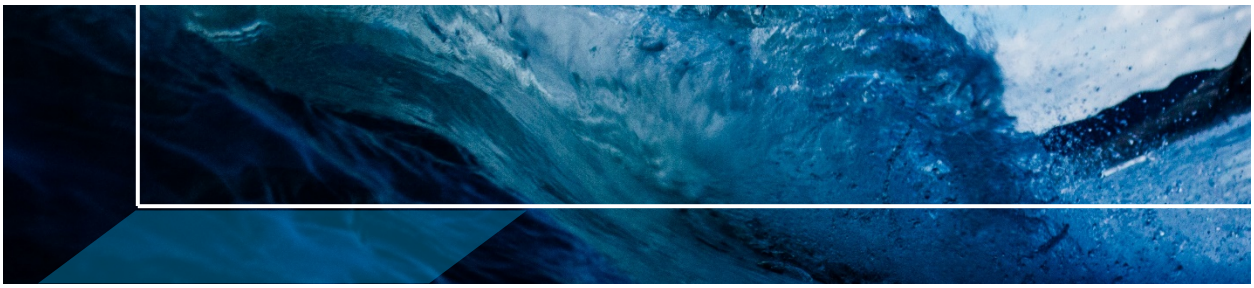
C/CAG City/County Association of Governments of San Mateo County

OFFICE OF SUSTAINABILITY
COUNTY OF SAN MATEO

San Mateo County

Energy and Water Strategy 2025

DRAFT January 2020



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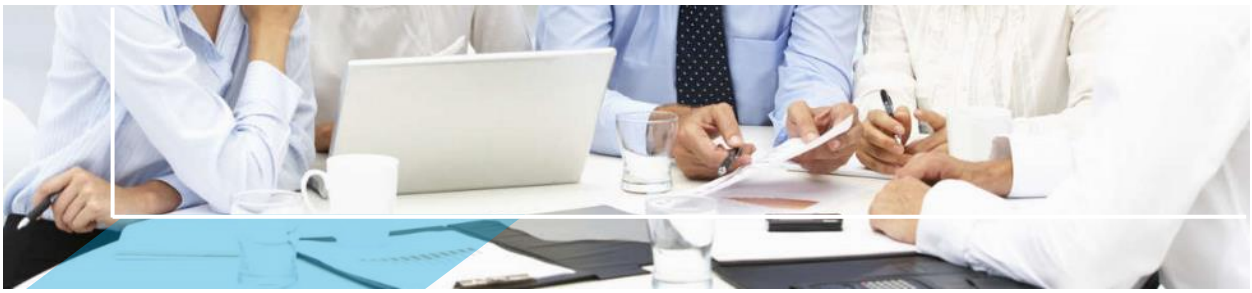


Executive Summary

The San Mateo County Energy Strategy 2012 was adopted by the County in 2008, and each city in 2009 and provided background on energy and water use trends, with the goal of identifying best practices and County infrastructure needs through 2012. Energy and water issues, opportunities, and priorities in California and San Mateo County have changed greatly since the adoption of the 2012 Strategy. The goals, strategies, and actions in the updated San Mateo County Energy and Water Strategy 2025 (Strategy) document, provide a comprehensive roadmap for addressing challenges in the energy and water sectors in San Mateo County through 2025. The development of the Strategy and its framework prioritized engaged, expert local stakeholders who, through a series of working meetings, developed foundational priorities that will serve to transform our use and transition of local energy and water systems.

The Strategy provides a common set of recommendations that can contribute to collaborative efforts to overcome barriers, harnessing existing and new energy and water technologies, community relationships, development of new policies, and workforce development, while considering the quality of life of communities in San Mateo County. The latter is captured through a set of guiding principles for the Strategy. Specific emphasis is made on issues of equity and economic opportunity throughout the document.

The energy and water sections each have a background and context section laying out the regulatory framework, available and relevant data for San Mateo County, and unique challenges and opportunities.

In terms of energy, the goals, strategies, and actions in the framework mimic the transformational pathway of the global energy sector from fossil-based fuels to efficient and greenhouse gas free electricity by 2050. Goals and strategies include: optimizing energy use through deploying smart design and technologies in existing buildings, policy and design education for new buildings, pilot projects with new technologies such as storage and microgrid, load balancing in real time, decarbonizing both the supply and demand, expanding electric vehicle infrastructure, advocacy, integrating carbon offset projects, better leveraging data, financing and funding .

In terms of water, the “One Water” concept is highlighted here, which emphasizes that all water has value during its continuous movement of water through all the phases of the natural hydrological and reuse cycle, including stormwater and recycling water for potable and non-potable uses. Goals and strategies include: enhancing indoor water conservation through policy and education, increasing outdoor conservation through policy and best practices, development and use of water data, expanded use of onsite recycled water, expanded use of utility-supplied recycled water, development of new technologies, and supporting system improvements by promoting integrated water management and wastewater treatment plant resiliency.

In terms of the energy-water nexus, the Strategy focuses on energy as a resource used in the treatment and movement of water.

Implementation of the Strategy is prioritized in terms of which actions require more immediate focus or should preceed other identified actions. Policy promoting infrastructure and building development that incorporates innovative energy and water design and construction is key to ensuring new construction is fit for the future. This Strategy document provides “first” actions to be taken, based on stakeholder input, to prioritize the broad list developed across all goals and strategies. Finally, the Strategy proposes a set of simple indicators to be tracked for both energy and water.

The San Mateo County Energy and Water Strategy 2025 project carefully considers how the County will address our communities’ needs in an environmentally, socially, and fiscally responsible manner. By taking the collaborative actions in this plan, we will be contributing to the well-being of our cities, the county, and the region.

1. Introduction

In December 2008, San Mateo County published the San Mateo County Energy Strategy 2012 to address the future energy and water needs of the county. The 2012 Strategy was subsequently adopted by every city in San Mateo County in calendar year 2009. Since that time, much has changed in the energy and water sectors. San Mateo County has seen a historic drought, the launch of Peninsula Clean Energy (PCE), new state climate resiliency goals and guidance, planned power shutoffs, and the declaration of a Climate Emergency. In addition, new technologies, the prevalence of energy efficiency and water conservation programs, new funding opportunities and financing mechanisms, the falling cost of distributed renewable energy, rising cost of water and pressure to reuse it, have all added to the need to for an updated strategy.

There has been significant progress towards energy sustainability since the 2012 Strategy was adopted in 2009. Local governments across California are becoming important players in energy markets with the launch of community choice aggregators, electric vehicles are becoming ubiquitous, andstakeholders across San Mateo County are forging new paths to move from centralized fossil fuels sources to cleaner, distributed and renewable energy resources.

Throughout San Mateo County, all 20 cities and the County are developing new programs and policies to use energy more efficiently and decrease fossil fuel use in buildings and transportation, aligning with state targets to reduce greenhouse gas emissions 40% by 2030 and 80% by 2050 and, most recently, a call for 100% greenhouse gas-free electricity.

While water wasn't an explicit focus of the 2012 Energy Strategy, extended drought conditions and national attention on water quality have led to state-level policy to improve water efficiency and maintain water quality. Many of these new regulations are a result of "Making Water Conservation a California Way of Life[1]" which includes programs and policies to craft a long-term water conservation framework to help prepare for changing climate conditions and water shortages, aligning with the state's increasing water conservation standards.

Countywide, we have seen decreases in water use since 2009 despite population growth. In 2015, BAWSCA published the Long-Term Reliable Water Supply Strategy Final Report, a five year effort to identify water management actions that supply long-term reliability of water supply through 2040.

[1]https://water.ca.gov/Programs/Water-Use-And-Efficiency/Making-Conservation-a-California-Way-of-Life/Implementing-the-Executive-Order

The *San Mateo County Energy and Water Strategy 2025* (Strategy) reflects the progress, commitments and priorities of diverse stakeholders across the County. Building upon past success and recognizing persistnet and emerging challenges, the Strategy presents a roadmap of energy and water policies and programs that promote continued quality of life, sustainability, and resilience for future generations.

1.1 Desired Outcomes

Readily available energy and water resources are foundational to current society however past approaches to resource extraction, processing, transportation and consumption are recognized as unsustainable for a variety of reasons related to supply, GHG emission impacts, equitable access and more.

These issues are already being addressed at multiple levels by many organizations including local, State and Federal governments, non-profits, utility providers, and the private sector to name a few. Climate action plans, regulatory agencies, policy updates, financial incentives and new technologies are all addressing sustainability of energy and water in some way but in order to be successful, there needs to be significant collaboration among relevant agencies and stakeholders to ensure a coordinated approach.

The Strategy seeks to encourage a coordinated approach by creating a roadmap of goals, strategies, and actions which can help align efforts and provide a common framework for addressing challenges in the energy and water sectors.

The Strategy seeks to foster regional partnerships between policy makers, private sector partners, and the public. By convening and aligning stakeholders around this strategic plan, the County hopes to increase collaboration and impact to achieve local and state climate goals, while working together to preserve the diverse natural and cultural richness that exists here. The reduction of greenhouse gas emissions from fossil fuels and the coordination of water management around the natural and reuse hydrological cycles will require participation from all sectors of the community, local governments, and other regional agencies. Through this Strategy, San Mateo County will steward the clean energy transition and move towards awareness of the “One Water” approach through shared programs, outreach and education, and coordination of funding opportunities.

While many stakeholders have a broader set of objectives, the Strategy focuses specifically on energy and water as a utility which includes supply, distribution and consumption. Some closely linked issues, such as sea level rise, wildfire risk, or stormwater management, are not comprehensively addressed in the Strategy as they are more thoroughly considered in more specific documents.

1.2 Vision and Guiding Principles

The impetus of this strategic planning effort was the desire to meet state regulatory goals, while balancing the economic, social, and ecological needs of the community and providing safe, reliable, and renewable energy and water locally.

