

County of San Mateo
Department of Public Works

Strategic Energy Master Plan (SEMP) Update

October 2025

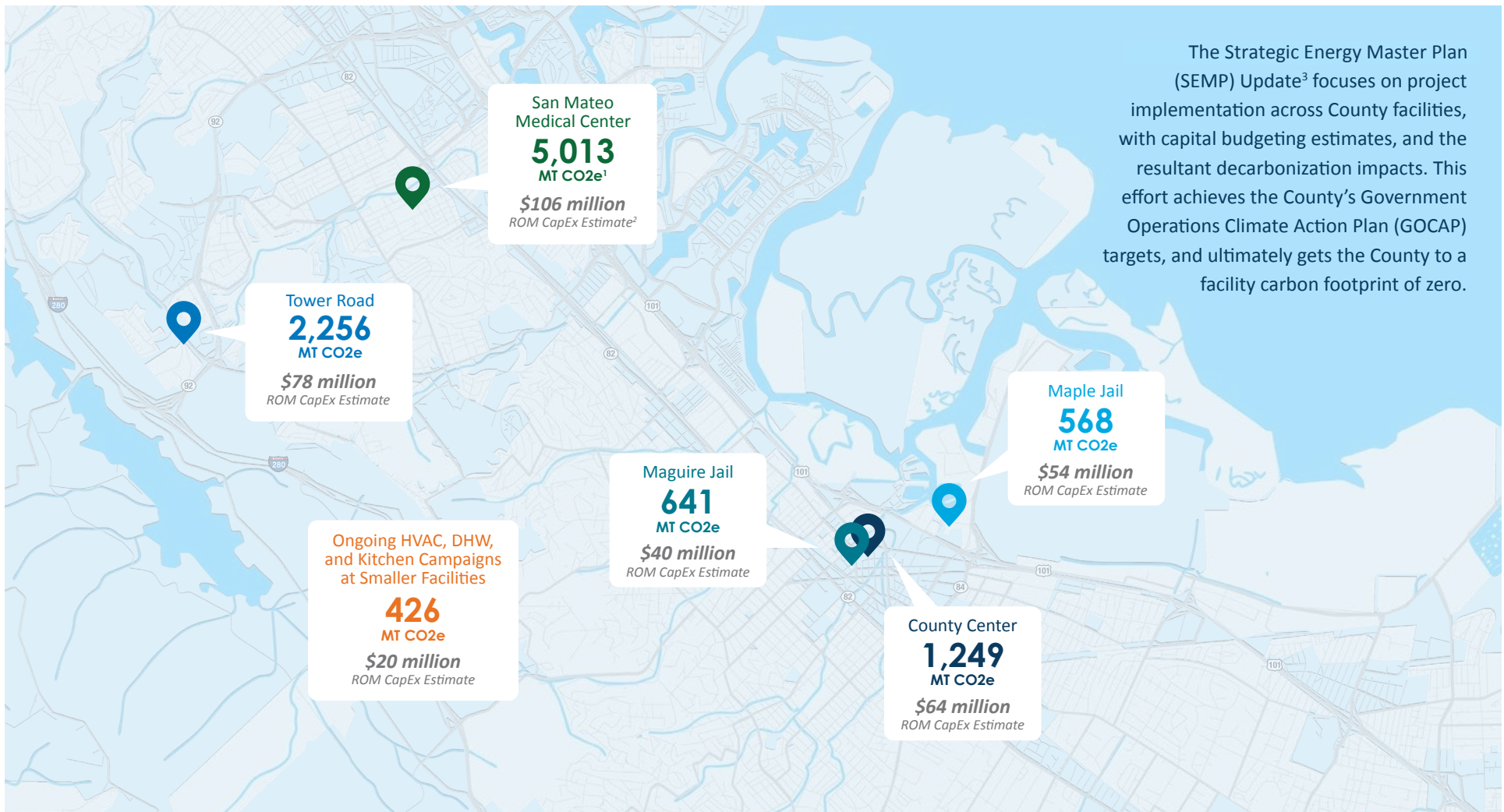


Executive Summary

Since its establishment in 1856, the County of San Mateo (the County) has long served as a getaway for Bay Area residents and visitors. With its remarkable blend of urban and natural landscapes, the County encompasses thousands of acres of parks, over 40% water coverage, and nearly 58 miles of Pacific coastline. Despite its beauty and natural resources, the County

faces significant challenges, including some of the highest population density in the Bay Area, escalating housing costs, and rising homelessness. These issues disproportionately affect the most vulnerable communities, many of whom are least responsible for climate change yet bear the brunt of its impacts.

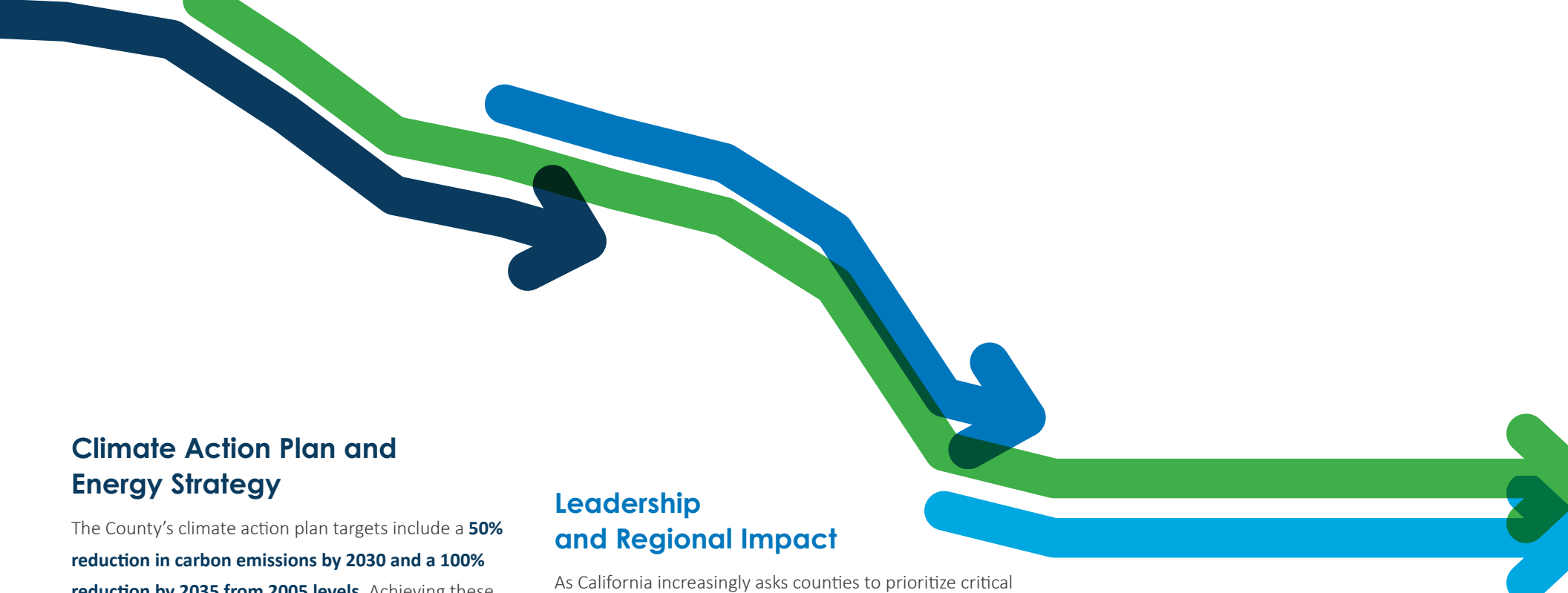
The County's commitment to meet or exceed state climate mandates is crucial in addressing these challenges. As the harmful impacts of climate change—including flooding, drought, wildfires, and heatwaves—continue to threaten the County's residents, it is essential that the County accelerates its efforts to mitigate these risks while improving equity.



¹MT CO₂e: Metric tons of carbon dioxide and carbon dioxide equivalents

²ROM Capex: Rough-order-of-magnitude capital expenditures

³The charts and the Roadmap of the SEMP Update are discussed in Section 6.3 of this report



Climate Action Plan and Energy Strategy

The County's climate action plan targets include a **50% reduction in carbon emissions by 2030 and a 100% reduction by 2035 from 2005 levels**. Achieving these goals will require a radical shift in energy management. While the County has made significant progress, particularly in reducing emissions, the transition to a sustainable energy future will require bold and immediate action. This SEMP Update will outline immediate actions to minimize facility operating costs, improve energy efficiency, and electrify buildings. By adopting a phased approach to building electrification, the County can capitalize on local incentives, funding opportunities, and contracts to reduce risk and ensure high-quality, cost-effective implementation. **Sections 8 and 9 of this SEMP Update lay out alternative methods and strategies for procuring these projects. Section 12 highlights responsibilities of the Board, County Management and County Staff to achieve these goals, as well as the cost of inaction.**

Leadership and Regional Impact

As California increasingly asks counties to prioritize critical climate issues, the County's leadership is essential. With federal policy risks in the future, the County's proactive approach will have ripple effects across neighboring communities, helping to **set an example for sustainable and equitable climate action**. By maintaining a focus on both cost savings and mission resilience, the County's commitment to sustainability ensures that it remains a desirable place to live, work, and do business.

This SEMP Update lays the foundation for a future where the County's critical infrastructure is both energy-efficient and resilient, reducing costs while maintaining the reliable service required to meet community needs. **By integrating cost minimization, electrification, and sustainability, the County will meet its environmental targets while improving equity, resilience, and the quality of life for all residents.**

Key Benefits and Results

Through SEMP energy efficiency improvements and electrification, the County will **minimize facility operating costs and decrease emissions by 41% by 2030, and 100% by 2035** compared to 2025 business-as-usual projections. These efforts will help to ensure that County buildings not only function more sustainably but also contribute to local economic growth, create green jobs, and provide significant public health benefits. By focusing on mission-critical facilities, the County will strengthen its resilience to climate change while maintaining its core services.

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1. Background

1.1. Overview of County Operations

The County of San Mateo (the County) is a multi-faceted government organization that serves the needs of over 750,000 residents living across coastal, urban, and suburban environments. The County government plays a crucial role in managing public services, ensuring community welfare, and fostering economic development. To effectively construct a plan that will benefit the County, it is crucial to understand its operations and organization.

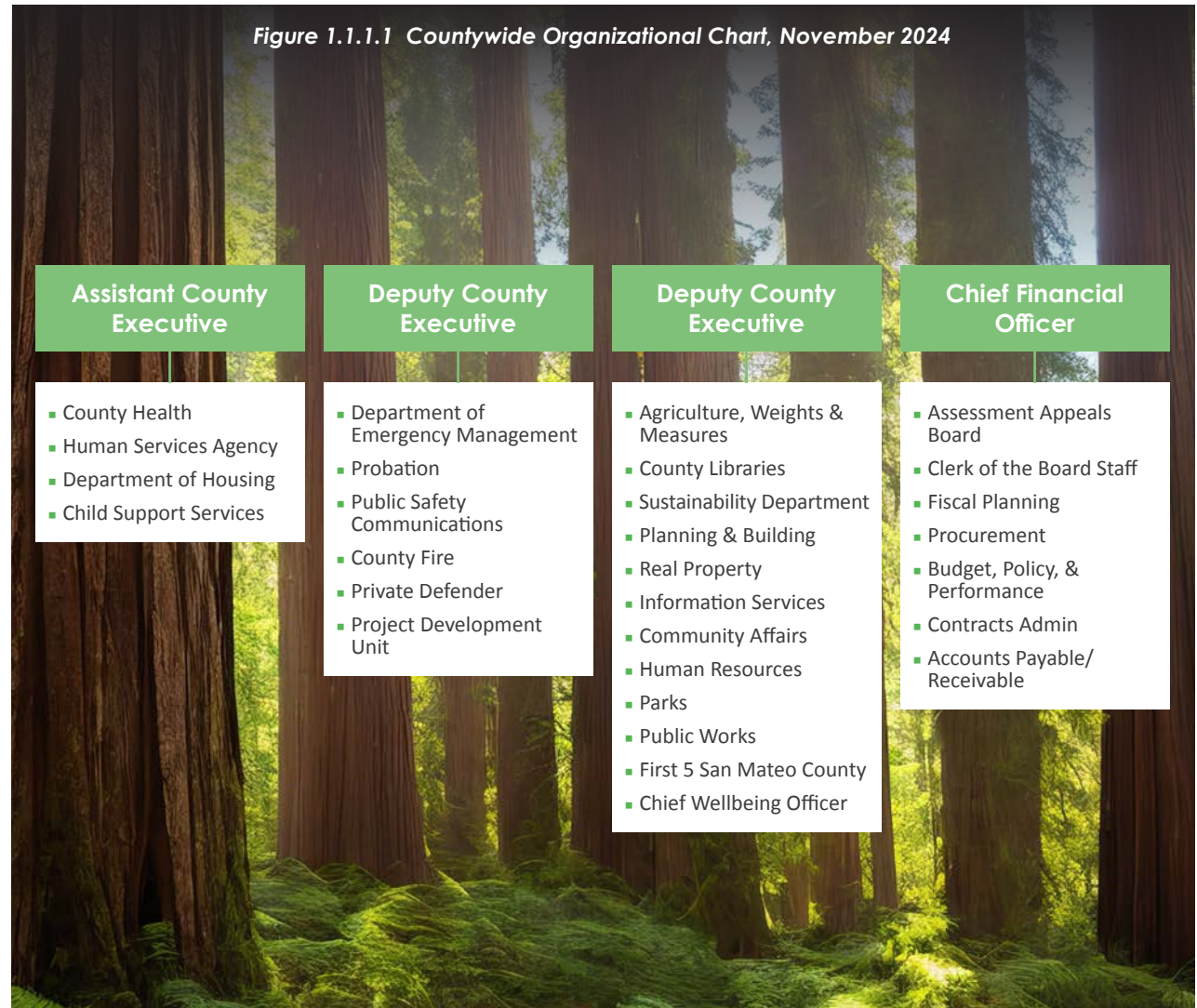
1.1.1. Leadership

At its top level, the County is run by a board of elected supervisors, each representing one of five districts elected by County residents. This board is responsible for enacting local laws, overseeing budget allocations, and setting policies that affect County operations. The districts they represent span from southern Daly City down to a large section of unincorporated land ending at Ano Nuevo State Park, and include numerous other Bay Area cities, such as Pacifica, Daly City, and San Bruno.

1.1.2. County Departments – Energy-Related

The County government is comprised of many departments, as can be seen in Figure 1.1.1.1. While every department is affected by energy-related issues to some degree, the following departments are directly involved in and affected by energy management and planning.

Figure 1.1.1.1 Countywide Organizational Chart, November 2024



Public Works

The Department of Public Works (DPW, the Department) serves the unincorporated areas of the County, providing public services and operating facilities that benefit the community as well as County employees and County agency clients. DPW manages energy through a combination of infrastructure planning, sustainability initiatives, and energy efficiency efforts. It plays a key role in integrating energy efficiency into public facilities, transportation systems, and municipal services. DPW optimizes energy use across buildings, lighting, fleet, and water systems, ensuring long-term resilience and affordability. Ultimately, these efforts contribute to reduced emissions, lower operational costs, and improved sustainability for the County.

The responsibility for past (2012) and the current SEMP, falls under the purview of the Department of Public Works, which includes this

SEMP Update. As such, a more detailed overview of this department follows. Public Works is the County's largest energy user, and energy management services are internal to this department.

Sustainability Department

This department strives to improve the sustainability of the County's operations and the greater community through work that is designed to bring solutions today while planning for tomorrow. The Sustainability Department has programs to help the County both fight and prepare for climate change; ensure clean energy, water, and air; conserve resources for future generations through waste reduction; and support livable communities with affordable housing and infrastructure for biking, walking, and public transit. Sustainability Department works with both internal and public stakeholders, mitigating climate impacts through policy and programs.

Planning and Building

This department serves as the Building Official for unincorporated areas of the County by conducting plan reviews, issuing building permits, and inspecting projects for building code compliance. They enforce zoning, building, and other land use regulation compliance in these same areas.

They are also charged with land-use planning functions and preparing community development policies, land use policies, and ordinance updates for unincorporated regions. Like Sustainability Department, this department works both with internal and public stakeholders, mitigating climate impacts through regulations.

