

Memorandum



Memorandum

TO: HONORABLE MAYOR
AND CITY COUNCIL

FROM: Lori Mitchell

**SUBJECT: SAN JOSE CLEAN ENERGY
SUMMER 2023 DEMAND
RESPONSE PROGRAM**

DATE: March 10, 2023

Approved

Date

3/21/23

RECOMMENDATION

Adopt a resolution approving the establishment of the Community Energy Department's Peak Rewards Program for the 2023 calendar year.

SUMMARY AND OUTCOME

Demand response programs compensate residents and businesses for reducing their energy usage during energy-saving events, which include grid emergencies when overall electricity demand is projected to be greater than the available supply. These programs are a cost-effective way to meet demand while improving grid resiliency, reducing greenhouse gas emissions, and helping avert rolling blackouts. Approving the recommendation results in the Community Energy Department (Department), as administrator of San José Clean Energy, establishing a demand response program for San José Clean Energy's commercial customers for summer 2023 called the "Peak Rewards Program."

The Department will conduct direct outreach to San José Clean Energy's largest 100 commercial customers measured by peak usage to encourage them to enroll in the program and offer technical support to participants to identify opportunities for saving energy during demand response events. Between May and October, the Department expects to call up to six energy-saving events each month, which would be triggered by temperature, projected electricity market prices, and/or state predictions for grid emergencies. Each energy-saving event would last for two or four hours. The Department plans to pay customers approximately between \$0.50 and \$2.00 per kilowatt-hour reduced during such events, calculated against their baseline usage. The total expected cost for the 2023 Peak Rewards Program is approximately \$325,000. Program costs may be offset either partially or completely by reduced power procurement costs and/or reduced regulatory compliance obligations. Projected reductions in energy usage and greenhouse gases depending on the level of customer participation and enrollment are depicted in Table 1.

Table 1. Peak Rewards 2023 projected program impacts

	Low Participation	High Participation
Peak demand reduction per event ¹	1 megawatt	5 megawatts
Total greenhouse gas reductions*	14 metric tons CO ₂	72 metric tons CO ₂

*Assumes:

- 10 events over the program period (May to October 2023),
- 100% of load is reduced during events (and not shifted to other times of day),
- and energy reductions avoid the average emissions on the grid from 4 p.m. to 9 p.m. in September.

BACKGROUND

On August 8, 2017, the City Council approved an ordinance establishing San José Clean Energy, a community choice aggregation program, and amending Title 26 of the San José Municipal Code to create the Department to administer and manage the program. Under sections 26.40.010 and 26.40.040 of the San José Municipal Code, the Department may provide for San José Clean Energy customers any energy efficiency, rate assistance, and other energy programs as approved by the City Council. In addition, under section 2.04.4620.E of the San José Municipal Code, the Director of the Department shall “[d]evelop and implement local energy efficiency, renewable energy, and other energy programs.”

On March 9, 2021, the City Council accepted San José Clean Energy’s Programs Roadmap,² which offers a vision of the types of customer programs San José Clean Energy will evaluate and choose over the next several years. The Programs Roadmap focuses on six program areas.³ Distributed energy resources are resources on the customer side of the utility meter (or “behind the meter”),⁴ such as rooftop solar, home energy storage, and demand response.

Demand response programs compensate San José Clean Energy’s commercial and residential customers for reducing their energy use during energy-saving events. There are three ways San José Clean Energy customers can participate in demand response events:

1. Change behavior (e.g., turn off lights, stop running appliances or charging electric vehicles, adjust thermostat or building controls, etc.);
2. Allow smart devices to be automatically adjusted (e.g., program provider wirelessly adjusts smart thermostats, smart plugs, electric vehicle chargers, and heat pump water heaters, or for commercial customers, building management systems, etc.);

¹ San José Clean Energy’s peak load is approximately 1,000 megawatts.

² [SJCE Programs Roadmap](#)

³ The six program areas are 1) distributed energy resources, 2) vehicle electrification, 3) building electrification, 4) energy efficiency, 5) program-specific rates, and 6) resiliency.

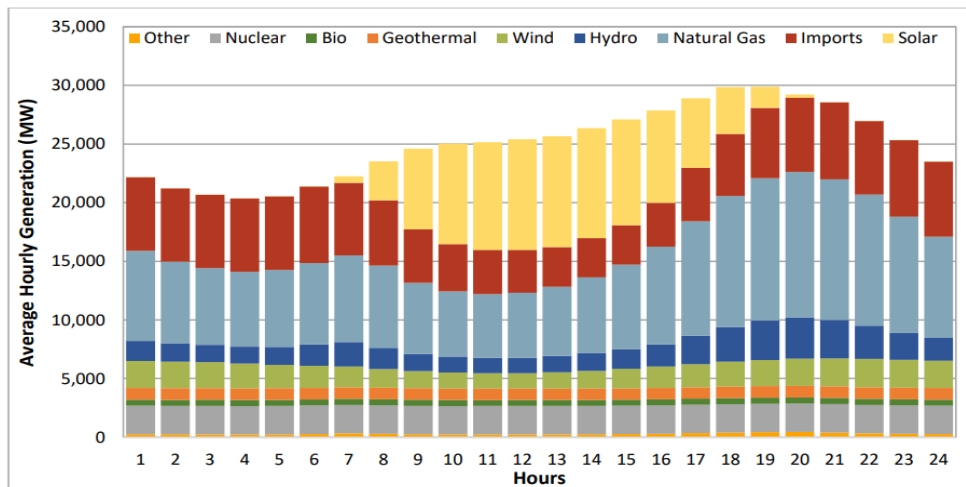
⁴ This contrasts with utility-scale solar, wind, batteries, and other energy sources located in “front of the meter.”