While the environmental and long tem benefits achieved through meeting state regulatory goals are well recognized, it is necessary to consider how environmental justice issues are addressed in the process of achieving these goals, especially given the diverse socioeconomic climate in San Mateo County. Disadvantaged communities historically experience the impacts of climate change more severely and the guiding principles of the Strategy include specific provisions to ensure that their needs are understood and incorporated.

The mission *of the San Mateo County Energy and Water Strategy 2025* is to ensure a safe, equitable, and coordinated transition towards clean energy and the One Water approach by leveraging new technologies, policy, funding resources, and opportunities for collaboration in San Mateo County.

The vision of *the San Mateo County Energy and Water Strategy 2025* is a successful collaboration of municipal, private, and public stakeholders, providing a sustainable utilization of energy and water resources and systems that are safe and reliable, in support of our climate action goals, energy infrastructure and water supply across San Mateo County.

The guiding principles for the San Mateo County Energy and Water Strategy include:

- **Safe:** Ensure energy and water is safe to consume for all, cybersecure, and does not pose a hazard for any community
- **Sustainable:** Support positive environmental impact with the lowest possible carbon footprint for delivered and consumed energy and water
- **Equitable:** Ensure energy and water is accessible to all, regardless of socioeconomic status and considering existing inequities
- **Abundant:** Provide water and energy at a capacity to serve current and future needs
- **Reliable:** Build and maintain infrastructure so energy and water are available to all when needed

- **Resilient:** Prepare for the effects of climate change or other potential disasters to ensure that energy and water is there when you need it, especially for vulnerable communities
- **Affordable:** Provide energy and water at a cost that is competitive and economically stable

1. Background and Context

Reliable energy and water resources are the foundation of modern life. In recent years, San Mateo County has seen significant changes related to energy in its availability, how it is supplied and managed and how residents and businesses use these resources. During this time, water management and governance has remained somewhat unchanged, though per capita water use has steadily decreased. Issues concerning the safety, sustainability, and resilience of energy and water systems are inextricably linked and require a mix of synergistic and unique solutions.

1.1 Energy

The urgency of climate change has motivated stakeholders across the County to leverage new opportunities and to step forward as key participants in the energy transition. We see these changes driven by three emerging trends:

- **Technology:** Technology in the energy sector is evolving quickly, presenting new opportunities for residents and businesses to produce, store, and consume energy more responsibly, promoting sustainability and cost savings. New distributed energy resources (DERs) include physical and virtual integrated solutions combining efficiency, solar, storage and demand management to provide value to the grid or individual customers. These technologies enable and promote microgrid applications for energy storage and community resiliency. Meanwhile, smart building controls have begun to support the aggregation of multiple sites to provide meaningful grid services and new cost savings for residents and businesses.

- **Markets:** The falling cost of renewable energy technologies such as PV and battery storage, combined with the rise of community choice aggregators (CCAs) and PG&E options for 100% clean electricity, is fostering local control of electricity supply in whole new ways. With the launch of Peninsula Clean Energy, all 20 cities and the County now procure cleaner, cost competitive, renewable energy for the vast majority of citizens and

businesses. To ensure further success of this pathway, consideration of when electricity is used is a sensible next step.

- **Policy:** Local governments are increasingly comfortable using their authority to enact new policies and programs to accelerate adoption of local renewable sources of energy. Local policies include building reach codes, energy disclosure, procurement practices, and innovative land use and zoning requirements that support sustainable development.

In order to support reduction of greenhouse gas emissions and limit global warming to 1.5 degrees Celsius, federal, state, and local government policymakers alike have recognized the need for smarter, more robust, clean electricity infrastructure to achieve GHG reduction goals. San Mateo County has further recognized the urgency of GHG reduction targets by declaring a Climate Emergency which calls for accelerdated decarbonization ahead of state goals. Electrification is a key priority in the energy transition, resulting in a convergence of clean vehicle policy and fuel switching in new and existing buildings.This transition to smart, electric buildings and vehicles also includes empowering the community to become active participants in the energy markets, while continuing to grow the local clean energy economy.

Grid safety and reliability is a significant priority in the face of climate change. Unprecedented wildfires are devastating the state on a regular basis and has directly resulted in structural, financial and political instability of the electricity network operated and maintained by Pacific Gas & Electric (PG&E). Wildfire risk is being addressed on multiple fronts. The Strategy intentionally focuses on solutions to local grid reliability but does recognize that fuel reduction programs and state-level efforts to improve utility safety are also essential to improving grid safety and reliability.

1.1.1 Regulatory Framework

The regulatory framework in California is rapidly expanding in support of a renewable energy future. The following regulations and commitments highlight the rapid developments in the state's energy regulations:

- **Senate Bill 100**: In September 2018, California committed to 100% GHG-free electricity by 2045 leading alongside Hawaii in statewide renewable energy goals.
- **Greenhouse Gas Reduction Imperatives**: Through Senate Bill 32 cities are required to reduce GHG emissions 40% by 2030 and following Executive Order B30-15, 80% by 2050, as compared to 1990 levels. The primary sectors for GHG emissions in San Mateo county are transportation and building energy use. Therefore, to meet these state requirements cities are swiftly moving to decarbonize buildings and transportation through electrification.

- **Renewable Portfolio Standard (RPS)**: California's 50% Renewables Portfolio Standard by 2030 has positioned the state as a global leader in renewable energy, with an interim requirement of 33% by 2020. The increasing amount of renewable energy has been the most significant driver of GHG reduction in buildings for many cities and counties.
- **CAFE Standards:** Transportation emission reductions since 1990 are largely due to stricter state requirements of vehicle fuel economy beyond the Corporate Average Fuel Economy, or "CAFE", Standards, improving the average fuel economy of cars and light trucks through standards and regulations.
- **5,000,000 Electric Vehicles Target**: California has set its sights on incentivizing the adoption of electric vehicles and electric vehicle charging infrastructure in order to meet the goal of getting 5 million EVs on the road by 2030.
- **Zero Net Energy (ZNE):** California building code requires all residential new construction to be built to ZNE standards by 2020, with a stated goal that all commercial buildings are ZNE by 2030.

These state-level regulatory commitments are moving toward GHG-free electricity and drastically reducing fossil fuel consumption in buildings and transportation. Additionally, on September 17, 2019 the County of San Mateo declared a Climate Emergency which calls for more immediate action towards reducing GHG emissions ahead of state goals.

Achieving this shift away from fossil fuels will require the County to work on behalf of our stakeholders with the governing energy agencies who regulate California's energy system: California Independent System Operator (CAISO), which operates and manages the the electric grid; California Public Utilities Commission (CPUC), which regulates the local distribution system; the California Energy Commission (CEC), which tracks historical use, forecasts future needs, sets energy efficiency standards and supports development of new energy technologies; our local investor-owned utility, Pacific Gas and Electric (PG&E); our local CCA, Peninsula Clean Energy (PCE) and the many stakeholders across San Mateo County who can support this transition.

1.1.2 San Mateo County Energy Data and Trends

Across San Mateo County, overall energy consumption has continued to decrease even as population and jobs have increased. From 2005 to 2015, population has increased 8.6%, jobs have increased 32.0% and service population (population + jobs) have increased 16.0%. As shown below in **Figure 1** and **Figure 2**, overall electricity consumption has decreased 8% and natural gas consumption has decreased 13% between 2005 and 2015, based on PG&E data.