1.2. Overview of the Department of Public Works

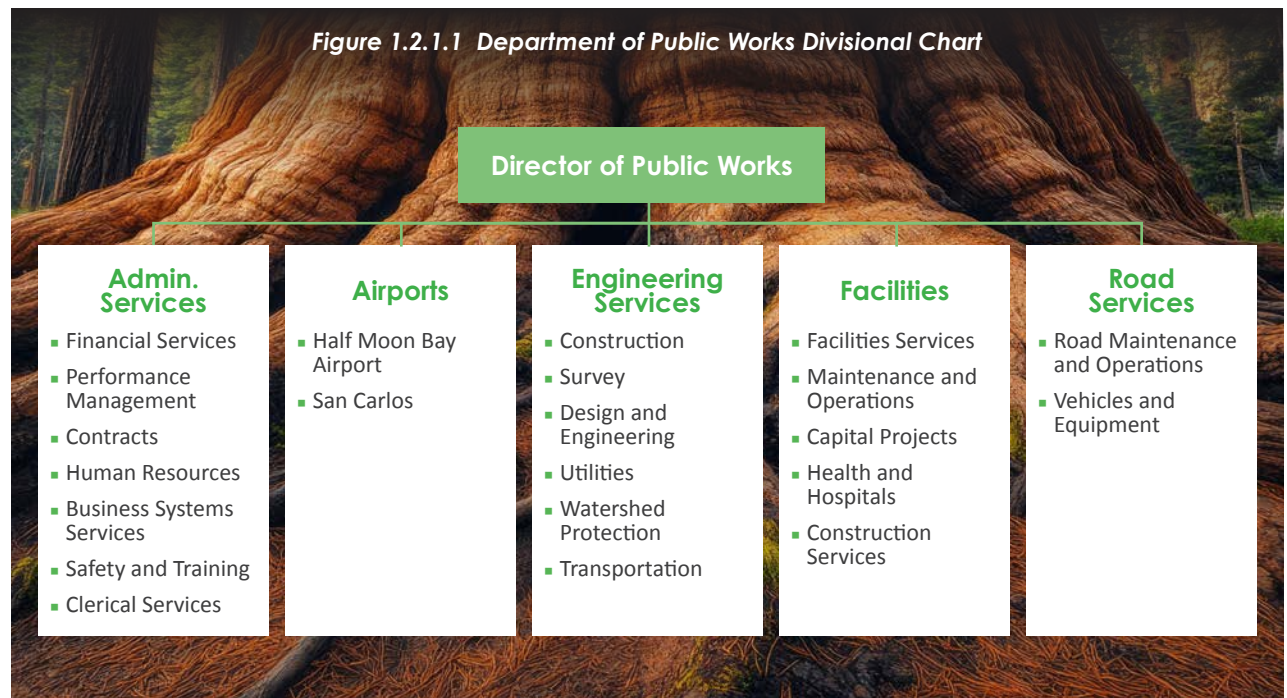
The DPW plans, designs, constructs, operates, and maintains facilities, equipment, roads, and fleet vehicles for the County agency clients, the general public, and County employees.

The Department advises the Board of Supervisors on all public works issues. The DPW has a budget of approximately \$300 million and is comprised of over 300 employees in five divisions: Administrative Services, Airports, Engineering and Resource Protection, Facilities and Capital Projects, and Road Services. The Department aims to provide these services to both effectively and sustainably meet community needs. The DPW Divisional Chart shown in Figure 1.2.1.1 lists DPW's five divisions, as well as their primary areas of responsibility⁴.



The DPW Energy Program manages facility energy efficiency, decarbonization, renewable energy projects, electric vehicle charging infrastructure, and design and implementation of all other green building initiatives.

Figure 1.2.1.1 Department of Public Works Divisional Chart



⁴More detail about these divisions and their activities can be found on the department's web page: <https://www.smcgov.org/publicworks/our-organization>

2. Overview of the Prior SEMP and SEMP Update

2.1. Strategic Energy Master Plan 2012

In October of 2012, the County finalized the initial SEMP. The goal of the plan was to advance and achieve the following goals specific to County-owned facilities:

- Energy conservation
- Energy cost reduction
- Greenhouse gas (GHG) reduction
- Environmental sustainability

At the time, the County recognized three major barriers to achieving of these energy-related goals:

- Organizational policy did not incorporate these energy goals and initiatives to sustain continuous improvement with respect to the goals.
- Planned energy projects were not identified, investigated, and prioritized comprehensively.
- Energy projects were not incorporated into the Capital Improvement Plan (CIP) process to ensure they were funded in both the short-term and long-term periods.

An eight-year project implementation plan was developed to attain the four goals. The implementation plan was based on projects identified in site-specific energy audits generated under the SEMP effort for each of the County's 10 major facilities. In addition to the technical-specific project plans, the 2012 SEMP also identified best practice organizational initiatives and strategies that the County could adopt to further the SEMP goals.

2.1.1. The Success of the 2012 SEMP

For the purposes of the 2025 SEMP Update, we are focusing on the 2012 SEMP Goals I & II, which address non-renewable source energy and GHG emissions associated with County-owned facilities.

The County has greatly exceeded both the 2012 SEMP Goal I and Goal II metrics. The largest component of this was achieved when the County began purchasing 100% clean electricity generation from the community choice aggregator, Peninsula Clean Energy (PCE). In 2019, the County purchased approximately 24,400,000 kWh of clean, renewable generation

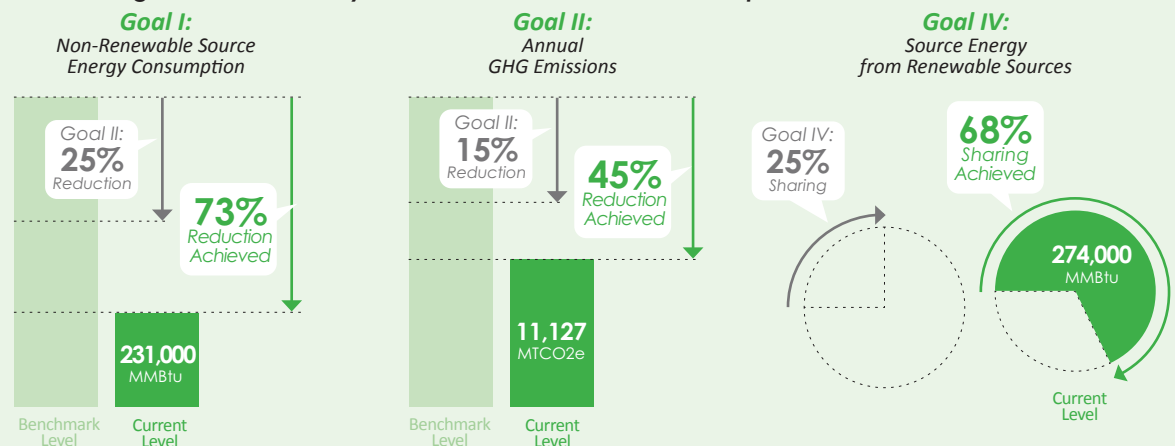
through PCE, with zero associated emissions. That quantity of clean electricity purchase in 2019 led to a decrease of approximately 4,760 MTCO₂e of GHG emissions which would have been released if the County had purchased standard grid supplied electricity instead. This alone represents an approximately 260,000 million Btu reduction in non-renewable source energy consumption, and 24% of the reduction from the County's 2010 GHG benchmark.

The remaining reductions in non-renewable source energy consumption and decrease in GHG emissions were achieved through implementation of energy efficiency measures plus on-site generation of renewable energy. Resiliency of County buildings has been greatly increased as these efforts reduce their energy requirements and allow them to generate their own power. The County's Community Choice Aggregator (CCA) is PCE. PCE's "GovPV" program can help the County install additional solar and storage systems to keep pursuing these resiliency benefits⁶.

The 2012 SEMP established four specific and measurable goals relative to a target year of 2020:

- **GOAL I** – Reduce non-renewable source energy consumption in County-owned facilities by 25% by 2020.
- **GOAL II** – Reduce GHG emissions in County-owned facilities by 15% by 2020.
- **GOAL III** – Reduce water consumption in County-owned facilities by 10% by 2020.⁵
- **GOAL IV** – Procure/generate 25% of source energy from renewable sources by 2020.

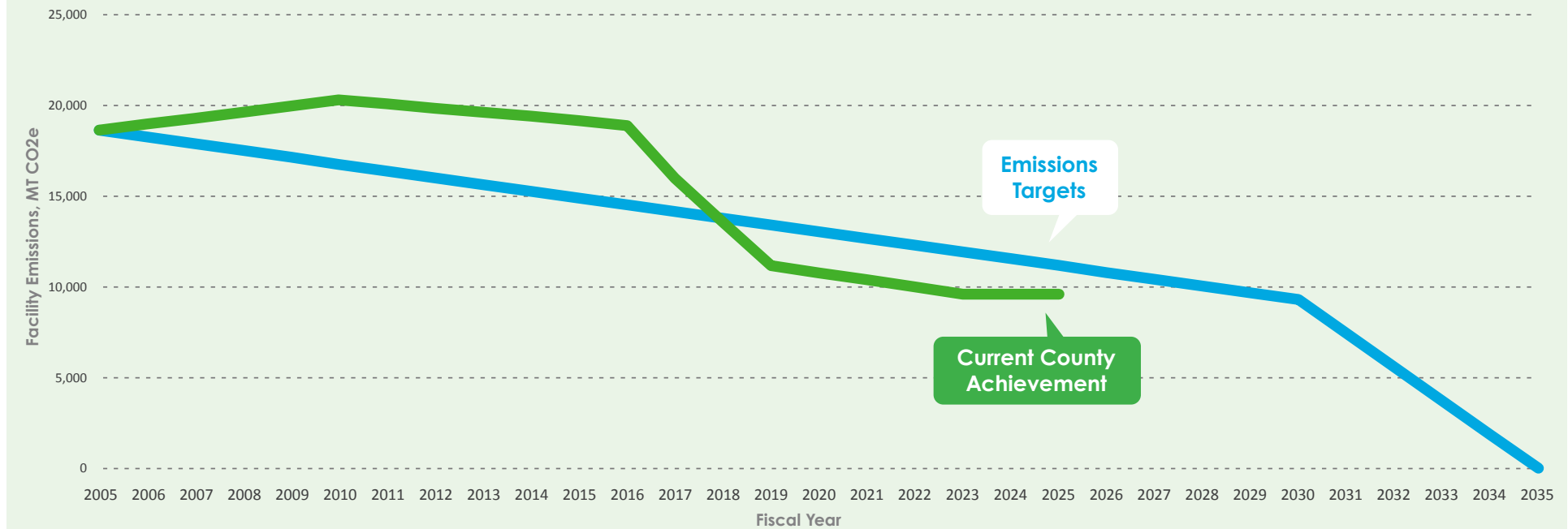
Figure 2.1.1.1 County's Actual Achievements Have Surpassed 2012 SEMP Goals



⁵Goal III was water related, and therefore not in the scope of the SEMP Update.

⁶More detail about the program can be found on PCE's web page: <http://www.peninsulacleanenergy.com/public-organization/govpv-solar-battery-for-public-buildings>

Figure 2.1.1.1 The County's Achieved Emissions Reduction Path



2.2. The Current SEMP Update – 2025

Presently in 2025, the County is updating the SEMP. Where the 2012 SEMP focused heavily on detailed but static energy audits of 10 major energy-intensive facilities, the 2025 SEMP Update follows the County's desire to proceed with agile, iterative upgrades ("campaigns" as defined later in this SEMP Update), combined with large, targeted, high-impact projects.

Detailed in Section 3, the 2025 SEMP Update goals derive from the County's 2020 GOCAP while also acknowledging DPW's need to manage facilities operating costs and desire to increase energy efficiency.

The County's intent is to adopt State of California goals and mandates. Particularly the following as they relate to buildings:

- **Assembly Bill 32 (AB32) and Senate Bill 32 (SB32)** – reducing GHG emissions to 40% below 1990 levels by 2030
- **Senate Bill 100 (SB100)** – 100% of electric retail sales be renewable and zero-carbon by 2045
- **Assembly Bill 1279 (AB1279)** – achieve targets for carbon neutrality and reduction of anthropogenic GHG emissions to 85% below 1990 levels by 2045

The County's GOCAP is designed to formally adopt these goals and mandates.

The strategies used to achieve these goals include the following:

- Actionable plans and paths to success
- Project and facility prioritization
- Financial and personnel resource planning
- Evaluation of potential funding pathways and procurement options
- Focus on "action," "persuasion," and vision of success

3. Primary Goals of the SEMP Update

3.1. Minimize Facilities Operating Costs

The following tables show the primary facilities cost factors, which fall under the scope of this SEMP Update. Namely, the costs paid to utilities (PG&E, PCE, and the Association of Bay Area Governments [ABAG]) for grid-supported electricity and natural gas. Electricity costs associated with power purchase agreements (PPAs) for on-site solar are not included at this time.

Table 3.1.1 below shows the County's total electricity consumption from the grid for the past three calendar years. This does not include any electricity that is produced at

County facilities, such as solar photovoltaic (PV) system or cogeneration system outputs. This data is from PG&E and covers 139 County electric meters.

Table 3.1.2 below shows the County's total natural gas consumption for the past three calendar years. Some of this gas is converted to electricity and usable waste heat at cogeneration systems at the Maguire Detention Facility (jails), San Mateo Medical Center (SMMC), and the Youth Services Center (YSC). Notice that even though total gas consumption is decreasing, rising gas costs are causing the cost of this energy

source to increase. This phenomenon of rapidly increasing gas prices may help further justify decisions and defray increased electric costs associated with building electrification, which is discussed in Section 3.3 below.

Note that the additional gas consumption estimates shown for the SMMC and YSC Central cogeneration plants represent the evaluation of their "normal" operation, in their current configuration and condition, with no unplanned outages.

DPW's goals of associated with this SEMP Update are as follows:

- Minimize facilities operating costs
- Increase energy efficiency and decrease energy use intensity (EUI)
- Achieve building electrification and decarbonization/net zero carbon (50% reduction from 2005 benchmark by 2030, 100% reduction by 2035)

Table 3.1.1 Year-Over-Year Grid Electricity Usage and Costs

Year	Grid Electricity Consumption, kWh	Year-Over-Year kWh Change	Grid Electricity Costs	Year-Over-Year Grid Electricity Cost Change	Average Electric Rate
2024 Total	26,401,000	2.2% increase	\$8,874,000	13.2% increase	\$0.336
2023 Total	25,822,000	10.2% increase	\$7,841,000	21.2% increase	\$0.304
2022 Total	23,437,000	25.9% decrease	\$6,472,000	16.9% decrease	\$0.276
2021 Total	31,622,000	-	\$5,538,000	-	\$0.175

Table 3.1.2 Year-Over-Year Natural Gas Usage and Costs

Year	PG&E and ABAG Provided Data					Average Natural Gas Rate Not Including SMMC Cogen Gas from DGS**
	Natural Gas Consumption (Therms) in PG&E and ABAG Data	Year-Over-Year Therm Change	Natural Gas Costs*	Year-Over-Year Natural Gas Cost Change	Average Natural Gas Rate	
2024 Total	1,254,000	23.1% decrease	\$2,053,000	22.2% decrease	\$1.64	\$2.11
2023 Total	1,631,000	3.3% increase	\$2,368,000	10.3% increase	\$1.62	\$1.95
2022 Total	1,579,000	25.1% decrease	\$2,392,000	23.2% increase	\$1.52	\$1.80
2021 Total	2,109,000	-	\$1,941,000	-	\$0.92	\$1.08

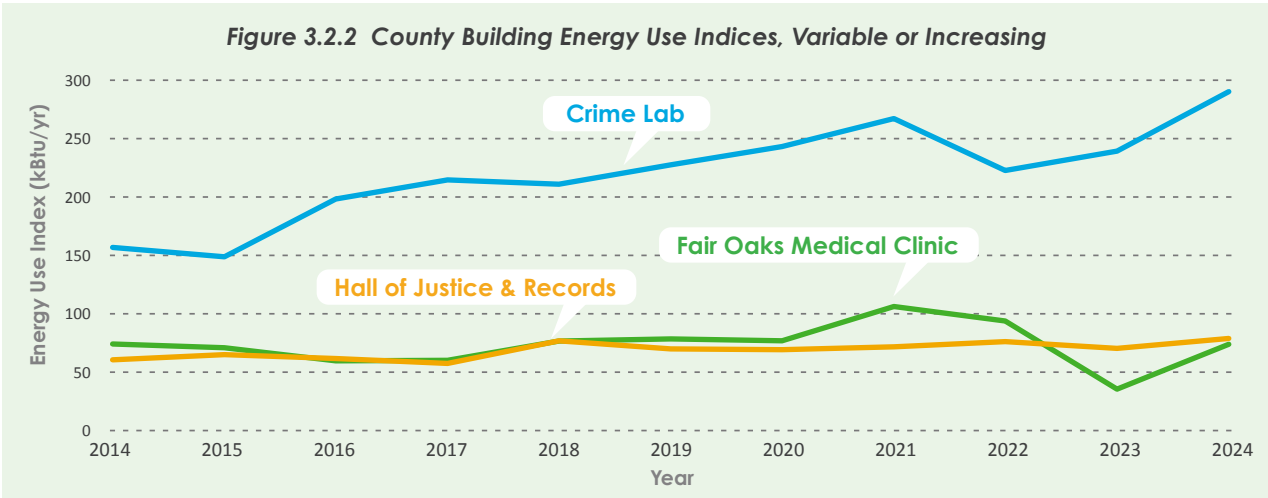
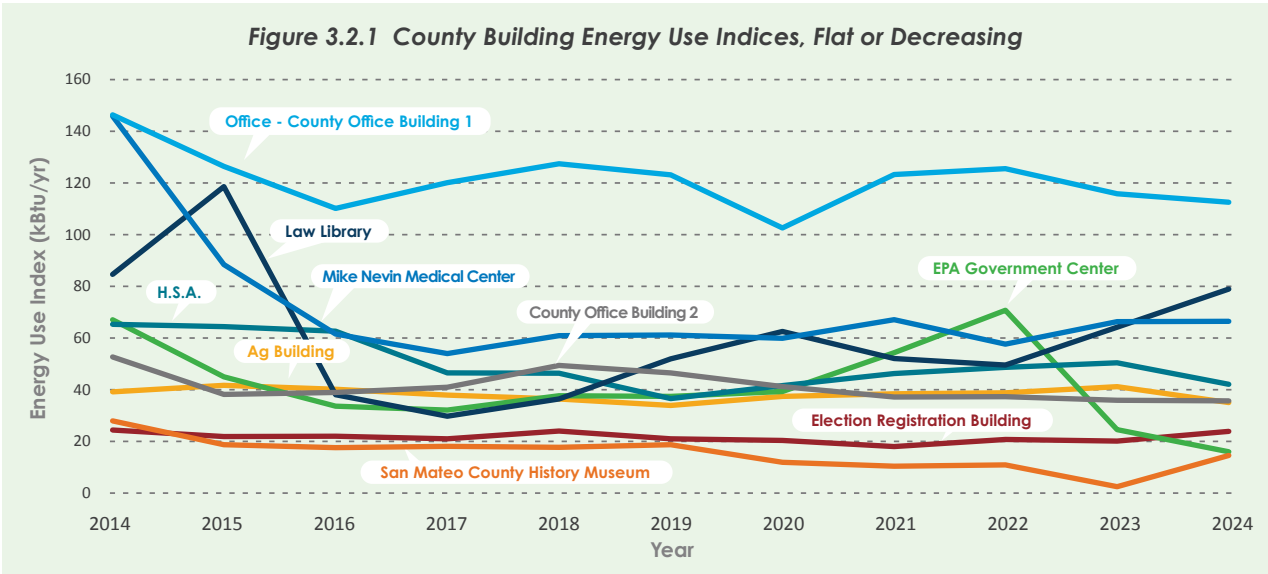
*Total gas cost data was not available for 2022 and 2021. These figures are estimated based on the available total gas cost data for 2023, and the gas transmission component costs for 2021 and 2022 from PG&E.

