

Attachment 1

Summary of Recommended Energy Upgrades at County Facilities

Facility Energy Audits

Building energy use accounted for 29% of the County's Municipal GHG emissions in 2021. With an overarching goal to achieve carbon neutrality, and a specific goal to make County facilities carbon free, the County needs to eliminate natural gas use, increase energy efficiency, and add renewable energy. In July 2021, the County engaged the Pacific Gas and Electric Company (PG&E) Sustainable Solutions Turnkey (SST) program through a Master Services Agreement to evaluate County buildings and propose a scope of work for equipment and other retrofits to improve energy efficiency, reduce utility costs and increase resiliency. Under the SST Program, contractors and County staff performed a preliminary assessment of County facilities. After considering factors such as future facility use scenarios and the expected life of the building, the project team (including CARD and SPI Facility Operations and Capital Projects staff) identified 87 buildings to receive utility usage analyses. Based on those analyses, the team selected 66 existing County buildings to receive detailed investment grade audits (IGAs) of their energy use and opportunities to reduce that use, associated GHG emissions, and utility costs.

The SST program combines energy retrofit/upgrade assessments, audits, and financing options, including low-interest loans, zero-interest utility on-bill financing, rebates, incentives, and tax credits to leverage County funds earmarked for capital improvements. If used, SST covers construction costs, permits, fees, and inspections, and allows the County to defer the initial costs of IGAs until upgrade projects are implemented. The SST program operates under an energy services company program structure, in which PG&E issues the RFP, selects qualified contractors, and ensures compliance with prevailing wage requirements and public contracting provisions. The SST program offers a streamlined process for identifying, funding, and implementing energy efficiency upgrades.

The County has the option to engage the SST Program to implement any of the proposed energy upgrades as long as project packages meet the requirements of Government Code Sections 4217.10 to 4217.18, which allow public agencies to develop energy conservation, cogeneration, and alternate energy supply sources at their facilities if the governing body determines, in a public hearing, that it is in the best interests of the agency, and if certain findings are made. In particular, the costs of the energy project must be less than or equal to the energy savings from the upgrades.

Reducing Facility Energy Use

Energy upgrades are recommended for 66 County facilities based on an evaluation of energy use, age of the equipment, and the expected life and future use of the facility. Executing on all identified measures is estimated to reduce yearly GHG emissions by more than 8 million lbs. of CO₂e or 3,628 MTCO₂e, a reduction that represents about 30% (29.7%) of the baseline GHG emissions from energy use by County facilities.

The recommended energy upgrades are presented in two phases. Phase I energy upgrades likely would meet the requirements of Government Code 4217 by paying for themselves with avoided costs over the life of the measure. These are upgrades that can be implemented through the streamlined contracting and financing procedures of the SST program. Phase II upgrades are more capital-intensive and likely do not meet the requirements of Government Code 4217. The measures in Phase II are not anticipated to pay for themselves in energy savings, however your Board may wish to consider advancing some, or all, of these upgrades in the future. Phase II includes actions such as electrifying and upgrading existing, end-of-life equipment and installing Electric Vehicle Charging

Infrastructure, improvements which are projected to result in substantial GHG emission reductions. Attachment 2 shows the facilities evaluated and the upgrades recommended for them.

Recommended Phase I Energy Upgrades | \$36 million & Reduction of 384 MTCO₂e

The proposed Phase I energy upgrade package includes energy efficiency, renewable energy, energy storage, and water saving measures at existing facilities, including installation of Solar Photovoltaic (PV) systems at the County Administration Center and Battery Energy Storage Systems (BESS) at the County Administration Center and Los Guilicos. The new Solar PV systems would be sized to offset approximately 25% of current administration center site electricity usage. Potential locations on the County Campus for the Solar PV systems were identified from site plans showing parking lot and roof areas likely to remain unaffected by any of the presently-considered new County Campus plans. The BESS systems would be designed to increase resilience at the County Administration Center and Los Guilicos by providing emergency backup power and allowing for peak load shifting to save electricity demand charges, optimizing the financial return from the Solar PV systems and improving electric grid stability. This package also would include repair of the various solar PV arrays at the Sonoma County Fairgrounds. It also includes Building Management System upgrades replacing end-of life equipment in 45 buildings and network programmable thermostats, consistent with the 2023-2028 CIP.

