize electricity over time, the emission reduction benefit of this measure will decrease accordingly.

Assumptions & Basis for Quantification

- Conservation efforts reduce the need for imported water (both raw and treated).
- Conserving water reduces the energy needed to supply potable water; it would have no impact on wastewater conveyance or treatment.

Annual GHG Reduction Potential

- 2030: 1,115 $MTCO_2e$
- 2045: 858 $MTCO_2e$

INTENTIONALLY BLANK