**Three-year gas dataset from PG&E and one-year gas dataset from ABAG do not appear to include the complete gas consumption at the SMMC cogeneration/central plant and the YSC cogeneration/central plant. The SMMC data estimate shown here is based on the average normal operating months between September 2023 and August 2024. The YSC cogeneration data estimate is extrapolated from three months of representative data – January 2023, February 2023, and November 2023.

3.2. Increase Facilities Energy Efficiency

The County tracks energy performance of key buildings using Energy Star Portfolio Manager (ESPM). The ESPM tool allows for organization of building data and automatically gathers monthly energy consumption and cost data from

the utility (PG&E). The County has been using this tool since 2013. County also uses other Energy Management software programs such as Energy Manager Pro to track Energy use and performance.



3.2.1 Energy Efficiency Track Record

Using data collected in ESPM, we can evaluate the overall trends of energy efficiency at these key buildings over time, based on their total annual energy use per square foot.

Figures 3.2.1 and 3.2.2 represent the average EUI for major County facilities over the 10 calendar years, showing trends in energy performance. These EUIs calculated as total energy consumption per gross square foot may provide a benchmark for identifying high-priority facilities for efficiency upgrades. Note that this energy consumption evaluation is net of any on-site solar generation, in other words, it only accounts for energy purchased from the utility electricity grid and gas transmission lines.

3.2.2 Future Energy Efficiency Efforts

The SEMP Update Roadmap includes the implementation of future energy efficiency measures to continue minimizing facility operating costs and reducing EUIs. The future impacts of energy efficiency on facility operating costs in the context of the Roadmap are the focus of Section 5.2. Table 3.2.1 shows the expected energy efficiency improvements that are built into the Roadmap for each of the major GOCAP milestone years. These efficiency efforts will be crucial to keeping future energy costs minimized, and therefore need to be prioritized.

Table 3.2.1 Expected Future Improvements to Energy Use Intensity via Energy Efficiency

GOCAP Milestone Year	Average EUI Improvement vs. 2024 Baseline
2030	1.7 kBtu per square foot decrease
2035	9.4 kBtu per square foot decrease

3.3. Achieve GOCAP Building Decarbonization Goals

This SEMP Update proceeds with the understanding that these two GOCAP goals are admirable but are somewhat in conflict with each other when trying to operationalize an effective ongoing plan. The reason for this is that total County facility emissions are approximately 11,000 MTCO₂e per year, but about 10,000 MTCO₂e (90%) of those emissions are generated by 20 buildings. There are approximately 55 buildings total that are currently generating significant GHG emissions (gas consumption greater than 100 therms per year). To reach the 50% and 100% emissions reduction goals, we must prioritize reducing emissions at the 20 highest GHG sites vs. focusing on smaller, less significant sites (to achieve the “quantity of buildings electrified” goals).

A more effective method of decarbonization in smaller buildings is to develop technology-specific “campaigns” that target many buildings, electrifying and decarbonizing common system types, rather than trying to individually decarbonize each building completely.



An example of a campaign to decarbonize smaller buildings across the County would be a “heat pump water heater conversion” campaign. The PG&E Government and K-12 (GK12) Energy Efficiency Program supports these types of campaigns and has already successfully decarbonized a handful of buildings for the County.

For these reasons, we have developed our approach for the SEMP Update to focus on the second GOCAP goal listed above. With this strategy, we focus on large decarbonization projects at the significant emissions footprint sites and pair those projects with technology-specific decarbonization campaigns for smaller systems/buildings. By orienting the plan in this manner, we can operationalize on the second GOCAP goal, and

the first GOCAP goal should also be significantly achieved by the 2035 milestone.

Table 3.3.1 illustrates the County’s current progress toward the second GOCAP goal and the further reductions needed to meet the milestones.

As noted in Section 2.1.1, a significant decrease in emissions has already been achieved by the County through the purchase of 100% clean, GHG-free, grid electricity from PCE. This means that ongoing efforts to reduce facilities energy emissions need to focus on the reduction and elimination of natural gas consumption.

The County has two primary goals for facilities with respect to electrification and emissions, with target milestones in 2030 and 2035:

- Electrify County-owned building stock
 - **80%** of existing buildings electrified by 2030
 - **100%** of existing buildings electrified by 2035
- Increase energy efficiency and maintain use of renewable energy
 - **50%** reduction in energy emissions compared to 2005 by 2030
 - **100%** reduction in energy emissions compared to 2005 by 2035

Table 3.3.1 GOCAP Facilities Emissions Target Metrics

Target Emissions Level	Target Emissions Level	Reductions
2005 Baseline Energy Emissions*	18,558 MTCO ₂ e	-
2019 Energy Emissions**	11,127 MTCO ₂ e	7,431 MTCO ₂ e Achieved
2030 Target Energy Emissions	9,279 MTCO ₂ e	1,848 MTCO ₂ e Needed
2035 Target Energy Emissions	0 MTCO ₂ e	9,279 MTCO ₂ e Needed

*Reference 2019 GOCAP Attachment B.

**Reference 2019 GOCAP Attachment B. Note that Attachment B states that in 2019, “natural gas contributes approximately 99% to 100% of County Buildings and Facilities emissions.”

4. Statement of SEMP Update Assumptions

The projections and recommendations of the SEMP Update are driven by a number of key assumptions. Given the breadth of the SEMP Update, the aim is to standardize the analyses across various energy efficiency, distributed energy resource (DER), and decarbonization strategies. **Assumptions were identified through discussions with County staff and drawn from the best available information on the County’s facilities.**

Existing Equipment

Where available, Willdan utilized existing equipment inventories to identify the quantity, capacity, and operating efficiency of gas equipment at each facility. **Primary sources of this information included SEMP audit reports (2012, by Enovity), BayREN audit reports, San Mateo County RICAPS emission inventories (2019), and building evaluations conducted by PG&E’s GK12 Program in 2021 to 2023.** Information from these inventories was then used to estimate the annual gas consumption of each end-use and to help inform the end-use electrification potential. Where inventories were incomplete or unavailable, Willdan assumed general building profile end-use percentages based on County averages and industry standards.

Decarbonization Approaches

For the purposes of estimating the cost and energy impact of each decarbonization approach, **Willdan selected technologies that are high-efficiency and commercially available in 2025.** Domestic water heating was generally assumed to be able to be replaced by heat pump technologies, since heat pump water heaters are commercially available in 2025. Alternatively, Willdan assumed large institutional gas dryers such as those found in the Maguire Detention Facility and Maple Street Correctional Facility would be replaced with electric resistance dryers since equivalent heat pump dryers are not commercially available. New decarbonization technologies may be available at the time of implementation, in which case a cost benefit analysis should be performed.

Capital Cost Assumptions

Capital costs of recommended projects in the SEMP Update were developed using a combination of engineering tools, previous project experience, and industry benchmarks to ensure that County staff can plan for the total costs of full decarbonization. These cost estimates are a rough order of magnitude (ROM) by necessity, while emphasizing the need to capture the total level of funding required for turnkey solutions. **In addition to typical material and labor costs, decarbonization retrofit projects frequently require significant additional costs to adapt the existing building’s electrical and mechanical infrastructure to accommodate the electrified technology.** Buildings with specialty- and process-end-uses, such as medical or correctional facilities, are expected to require additional infrastructure beyond what is required for typical office and administration buildings.

For reference, the County recently undertook a whole building decarbonization project at the East Palo Alto Government Center, with an estimated project cost ROM of \$100 to \$200 per square foot of building space. These numbers, along with Willdan’s experience with decarbonization planning and cost estimating for other large institutional organizations, were used as guidance to help validate the SEMP Update’s cost calculations and assumptions.

Note that estimates of cost-per-square-foot for decarbonization at buildings with large, complex heating loads (such as those found at medical centers and other sites with central heating plants) can be significantly higher than for buildings with more basic gas-consuming equipment. **Decarbonization costs across a variety of County buildings may range from \$30 per square foot to \$300 per square foot when evaluated at the individual building level.**

Operating Cost Assumptions

Our SEMP Update models assume consistent energy cost rates across the County’s facilities based on review of billing

records from PG&E (electric and gas transmission), PCE (electric commodity), and ABAG (gas commodity) as presented in Section 3.1. These rates are inclusive of commodity, transmission, and distribution costs. The electricity rate includes both energy charges (per kWh) and demand charges (per kW).

These rates are reflective of electricity purchases from the grid rather than on-site solar PV systems. Grid rates are used here because it is assumed that solar PV system generation is currently supporting base loads, and new electrification loads will need to be supported by the grid in the absence of new solar PV system installations.

Table 4.1 Average County Energy Rates	
Energy Sector	SEMP Update 2023 Rate Assumption
Electricity	\$0.336 per kWh
Natural Gas	\$2.11 per therm

The operating cost calculations do not consider any rate variation by facility, and instead use average rates for all County sites.

Sections 5.1.2 and 5.2 present differential annual energy costs that will result from meeting 2030 and 2035 GOCAP decarbonization goals in terms of 2023 rates indicated above. Future County energy costs will be impacted by increases in the cost of energy whether the SEMP Update recommendations are followed or not. However, because the **decarbonization/ electrification efforts included in these recommendations entail switching from gas to electricity, cost differentials are sensitive to the relative difference in increases of gas and electric costs.** If gas costs increase more rapidly than electric costs, this will reduce the differential annual energy costs and may even effectively reduce the County’s energy expenditures. If gas costs increase more slowly than electric costs, the differential energy costs will increase.

ECONOMY



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5. New Loads, Energy Efficiency, & Distributed Energy Resources

5.1. New Loads – New Buildings, Building Electrification, and Electric Vehicles

There are three components of new facilities energy loads that currently present themselves to the County. They are newly constructed buildings, new electric loads from electrification of formerly natural gas-powered systems, and new electric loads from installation of new electric vehicle (EV) charging.

5.1.1. New Buildings

The significant new buildings being constructed are County Office Building 3 (COB3), the SMMC Administrative Wing, the Cordilleras Heath Facility, and the new Navigation Center.



This building is a 208,000 square foot office building located in the County Center. This building achieves “net-zero” energy, balancing 100% of the energy it consumes with renewable electric energy from new solar PV panels on the roof plus the solar PV panels on the adjacent parking garage. It should be noted that the solar PV panels on the parking garage previously were producing energy being consumed at other buildings at the County Center, so as that energy is accounted for at COB3, it needs to be displaced by additional

electricity from the grid at the buildings currently using the parking garage solar PV energy. The County is purchasing 100% clean grid electricity, so neither locally produced solar PV nor grid electricity will impact carbon emissions. However, there will be cost impacts. COB3 is also designed as an all-electric building.

Note that while locally produced solar electricity is clean, it is not free. Whether directly paid for on a per-unit basis through a PPA or indirectly through the cost of capital and maintenance associated with County-owned on-site solar systems, there are costs associated with solar-produced electricity.

We can roughly estimate what the annual energy cost impacts associated with COB3 are by comparing it to the projected electrified costs of the adjacent COB1 and COB2 buildings. Comparing to 2023 electricity costs, we estimate that the energy costs impact for COB3 are between \$553,000 and \$675,000 per year. The additional electric load is estimated to be between 2,003,000 and 2,448,000 kWh per year.

Table 5.1.1.1 Estimate of Fully Operational COB3 Energy Cost Impacts Compared to COB1 and COB2

Building	Approx. 2023 Electricity Consumption (kWh)	SEMP Update Projected Electrification Increase	Efficiency Gains Savings (10% of Base)	Electrified, Efficient Consumption	Square Footage	Annual Cost at \$0.277 per kWh	Avg. Electricity Consumption per Square Foot	Avg. Electricity Cost per Square Foot 2023
COB1	1,300,000	536,000	(130,000)	1,706,000	116,000	\$473,000	14.7	-
COB2	815,000	308,000	(81,500)	1,042,000	142,000	\$289,000	7.3	-
Total COB1 and COB2	-	-	-	2,748,000	258,000	\$762,000	10.7	\$2.95
COB3 Avg Estimate	-	-	-	2,226,000	208,000	\$614,000	10.7	\$2.95
COB3 High Estimate: +10%	-	-	-	2,448,000	208,000	\$675,000	11.8	\$3.25
COB3 Low Estimate: -10%	-	-	-	2,003,000	208,000	\$553,000	9.6	\$2.66

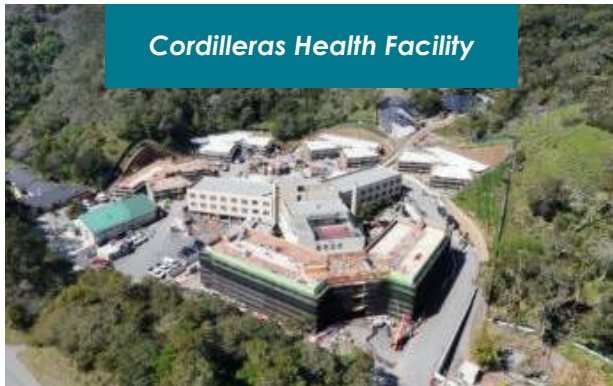




San Mateo Medical Center (SMMC) Administrative Wing

The SMMC complex demolished the old Health Services and Administration Buildings that were built in 1952 and 1954 and did not meet current earthquake safety standards. These were replaced by the newly constructed Administration and Link Buildings. This new construction houses administrative programs as well as the new Coroner's Morgue and Offices and a Public Health Lab in approximately 87,000 square feet.

The overall differential energy impact of this new project is not estimated here, due to the fact that the project is newly occupied, and that any increase in energy consumption from the new building is net of decreases associated with the demolition of the old buildings, plus efficiency improvements in the new building plus those that may come from simultaneous renovations of 35,000 square feet of the main hospital building.



Cordilleras Health Facility

The Cordilleras Mental Health Center project replaced sixty-two-year-old three-story San Mateo County-owned 117-bed psychiatric facility, with smaller residential structure and a campus center that meet modern standards of care.

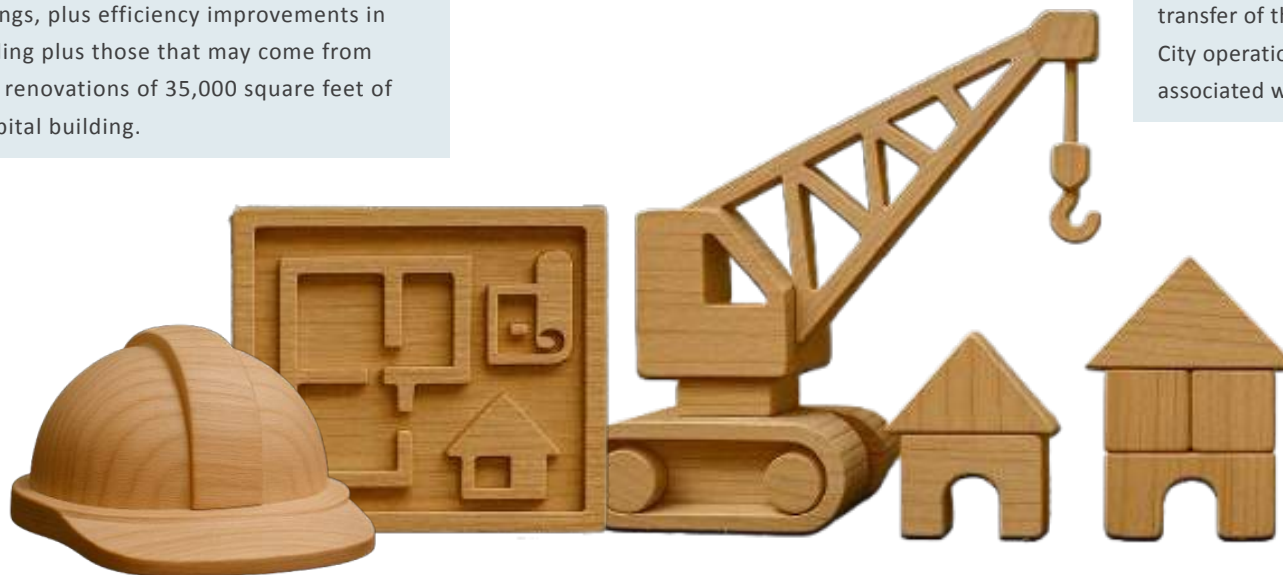
The overall differential energy impact of this new project is not estimated here, due to the fact that any increase in energy consumption from the new building is net of decreases associated with the demolition of the old building, plus efficiency improvements associated with the project.