Figure 1. Electricity Consumption by Sector

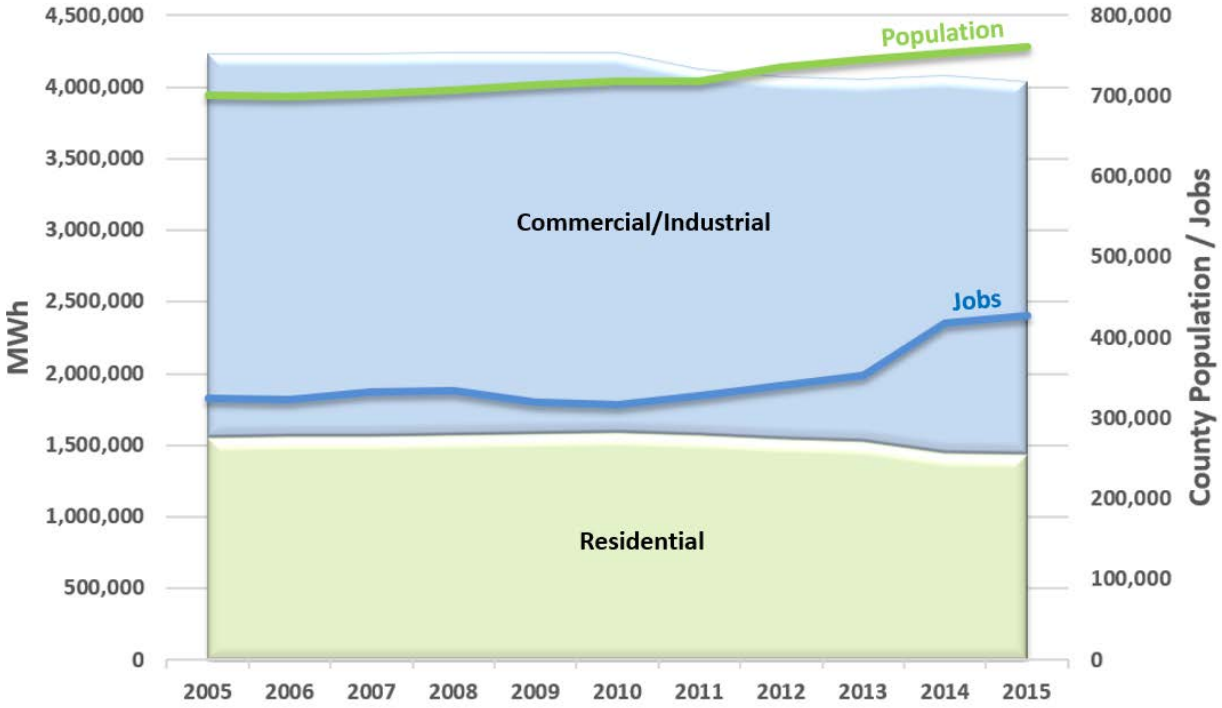
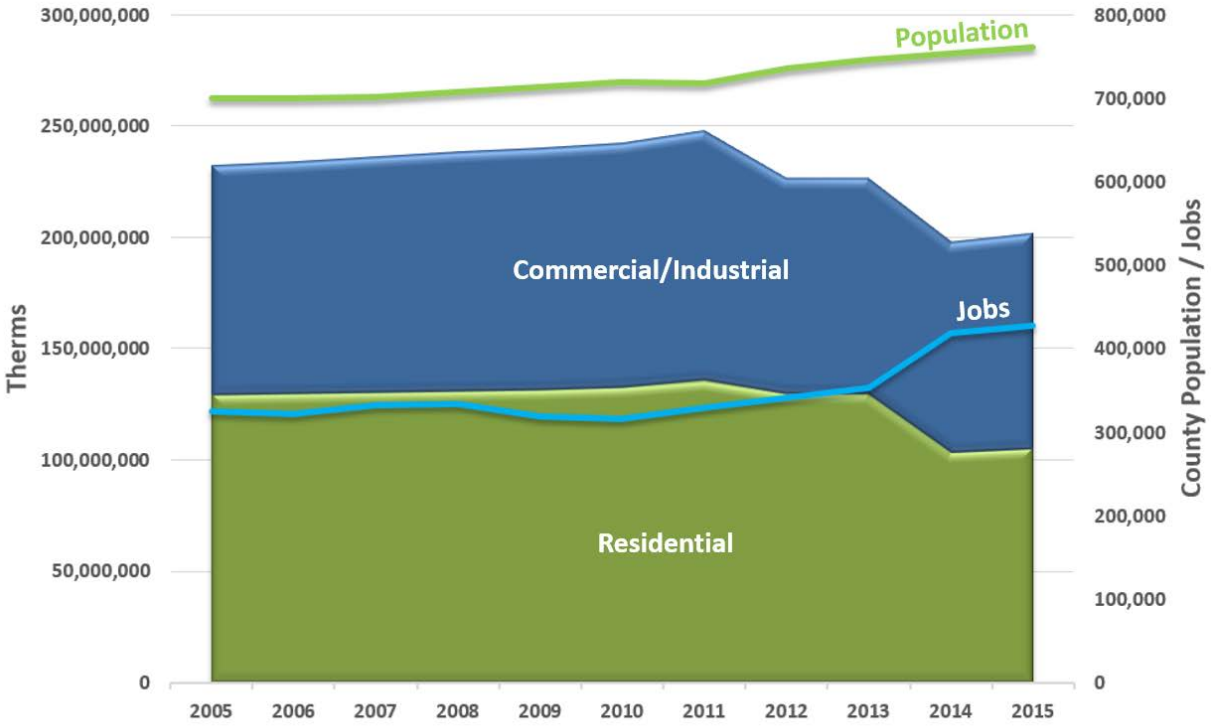
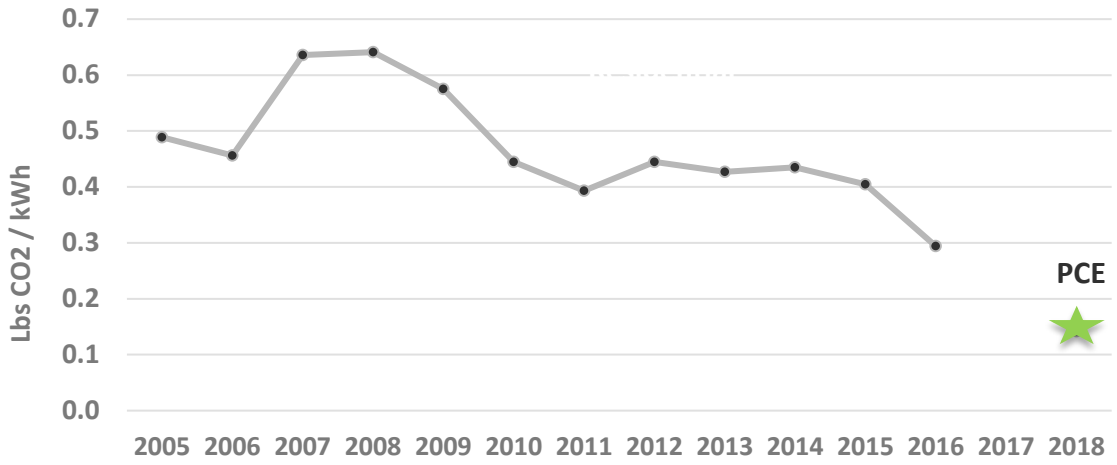


Figure 2. Natural Gas Consumption by Sector



While electricity consumption has decreased slightly, the greenhouse gas emissions factor associated with PG&E supplied electricity has decreased 40% since 2005, largely driven by the State's renewable portfolio standard (RPS). As shown in **Figure 3**, with the launch of PCE an additional 30% decrease in emissions is expected based on PCE's 2018 emissions factor, with PCE setting a goal to supply 100% GHG-free electricity by 2021 and source 100% CA RPS eligible renewable energy by 2025.

Figure 3. Electricity Emissions Factor (PG&E 2005 – 2016)



One of the main factors in decreasing emissions is the increase in solar energy generation, as shown in **Figure 4**. There has been an increasing trend for distributed energy resources such as solar PV, and electric vehicles. As of January 2018, approximately 2% of vehicles registered in San Mateo County with Department of Motor Vehicles are estimated to be battery electric (BEV), or plug-in hybrid (PHEV) electric vehicles (Figure 5).

Figure 4. Cumulative Distributed Solar Capacity Installed by Sector

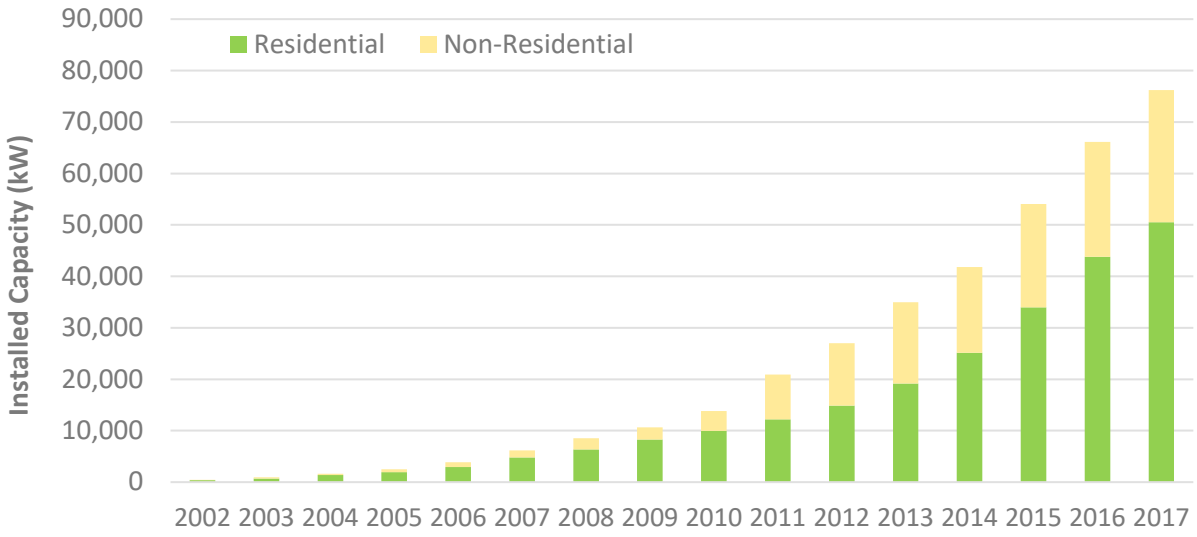
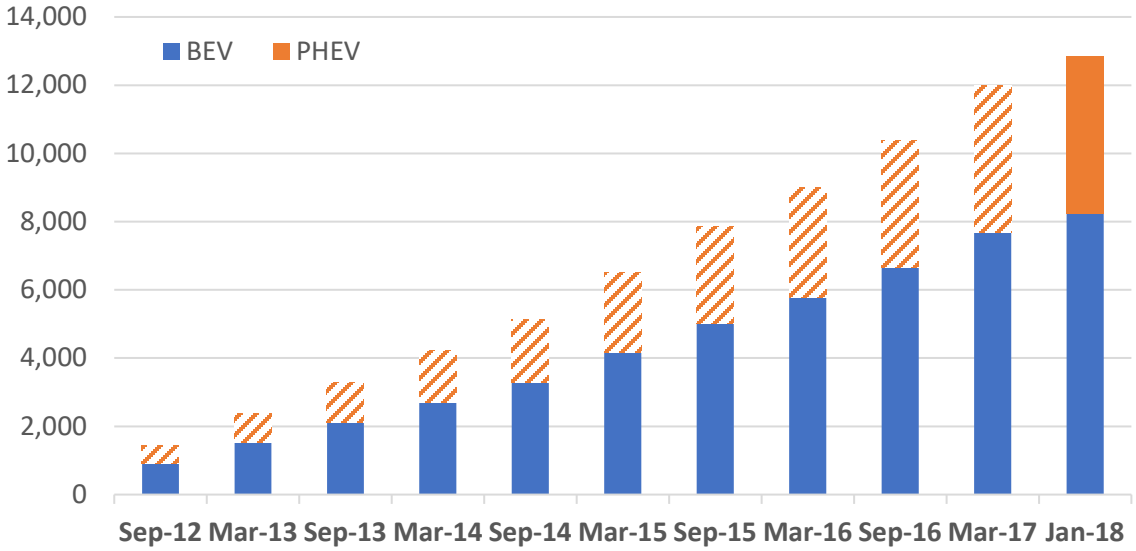


Figure 5. [2]Electric Vehicles Registered in San Mateo County (Passenger Vehicles)



In summary, substantial progress is being made countywide to reduce energy consumption and shift to cleaner sources of energy to power our vehicles, homes and businesses. A recent study by the City and County Association of Governments suggested that, to meet 2040 GHG reduction goals, approximately 40% of the registered vehicles in San Mateo County would need

[2] Prior to January 2018, data on the # of PHEVs was not available from the DMV. For all time periods prior to January 2018, the number of PHEVs is estimated based on the ratio of BEV to PHEVs in San Mateo County in January 2018 and the number of BEVs registered in San Mateo County in given time period (e.g. March 2017, September 2016, etc.). That is why the orange bars are striped on graph prior to 2018

to be EVs. Currently, only 2% of registered vehicles in San Mateo County are EVs. Significant work remains to meet the State of California's ambitious climate goals for 2030 and beyond.