3. Allow battery storage systems and, in the future, electric vehicles, to discharge onto the grid.

Energy-saving events can occur throughout the year when market prices for electricity are high or during grid emergencies when overall electricity demand is projected to be greater than available supply and rolling blackouts could be imposed. Increasing supply is not the only way to meet electricity demand during these critical times; paying customers to reduce their electricity usage through demand response programs is a cost-effective way to meet demand while improving grid resiliency and reducing greenhouse gas emissions.

In California, grid emergencies and high electricity market prices have occurred during hot summer evenings, from approximately 4:00 p.m. to 10:00 p.m. Over the past decade, California's investments in solar power have resulted in an abundance of electricity during daylight hours. This abundance very quickly turns into a shortfall as the sun begins to set (Figure 1). To maintain grid stability, the state energy grid operator (i.e., California Independent System Operator) needs to bring gigawatts of capacity online within minutes. Battery storage charged during the day with renewable energy is a newer, carbon-free option for quick ramp up that power providers, including San José Clean Energy, have invested in over the last several years. Peaking power plants, which are natural gas power plants specifically designed for quick start-up, are another option but are highly polluting and have been unreliable in recent extreme weather events.⁵ Typically, these power plants pollute over 50% more than their efficient counterparts, wasting fuel and increasing costs. In addition to greenhouse gas emissions, peaking power plants are a primary source of local pollution for nearby communities, which are typically inhabited by low-income households and people of color.⁶ Large-scale demand response programs have the potential to reduce the need for peaking power plants, thereby reducing pollution and greenhouse gas emissions.

Figure 1. California Independent System Operator average hourly power production by resource type – 2020



⁵ [Politico: "Old clunkers: California power plants break down during heat wave"](#)

⁶ ["Natural gas power plants in California's disadvantaged communities," PSE Healthy Energy research brief \(2017\)](#)

In recent years, the state has provided funding to utilities to develop demand response programs to reduce electricity demand during grid emergencies called by the California Independent System Operator. San José Clean Energy elected to participate in the state's 2022 Emergency Load Reduction demand response pilot program for residential customers. Pacific Gas and Electric Company operates the Emergency Load Reduction program for San José and automatically enrolled approximately 150,000 San José Clean Energy customers in 2022. Residential and commercial customers are paid \$2 per kilowatt-hour of energy saved during grid emergencies and are not penalized for not saving energy. The pilot will continue through 2025, and San José Clean Energy can elect to participate each year. The Department is unable to evaluate the impacts from the program as investor-owned utilities have elected not to share any participation or energy savings data. San José Clean Energy plans to participate again in 2023, and as a result, Pacific Gas and Electric Company will automatically enroll approximately 125,000 existing San José Clean Energy residential customers. San José Clean Energy will likely not participate in the Emergency Load Reduction program in 2024, as the Department aims to offer its own large-scale demand response program that would offer San José Clean Energy customers more energy-saving events, and thus more opportunities to be compensated for saving energy. San José Clean Energy would help customers most in need of energy savings enroll and develop strategies to save.

ANALYSIS

In fall 2022, the Department hired a consultant to prepare a long-term demand response program strategy for San José Clean Energy that identifies the costs, benefits, requirements, and ideal pathway. The consultant found that the benefits and avoided costs of a demand response program to San José Clean Energy likely outweigh the program implementation costs by more than \$300,000. The program strategy involves a three-phase approach that increasingly reduces peak demand and ensures all customers can participate and receive benefits (Table 2). The Department recommends launching Phase 1A in summer 2023, targeted to a subset of top commercial users, and subsequently implementing a larger Phase 1B in 2024 and Phase 2 and Phase 3 in one- to two-year increments thereafter.