New Navigation Center

The state-of-the-art San Mateo County Navigation Center encompasses 240 safe, temporary living units to provide intensive on-site support services to individuals and couples experiencing homelessness. The land on which the Navigation Center is located was transferred to the County via a land swap with Redwood City. The County acquired green-field land to build this new construction, while Redwood City took ownership of the Maple Street Shelter site.

The overall differential energy impact of this new project is not estimated here, due to the fact that any increase in energy consumption from the new Navigation Center is net of decreases associated with transfer of the Maple Street Shelter site to Redwood City operations, plus efficiency improvements associated with the project.



5.1.2. Building Electrification

The primary approach to reaching the aggressive emissions reductions goals in the GOCAP is electrification of natural gas loads at County facilities. This is currently the most feasible and comprehensive long-term strategy to eliminate emissions.

Gas prices in California over recent years has been more volatile and increasing at a greater rate than electricity, and this trend will likely continue as more customers convert to all-electric systems and depart the gas market. If these market aspects continue, building electrification will lead to better energy cost control and stability.

All electricity currently being consumed by County facilities is 100% GHG-free via on-site solar or clean grid electricity from PCE, with exceptions at two facilities. The exceptions are the SMMC and the YSC facilities and their consumed electricity being generated via onsite gas-fired cogeneration plants.

While it can be energy-efficient to cogenerate electricity and useful thermal energy at a central plant, large amounts of gas are consumed in the process, which carries with it a large emissions footprint. If the County intends to fully achieve the ultimate GOCAP goal of 100% emissions reductions, these cogeneration plants will likely need to be decommissioned and replaced with all-electric alternatives (clean renewable electricity and electric boilers).

The push to electrify gas loads at County facilities (including the cogeneration plants) will come with a large increase in overall electricity consumption but also with an associated decrease in natural gas consumption. Early in the SEMP Update Roadmap, the electricity consumption increase will be less severe, as many of the gas systems that will be initially addressed can be replaced with highly efficient heat pump devices. Later down the Roadmap, the increase in electricity consumption will be more severe as gas alternatives become more energy intensive (e.g., electric

resistance boilers) and electricity generated by cogeneration plants needs to be displaced by electricity from the grid.

Figure 5.1.2.1 shows the profiles of the electricity consumption increase and natural gas consumption decrease associated with the electrification Roadmap. Note that this electricity consumption

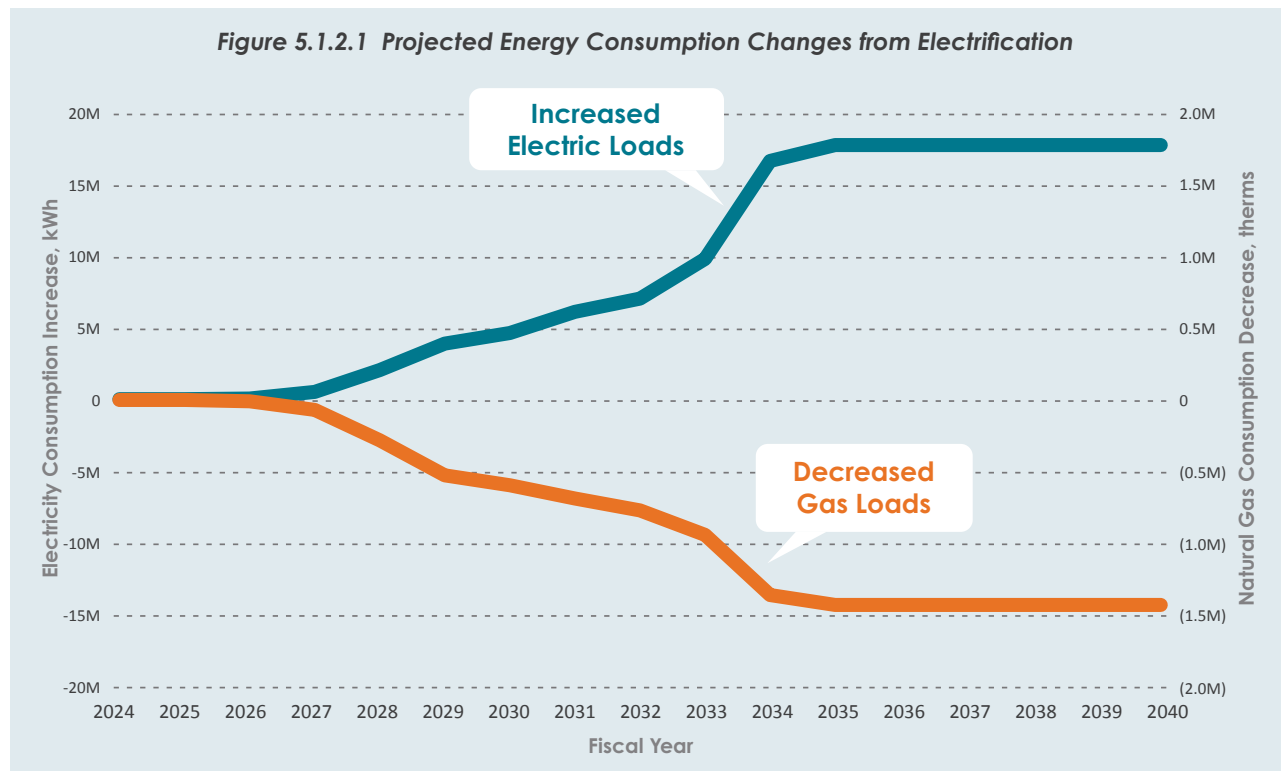
increase estimate does not include the effects of future energy efficiency efforts, which will be discussed in the next section.

Table 5.1.2.1 below estimates the net cost impacts that will occur if our SEMP Update Roadmap is followed to meet the emissions reduction milestones (according to present energy pricing).

Table 5.1.2.1 Energy Consumption and Cost Differentials to Meet Emissions Reduction Milestones

Target Milestone	Increased Electricity Consumption kWh	Increased Electricity Costs (2023 Prices, \$0.277/kWh)	Decreased Natural Gas Consumption, therms	Decreased Gas Costs (2023 Prices, \$2.03/therm)	Net Cost Increase (2023 Prices)
Current to 2030 Step (50% Emissions Reduction)	4,746,000	\$1,595,000	(607,000)	(\$1,282,000)	\$313,000
2030 to 2035 Step (100% Emissions Reduction)	13,429,000	\$4,512,000	(859,000)	(\$1,814,000)	\$2,698,000
Totals	18,175,000	\$6,107,000	(1,466,000)	(\$3,096,000)	\$3,011,000

Figure 5.1.2.1 Projected Energy Consumption Changes from Electrification



5.1.3 Alternatives to Electrification

Although the SEMP Update focuses heavily on a building electrification approach to achieving GOCAP emissions targets, here we explore **alternatives to building electrification**.



Carbon Offsets

An alternative to direct decarbonization/electrification strategies is the purchase of carbon offsets. These offsets are typically generated when companies or individuals finance projects that reduce GHG emissions elsewhere. Such projects often fall into two categories: mechanical and natural. Natural solutions, like reforestation and wetland restoration, actively sequester carbon from the atmosphere, while mechanical solutions involve investments in technologies that enhance efficiency and lower emissions.

While purchasing carbon offsets has been a common approach for companies pursuing carbon neutrality, Google's recent decision to stop buying cheap offsets underscores a shift toward more substantial emissions reduction and reliable carbon removal solutions. In 2023, Google's GHG emissions reached 14.3 million tCO₂e, representing a 13% year-over-year increase and 48% higher than in 2019. **This significant rise in emissions has raised concerns about the potential overreliance on offsets, their change in cost over time, and their availability down the line.**

Future pricing for carbon offsets can be hard to estimate and are dependent on how the market is ultimately regulated, but some estimates range from \$40 to \$250 per ton of CO₂ offset.⁷

Green Hydrogen

Hydrogen is a promising alternative for decarbonization, especially in sectors where direct electrification is challenging, such as heavy industry, long-haul transportation, and shipping. As a clean energy carrier, hydrogen can be produced from renewable sources (green hydrogen) or with carbon capture (blue hydrogen), offering a way to reduce emissions in industries that require high energy density or process heat. Hydrogen can also be stored and transported, providing flexibility and supporting intermittent renewable energy sources like solar and wind. This versatility makes it a critical solution for deep decarbonization, complementing electrification efforts.

However, several barriers to hydrogen adoption highlight that direct decarbonization through electrification remains the most efficient and cost-effective path in many cases. **Hydrogen production is energy-intensive and costly, particularly when relying on renewable energy, making it less efficient than using electricity directly in some sectors.** Additionally, the lack of hydrogen infrastructure—such as pipelines, refueling stations, and storage—hampers its widespread adoption. Transporting and storing hydrogen, which has a low energy density by volume, is also technically complex and expensive. **Policy and regulatory uncertainty further complicate large-scale investment in hydrogen projects, while the commercial viability of hydrogen in some industries remains limited due to high costs and low market demand.**



Ultimately, while hydrogen is a valuable tool for decarbonizing hard-to-electrify sectors, these limitations suggest that direct electrification, where feasible, should remain the primary focus of decarbonization efforts. Electrification offers higher efficiency and lower costs in many applications, and its infrastructure is more advanced. Hydrogen will play a complementary role, particularly in sectors where electrification alone cannot achieve deep decarbonization.



5.1.3. New Electric Vehicle Charging

Concurrently with the development of this SEMP Update, the County is conducting an EV Charging Study with support from AECOM. The County segregates and accounts for energy loads and costs associated with EV charging apart from facility energy performance and budgets. This approach is justified since these are primarily costs associated with fleet vehicle operations, and currently/in the past, the cost of fuel for these vehicles has been borne by that department. Therefore, **the SEMP Update and associated Roadmap do not take into consideration the energy associated with fleet EV charging.** The entire fleet will ultimately be electrified and separately metered according the Fleet Electrification and Infrastructure Plan to be complete in 2025. This is a joint effort between the County DPW and Sustainability Department.

⁷For more details, visit <https://www.bloomberg.com/professional/insights/sustainable-finance/long-term-carbon-offsets-outlook-2023/>

5.2. Energy Efficiency

Considering the increased electricity loads and net energy costs discussed in the previous Sections, in this SEMP Update we recommend that the County aggressively pursue energy efficiency measures to bring down the overall energy consumption of the buildings.

The 2012 SEMP detailed an evaluation of energy efficiency measures at some of the highest energy-consuming buildings. Much of that potential for energy efficiency has not yet been fully pursued, and it is believed that the results are still representative of the opportunity at County buildings today.

For the purposes of the SEMP Update, we have modified the energy efficiency savings estimates generated by the 2012 SEMP to represent how they occur in the most significant energy-consuming buildings – if they were already electrified. In this way, we can project the Roadmap’s energy consumption impacts if both electrification and aggressive energy efficiency are pursued together. Figure 5.2.1 represents that recommended approach.

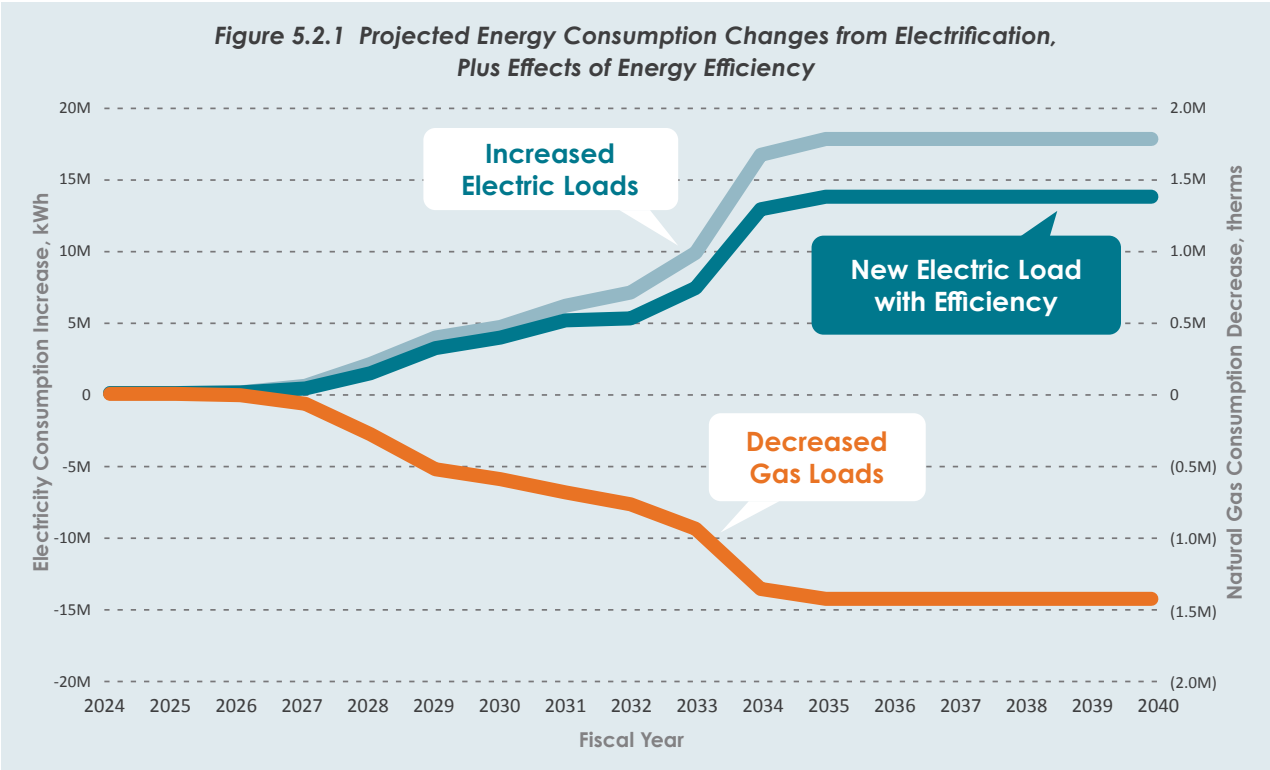
Table 5.2.1 to the right shows that when combined with aggressive energy efficiency, the net-cost increases associated with electrification alone can potentially be reduced by more than half.

In addition to the energy efficiency measures explored under the 2012 SEMP, the County DPW continues to pursue and develop additional energy efficiency initiatives. These include ongoing lighting efficiency and controls upgrades, HVAC system and controls optimizations, and improvements to central utility plants. The ongoing impacts of these efforts can be seen in the building energy performance metrics being tracked in ESPM, which is further discussed above in Section 3.2.



Table 5.2.1 Energy Consumption and Cost Differentials to Meet GOCAP Milestones, if Electrification and Energy Efficiency Are Pursued Simultaneously

Target Milestone	Increased Electricity Consumption kWh	Increased Electricity Costs (2023 Prices, \$0.277/kWh)	Decreased Natural Gas Consumption, therms	Decreased Gas Costs (2023 Prices, \$2.03/therm)	Net Cost Increase (2023 Prices)
Current to 2030 Step (50% Emissions Reduction)	3,994,000	\$1,342,000	(607,000)	(\$1,282,000)	\$60,000
2030 to 2035 Step (100% Emissions Reduction)	10,050,000	\$3,377,000	(859,000)	(\$1,814,000)	\$1,563,000
Totals	14,044,000	\$4,719,000	(1,466,000)	(\$3,096,000)	\$1,623,000



5.3. Distributed Energy Resources



5.3.1 Solar PV Resources

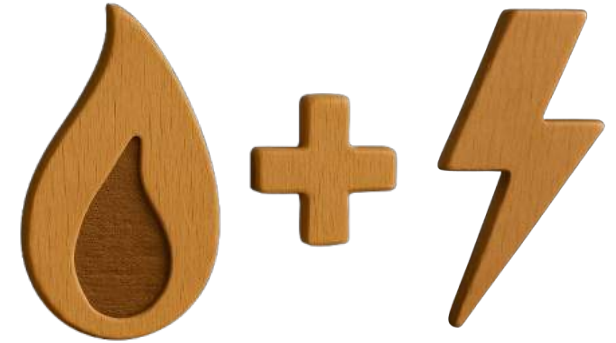
There are currently multiple distributed solar PV energy generating systems located across County facilities. They are listed here:

- San Mateo Medical Center (SMMC)
- Animal Shelter
- Crime Lab (requires re-commissioning)
- Parking Structure 1
- Maple Jail
- Parking Structure 2
- Cordilleras Health Facility
- New Navigation Center
- Human Services Agency District Office
- County Office Building 3 (COB3)
- East Palo Alto Government Center

These systems are currently helping to mitigate electricity costs at these sites. Because the County currently purchases 100% clean electricity generation from PCE for all sites, there is not a net impact on GHG emissions levels associated with on-site solar PV. Additional operating cost reduction effects could be

obtained through installation of battery energy storage systems (BESS), which would allow for the storage of excess solar-generated electricity to be used during peak and super-peak grid time-of-use (TOU) periods. These TOU periods occur when grid-supplied electricity is most expensive, and when solar panel output is waning or non-existent (i.e., late afternoons and evenings).