1. LED lighting retrofit and controls retrofit – Fluorescent and compact fluorescent lighting upgraded to Light Emitting Diode (LED) lighting across 55 buildings **(\$5,071,200)**
2. Select HVAC - Upgrade units past their expected useful life at the Juvenile Justice Center (select units only), Facility Operations, Maintenance, and Animal Services **(\$1,154,800)**
3. HVAC controls upgrade – Replace end of life HVAC controls with a Building Management System and network programmable thermostats in 45 buildings **(\$7,083,600)**
4. Solar PV - Rooftop – 270 kW Roof Mounted Solar PV – installed on roof area available at one building planned to remain in County Administration Center. Sized to offset approximately 25% of current administration center site electricity usage in conjunction with carport solar. [scope includes repair of various solar array systems at Fairgrounds] **(\$1,334,100, less \$340,000 in tax incentives)**
5. Solar PV – Carport - 2 MW Carport Solar PV – installed at the County Administration Center in parking areas planned to remain and not impacted by new County Campus plans. Sized to offset approximately 25% of current administration center site electricity usage in conjunction with rooftop solar. **(\$12,427,700, less \$3,169,100 in rebates)**
6. Battery Energy Storage Systems (BESS) – Up to 5000 kWh of battery storage at the County Administrative Center and Los Guilicos Campus **(\$6,600,000, less \$2,435,000 in tax incentives)**
7. Water Conservation – Retro-commissioning, retrofit and/or replacement of high flow water fixtures across County facilities **(\$1,483,500)**
8. High Efficiency Transformers – Install high efficiency transformers in up to 5 buildings **(\$700,000)**
9. Domestic Hot Water upgrades – Install high efficiency heat pump water heaters with pre-reserved incentives **(\$119,900, less \$103,800 in rebates)**

Phase I Energy Upgrade Performance Details:

- Simple Payback w/escalation¹: 17 years

¹ Simple payback is the number of years it would take to recover energy upgrade costs; the calculation includes the total cost (excluding financing) and the energy savings, with an assumption that energy costs increase at an average annual rate of 4.75%. This may be a conservative assumption as a review of historical utility rate increases revealed an average annual increase of 8.25% from 2009 to 2022.

- Estimated Energy Upgrade Construction Costs ² before incentives/tax credits: \$35,974,800
- Grants & Incentives: \$6,048,100
- Annual savings:
 - Utility costs reduced: \$1,273,000/yr
 - Energy use reduced: 5,752,700 kWh/yr & 34,000 therms/yr
 - CO2e reduced/yr: 846,500 lbs. or 384.0 MTCO2e (about 3.1% of baseline energy GHG)

Note that while the estimated energy savings are large, the expected GHG emissions reductions associated with these improvements appear small; this is in large part because the County purchases electricity that is already very clean from Sonoma Clean Power.

None of the upgrades would affect buildings that may be replaced by the new County Center. The preliminary cost ³ for all upgrades is estimated at \$35,974,800, with a total of \$6,048,100 in incentives; those costs would be recovered through energy savings in 17 years⁴. The upgrades would reduce utility costs by \$1,273,000 per year, reduce energy used by 5,752,700 kWh/yr & 34,000 therms/yr, and reduce 846,500 lbs. or 384.0 MTCO2e (about 3.1% of baseline energy GHG). Note that while the estimated energy savings are large, the expected GHG emissions reductions associated with these improvements appear small; this is in large part because the County purchases electricity that is already very clean from Sonoma Clean Power.