1.1.3 Challenges and Opportunities

Despite progress in the transition from centralized fossil-fuel based energy to distributed and renewable resources, many issues and challenges remain. These include:

- **Grid infrastructure to support electrification and distributed energy resources.** As our communities increasingly electrify both transportation and buildings, the grid infrastructure must be upgraded to ensure adequate capacity for increased and distributed loads.
- **Data access for stakeholders and community partners.** With smart grid and smart building technologies, more and more data is now available in real-time for managing consumption and generation. This includes data associated with grid capacity. Currently, the data is restricted by data privacy rules. More work is needed to identify how data can be securely leveraged to support various energy initiatives and priorities.
- **Existing buildings and opportunities for upgrades.** The biggest issue holding back the transformation of the building sector is the rate at which existing buildings can be retrofitted for energy efficiency, building envelope and electrification of space and water heating systems. This is mainly attributed to significant costs associated with these improvements, perceived or real. While building codes have continued to increase in stringency for new construction, existing buildings form the vast majority of the built environment and further innovations are needed for decarbonization of existing buildings.
- **Need for new collaborations.** The energy landscape in the County is changing with more players, and more coordination is needed across various partners (e.g., the County, PCE, PG&E, the 20 Cities, non-profits, private sector partners, regional agencies) to incentivize and accelerate the adoption of efficient, electric technologies and transition the fuel of our buildings and fleets to clean electricity.
- **Community engagement for all sectors, including communities of concern.** The energy transition necessitates individual action, in addition to government and private sector action. Therefore, deep engagement with community members across San Mateo County is needed in the development of new programs and policies. Particular focus is needed on socioeconomic equity, encompassing racial and social justice, as well as affordability, to support our most vulnerable populations.
- **Cost and magnitude of aging and outdated Infrastructure.** Old systems and the process by which infrastructure decisions are made are in dire need for updating.

Neglected maintenance of aging grid infrastructure combined with the effects of climate change directly affect the safety and reliability of electricity delivery. Improving reliability by distributing energy resources, establishing grid redundancy and installing backup capacity is needed as the effects of climate change increase in severity but the magnitude of the improvements needed and the associated costs will require significant coordination and planning among many parties.

1.2 Water

Water is an essential resource for life and is inextricably linked to energy. While modern society can (arguably) live without electricity and natural gas, water is the lifeblood of humanity – constituting 60% of the adult body with every living cell in the body needing water to function.

Despite increased conservation, water supply is still an issue of concern due to the impacts of climate change on the hydrologic cycle and the additional complexity of how the State of California might adopt policies that impact water supply in the County.

The concept of “One Water” emphasizes that all water has value during its continuous movement through the natural hydrological cycle and reuse cycles, including stormwater, irrigation, wastewater and recycled water that is reused for potable and non-potable purposes. A sustainable future requires managing water resources more collaboratively, reducing water consumption, leveraging a variety of supplies and promoting innovation across the water sector.

1.2.1 Regulatory Framework

In contrast to energy, which is primarily procured by two entities (PG&E and PCE), there are numerous water retailers operating across San Mateo County. In 2003, the Bay Area Water Supply & Conservation Agency (BAWSCA) was created to represent the interests of 24 cities and water districts, and two private utilities, in Alameda, Santa Clara, and San Mateo counties that purchase water on a wholesale basis from the San Francisco Regional Water System.

Several cities and joint powers of authorities across San Mateo County provide wastewater treatment and services, including Silicon Valley Clean Water, Sewer Authority Mid-Coastside and others.

> *"Current management practices for water supply and flood management in California may need to be revised for a changing climate. This is in part because such practices were designed for historical climatic conditions, which are changing and will continue to change during the rest of this century and beyond. As one example, the reduction in the Sierra Nevada snowpack, which provides natural water storage, will have implications throughout California's water management system."*
>
> State of California's 4th Climate Change Assessment Report (2018)

The regulatory framework for water supply and use is largely driven at the state level, providing oversight of disparate urban water suppliers to, for example, drive conservation efforts, enforce drinking water quality standards, and regulate wastewater processing to ensure public health is maintained.

Some key regulations include:

- **Making Water Conservation a California Way of Life** establishes a framework for the implementation of new standards around efficient water use. The related legislative bills require cities and water districts to establish strict annual water budgets and set water use targets by 2022. Agencies not meeting their goals by 2027 may face fines of up to $10,000 per day. The water use standards will be developed based on indoor and outdoor residential water use; commercial, industrial, and institutional outdoor water use; water loss; and other regional variances. The indoor water standard will be 55 gallons per person per day in 2022, falling to 50 gallons per person in 2030. The bills also provide incentives to water suppliers for recycling water.
- **Sustainable Groundwater Management Act (SGMA)** requires governments and water agencies of high and medium priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. Under SGMA, applicable basins should reach sustainability within 20 years of implementing their sustainability plans.
- **National Pollutant Discharge Elimination System (NPDES),** is a U.S. Environmental Protection Agency permit program created in 1972 by the federal Clean Water Act

addressing water pollution by regulating point sources that discharge pollutants. The San Mateo Water Pollution Prevention Program (SMCWPPP) is a partnership of C/CAG, each incorporated city and town in the county, and the County of San Mateo, which share a common NPDES permit to comply with federal and state requirements.

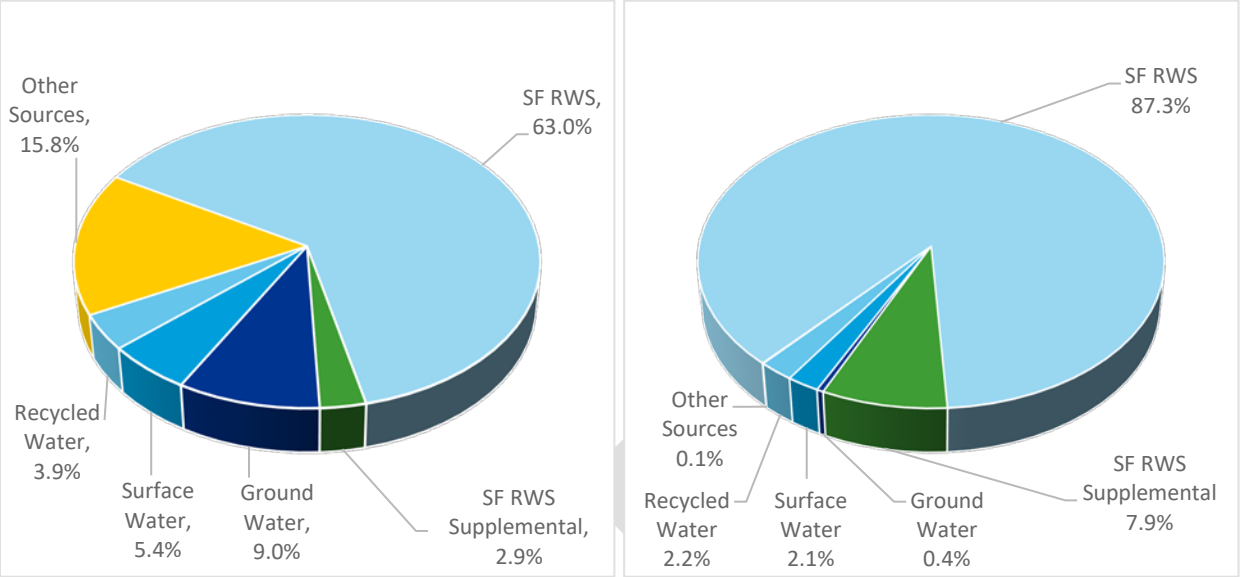
- **Water Reclamation Requirements for Recycled Water Use (General Order)** were adopted in 2016 by the California State Water Resources Control Board to establish standard conditions for recycled water use and further encourage recycled water use statewide. The General Order acknowledges recycled water as a resource through water reclamation requirements and allows recycled water programs to be permitted by the State Water Board.

- **The Bay Delta Water Quality Control Plan** supplements the other water quality control plans that cover the Bay-Delta Estuary. Together they include all necessary elements of water quality control plans in accordance with Water Code sections 13241 and 13242 and federal requirements.