PCE, offers a unique program to allow for additional future on-site solar generation and storage at public buildings. This can help overcome capital investment and resource requirement barriers by providing the needed technical support and a streamlined process. A PPA with PCE can provide the County with a fixed, economical price for electricity at the solar PV system host sites. Under this GovPV⁸ Program, there is no capital outlay required. While other private firms offer PPAs which may have some similarities to the GovPV Program, it may be in the County's wider interest to work with PCE as a community-led, not-for-profit local agency that makes significant investments in the community to expand access to sustainable and affordable energy solutions.



5.3.2 Cogeneration System Resources

In addition to on-site, renewable energy generation, the County currently operates two natural gas-fueled cogeneration systems. These are located at the YSC Central Plant, and at the SMMC (a third cogeneration system at the Maguire Detention Facility (Jails) has already been decommissioned). Since these systems burn natural gas to operate, they are not clean/renewable; however they do obtain an efficiency benefit from producing both electricity and useful heat simultaneously. In keeping with the decarbonization goals of the GOCAP, these cogeneration systems will need to be decommissioned to achieve 100% carbon neutrality (barring the County securing a source of carbon free fuel such as green hydrogen as is discussed in Section 5.1.3). Note that these cogeneration systems are likely near the end of their effective useful life (EUL) and in need of major overhauls were they to continue operation. Since decommissioning these large systems will require extensive planning due to their size and complexity, those actions are pushed out to later phases of the SEMP Update Roadmap.

⁸<https://www.peninsulacleanenergy.com/solar-for-public-buildings/>

6. Building Electrification and Decarbonization

6.1. Achieved Success – the East Palo Alto Government Center



The County has already successfully implemented electrification of one of their primary existing buildings. The East Palo Alto City Hall Improvements Project consists of replacing existing mechanical systems and upgrading to all-LED lighting, along with other non-energy-focused improvements to the building. Within the scope of this project, all-natural gas-fired systems were removed from the building, as HVAC and service water heating equipment were replaced with all-electric alternatives. The total project cost, including both electrification and non-electrification efforts has been reported to be approximately \$15 million.

6.2 Electrification Project Prioritization

The SEMP Update has been developed using two approaches to electrification project development: (1) Natural Gas Mitigation Campaigns and (2) Heavy Gas-Using Buildings. This is due to the nature of the County's building stock, where there exists a mix of large and complex, significant gas-using buildings, and a multitude of smaller and basic, less-significant gas-using buildings.

DPW and the County have already made electrification progress:

- Electrified new construction of County Office Building 3
- Electrified renovation of East Palo Alto Government Center
- Retrofit all-electric heat pumps into select buildings
- Paused operation of Maguire cogeneration plant

6.2.1. Natural Gas Mitigation Campaigns for Common Buildings and Basic System Types

A “campaign” is an initiative that is built on the three primary drivers (cost-effectiveness, technical feasibility,

operational feasibility) that can move the County toward its natural gas reduction goals with defined technology solutions, budget, sites, timeline, and contracting strategy. Multiple campaigns can be grouped together and phased to develop an implementation plan that achieves 2030 and 2035 GOCAP targets.

Identification of opportunities by system type allows for the development of campaigns that focus on specific areas with lower cost implementation (due to scale, targeting best applications of mature technology) and higher operational feasibility with a focus on building systems that cause fewer disruptions. For the purposes of Roadmap development, we have focused on campaigns addressing common HVAC (e.g., furnaces and packaged units), unitary service water heaters, and common residential-scale kitchen equipment (e.g., types found in office kitchens/kitchenettes).

6.2.2. Focus on Complex Projects at Heavy Gas-Using Buildings

In addition to the above-described campaigns addressing common buildings and basic system types, for the SEMP Update, we have evaluated more complex electrification project opportunities at heavy-emissions-footprint buildings. Buildings included in this category are hospitals, the Jails and YSC, the Crime Lab, and the major office buildings in the County Center.

The projects in this complex category include scopes, such as decommissioning of cogeneration plants and conversion to standard central plants, conversion of absorption chiller plants to standard electric chiller plants, complex mechanical system (HVAC, service water) upgrades, large-scale kitchen upgrades, and high temperature boiler/steam boiler electrification.

6.3. Path to 2030/2035 Targets

Figure 6.3.1 shows the County’s progress toward GOCAP targets, going back to the baseline year of 2005, as well as the Roadmap to achieve those targets by the milestone years. The County has

already made great progress through energy efficiency efforts, implementation of clean distributed energy resources, and the purchase of 100% clean electricity from Peninsula Clean Energy.

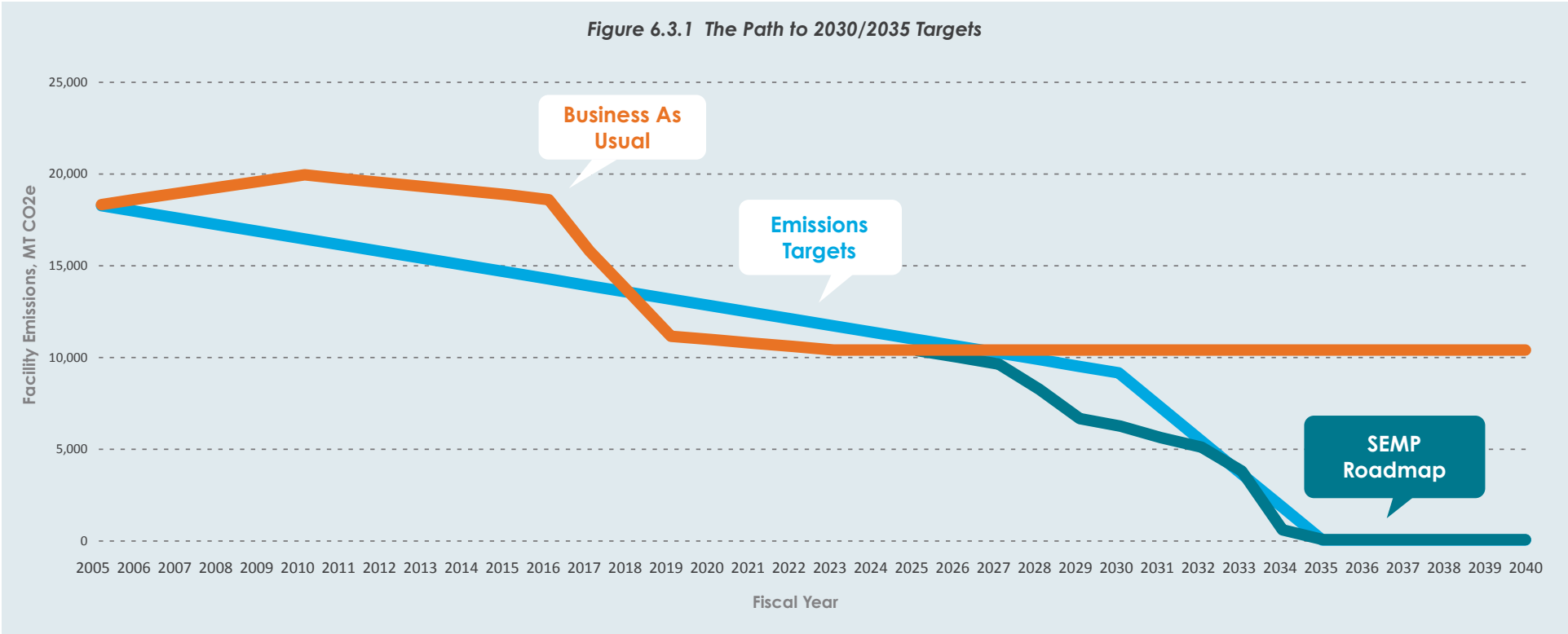
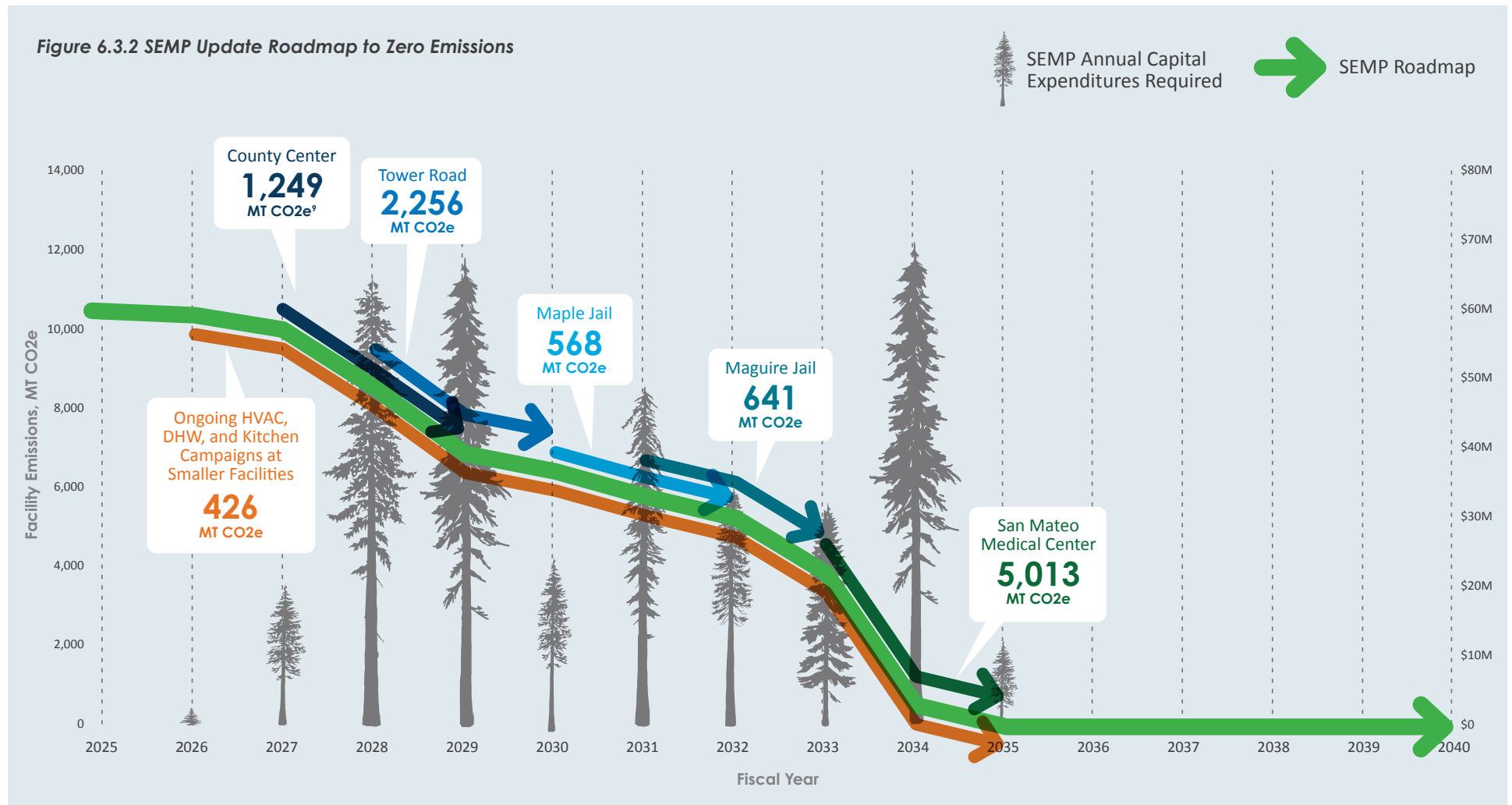


Figure 6.3.2 focuses on the future Roadmap to zero emissions developed under this SEMP Update. The green line represents the annual emissions from County buildings being driven to zero by 2035. The gray bars represent the ROM capital costs that will be required to implement these emissions reduction projects. The floating, multi-colored tags show the complex projects that will be implemented at these terms on the

Roadmap (above the target line) and the ongoing smaller building campaigns (below the target line). The complex projects have been sequenced based on a combination of their perceived feasibility and cost-effectiveness with current technologies. The Jails and the SMMC are sequenced later in the Roadmap, in the hopes that electrified technology solutions for their complex kitchens and high-temperature

boiler needs are more fully developed and more cost-effective further in the future.

For clarification, in Figure 6.3.2, the projects marked “Tower Road” focus on the YSC Center and the Crime Lab.



⁹MT CO₂e: Metric tons of carbon dioxide and carbon dioxide equivalents

SOCIAL IMPACT

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7. Behavioral Changes

County building managers and other employees and building occupants have a part to play in achieving SEMP Update goals. Day-to-day decisions in how the buildings operate, plus occupant behavior, can have significant impacts on energy efficiency and costs, as well as the overall building emissions footprints. These operational and behavioral approaches can be significant even when compared to the capital-intensive measures discussed elsewhere in this report.

Willdan recommends a setpoint policy that takes the following form. The values shown to the side serve as a starting point for evaluation. Further adjustment can be made for buildings housing atypical activities. As shown to the right, the primary recommendation will lead to optimal energy savings and a carbon footprint reduction, while the secondary recommendation can be moved if occupant satisfaction is not being met.

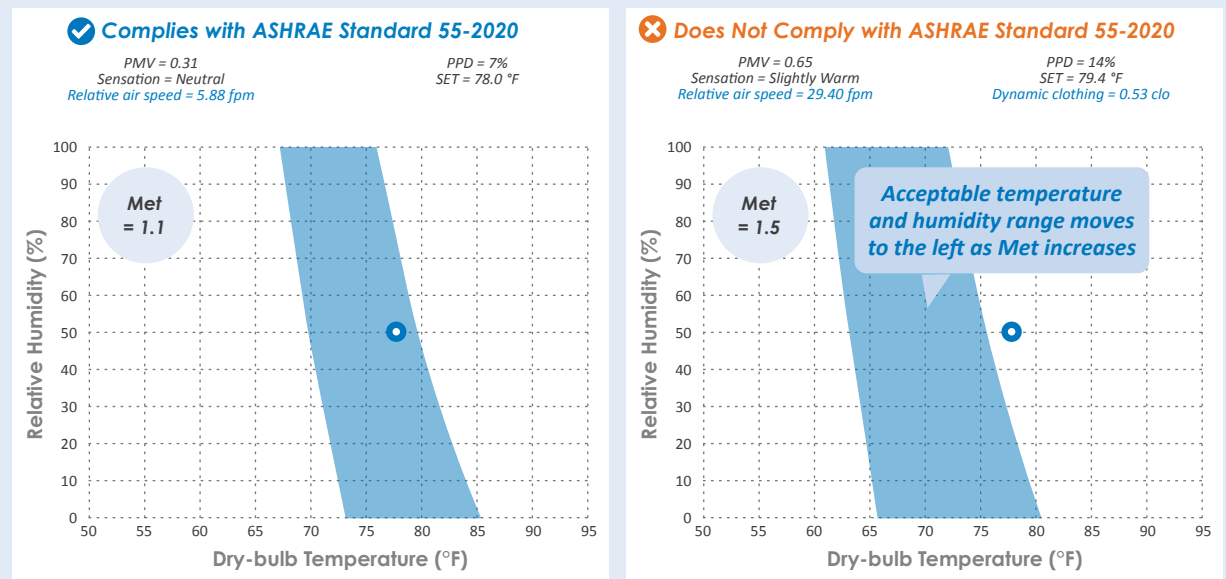
The setpoint recommendations are further segregated by recommendations for general areas (which should be the “standard” recommendation) and recommendations for “high rigor activity” areas. The shift in temperature setpoint recommendations between these two types of spaces is based in the shift-compliant temperatures observed in the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 55 Thermal Comfort Tool when increasing occupant metabolic activity levels from Met = 1.1 to Met = 1.5.

The temperature setpoint policy shown above for general areas would be for common space types with low-to-medium-rigor activities such as office, lobby, library, meeting space types. Space types with atypical uses like fitness rooms or other areas where occupants are expected to have higher metabolic rates may warrant the lower setpoints shown for high-rigor activity areas. These spaces include things like laboratories, gymnasiums, corporate yards at County Buildings. As a guide, the ASHRAE Standard 55 Thermal Comfort Tool can be evaluated at elevated metabolic rates, to see how acceptable temperature and humidity conditions decrease. See Figure 7.1 for an illustration of this effect. The U.S. Green Building Council (USGBC) suggests using ASHRAE Standard 55 as a thermal comfort standard.¹⁰

Table 7.1 Recommended Temperature Setpoint Policy

Recommendation	Cooling Setpoint (Occupied)	Heating Setpoint (Occupied)	Occupant Adjustability	Cooling Setpoint (Unoccupied)	Heating Setpoint (Unoccupied)	Notes
Recommendations for general areas (low-to-medium-rigor activity)						
Primary Recommendation	78°F	68°F	±3°F	85°F	55°F	■ Use optimum start ■ Revert occupant adjustments to standard setpoint after a period (4 days) ■ Areas expected to have dense, variable occupancy (e.g., large meeting rooms, auditoriums) may require pre-cooling prior to large events outside of the cooling setpoints shown
Secondary Recommendation	75°F	70°F	±3°F	82°F	58°F	
Recommendations for high-rigor activity areas (3°F lower setpoints)						
Primary Recommendation	75°F	65°F	±3°F	85°F	55°F	■ Use optimum start ■ Revert occupant adjustments to standard setpoint after a period (4 days)
Secondary Recommendation	72°F	67°F	±3°F	82°F	58°F	

Figure 7.1 ASHRAE Standard 55 Thermal Comfort Tool Results for Increasing Metabolic Rates



¹⁰<https://www.usgbc.org/node/2755931>

Also, please note the effects of seasonal clothing on occupant comfort levels at the recommended setpoints. In colder months, when occupants will typically feel “cold”, the HVAC system is expected to be in heating (or neutral) mode of operation. In heating mode, the HVAC system will be attempting to meet the heating setpoint (68°F to 70°F recommended). Occupants during these months are expected to be wearing warmer clothing (e.g., heavier fabrics, and long sleeves, pants, skirts). Conversely, when HVAC systems are in cooling mode, and operating at the cooling setpoints (75°F to 78°F recommended), occupants are expected to be wearing cooler clothing. Further adjustments for occupant comfort are accommodated by the recommended occupant adjustability ranges.