County Administration Complex Solar PV

- **Existing Conditions:**
 - 12 kV Campus Loop with Main Service/Meter on South End of Campus
 - Select existing distributed rooftop PV systems
- **Proposed Scope:**
 - Install ~ 1.97MWdc Solar PV Carport Canopy System
 - Investigating design options to utilize existing onsite electrical infrastructure
 - System would generate approximately 2,810,000 kWh/yr, ~25% of current annual site usage
- **Benefits:**
 - Reduction in utility costs
 - Provide shade for parking
 - Reduce greenhouse gas emissions
 - Note: System would be interconnected under PG&E's Net Billing Tariff (aka NEM 3.0)



² Energy upgrade costs include all SST project implementation costs (equipment, contractor labor, contractor and program overhead) but not the \$275,000 cost for the Investment Grade Audits, County staff costs, or any financing-related costs. Cost estimates are also not adjusted to remove costs that would otherwise be incurred to replace aging and end-of-life equipment.

³ The preliminary energy upgrade costs presented here include all SST project implementation costs (equipment, contractor labor, contractor and program overhead) but not the \$275,000 cost for the Investment Grade Audits, County staff costs, or any financing-related costs. Cost estimates are also not adjusted to remove costs that would otherwise be incurred to replace aging and end-of-life equipment.

⁴ The payback calculation includes the total cost (excluding financing) and the energy savings, with an assumption that energy costs increase at an average annual rate of 4.75%. To make the findings under Government Code 4217 to utilize financing, all financing related costs will have to be included.

Staff explored alternatives to the Phase I energy upgrade package that are more limited in scope and exclude the most expensive upgrades. These alternatives are less costly but would delay the County's progress to carbon free and resilient facilities and could make that goal unattainable by 2030. The date when carbon free, resilient facilities would be achieved depends on when these upgrades are ultimately implemented.

Alternative Phase IA

This alternative includes the upgrades and retrofits discussed above but excludes the installation of solar generation and energy storage. Removing the solar installations (Phase I item 7, above) and battery storage (Phase I item 8, above) from the recommended Phase I upgrades would reduce the total cost of upgrades by over 56%, to \$15.6 million, but would forgo over \$5.9 million in incentives. The utility cost savings would be 54% less than for the recommended Phase I upgrades, the electricity savings would be 56% lower, and CO₂e reductions would be reduced by 24% (because the natural gas use is still eliminated). Alternative Phase IA includes:

1. LED lighting retrofit and controls retrofit – Fluorescent and compact fluorescent lighting upgraded to Light Emitting Diode (LED) lighting across 55 buildings **(\$5,071,200)**
2. Select HVAC – upgrade units past their Expected Useful Life at the Juvenile Justice Center (select units only), Facility Operations, Maintenance, and Animal Services. **(\$1,154,800)**
3. HVAC controls upgrade – Replace end of life HVAC controls with a Building Management System and network programmable thermostats in 45 buildings **(\$7,083,600)**
4. Water Conservation – RCx, retrofit and/or replacement of high flow water fixtures across County **(\$1,483,500)**
5. High Efficiency Transformers – install high efficiency transformers in up to 5 buildings **(\$700,000)**
6. Domestic Hot Water upgrades – Install high efficiency heat pump water heaters with pre-reserved incentives **(\$119,900, less \$103,800 in rebates)**

Package details:

- Simple Payback w/escalation: 15 years
- Project Cost before incentives/tax credits: \$15,613,000
- Grants & Incentives: \$103,800
- CO₂e reduced/yr: 642,100 lbs. or 219.3 MTCO₂e
- % of total Baseline GHG Emissions - County operations energy: 2.4%
- GC 4217 criteria analysis:
 - Option package cost savings are greater than the total project costs over the life of the project.
 - Annual savings will cover the annual lease payments if:
 - County contributes at least \$1.75M to reduce the financing costs
 - OR
 - Estimated savings from avoided capital expenses for the HVAC controls upgrade are included in the calculations

Alternative Phase IB

Upgrade costs could be further reduced to \$8.5 million, or about 78% lower than the recommended Phase I upgrades by also removing the installation of the advanced building management system (item 3), which further reduces expected utility cost savings, energy savings, and CO₂e reductions.