1.2.2 San Mateo County Water Data and Trends

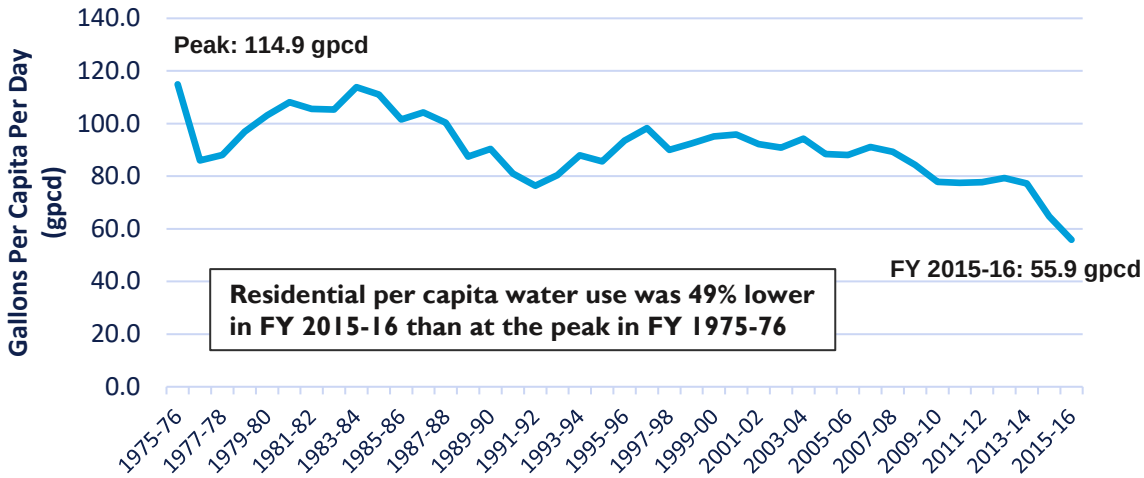
According to BASWCA, the majority of water supplied across its service area of San Mateo, Alameda, and Santa Clara counties is provided by San Francisco Regional Water Supply (RWS), followed by groundwater and other sources as shown in **Figure 6**. Among the BAWSCA member agencies, however, sources of supply vary considerably. In San Mateo County, a very small portion of water is supplied by groundwater in contrast to other counties, the majority of water supplied to communities in San Mateo County comes from San Francisco Regional Water Supply, as shown in Figure 6.

Figure 6. Water Use by Source (2017) BAWSCA Members Total (left) versus San Mateo County BAWSCA Members (right)



Over the past four decades, overall water consumption has decreased across San Mateo County consistent with trends in decreasing residential per capita water use across BAWSCA's service area. As shown below in **Figure 7**, in BAWSCA's service territory for Alameda, Santa Clara, and San Mateo counties, the average residential gallons per capita per day (gpcd) decreased 49% from 1975 to 2015.

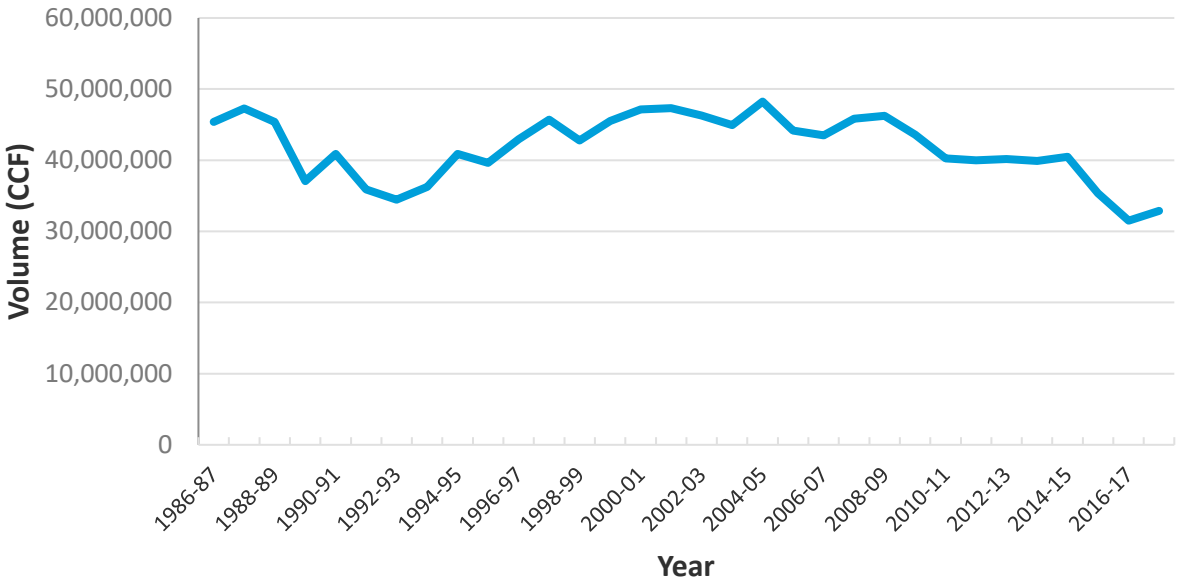
Figure 7. BAWSCA Residential Per Capita Water Use



While per capita water consumption has decreased across San Mateo County, **Figure 8** shows that total water consumption has largely remained relatively stable despite significant population and jobs growth. Additionally, after Governor Jerry Brown issued a proclamation declaring a

Drought State of Emergency in January 2014, total water consumption of BAWSCA agencies in San Mateo County decreased by 19% from from FY 2013-14 to FY 2016-17.

Figure 8. Total Water Consumption of BAWSCA Member Agencies in San Mateo County



1.2.3 Challenges and Opportunities

Similar to energy, the water sector is facing numerous issues and challenges moving forward related to ensuring reliable water supply and fair costs, integrating recycled water, and minimizing environmental impacts. These include:

- **Water and wastewater infrastructure withstanding seismic and other hazards.** Continued investments are needed to upgrade aging infrastructure, including identifying risks associated with seismic and other hazards such as sea level rise and extreme weather. Regional wastewater treatment plants are identified as critical infrastructure and face risks associated with backflow due to sea level rise.
- **Water supply management that accounts for uncertainties of climate change.** The effects of climate change are already being felt with increasingly unpredictable winters. Less frequent yet more severe storm events are being experienced at the same time that the length of the wet season is diminishing. Long term effects on the snow pack in the Sierra Nevada are anticipated to affect the Hetch Hetchy water system. BAWSCA, through its Long-Term Reliable Water Supply Strategy,[3] has been working to identify regional water supply needs and water supply management projects and/or programs

[3] http://bawsca.org/water/reliability/strategy

(projects) that can be developed to meet supply needs. BAWSCA identified a myriad of potential projects, and much of the current focus is on exploring opportunities for indirect potable water reuse, which introduces purified recycled or reclaimed water into an environmental buffer such as groundwater aquifer or surface water reservoir prior to its use.

- **Innovation in water conservation strategies.** In contrast to energy, there are limited dedicated funding streams for water conservation and more work is needed to leverage opportunities for innovation, including real-time metering of water use data, app-enabled water monitoring, and aggressive policies and programs to conserve water at the local level.

Working across a large number of diverse stakeholders, agencies and community-based organizations. Many of the water supply management strategies, including conservation and developing new water supplies, require engaging with many water retailers across San Mateo County and the region. In addition, there is a need for continued engagement with community-based organizations and communities of concern to ensure an equitable distribution of resources and programs.

2. Navigating this Strategic Plan

Partnering to bring about a sustainable energy and water future is more important than ever. The County, the cities, Peninsula Clean Energy (PCE), PG&E, BAWSCA, local joint powers of authorities (JPAs), and the dedicated NGOs and businesses in the region are all key partners. These implementation and resource partners have collaborated to identify countywide priorities for expanding programs and policies to support sustainable, reliable, and equitable management of energy and water resources.

The result is a coordinated *San Mateo County Energy and Water Strategy 2025* that focuses on goals, strategies, and actions to guide efforts and priorities for the next several years, with a prioritized set of foundational actions in Section 5. In the process of developing this strategic plan, a deeply connected cross-sectoral working group of local experts came together to advance innovative energy and water solutions to benefit our communities. For both energy and water, key partners were identified by the working group for implementation of the Strategy as listed in **Table 9**. The County also seeks to engage with local environmental organizations, sustainability advocacy organizations, community-based organizations, local student groups, and other entities active in implementing and promoting innovative energy and water initiatives.

Table 9. Key Partners for Implementation

Energy	Water
• San Mateo County (SMC) • City government • Peninsula Clean Energy (PCE) • Pacific Gas & Electric (PG&E) • Resource Conservation District (RCD) • Non-government organizations (NGO) • Private sector partners	• San Mateo County (SMC) • Bay Area Water Supply and Conservation Agency (BASWCA) • Water retailers • Wastewater facilities • City (other departments) • Resource Conservation District (RCD) • Non-government organizations (NGO) • Private sector partners

Since each action described in this strategic plan is multi-faceted, different roles were further identified.

Table 10 provides a list of the specific categories of actions key partners may engage in to address specific strategies(denoted by the corresponding icon).

Table 10. Key to Categorizing Actions

Category of Action	Example Actions	Icon
Policy or Policy support	Adopt reach codes, ordinances, and new policies to influence community behavior, retrofits and upgrades	
Outreach/Marketing	Launch education campaigns to increase awareness of resources, desired behaviors and trainings	
Programs and Partnerships	Provide technical assistance and pilot programs and facilitate engaging with partners. This also includes workforce development and education.	
Utility Infrastructure	Invest in and upgrade energy and water infrastructure at the utility-scale	
Technology	Supporting technology dissemination and development, as well as foster commercialization of new technologies	
Financing/ Incentives	Provide funding, financial incentives, financing and loans	

3. Opportunities in a Changing Energy Landscape

Driven by new state policies, grid instability, emerging technology, and market opportunities, the way local governments manage, supply, and interact with energy is changing rapidly. In this chapter, three major goals are identified along with strategies to achieve those goals. These strategies identify how San Mateo County, Peninsula Clean Energy, PG&E, cities, and others can work together to navigate the energy transition to the greatest benefit for our local communities.