County staff may want to consider the following for occupant adjustability for HVAC setpoints:

- Consider control capabilities to reset cooling and heating setpoints to their standard values after a set time period. For example, after an occupant adjustment is made within the allowable range, the setpoint will revert to the standard four days later.

For spaces with variable occupant levels, such as large meeting rooms or auditoriums, consider a wider range of user adjustability. For example, if a large meeting room is expected to be heavily occupied in the summer, the space can be pre-cooled more to handle the upcoming thermal load from occupants.

Willdan has conducted modeling studies of municipal buildings in the San Francisco Bay Area and found the following potential energy impacts can be achieved through close compliance with a temperature setpoint policy. Results are shown for both large buildings and small buildings.

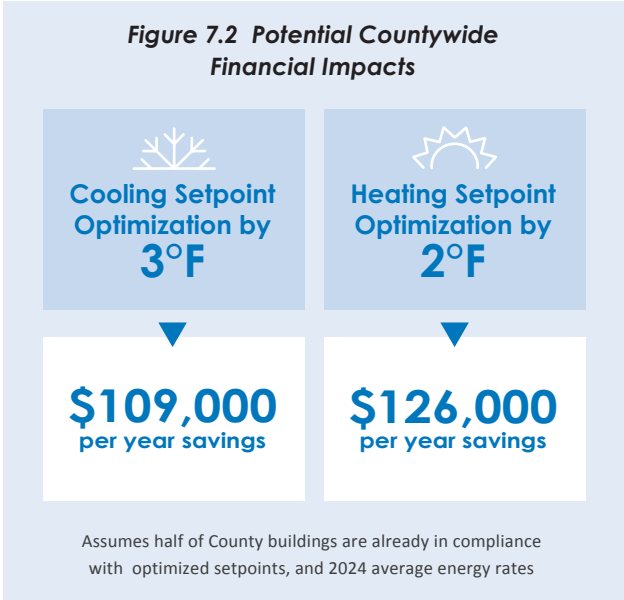
Both electric savings and gas savings will provide energy cost savings to the County. Because the buildings currently

Table 7.2 Space Temperature Setpoint Evaluation Results

Impacts of Cooling Setpoint Variation					
Range Tested		Large Building Electricity Savings Impacts		Small Building Electricity Savings Impacts	
Setpoint Variation	Setpoint Value Range	Average Percentage Savings vs. Baseline, per Degree Increase	Average Annual kWh Saved per 1,000 sf per Degree Increase	Average Percentage Savings vs. Baseline, per Degree Increase	Average Annual kWh Saved per 1,000 sf per Degree Increase
Baseline, +3°F to +9°F	71°F to 80°F	0.50%	43.2	0.65%	45.0
Impacts of Heating Setpoint Variation					
Range Tested		Large Building Gas Savings Impacts		Small Building Gas Savings Impacts	
Setpoint Variation	Setpoint Value Range	Average Percentage Savings vs. Baseline, per Degree Decrease	Average Annual therms Saved per 1,000 sf per Degree Decrease	Average Percentage Savings vs. Baseline, per Degree Decrease	Average Annual therms Saved per 1,000 sf per Degree Decrease
Baseline, -2°F to -8°F	72°F to 64°F	6.0%	12.3	3.9%	12.5

use 100% clean electricity, only the gas savings associated with heating setpoint adjustments will result in emissions impacts. According to the modeled savings results shown above, for every ~15,000 square foot of building brought into compliance with the setpoint policy, County emissions will be reduced by approximately 1 MTCO2e per year.

In addition to operations and behavior related to space temperature setpoints, the County should also pay close attention to the operational schedules of HVAC and lighting control systems. To the greatest extent possible, these schedules should closely match the actual usage schedules of the buildings. Minimal time should be allowed for building pre-conditioning (i.e., turning on HVAC equipment prior to occupancy). When systems are scheduled to operate to accommodate off-hour events, care should be taken to revert to normal operating schedules immediately afterward.



8. How to Move Forward

8.1. Funding Requirements and Carbon Impacts

Successfully reaching the GOCAP 2030/2035 emissions reduction targets will require significant capital expenditures (CapEx) to be deployed by the County. Working within current SEMP budgeting and scheduling constraints, Willdan has developed ROM cost estimates for the required decarbonization efforts. Due to the large amount of funding that will be needed, this type of comprehensive ROM estimate is illustrative for the SEMP Update Roadmap evaluation, rather than detailed project specific cost estimates that may not be valid years into the future. These ROM costs and estimated emissions impacts are shown in Table 8.1.1, organized by Building Groups. The highest cost projects will be the SMMC, followed by YSC and the Jails. County Office Building 1, the Crime Lab, the Grant Yard Buildings, and SMMC Serenity

House combine relatively low total CapEx requirements with good value, as indicated by the lower CapEx costs per annual MTCO2e Impact metrics.

As noted in the previous section, these considerations, as well as the current state of technology for electric system alternatives, are incorporated into the SEMP Update Roadmap phasing strategy.

The 2025 SEMP Update's approach to evaluating and planning for building decarbonization across County facilities. Existing equipment inventories have been sourced from various audits and evaluations. These inventories were used to estimate gas consumption and assess electrification potential, balanced against historical energy billing records.

Technologies have been chosen for decarbonization, emphasizing commercially available, high-efficiency options. Capital cost estimates were developed using engineering tools and benchmarks, with costs adjusted depending on building type and project complexity. Operating cost assumptions were based on average energy rates across County facilities, with projections considering future shifts from gas to electricity. Costs are shown in nominal 2025 dollars, and are meant to represent turn-key implementation including all hard and soft costs associated with a completed project. Further details on the 2025 SEMP Update assumptions can be found in Section 4 of this Report.

DPW will continue to extend the GHG Cataloging process associated with the County's Regional Climate Action Planning Suite (RICAPS). Continuing to gather this data will allow more refined project development and cost estimation in the future.

As electrification projects are developed new opportunities for on-site solar with battery energy storage systems will be pursued, which can enhance building resiliency and mitigate costs associated with increased electricity consumption, while also contribute to cost reductions through peak shaving.

Table 8.1.1 Building Electrification ROM CapEx Estimates, In Nominal 2025 Dollars

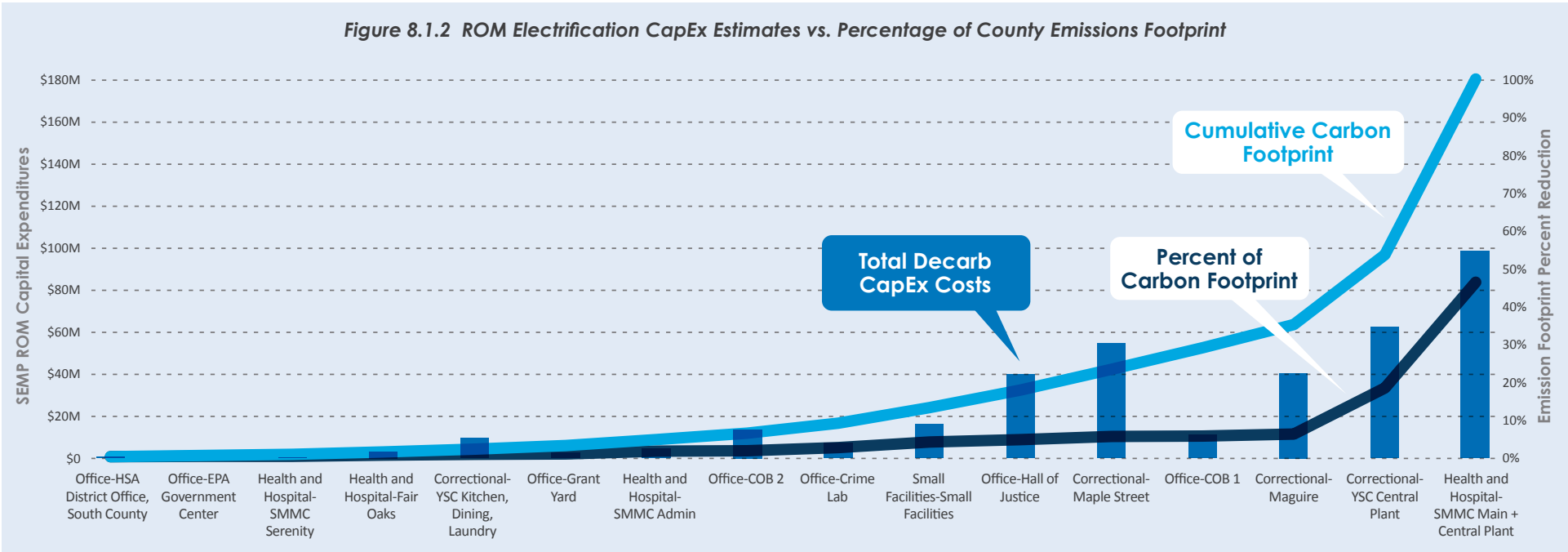
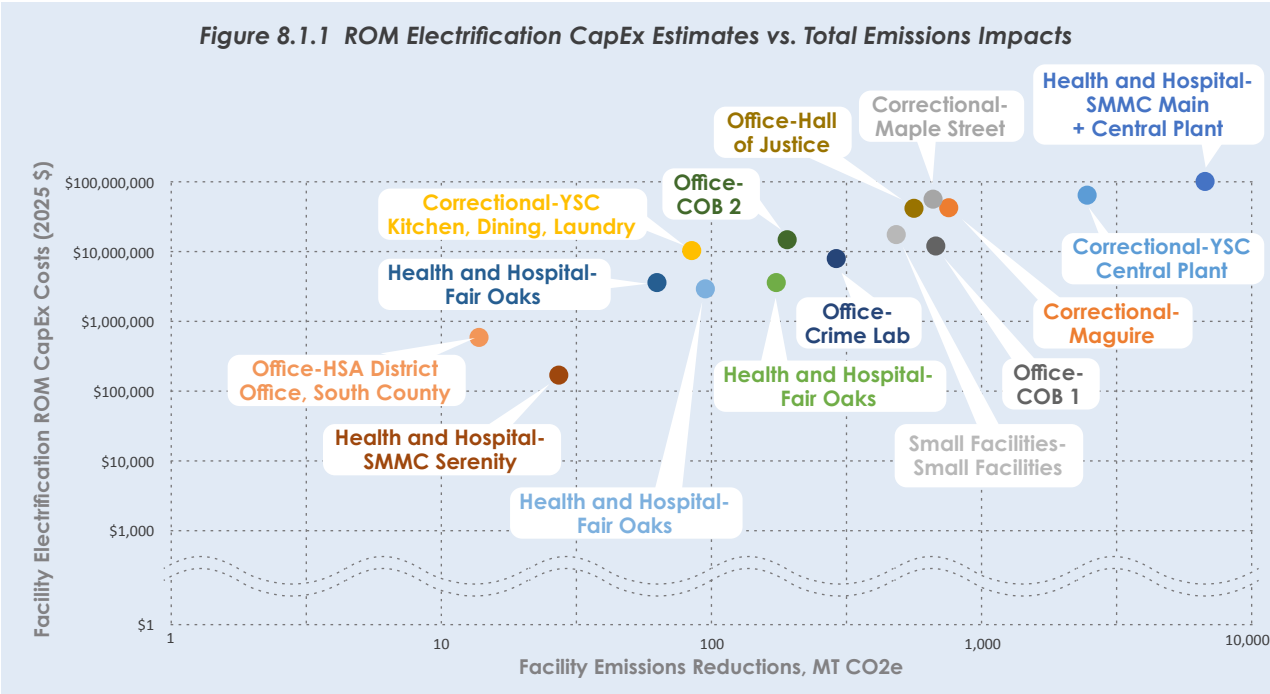
Building Group	Buildings	Total Emission Reduction (MTCO2e)	Total Decarb CapEx Costs	Average Decarb CapEx Cost per Annual MTCO2e Impact
Health and Hospital	SMMC Main + Central Plant	4,818	\$98,080,000	\$20,400
	SMMC Admin (New)	166	\$4,540,000	\$27,400
	Fair Oaks Health Center	65	\$3,130,000	\$48,200
	SMMC Serenity	30	\$130,000	\$4,600
Correctional	YSC Central Plant	1,904	\$62,110,000	\$32,600
	Maguire Detention Facility	641	\$40,130,000	\$62,600
	Maple Street Correctional Facility	568	\$54,330,000	\$95,700
	YSC Kitchen, Dining, Laundry	85	\$9,330,000	\$109,600
Office	COB 1	580	\$10,820,000	\$18,600
	Hall of Justice	488	\$39,530,000	\$80,900
	Crime Lab	266	\$7,060,000	\$26,500
	COB 2	180	\$13,530,000	\$75,300
	Grant Yard Buildings	95	\$2,500,000	\$26,400
	HSA District Office, South County	16	\$480,000	\$30,700
Small Facilities	Small Facilities Campaign	426	\$16,040,000	\$37,600
Totals		10,328	\$361,740,000	\$35,000

Current Accomplishments:

- Procurement of **100% GHG-free electricity** from PCE at all buildings
- **On-site PV installations** using PCE power purchase agreements
- **Heat pump retrofits** at select buildings (water heating and HVAC)
- Energy efficiency projects with **PG&E incentives**
- Electrification renovation of **East Palo Alto Government Center**
- New construction of COB3 as **fully electric and zero-net-energy**
- Maguire Jail cogeneration operation paused - **PPA's**

Figure 8.1.1 plots total ROM CapEx estimates against emissions reduction impacts for individual buildings. Note that both axes are plotted logarithmically to better illustrate the spread of values.

Figure 8.1.2 presents the ROM electrification CapEx estimates by individual building, against the percentage of today's County emissions footprint that will be mitigated.



8.2. Immediate Plan, Operationalizing the Roadmap

As shown in Figure 6.3.2 in Section 6.3, the SEMP Update Roadmap envisions the County starting to implement technology-specific electrification campaigns in basic buildings beginning in 2025 and will continue to develop and implement projects at more complex buildings in 2027/2028 and beyond. An important effort that has kicked off in 2025 is the full electrification of County Office Building 1, which is part of the County Center complex. Focusing on these efforts in the immediate term (i.e., five-year planning, two-year budget cycles) will put the County on the path to achieving the first 2030 SEMP target of 50% emissions reductions compared to the 2005 baseline.

Operationalizing this plan will be a significant effort and involve the Department of Public Work's staff time and resources, coordination with the County Sustainability Department, political engagement and outreach with the County board of supervisors, County residents, and the involvement of other stakeholders. Staff time in particular will be a significant resource requirement in order to cover project planning, management, monitoring, and reporting.

Figure 8.2.1 Operational Goals, Objectives, Outcomes, and Immediate SEMP Update Planning

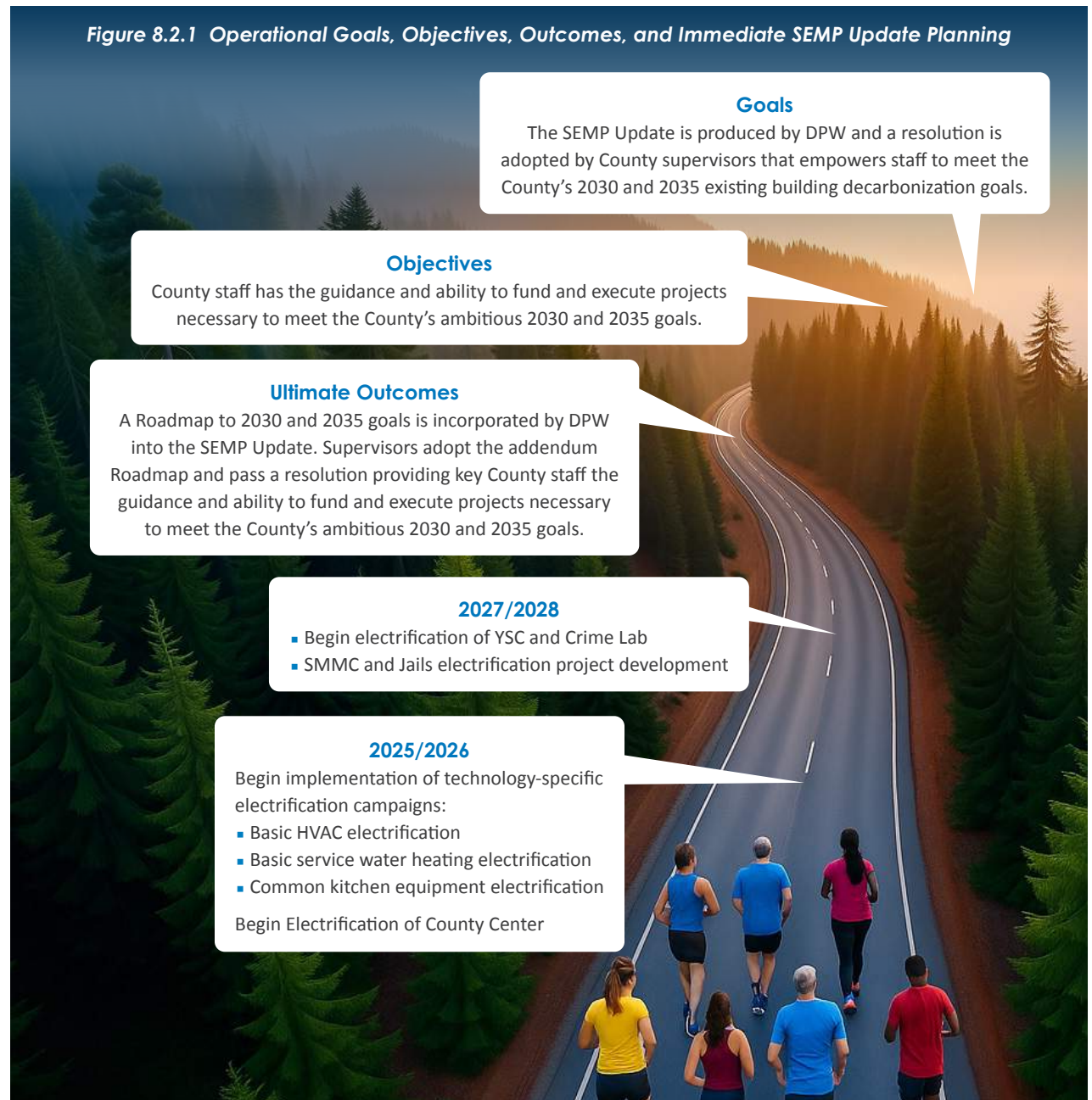


Figure 8.2.2 envisions a 17-month schedule to achieve the goals, objectives, and outcomes described above.