The building management system upgrades would need to be implemented eventually to replace outdated equipment and are already included in the Capital Improvements Plan, however they are phased in gradually. Alternative Phase IB includes:

1. LED lighting retrofit and controls retrofit – Fluorescent and compact fluorescent lighting upgraded to Light Emitting Diode (LED) lighting across 55 buildings **(\$5,071,200)**
2. Select HVAC - Upgrade units past their Expected Useful Life at the Juvenile Justice Center (select units only), Facility Operations, Maintenance, and Animal Services **(\$1,154,800)**
3. Water Conservation – RCx, retrofit and/or replacement of high flow water fixtures across County **(\$1,483,500)**
4. High Efficiency Transformers – install high efficiency transformers in up to 5 buildings **(\$700,000)**
5. Domestic Hot Water upgrades – Install high efficiency heat pump water heaters with pre-reserved incentives **(\$119,900, less \$103,800 in rebates)**

Package details:

- Simple Payback w/escalation: 11 years
- Project Cost before incentives/tax credits: \$8,529,400
- Grants & Incentives: \$103,800
- CO₂e reduced/yr: 173,000 lbs. or 78.5 MTCO₂e
- % of total Baseline GHG Emissions - County operations energy: 0.6%
- GC 4217 criteria analysis:
 - Package cost savings are greater than the total project costs over the life of the project.
 - Annual savings will cover the annual lease payments over the term of the lease

Phase II Improvements | \$58.2 million & Reduction of 3,267.3 MTCO₂e

Phase II includes the balance of the identified facility improvements that can be phased in by 2030. A plan to implement the improvements in Phase II will provide an energy efficiency, resiliency and decarbonization pathway for future projects by detailing possible project phasing and effective groupings of energy conservation measures. The measures identified for Phase II **do not pay for themselves in energy savings**, however as shown below, electrifying and upgrading existing, end-of-life equipment and installing Electric Vehicle charging infrastructure, is projected to result in substantial GHG emission reductions. Phase II measures include replacing end-of-life HVAC and water heating equipment with high efficiency, electric heat pumps, installing EV charging infrastructure that is expected to be increasingly code-mandated, and replacing the end-of-life Spud Point Icehouse. These upgrades are generally characterized as “avoided costs” in the analysis because the proposed improvements are applied to equipment that will already need to be replaced at end-of-life by 2030 or are expected to be code-mandated by 2030.

As part of the preliminary IGA, a comprehensive engineering analysis was completed for replacement of the Spud Point Icehouse, a high priority capital project for Regional Parks because of the economic value it provides for the coastal economy. It has been included in Phase II because it is a capital-intensive upgrade that is not projected to pay for itself in energy savings over its service life. Staff continues to work with Regional Parks staff to identify and provide support for potential grant funding opportunities for this upgrade.

Phase II energy upgrades include:

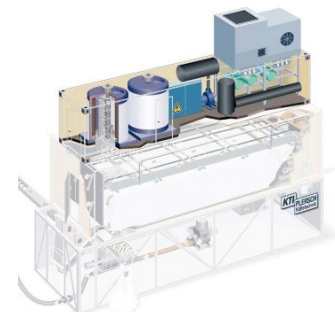
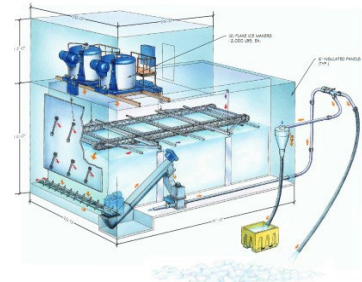
1. HVAC upgrade – Upgrade units past their expected useful life at buildings outside of the new County Center scopes.
2. Water heater upgrades – Install other identified Heat Pump hot water heating upgrades that were not included in the Phase I incentivized program, at buildings that will not be affected by the construction of the new County Center.
3. Electric Vehicle Charging Stations – Install 120 ports of Level 2 charging stations across buildings at locations to be determined.
4. Heating Hot Water upgrade – Upgrade Central Mechanical Plant (CMP) at County Administrative Campus to air and water source heat pumps.
5. Spud Point Icehouse – Replace existing failing Icehouse with new built-up system

Phase II Energy Upgrade Performance details:

- Simple Payback w/escalation: NA, No simple payback
- Estimated Energy Upgrade Construction Costs before incentives/tax credits: \$58,254,200.
- Grants & Incentives: \$869,800
- Annual savings:
 - Utility costs increased: \$303,500/yr
 - Energy use change: 3,807,550 kWh/yr increase & 531,000 therms/yr reduction
 - CO2e reduced/yr: 7,203,000 lbs. or 3,267.3 MTCO_{2e} (about 26.7% of baseline energy GHG)

Spud Point Ice Plant

	Existing Built -Up Plant Manufactured and installed in 1985	Proposed Site Built Built-Up Plant	Proposed Containerized Plant
Ice Storage Capacity	35 Tons	50 Tons	40 Tons
Ice Making Rate	1 Ton ice/hour	40 Ton/day	24 Tons/day
Refrigerant	R-22 (Freon)	Ammonia	Ammonia
Rough Order of Magnitude Cost Estimate (Feb 2023)	Repairs and parts replacement ~\$30k/yr & Economic impact of plant being offline for regular repairs	\$3.2 Million	\$2 million
Construction Time	NA	11 weeks	7 weeks
Energy Savings	NA	~15%	~15%



Proposed Scope:

- Built Up
 - Higher first cost (~\$3.2m) but more configurable
 - Operators already familiar with system maintenance
- Containerized
 - Lower first cost (~\$2m) and reduced installation time
 - Higher maintenance costs

The preliminary energy upgrade pricing estimates shown in this report are based on initial site walks, historic information, and standard estimating rules, with an accuracy of +/- 20%. Fixed and firm pricing will be provided as part of the final IGA report. These upgrade estimates do not reflect lease financing costs, which are subject to market variation and other changes and will be calculated when fixed and

firm pricing is in hand. Cost estimates also do not reflect other project- and financing-related costs, such as internal county project management and outside financing services expenses, or the cost of the investment grade audits and Energy Conservation Assessment report. Under the current SST contract the cost of the IGAs and the Energy Conservation Assessment (\$275,000) is due upon delivery of the IGAs and report. If the County ultimately decides to move forward with implementation of any energy upgrade projects with SST, that cost can be rolled into the costs of the selected package. The County is under no contractual obligation to implement any upgrades proposed for Phase I or Phase II with SST.

Funding Options and Next Steps

The funding sources available for the proposed upgrades include Tax Exempt Lease Purchase financing, bonds and grants, on-bill financing, utility rebates, Power Purchase Agreements, and County contributions. Under SST, on-bill financing is available up to \$4 million for certain types of upgrades that have a payback period of 10 years or less, subject to approval by the California Public Utilities Commission. Up to \$4 million of Phase I lighting upgrades are eligible for on-bill financing at zero interest with application to and approval by the California Public Utilities Commission. On October 3, your Board approved a Master Equipment Lease Purchase Agreement for up to \$9 million in energy equipment purchases, of which about \$1.8 million has been utilized for the Santa Rosa Veterans Memorial Building energy upgrades; the remaining financing capacity could be utilized with approval by your Board. Staff is not seeking commitments regarding funding or financing decisions from your Board at this time. Staff will reengage your Board in the spring of 2024 when fixed and firm pricing has been received for those improvements that your Board is interested in pursuing as part of phase I.

Staff seeks direction from your Board to identify which of the Phase I and/or Phase II proposed energy upgrades or upgrade packages to prioritize for further analysis, costing, and proposal for funding and delivery. Based on that direction, staff will work to obtain fixed and firm pricing proposals for the identified Phase I energy upgrade packages, as well as estimates for any identified Phase II upgrades. For all identified upgrade proposals, direction and any questions, concerns, or guidance related to funding and financing will help inform options for later presentation on further decision on if and how to proceed on any actual implementation. IGAs for all 66 County facilities are scheduled to be complete by the end of 2023 and fixed and firm pricing will be secured for the energy upgrades prioritized by your Board. If needed, the required public hearing(s) for utilizing Government Code 4217 allowances will later be scheduled for your Board's consideration of the final package of energy upgrades with fixed and firm pricing.