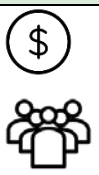
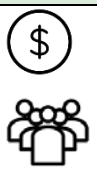
Goal E1. Optimize and Reduce

Strategy E1.1: Leverage passive design and smart building technologies to optimize and reduce energy use in existing buildings

	Actions	SMC	City	PCE	PG&E	Other
1.	Provide financial and technical resources and local workforce development trainings for installers and building owners/operators to learn to analyze building energy use through a combination of measures.					RCD
2.	Pursue development of local benchmarking and energy use disclosure ordinances, with County support for cities to develop policies and set energy efficiency goals.					
3.	Leverage utility and PCE program incentives for energy efficiency and demand side management, including monitoring-based commissioning programs and energy (and water)					

	audits of agricultural and industrial operations.					 RCD
4.	Develop programs for all income levels that encourage retrofits and smart home, real-time monitoring including sub-metering, along with passive (efficiency) design features for major remodels.					
5.	Educate, engage and incentivize building owners, real estate and property management representatives to address split-incentive issues, including developing tenant improvement guidelines and green lease contracting templates.					
6.	Leverage public-private partnerships and multisector resources support efforts like innovative pilots including a smart/efficient building design competition. Secure partnerships with partners such as Nest, Mynt and OhmConnect.					PG&E 

Strategy E1.2: Promote policy and high efficiency design approaches for zero net carbon in new construction

	Actions	SMC	City	PCE	PG&E	Other
1.	Support regional approaches to promoting reach codes for new construction to go beyond state ZNE goals, including templates, pilots and case studies focusing on Net Zero Carbon (NZC), also known as all-electric. Partner with utilities around all electric infrastructure planning.					
2.	Adopt local reach codes, streamline permitting and other green building policies focusing on Net Zero Carbon, beyond state ZNE codes. County to provide templates for NZC reach codes and outreach materials.			 Partner		

3.	Aggressively promote all-electric new buildings including accessory dwelling units and funding for net zero carbon pilots.					
4.	Increase customer and trades education and training for the trades around net zero carbon buildings, including efficiency, heat-pump water and space heating/cooling systems, on-site renewables and other distributed energy resources.					Regional 
5.	Integrate resilience assessments, upcoming AB 262 assessment of project materials for global warming potential, and energy audits for planning with new developments to ensure longevity, including consideration of future climate impacts (increasing heat, flooding, etc.).					

Strategy E1.3: Leverage new technologies related to existing building electrification such as heat pumps for thermal loads

	Actions	SMC	City	PCE	PG&E	Other
1.	Create heat pump water heater (HPWH), space heating and electric stoves/dryers program and incentives (residential). County will support cities and PCE to create education, training and outreach for electrification measures.					
2.	Create public-private partnership around mid-stream incentives and/or bulk buys of HPWH (like Sunshares). Work with utility or PCE to set up on-bill or easy financing solution.					 Regional & State
3.	With utility and PCE, explore opportunity to pilot a fleet of grid-enabled heat pump water heaters in multi-family new construction or large-scale retrofit.					 Developer, Manufact.

4.	Provide/promote local workforce development opportunities related to building electrification, including cross-training of plumbing and electrical trades, engage industry to provide trainings for all electric technologies (including stoves, heaters, etc.) and provide educational resources for inspectors/ permit/ plan checkers.					
5.	Develop model reach codes and incentives for all electric building measures and streamline permitting processes for heat pump technology, and other related technologies.					

Strategy E1.4: Align energy demand (loads) with renewable energy generation for grid stability

	Actions	SMC	City	PCE	PG&E	Other
1.	Analyze and prioritize buildings for demand response and load shaping opportunities; considering rolling out alongside Energy Benchmarking program launch.					
2.	Promote permanent shifts of load to times when renewable energy is plentiful through energy and thermal storage, load timing/controls, precooling/pre-heating and other measures.					 Utility
3.	Promote automated demand response solutions/technologies to curtail customer demand (e.g., AC load control, etc.).					

Goal E2. Decarbonize and shift to clean energy

Strategy E2.1: Support rapid community shift to 100% GHG-free electricity

	Actions	SMC	City	PCE	PG&E	Other
1.	Create partnerships, awareness campaigns and incentives to maximize opportunities for local rooftop PV and carport PV systems combined with energy storage for residential and commercial buildings. For the agricultural sector, promote solar-powered pumps (for water).					 RCD
2.	Enhance building reach codes to support community scale smart solar projects with energy storage, and multifamily dwelling units' electric vehicle charging infrastructure.					
3.	Encourage all consumers to move towards 100% renewable energy, through PCE's ECO100 supply option and its 100% renewable energy by 2025, as well as regional power purchase agreements and bulk buy programs.					
4.	Partner with a local university or national lab to research and develop appropriate response plans to ensure seasonal and time dependent impacts on grid are addressed.					
5.	Plan for regional or municipal emergency centers to site battery storage, and/or use renewable energy microgrids, especially in vulnerable communities.					

Strategy E2.2: Electrify transportation

	Actions	SMC	City	PCE	PG&E	Other
1.	Initially focus on fleet electrification opportunities (e.g., school buses, transit, municipal fleets, etc.). Work with Transportation Demand Management programs, transportation network companies to electrify commuter fleets. Provide fleet					

	manager trainings and leadership trainings around true costs and the advantages of clean technologies.					
2.	Accelerate adoption of electric vehicles in the community: provide incentives and expand bulk buy opportunities, including communities of concern. Promote through municipal channels as well as ride and drive events					 State
3.	Pursue state and regional partnerships to promote and incentivize EVs and include low emission biofuel for existing vehicles and off-road equipment alternatives, including electric tractors.				  	 PG&E  RCD

Strategy E2.3: Increase EV charging infrastructure countywide

	Actions	SMC	City	PCE	PG&E	Other
1.	Develop an organized charging infrastructure strategy that incorporates expansion throughout the region including curbside, workplace, fast chargers and at home charging, especially within communities of concern. Include tools for assessment, available incentives and policy templates.				 	
2.	Partner with PCE, PG&E and technology providers to implement EV2Grid strategies for load shaping and resilience.			 	 	
3.	Provide model consumer payment policies at charging stations to support cities and local businesses to install public and workplace charging infrastructure.			 		
4	Develop model ordinances and policies for Electric Vehicle Charging Infrastructure (EVCI) in multi-unit dwellings and low-income communities. Ordinances should include other building and business types as well.					

Strategy E2.4: Participate in building electrification advocacy

	Actions	SMC	City	PCE	PG&E	Other
1.	Support building electrification through regional and statewide advocacy.					 NGOs
2.	Research gas line issues, gas data and policy pathways to evaluate risks associated with natural gas infrastructure. Based on findings, develop infrastructure improvement plan to address outstanding gas line issues, and clearly communicate ecological, economic, and social benefits of electrification.					

Strategy E2.5: Foster innovative local energy sources and carbon offset projects

	Actions	SMC	City	PCE	PG&E	Other
1.	Explore waste-to-energy (including food waste-to-energy and landfill methane capture) and pyrolysis of unrecyclable plastic waste.					
2.	Explore opportunities for renewable gas, including biogas, digester gas and landfill gas and more efficient district energy systems.					
4.	Study wind, tidal, water storage release hydro power and other renewables in region, supporting uptake through pilot projects.					
5.	Develop a partnership program or regional collaboration for R&D, investments and opportunities in local alternative/clean energy businesses.					
6.	Develop and implement Carbon Farm plans on the Coastside for carbon sequestration, including agricultural waste and food waste (compost).					RCD  

Goal E3. Modernize the grid for resilience and decarbonization

Strategy E3.1: Support integrated distributed energy resources (DER) solutions for resilience and optimization

	Actions	SMC	City	PCE	PG&E	Other
1.	Streamline permit processes (city, county, state, utility) for new DER technologies including for storage and electric vehicle charging infrastructure.					PG&E
2.	Establish microgrid pilot projects and distributed energy resources at critical facilities across San Mateo County (e.g., schools, hospitals, fire, police), prioritizing opportunities to serve low-income and vulnerable populations.		Public works			
3.	Work with advocacy coalitions to shift regulatory barriers to cost-effective multiple use applications for solar+storage, microgrid and other DER project opportunities.			Data		PG&E
4	Integrate DER measures into existing utility programs that provide financial and technical assistance, including on-bill repayment.					PG&E

Strategy E3.2: Utilize equity tools to expand access to clean energy projects and job opportunities

	Actions	SMC	City	PCE	PG&E	Other
1.	Leverage existing networks across San Mateo County (e.g., County Office of Health & Human Services, energy financing, community-based organizations) to target new energy programs and local workforce development opportunities for communities of concern.					NGO
2.	Identify core resources and local San Mateo County barriers to energy efficiency, microgrid, electric vehicle and DER project opportunities.					NGO
3.	Partner with San Mateo County Office of Education, and San Mateo Community College District, regional universities, PCE, PG&E and					

	other organizations to develop new training and local workforce development programs.					
4.	Ensure that all incentives prioritize social equity (e.g., income-related filters for incentives) and assess opportunities to better channel resources to communities of concern.					