The plan outlined in Figure 8.2.2 offers a strategic approach to ordering and achieving the County’s decarbonization goals for existing buildings by 2030 and 2035. This process begins in Months 1 and 2 with internal preparations, including coordinating discussions around key stakeholders and simplifying the goals into an easily relatable format, then acquiring additional feedback in Month 3.

The next phase, referred to here as “tell[ing] the story,” begins concurrently in Month 3 and involves socializing these goals

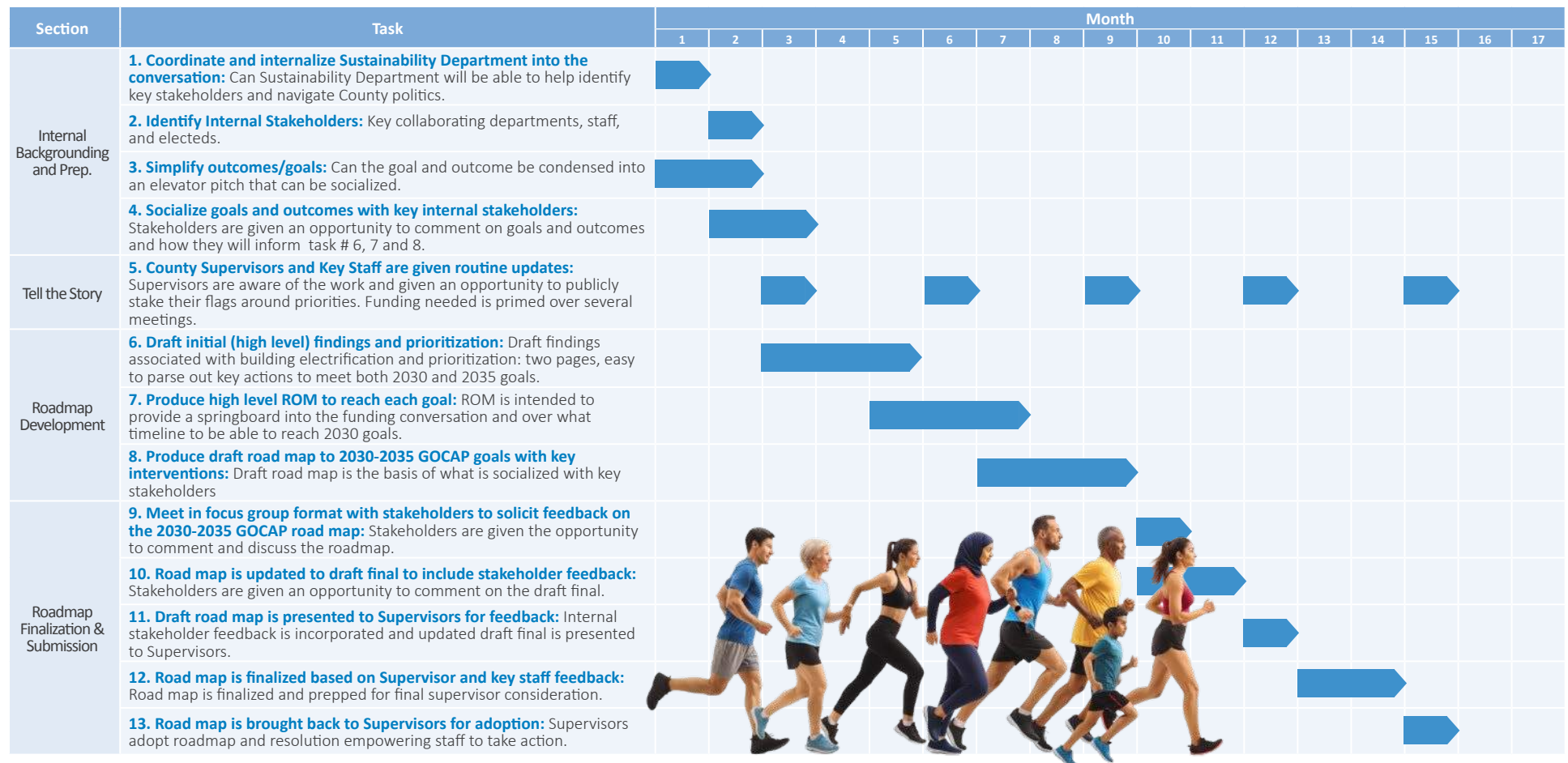
with internal stakeholders and providing routine updates to County supervisors in such a way as is easily digestible to them, to ensure they are informed, engaged, and able to make their priorities clear. Looking ahead, this step should recur about every three months to provide a “story” update to the interested parties at regular intervals.

Following the initial update, Months 3 through 9 bring the development of a Roadmap to achieve the presented goals by the 2030-2035 target dates. This development process includes drafting initial findings related to building electrification (Months 3-5), producing a high-level ROM for funding

discussions (Months 5-7), then finally creating the first draft Roadmap that outlines key interventions needed to meet the GOCAP goals (Months 7-9).

The Roadmap finalization and submission process should begin around Month 10 and will consist of soliciting the last round of stakeholder feedback, updating the developed Roadmap based on this input in Months 10 and 11, presenting it to supervisors and key staff for further feedback in Month 12, and ultimately finalizing the Roadmap for adoption by the supervisors, empowering staff to take necessary actions.

Figure 8.2.2 17-Month Goals, Objectives, and Outcome Schedule



8.2.1. Incorporating SEMP Update and Goals into CIP

The CIP guides the long-term strategic decisions regarding the construction, repair, and replacement of County assets. The CIP outlines capital improvement projects, many of which require funding over multiple fiscal years. The CIP is also linked to annual financial plans. Because of these long-term planning and budgeting features, the CIP process can be a productive pathway for identifying projects furthering the goals of the SEMP Update and the GOCAP. Identifying potential projects in existing CIPs can allow the County to identify and avoid new natural gas infrastructure or other baseline efficiency systems by shifting existing natural-gas projects to all-electric, efficient designs.

For long-term projects (e.g. boilers, major HVAC systems) with a potentially complex or lengthy development and implementation process, County staff may want to coordinate across sustainability and public works/facilities staff to plan for eventual electrification through the annual budget cycle and/or five-year CIP processes.

DPW will establish processes to routinely review lists of CIP projects and consider intervention to prevent standard-practice, gas-consuming and/or baseline efficiency designs from proceeding when all-electric, premium efficiency alternatives are feasible. DPW will consider that any gas-consuming systems that are installed going forward are contrary to the GOCAP target of 100% decarbonization by 2035.

DPW will team with the County Sustainability Department in these efforts, which has developed robust approaches for municipal electrification and gas equipment cataloging, with a focus on CIP process interventions.

8.2.2. Incorporating SEMP Update and Goals into Routine Maintenance

DPW Facilities Maintenance and Operations (FMO) and Health and Hospital (H&H) staff need to be supported such that when emergency repairs and quick turnaround projects are required, energy-efficient and decarbonized alternative solutions can be considered and implemented in real time.

An important concern for FMO and H&H staff is equipment uniformity so they can stay up to date on training for various designs and models and keep repair stocks on hand, etc. Please note that achieving equipment uniformity across many buildings can be difficult for the government sector, due to prohibitions against “sole-sourcing” and requirements to seek out best pricing when new systems are installed.

One way California State Agencies can mitigate this issue is by using “Leveraged Procurement Agreements”¹¹. Public Contract Code Section 10298 allows the State to leverage its buying power and purchase directly from suppliers through existing contracts and agreements, without further competitive bidding. The County may want to investigate whether these methods could be applicable to energy-efficient and decarbonized facilities equipment. For example, the County could competitively establish an agreement with a heat pump HVAC unit manufacturer/distributor and then continue to purchase that specific equipment type for a campaign that would retrofit many buildings over several years. A similar resource is Sourcewell¹².

Additional specialized staff is recommended to monitor and report on FMO and H&H progress, building analytics and equipment replacement logging, electric vehicle infrastructure contracts management, and solar contracts management.



¹¹<https://www.dgs.ca.gov/PD/Services/Page-Content/Procurement-Division-Services-List-Folder/Find-Leveraged-Procurement-Agreements>

¹²<https://www.sourcewell-mn.gov/>

9. Procurement and Funding Options

9.1 Procurement

Local governments have several options to procure DERs. Applicable DERs include but are not limited to:

- Energy Efficiency/ Building Electrification
- Transportation Electrification and EVSE
- Battery Energy Storage Systems
- Thermal Energy Storage Systems
- Demand Response Integration
- Cogeneration Systems

The following section will outline several procurement options available to California local government. Procurement pathways will be presented from simplest to most complex.

- Turnkey Energy Program Offerings
- Piggyback Contracting
- California Uniform Construction Cost Accounting Act Procurement
- Government Code 4217
- Standard Design-Bid-Build and Design/Build Contracting

A broad category of approaches to complex project procurement is Energy Service Performance Contracting (ESPC). ESPC may include any, or a combination, of the specific approaches further discussed in this section. ESPC is a financing mechanism that enables municipal customers to implement energy efficiency upgrades without upfront capital investment. Under this approach, an Energy Services Company (ESCO) conducts a comprehensive energy audit, designs and installs energy and decarbonization improvements and guarantees that the resulting energy savings will cover the cost of the project over time. If the savings fall short, the ESCO is contractually obligated to make up the difference.

This model is especially popular among municipalities, which often face budget constraints. ESPCs allow these organizations to modernize infrastructure, reduce energy consumption, and improve operational efficiency while maintaining budget neutrality. The ESCO typically assists with arranging third-party financing, and the municipality repays the investment through the savings generated, which may allow for a low-risk and cost-effective solution for public sector energy improvements.

Risk factors in the ESPC approach generally arise when the interests of the ESCO are not closely aligned with the interests of the municipal customer. For example, an ESCO may present only measures that benefit them the most financially (high margin, fast execution), while leaving other measures that would more comprehensively benefit the customer off the table. Another risk comes from large and frequent change orders which can upset the overall beneficial economics of a complex project that were presented at the outset. These risks can be mitigated through diligent procurement and contracting documentation, and by bringing in third-party subject matter expert consultants to act as owner's representatives during procurement, negotiation, project implementation, and close-out.

a. Turnkey Energy Program Services

Administrators of California Public Utilities Commission (CPUC) Public Purpose Program surcharge funding will at times have services that directly serve local government agencies. These programs may opt to provide turnkey energy program services.

In some cases, program services will be designed to address procurement as a barrier to action. In these

cases, the local government may be able to work directly with the program implementer to construct DER projects without a formal bid.

Recommended Use Case: Turnkey Energy Program Services offerings are best used when a project has a limited and discrete scope that will not impact a larger more comprehensive project.

b. California Uniform Public Construction Cost Accounting Act (CUPCCA) Procurement

The CUPCCA was enacted in 1983. Its goal was to promote uniform cost accounting standards for public agency procurement (see section PCC 22001). CUPCCA is voluntary and available to all public entities in California but only applies to those agencies that have "opted in" to the provisions set within the act. The entirety of the act can be found in sections PCC 22000-22045.

Opted-in agencies have access to updated bid threshold values as compared to those who have not opted in.

As of 2024 the following bid thresholds are:

- \$60,000 or less: Public projects can be performed by a public agency's employees through force account, purchase order, or negotiated contract.
- \$200,000 or less: Public projects can be let to contract through informal procedures.

- \$200,001 or more: Public projects must be let to contract through formal bidding procedures.
- \$1 million or more: Public projects must follow prequalification processes.
- \$100,000 or less: Non-construction services with negotiated contract or purchase order can be performed without bidding.
- \$220,000 or less: Non-construction services with informal bidding procedures can be performed.
- \$220,001 or more: Formal bidding procedures must be used.

Recommended Use Case: Once opted in, CUPCCA can be used to advance small projects and non-construction activities with altered bid thresholds through informal and/or purchase order pathways.

c. Piggyback Contracting

“Piggyback contracting” for construction and non-construction services can be explored. Piggyback contracting is when one local government adopts the competitive solicitation for construction or non-construction services that was used by a separate local government.

In some cases, a government agency will write their solicitation with piggybacking in mind.

Piggyback contracting is enabled through PCC 20118, 22000 et, seq., 20101, and 10298. Additional Government Code sections that intersect with piggyback contracting include 1090, 54202, 54203, 65402, and 65401.

It should be noted that there are two different interpretations of the use of piggyback contracting:

1. Piggyback contracting should only be used for non-construction services, such as retaining professional services or purchasing of equipment.
2. Piggyback contracting can be used for both construction and non-construction services.

Recommended Use Case: Piggyback contracting can be effective for solar, storage, electric vehicle service equipment (EVSE), scaled lighting, and professional services. Piggyback contracting can also be used for non-construction services.

d. Government Code 4217

Government Code 4217 (GC 4217) or GC 4217.10 to GC 4217.18 was enacted in 1984 and has been the standard for non-routine procurement of DERs. GC 4217 allows a public agency to single-source contract with a selected installer where the project meets GC 4217.12 or 4217.13.

- 4217.12 states that the utility cost savings must pay for the project within the EUL of the installation.
- 4217.13 states an agency can enter into a financing contract for energy (e.g., a solar PPA in which a governing body determines that the financing is in the best interest of the public agency).

Although GC 4217 is widely known as a tool for single-source contracting with energy service companies, the code can also be used to facilitate a competitive design-build procurement process. Additional value of a GC 4217 competitive process is delivered by allowing for the use of the “Best-Value” criteria in selection, as opposed to the lowest responsive and responsible bid.

Recommended Use Case: GC 4217 is widely known and available to be used in ways that streamline DER procurement in which 4217.12 or 4217.13 is met. Where an agency is concerned with single-source contracting a competitive 4217 process can encourage competition while streamlining the procurement process.

e. Standard Design-Bid-Build and Design/Build Contracting

These are the standard processes known to most public agencies where no alternation or alternative path is taken. As these are standard, they will not be discussed below.

Procurement options are being presented for informational purposes only. The listing and discussion of procurement options does not represent legal guidance. Interpretations of allowable procurement strategies may vary by local government.

It is recommended that all procurement strategies are discussed internally and that legal and fiscal auditor guidance is solicited prior to any decision on approach is made.

9.2 Funding

There are a variety of funding opportunities. Funding opportunities are dynamic and must be followed and updated routinely to best understand what options may be available at any given time.

Figure 9.1.1 below presents an illustrative summary of available funding for a variety of measures. Each funding source will have different applications, documentation needs and eligibility requirements.

Recommended Use Case: DPW recommends that accessing additional funding sources is made part of the selected contractors' obligations regardless of procurement pathways.