Strategy E3.3: Leverage open data and big data opportunities to transform energy systems locally

	Actions	SMC	City	PCE	PG&E	other
1.	Develop an integrated map of DER project feasibility parameters on easy-to-access shared platform (e.g., with multiple information layers related to solar potential, hosting capacity and other grid analyses).					
2.	Use utility distribution system capacity maps to prioritize microgrid, solar+storage and other DER project opportunities, focusing on communities of concern.					PG&E NGO
3.	Develop localized metered data (AMI interval data) to understand existing conditions for energy efficiency, demand response and resilience.					PG&E
4.	Leverage utility partnership to plan for electrification and grid modernization, including prioritization of improvements (in lieu of new 50-year gas distribution strategy).					PG&E CPUC

Strategy E3.4: Explore and develop innovative financing and funding models for advanced energy community solutions

	Actions	SMC	City	PCE	PG&E	Other
1.	Pursue grants with California Energy Commission, BAAQMD, Office of Planning and Research, federal agencies and local philanthropic organizations with focus on low-income and communities of concern.			Partner		NGO PG&E RCD
2.	Promote existing financing vehicles including property-assessed clean energy (PACE), on-bill financing/repayment, power purchase agreements (PPAs) and energy savings performance contracts.					PG&E RCD
3.	Consider local carbon bonds or carbon taxes to support local clean energy projects that serve all members of the community.					NGO
4.	Explore new gas and utility user taxes (UUT) to incentivize electrification and shifting from fossil-fuel based energy sources.			Partner		
5.	Explore new opportunities to leverage private capital for decarbonization initiatives, including bonds, and utilizing public match funding to de-risk private sector investments.					NGO Private

4. Realizing the Vision of One Water

The One Water approach views all water – drinking water, wastewater, stormwater, greywater and more – as resources that must be managed holistically and sustainably. In this chapter, three goals are identified along with strategies to meet those goals. These strategies show how San Mateo County, BAWSCA, water retailers, cities and others can work together to enhance water use efficiency, expand alternative sources of water and support systemic improvements in water resource management throughout the County. These three goals will move the County towards realizing the vision of One Water.

Goal W1. Enhance water use efficiency

Strategy W1.1: Expand use efficiency programs for indoor water

	Actions	SMC	BAWSCA	Retailer	City	Other
1.	Promote third-party and self-auditing approaches to identifying water efficiency opportunities including commercial/industrial, and agricultural uses.	RCD				RCD
2.	Implement and evaluate cost-effective commercial/industrial water efficiency measures.					RCD
3.	Evaluate and design programs for remaining residential water efficiency opportunities, prioritizing communities of concern.					
4.	Work with city inspectors to ensure enforcement of state requirements for water efficient fixtures and appliances for new buildings and retrofits.					
5.	Update mandatory ordinances for water efficiency above state requirements.					

Strategy W1.2: Expand programs, policies and best practices for outdoor water use efficiency

	Actions	SMC	BAWSCA	Retailer	City	Other
1.	Provide and promote standardized landscape conversion designs (e.g., Lawn-Be-Gone programs) for residential customers.	RCD				
2.	Provide efficient irrigation standards to assist commercial property owners with landscape design and management decisions.					
3.	Promote Bay Friendly Landscape Guidelines[4] and other resources for new buildings and landscape replacement.	RCD				
4.	Expand programs to educate local landscape professionals on technologies and strategies for water conservation.					
5.	Promote agriculture irrigation efficiency for row crop and other irrigated agriculture.	RCD				RCD

Strategy W1.3: Provide real-time water use data

	Actions	SMC	BAWSCA	Retailer	City	Other
1.	Promote the uptake and implementation of advanced metering infrastructure (AMI) and smart meters for water, prioritizing communities of concern.					RCD
2.	Develop new programs to provide real-time water consumption data to residents and business owners to influence behavioral usage.					
3.	Support pilots for utilizing app-enabled home water monitoring approaches.					

[4] www.stopwaste.org/resource/brochures/bay-friendly-landscape-guidelines-sustainable-practices-landscape-professional

4.	Require submetering in new construction.					
5.	Fund and develop leak detection at the building level, prioritizing multi-family units and communities of concern.					
6.	Adopt Energy Star Portfolio Manager benchmarking tools, including irrigation submeters, for new construction and existing building with high use projections.					

Goal W2. Expand alternative sources of water

Strategy W2.1: Encourage water reuse

	Actions	SMC	BAWSCA	Retailer	City	Other
1.	Increase education and outreach related to potable and non-potable reuse opportunities, especially for communities of concern.	 RCD 				NGO
2.	Support development of on-site non-potable reuse regulatory/implementation framework, including model ordinances for new construction.					
3.	Provide additional incentives and resources for non-potable reuse (e.g., greywater, rainwater, stormwater) for landscape irrigation, and tailwater recycling for greenhouses, including both demonstration projects and trainings.					RCD  

Strategy W2.2: Support expanded use of utility-supplied recycled water

	Actions	SMC	BAWSCA	Retailer	City	Other
1.	Promote use of recycled water in pre-plumbing and landscape.					
2.	Bring awareness and engage in outreach for potable reuse.					NGO
3.	Promote potable reuse pilot projects and advancement of regional potable reuse projects.					

Strategy W2.3: Continue to explore new innovative technologies and land uses for alternative water supplies

	Actions	SMC	BAWSCA	Retailer	City	Other
1.	Support investigation of innovative brackish groundwater desalination projects.					
2.	Explore opportunities related to surface water management and integrated water management on the Coastside.					RCD  
3.	Support innovative water technologies (e.g., fog, condensation, recycled water and energy)					NGO

Goal W3. Support systemic improvements

Strategy W3.1: Engage stakeholders countywide on Integrated Regional Water Management

	Actions	SMC	BAWSCA	Retailer	City	Other
1.	Support awareness and community outreach related to water supply, wastewater treatment, flood and stormwater management and the impacts of climate change.					RCD SWCB NGO
2.	Promote school programs focused on water efficiency and conservation.	SMCOE 				NGO
3.	Expand green infrastructure for stormwater management including permeable pavement, vegetated stormwater features, streetscape improvements and incorporating stormwater/flood conveyance into city planning.					RCD

Strategy W3.2: Support resilience of regional wastewater treatment plants to mitigate environmental health impacts

	Actions	SMC	BAWSCA	Retailer	City	Other
1.	Identify and mitigate highest priority facility risks at wastewater treatment plants across the County, including consideration of countywide sea level rise projections and hazards.	RCD 				BACWA
2.	Encourage new technologies for wastewater treatment plan resilience (e.g., horizontal levees to address backflow risks)			WWTP agencies		BACWA

Strategy W3.3: Encourage innovation for water utilities

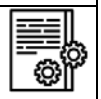
	Actions	SMC	BAWSCA	Retailer	City	Other
1.	Assess water rates and ensure true cost of water as part of stakeholder engagement.					
2.	Improve leak detection and service response on utility side of the meter.					
3.	Explore opportunities for open data related to water consumption to spur innovation in water efficiency programs and management practices.					RCD
4.	Utilize real-time water use data for machine learning, including other data sources such as inspection records.					

5. Energy-Water Nexus: Collaborative Impact

This strategic plan focuses on energy and water resources as foundational to modern life and prosperity across San Mateo County. Energy is inextricably linked to water in many ways. First, energy is required to for heating water within homes and businesses. Reducing water use, especially hot water use, reduces energy use in San Mateo County. Similarly, water is used for energy and electricity generation, including fossil fuel extraction, hydropower and geothermal energy, cleaning solar photovoltaic panels and as cooling water for power plants. Wastewater treatment plants can generate energy onsite though the capture and use of bigas. Proper timing of water pumping can help balance energy loads based on the needs of the grid (supply or demand). Water can also be an inexpensive way to store energy. For example, Hawaii has a fleet of 500 grid enabled heat pump water heaters which are used to store energy during the day when there is an excess of renewables on the grid. Additionally, there are water technologies which save energy such as counterflow waste water exchange pipes which can shift the heat of outgoing water from a building over to heat incoming cold water.

Engagement with diverse stakeholders across both energy and water is important when addressing the issues and challenges facing the County regarding the sustainable use of both energy and water resources. The following actions have both energy and water benefits and are therefore of the highest impacts possible across all sectors.

Strategy Energy & Water (E&W)1: Develop collaborative impact projects to optimize and reduce energy and water use

	Actions	SMC	BAWSCA	PCE	PG&E	Other
1.	Investigate opportunities to initiate direct water-to-energy projects, by identifying locations of existing or new large volume water movement with energy-generation capacity. Consider pilots at these locations.					 
2.	Pursue development of water tanks as energy storage, including grid enabled heat pump water heaters. Investigate where other large water tanks can be used for energy storage. Pursue pilot projects.					 
3.	Develop pilot deploying counterflow wastewater heat exchangers in multifamily or mixed-use buildings.					

6. Looking Ahead

While many important and noteworthy actions are identified in this strategic plan, implementation requires continued coordination. Prioritization of efforts was a key consideration at stakeholder meetings during the plan development. Policy changes were identified as one priority as they have great power to transform markets and affect change in energy and water uses and infrastructure decisions. Setting up tools and processes that will allow stakeholders to collaborate most effectively is also a priority.

6.1 Innovation and the Green Economy

The *San Mateo County Energy and Water Strategy 2025* implementation actions must harness the power of innovation and collaboration, working with the private sector and across governmental agencies to create a thriving, regenerative ecosystem and green economy. Innovation is a major part of San Mateo County, home to industry-leading companies in biotechnology, computer software, green technology, financial management, health care, education, and transportation solutions.

> The green economy is defined as an economy that reduces environmental impacts and aims for sustainable development without degrading the environment.

In this strategic plan, we have identified many additional opportunities for innovation that align with clean, reliable energy and water. These include leading innovative opportunities related to:

- **Data analytics and real-time optimization.** Building systems are increasing in sophistication and controllability, with the ability to provide preventative maintenance. With smart meters providing real-time energy and water data, as well as two-way communication capabilities, new opportunities are emerging to optimize sustainable consumption. Data at the community level must also be leveraged for new programs and policy adoption.

- **Distributed resources.** Increasingly, energy and water resources are becoming spatially distributed. More and more buildings are self-generating electricity through solar and reusing water on-site through greywater recycling and rainwater catchment systems.