County Capital Budgets and Bonds Will Be the Primary Driving Funding Sources

Figure 9.1.1 Funding Source by Measure

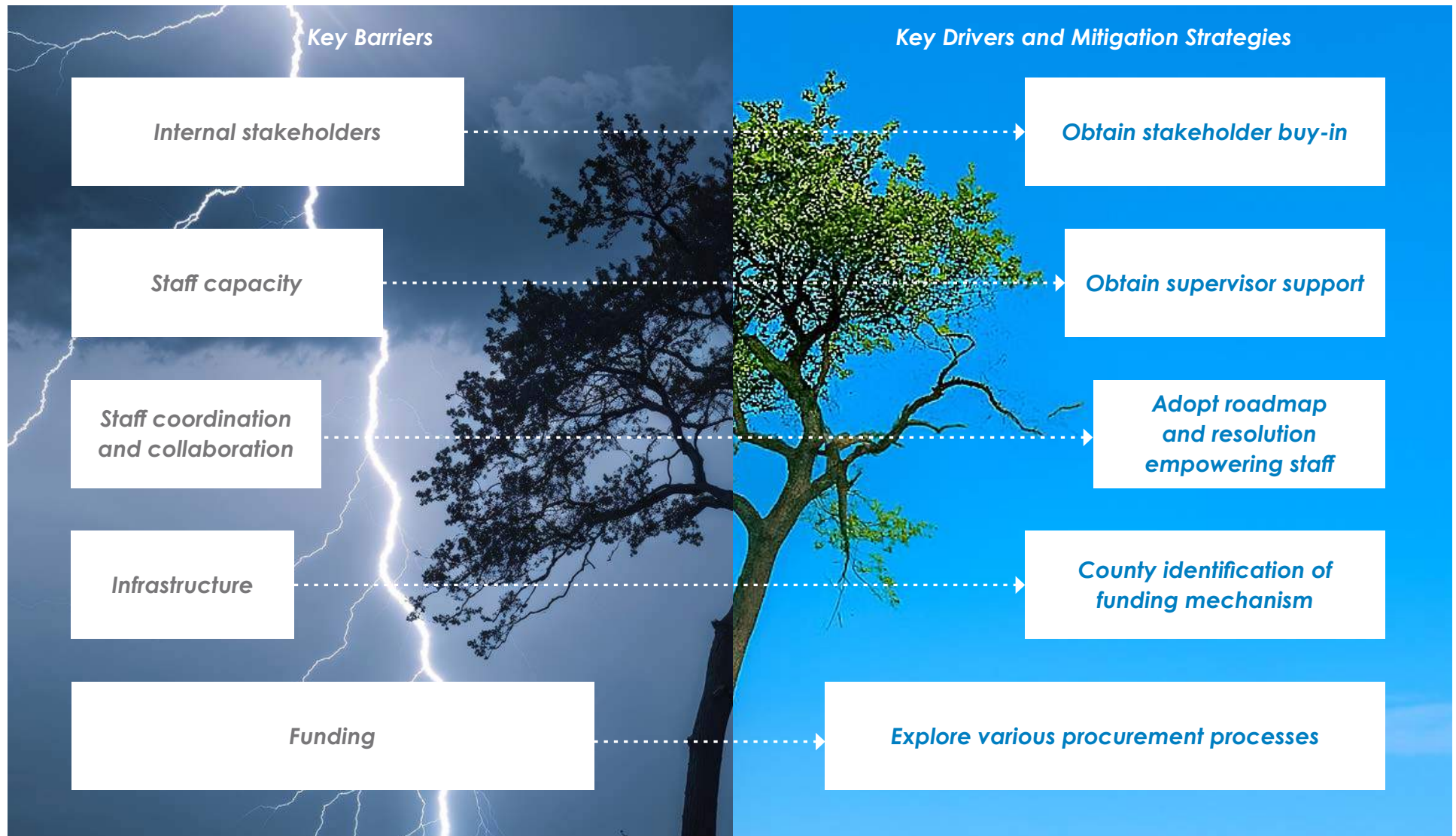
Funding Source	Funding Type	Energy Efficiency	Water Heating Electrification	HVAC Electrification	Food Service Electrification	Electric Vehicles	Demand Response	Solar	Battery Energy Storage Systems
County Capital Budgets	County Funds	✓	✓	✓	✓	✓	-	✓	✓
Municipal or Green Bond	Bond	✓	✓	✓	✓	✓	-	✓	✓
Utility Funding	Incentive	✓	✓	✓	✓	✓	✓	-	✓
Peninsula Clean Energy GovBE Program	Incentive	-	✓	✓	-	-	✓	-	-
Peninsula Clean Energy GovEV Program	Incentive	-	-	-	-	✓	-	-	-
Peninsula Clean Energy GovPV Program	PPA	-	-	-	-	-	-	✓	-
Self Generation Incentive Program	Incentive	-	✓	-	-	-	-	-	✓
IRA Direct Pay	Tax Credit	-	-	-	-	-	-	✓	✓
Inflation Reduction Act (Direct Pay and 179D)	Tax Credit	✓	✓	✓	✓	✓	-	✓	✓
CEC Energy Conservation Assistance Act 1% Financing	Loan	✓	✓	✓	✓	✓	-	✓	✓

10. Barriers to Success and Mitigation

We have identified the top barriers to the success of the SEMP Update Roadmap and their corresponding drivers that will help overcome these challenges. By recognizing potential obstacles

and pairing them with proactive strategies and supporting factors, our chart below provides a framework for effective mitigation. Our goal is to ensure that identified barriers are

systematically addressed, allowing for smoother execution of the plan and achievement of environmental goals.



11. The Effects of Inaction or Partial Inaction

The County faces significant potential consequences if it delays adopting or refuses to adopt the SEMP Update. These impacts range from escalating costs to reduced environmental effectiveness and potential harm to the County's reputation.

Potential Effect of Inflation and Shorter Timelines

\$45 to \$145 million

in increased costs (nominal 2025 dollars)
associated with a 5-year delay

Ref: DGS California Construction Cost Index (CCCI)

Potential Effect of Lost Incentives and Rebates

\$10 to \$18 million

in lost incentives and rebates
(nominal 2025 dollars)

Ref: Current PG&E GK12 Program and
PCE GovBE program levels

Potential Costs of Carbon Offsets

\$0.4 to \$4.6 million

in annual carbon offset costs

Ref: Section 5.1.3 of this Report

Increased Costs Due to Inflation and Shorter Timelines

Delaying the implementation of the SEMP Update will likely result in higher overall costs. As inflation continues to affect the national economy, including the construction industry, material and labor costs are expected to rise, making projects more expensive over time. If the County waits too long then accelerates project timelines to meet ambitious goals, the urgency may drive costs up even further. Expedited projects involve premium pricing, labor shortages, and logistical challenges, resulting in an overall increase in expenses. In contrast, immediate action would lock in current costs and enable the County to take advantage of more favorable pricing.

Reduced Availability of Incentives and Rebates

Many energy efficiency projects rely on external incentives, rebates, and financial assistance. As the County delays its SEMP Update, these opportunities may become less available or diminish in value. Government programs, utility incentives, and private-sector rebates that support energy-efficient initiatives have expiration dates or may be reduced as funding is depleted by more proactive organizations or shifted to newer initiatives. By delaying, the County risks missing out on crucial financial support.

Negative Environmental Impact

Each day that the County delays adopting the SEMP Update contributes to continued environmental degradation. Energy consumption, particularly from non-renewable sources, generates GHG emissions that contribute to climate change. If the County fails to act in a timely manner, it will neglect the reduction of its carbon footprint, ultimately contributing to pollution and environmental harm. Missed opportunities for sustainability at the County level will also set back state and national goals related to renewable energy adoption, GHG reductions, and climate action.

Broken Promises and Discontent among Constituents

When any government makes commitments to its people, whether through policy promises or public statements, failing to follow through on these promises leads to public frustration and diminished trust. Many constituents are feeling the presence of climate change in their daily lives and expect proactive action on energy efficiency from their government. A delay in adopting a comprehensive SEMP could be perceived as a failure to prioritize the future well-being of the community. Broken promises foster dissatisfaction, erode confidence in local leadership, and diminish public support for future initiatives.

Setting a Bad Example for Peer Cities and Organizations

Not adopting the SEMP Update sends a poor message to neighboring cities, counties, and other organizations that might look to the County as a model for leadership or peer comparison. If the County, which has a progressive reputation, hesitates on implementing energy efficiency strategies, other local governments may feel justified in taking a similar approach, further impacting statewide progress in energy management and sustainability.

Providing Support to Detractors of Carbon Reduction Efforts

By not taking decisive action on energy management, the County may reinforce the narrative of those who argue that meaningful carbon reduction is not possible. Critics of climate initiatives claim that efforts to reduce emissions are unrealistic or too costly. A delay in the County's action, or worse, total inaction, would lend credibility to these arguments, providing ammunition to those who peddle the narrative that government-led sustainability programs are doomed to fail.

12. Envisioning Success

12.1 Examples of Success in Action

Following the SEMP Update in full will prevent the negative effects of inaction and will keep the County on course with local and state climate goals. Willdan has years of experience assisting governments, campuses, and other entities in developing their long-term plans for a net-zero future and we have seen large institutional organizations overcome significant barriers and achieve success. In developing pathways to a resilient, cost and energy-saving future, we recommend a focus on the specific needs of local stakeholders.

National Parks of Lake Superior Foundation Decarbonization



The National Parks of Lake Superior Foundation (NPLSF) has undertaken a plan to cut carbon pollution from park facilities and pursue net-zero energy consumption¹³. Willdan worked with NPLSF to create a multi-path option and budget plan that ensures 93%-100% decarbonization of the parks over 25 years. Note that these facilities are all located in cold, northern-Midwest locations where climate dictates very significant space heating requirements for occupant comfort and building safety.

Stanford University – Stanford Energy Systems Innovations (SESI) Project



In 2015, Stanford University undertook a \$438 million project to convert their gas- and electric-powered central heating and cooling central utility plant into a predominately 100% renewable, grid-sourced electricity facility, while improving energy efficiency by a reported 70%. The University currently has adopted a goal to reach 100% net-zero emissions in its operations and endowment by 2050¹⁴.

LA100: The Los Angeles 100% Renewable Energy Study



The City of Los Angeles worked with the Los Angeles Department of Water and Power (LADWP), the National Renewable Energy Laboratory (NREL), and other research partners to create plans for the nation's second largest city to achieve an 100% clean energy future across all residents. NREL claims this effort is one of their most momentous achievements to date. Unlike other studies of high-renewable systems, the LA100 study¹⁵ made reliability a fundamental requirement of their strategies, especially in the face of extreme events like wildfires and heat waves.

¹³<https://www.nplsf.org/decarbonize-the-parks>

¹⁴<https://news.stanford.edu/stories/2024/09/electrical-upgrades-will-help-stanford-achieve-climate-goals>

¹⁵<https://www.ladwp.com/strategic-initiatives/clean-energy-future/la100-equity-strategies/100-renewable-energy-study>

New York City Local Law 97



Buildings contribute over two thirds of GHG emissions in New York City (NYC). Local Law 97 (LL97)¹⁶ is one of the most ambitious plans for reducing these emissions in the nation. The law requires buildings over 25,000 square feet to comply with strict emissions limits beginning in 2024 and then tightening in 2030, with a goal of achieving net zero emissions in these buildings by 2050.

The LL97 legislation sets forth a portfolio-based approach for NYC government operations, whereby NYC is mandated to achieve a 40% reduction. Released in December 2021, the LL97 IAP recommends specific, scalable steps to achieve the goals set out in the legislation from city government operations by 2025 and a 50% reduction by 2030, using a baseline year of 2006, NYC committed a budget of nearly \$4 billion over the next nine years to invest in NYC's assets, facilities, and energy supply.

San Diego Climate Pollution Reduction Grant Project



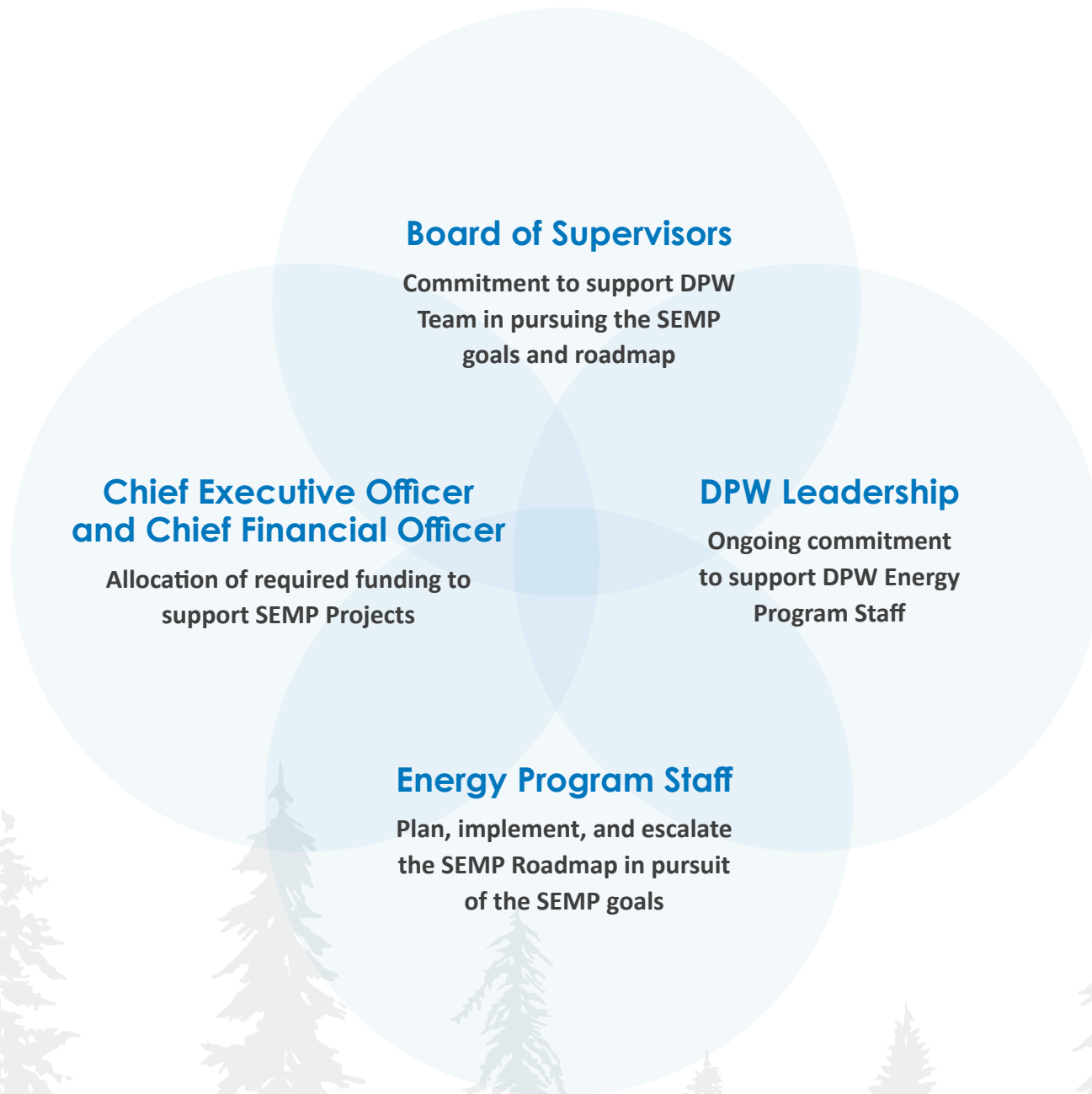
The City of San Diego¹⁷ is undertaking a \$100 million project to implement GHG reduction and energy savings projects across 54 municipal facilities, parks, and over 50,000 streetlights, using an energy service performance contracting (ESPC) approach. The project is attempting to combine several funding sources including California Energy Commission (CEC) Virtual Power Plant-Flex Program, and the U.S. Environmental Protection Agency (EPA) Climate Pollution Reduction Grant Program.

Looking toward other large organizations' achievements helps us envision the County successfully meeting the SEMP Update goals over the next 10 years and beyond.

¹⁶<https://www.nyc.gov/site/buildings/codes/ll97-greenhouse-gas-emissions-reductions.page>

¹⁷<https://www.sandiego.gov/sustainability-mobility/climate-action/bd>

12.2 SEMP Stakeholders and Commitments for Success



Acronyms

Acronym	Definition	Acronym	Definition
AB	Assembly Bill	IRA	Inflation Reduction Act
ABAG	Association of Bay Area Governments	IRP	Integrated Resource Plan
ASHRAE	American Society of Heating Refrigeration & Air-Conditioning Engineers	kW	kiloWatt
BAU	Business As Usual	kWh	kiloWatt-hour
BayREN	Bay Regional Energy Network	LADWP	Los Angeles Department of Water and Power
BESS	Battery Energy Storage System	LED	Light Emitting Diode
Btu	British Thermal Unit	LL97	Local Law 97
CapEx	Capital Expenditures	MMBtu	Millions of British Thermal Units
CCA	Community Choice Aggregator	MTCO2e	Metric Tons of Carbon Dioxide Equivalents
CEC	California Energy Commission	MW	MegaWatt
CIP	Capital Improvement Plan	MWh	MegaWatt-hour
CO2e	Carbon Dioxide Equivalent	NPLSF	National Parks of Lake Superior Foundation
COB	County Office Building	NPV	Net Present Value
CPUC	California Public Utilities Commission	NREL	National Renewable Energy Laboratory
CUPCCA	California Uniform Public Construction Cost Accounting Act	NYC	New York City
DER	Distributed Energy Resource	O&M	Operations & Maintenance
DGS	Department of General Services	OEM	Original Equipment Manufacturer
DOE	U.S. Department of Energy	OOS	Office of Sustainability
DPW	Department of Public Works	OpEx	Operating Expenditures
EPA	East Palo Alto	PCC	Public Contract Code
EPA	U.S. Environmental Protection Agency	PCE	Peninsula Clean Energy
ESCO	Energy Service Company	PG&E	Pacific Gas & Electric
ESPC	Energy Savings Performance Contract	PPA	Power Purchase Agreement
ESPM	Energy Star Portfolio Manager	PV	Photovoltaic
EUI	Energy Use Intensity	ROM	Rough-order-of-magnitude
EUL	Effective Useful Life	RPS	Renewable Portfolio Standard
EV	Electric Vehicle	SAT	Scenario Analysis Tool
EVSE	Electric Vehicle Supply Equipment	SB	Senate Bill
FMO	Facilities, Maintenance & Operations	SEMP	Strategic Energy Master Plan
GC	Government Code	SESI	Stanford Energy Systems Innovations
GHG	Greenhouse gas	SMMC	San Mateo Medical Center
GK12	Government & K-12 Program	TOU	Time-of-Use
GOCAP	Government Operations Climate Action Plan	UPS	Uninterruptible Power Supply
HSA	Human Services Agency	USGBC	U.S. Green Building Council
HVAC	Heating Ventilating & Air Conditioning	YSC	Youth Services Center
IAP	Implementation Action Plan		