- **Technology.** In the energy sector, battery storage is rapidly falling in cost, with significant innovation occurring at the intersection of solar PV, buildings and electric vehicles. New infrastructure, such as microgrids and aggregated distributed energy resources, are creating new players in energy markets. Additionally, there are technologies which have energy and water benefits such as the heat-pump water heater, heat exchangers, and use of water for energy storage, based on the needs of the grid's supply/demand needs. Some of the most recent exciting developments are related to app-enabled programs for energy management, renewable generation, water conservation, and leak detection. These, combined with Internet of Things (IOU) will enable consumers and building managers to track and influence consumption and generationin real time.

- **Financing and financial opportunity.** New financing innovations are also essential to transforming our energy and water systems. Crowdfunding, utility/sustainability as a service, power-purchase agreements, bulk buy programs, and leveraging private capital in new ways all help to make the transition to more sustainable energy and water systems accessible to all, including low-income residents and other communities of concern.

- **Making the financial case.** At the end of the day, ensuring a strong financial and business case for action is essential to supporting the transition to a clean energy and water future. A positive return on investment (ROI) and accurate lifecycle costing is needed in evaluating investments for new programs and policies.

- **Worforce Development.** Green jobs are growing steadily in the region. With clear state climate targets, combined with state and federal tax credits and incentives, the Bay Area now leads the nation in clean tech jobs, with 11% of all US clean tech jobs located in the region[5]. Our region now exports more than $1 billion in clean tech exports, including building control systems and electric vehicles. Finally, as part of our commitment to social equity and justice, we seek to promote middle wage "green collar" jobs that offer better pay for low- and middle-skilled workers.

6.2 Foundational Actions

This plan identifies many important strategies and actions to achieve a collective vision for the transition to a clean energy and water future. As described in Figure 11 and Figure 12, a number of foundational actions are identified in this strategic plan as priorities and will be the focus for immediate action. All actions identified in the energy-water nexus section are also considered primary and

[5] http://www.bayareacouncil.org/economy/green-jobs-actually-are-sprouting-in-bay-area/

included in the first implementation phase discussed below. Additionally, through the Resource Management and Climate Protection committee (RMCP), there will be a continued exploration of setting up working groups for meta-level actions such as grid transformation and around the proper integration of social equity in energy and water planning.

Figure 11. Foundational Actions for Energy

Goal	Foundational Actions
E1. Optimize and reduce	**E1.2 - Policy and high efficiency design approaches for Zero Net Carbon ("ZNC", also called "all electric") in new construction** **1.2.2** - Adopt local reach codes, streamlining permitting going beyond state requirements to ZNC. Include financial and technical resources and trainings for low EUI construction and ZNC system installations **E1.3 – Leverage New Tech for existing building electrification** **1.3.4** – Local workforce development include cross-training for plumbing and electrical trades, include customer education and training for the trades around all electric (retrofits and NC). Include development of educational resources for inspectors, permitting, plan checkers, etc.
E2. Decarbonize and shift to clean energy	**E2.1 – Support rapid community shift to 100% GHG free electricity** **2.1.1** – Partnerships, awareness campaigns, incentives to maximize local PV combined with energy storage for residential and commercial buildings. For agricultural sector – solar powered water pumps. **E2.2 – Electrify Transportation** **2.2.1** Initially focus on fleet electrification opportunities **2.2.2** – Electrify fleets and community vehicles – Provide incentives, bulk buys, ride and drives, and city/county fleet trainings. **E2.3 - Increase EV Charging Infrastructure Countywide** **2.3.1** - Develop Countywide charging infrastructure strategy incorporating curbside, workplace, fast chargers and home charging, including Multifamily dwellings. Final deliverable to include tools and templates.

E3. Modernize the grid for resilience and decarbonization	**E3.1 – Support DER for reliance and optimization** **3.1.2** - Pilot microgrids at critical facilities, prioritizing social equity and vulnerable populations **E3.4 - Develop innovative financing and funding models for advanced energy community** **3.4.3** – Create regional local carbon bonds or taxes for equitable clean energy projects

Figure 12. Foundational Actions for Water

Goal	Foundational Actions
W1. Enhance water use efficiency	**W1.1- Expand use efficiency programs for indoor water** **1.1.2**- Implement cost effective commercial industrial water efficiency measures **W1.2 – Expand programs for outdoor water use efficiency** **1.2.2 –** Efficient irrigation standards for commercial property owner decision making, and education/trainings for landscape professionals **1.3.1** – (Data) – Implement Advanced Metering Infrastructure
W2. Expand alternative sources of water	**W2.1 – Encourage water reuse** **2.1.3** – Incentives and resources for non-potable reuse for landscape irrigation, and for agriculture- tailwater recycling for greenhouses. Develop pilots and workforce trainings. **W2.2 – Support expanded use of utility supplied recycled water** **2.2.2**- promote awareness around potable reuse. Deploy pilots and conduct outreach campaigns.
W3. Support systemic improvements	**W3.1 – Engage stakeholders county wide on Integrated Regional Water Management** **3.1.1** – Awareness and outreach related to water supply, wastewater treatment, flood and stormwater management. **3.1.3** -Stormwater (capture) – expand green infrastructure and stormwater/flood conveyance into cross-departmental city planning. **W3.3 - Encourage Innovation for water utilities** **3.3.1** Asses water rates and incorporate true cost of water.

6.3 Monitoring and Tracking

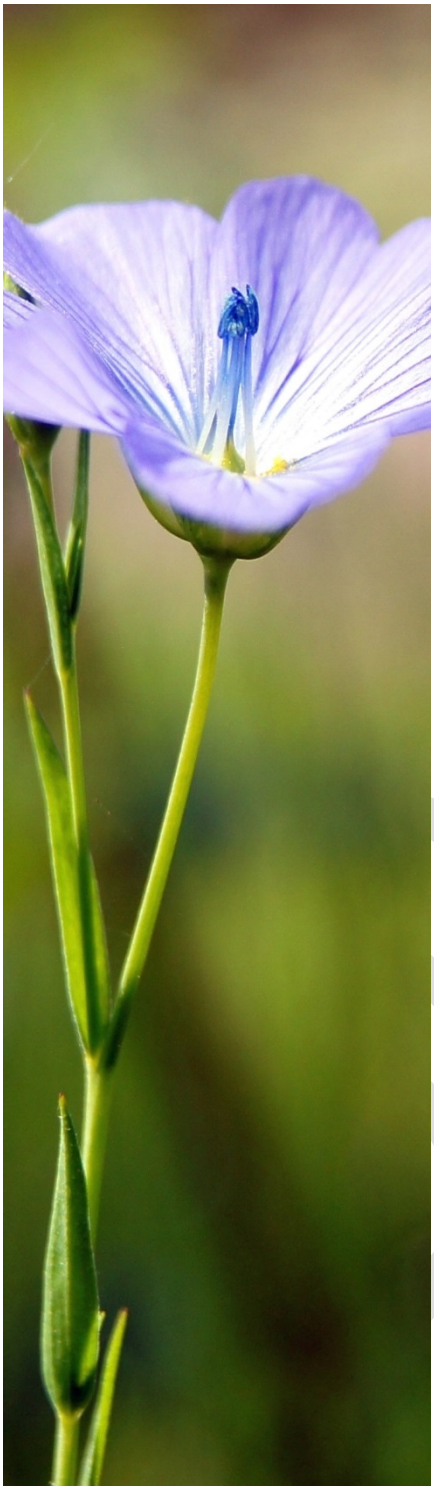
Key implementation and resource partners will continue acting together and individually to advance innovative energy and water solutions, policies and programs, including the coordination of monitoring and tracking progress. In Figure 13 and Figure 14, a number of key performance indicators (KPIs) are identified for energy and water to track progress towards the vision and guiding principles set forth in this plan. Many of these KPIs and associated metrics are already being tracked by various partners, including the County through its open data portal, PG&E, PCE and BAWSCA.

Figure 13. Tracking Progress on Energy

Key Performance Indicator	Metric
Energy consumption (electricity and natural gas)	kWh therms
Electricity supply (renewable energy, local distributed energy resources)	kW of local solar PV kW of battery storage % renewable energy, or GHG -free electric supply
Electricity emissions factor	MTCO2e/kWh
Electric vehicle registrations and infrastructure	Electric vehicle registrations (BEV and PHEV %) # of electric vehicle charging stations

Figure 14. Tracking Progress on Water

Key Performance Indicator	Metric
Water consumption	Total acre-feet per year consumed Gallons per capita per year
Diverse water sourcing	BAWSCA Annual Survey (%) Greywater system permits Acre-feet of recycled water produced



7. Conclusion

Since the adoption of the 2012 San Mateo County Energy Strategy, San Mateo County has been a leader in providing solutions for the efficient use of energy and water resources and reduction of greenhouse gas emissions. However, the environment for solutions has changed greatly since 2009. The establishment of Peninsula Clean Energy and the California drought are two examples.

The updated San Mateo County Energy and Water Strategy 2025 document proposes efficiency, innovation, resilience, advancement and deployment of new technologies, new policies, and education, to achieve a collaboratively-developed set of energy goals. For water, implemtation of BAWSCA's Long-Term Reliable Water Supply Strategy, promotion of One Water approaches, and leveraging data are key to improving resiliency to drought.

Stakeholders in San Mateo County have shown a desire to lead by intently focusing on regional partnerships between policy makers, private sector partners, and the public, to increase collaboration around achieving energy and water management goals.

Supporting the transition to a clean energy future and regionally-coordinated One Water systems requires participation from all sectors of the community, local governments, and other regional agencies. San Mateo County will continue to steward the transition through shared programs, outreach, education and coordination of funding opportunities. The identified goals, strategies, and actions in the Strategy represent a holistic pathway for San Mateo's energy transition and realization of the One Water vision.

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Resource Management and Climate Protection (RMCP) Committee (2018)

Deborah Gordon, Chair
Town of Woodside

Maryann Moise Derwin, Vice Chair
Town of Portola Valley

Dave Pine
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