Table 2. Proposed Demand Response Program Phases

Proposed Design	Description	Target Audiences	Event details and enrollment	Customer incentive
Phase 1A (2023) – Behavior-Based Demand Response	Participants take action to reduce consumption (e.g., pre-cooling buildings, turning off lights, shifting energy intensive operations)	Targeted commercial customers	Advance notice provided; targeted outreach to select customers, elect to enroll in the program	\$ per kilowatt-hour reduced; No penalty for non-participation
Phase 1B (2024) – Behavior-Based Demand Response	Participants take action to reduce consumption (e.g., turning off air conditioners, lights, avoiding appliances)	Residential customers with highest usage, low-income residential customers, and all commercial customers	Advance notice provided; some customer groups automatically enrolled but can opt out; any customer can enroll	\$ per kilowatt-hour reduced; No penalty for non-participation
Phase 2 – Automated Demand Response and Load Shaping	Smart technology (thermostats, smart plugs) are wirelessly sent a signal and automatically power down; wirelessly discharging customers' battery storage systems onto the grid	Any home or business with eligible devices, battery storage, or heat pump water heaters with smart controls	No advance notice; maximum three events per month; targeted outreach to select customers, elect to enroll in the program	\$ per kilowatt-hour reduced; Free low-cost smart devices; Possible storage rebates
Phase 3 – Load Shaping	Managing peaks by making adjustments to industrial-sized equipment and wirelessly powering down electric vehicle chargers or discharging customers' electric vehicle batteries	Large offices, fast charging hubs, commercial electric vehicle fleets, residential homes with electric vehicles	No advance notice; maximum three events per month; targeted outreach to select customers, elect to enroll in the program	\$ per kilowatt-hour reduced; Possible charger rebate

Phase 1A: Summer 2023 Peak Rewards Program

The Department recommends offering a commercial demand response program from May through October 2023, called the Peak Rewards Program. Staff would develop and implement the program in-house with support on program design from consultant Energeia USA, Inc. While the program would be open to all San José Clean Energy commercial customers, the Department plans to target outreach to the top 1,000 commercial customers according to usage during periods of peak electricity demand on the grid (peak usage) and conduct direct outreach to the top 100 commercial customers by peak usage to encourage them to enroll in the program. Through Energeia USA Inc., the Department plans to offer technical support to program participants to

identify opportunities for saving energy during energy-saving events. This would include site walks to develop tailored strategies for San José Clean Energy customers and the development of case studies for similar building types and commercial activities, such as hotels or restaurants.

Between May and October, the Department expects to call up to six energy-saving events each month. Events would be triggered according to pre-determined criteria that include weather or temperature, projected electricity market prices, or state predictions for grid emergencies. Each event would last for two or four hours and would fall between the hours of 4:00 p.m. and 10:00 p.m. Customers would receive 24-hours advance notice for most events and would not be penalized for not participating in events. The Department plans to pay customers approximately \$0.50 to \$2.00 per kilowatt-hour reduced during events, calculated against their baseline usage. The event trigger criteria determine the level of incentive payments; the higher \$2.00 per kilowatt-hour would be offered during grid emergencies to match the incentive offered by the state's Emergency Load Reduction program. The Department plans to aggregate payments and apply them as bill credits on a monthly or quarterly basis.

Projected reductions in energy usage and greenhouse gases are depicted above in Table 1. Actual reductions would be measured throughout the program and will depend heavily on customer enrollment in the program and participation in events. The Department plans to apply lessons learned during summer 2023 as it designs the Phase 1B demand response program. The Department's consultant estimates that a full Phase 1 implementation can achieve 14 megawatts of peak demand reduction.

EVALUATION AND FOLLOW-UP

The Department will report on the impact of San José Clean Energy's summer 2023 Peak Rewards program in spring 2024 during its annual Programs Roadmap update to the Transportation and Environment Committee. Subject to the results of the summer 2023 program, staff may return to the City Council in early 2024 to seek approval for its expanded demand response program (Phases 1B-3).

COST SUMMARY/IMPLICATIONS

Funding for the summer 2023 Peak Rewards program would come from the Clean Energy Operating Fund. The total cost for the summer 2023 program is expected to be approximately \$325,000; a breakdown is depicted in Table 3. Program costs may be offset by reduced power procurement costs, which can jump from \$100 per megawatt-hour on a typical day to over \$1,000 per megawatt-hour during extreme heat waves, and/or lower regulatory compliance obligations for resource adequacy.⁷ Staff is exploring how to realize resource adequacy savings through the regulatory process. Other program benefits include avoided greenhouse gas

⁷ Resource adequacy is a power product all providers must purchase that ensures the provider has enough capacity to meet expected demand at all times.

emissions due to peak demand reductions, estimated to be 14 to 72 metric tons of CO₂ over the duration of the summer 2023 program. Importantly, San José Clean Energy will also be seen by regulators and the state as doing its part to reduce stress on the grid and avoid rolling blackouts during emergencies.

Table 3. Peak Rewards 2023 expected program costs

Expenditure	Amount
Incentives	\$250,000-\$260,000
Consultant support (Energeia) <ul style="list-style-type: none"> • program design • development of energy-saving strategies for participants 	\$50,000-\$60,000
Marketing	Up to \$5,000
Total	~\$325,000

BUDGET REFERENCE

The table below identifies the fund and appropriation used to fund the recommended program costs.

Fund #	Appn #	Appn Name	Total Appn	Amt. for Program*	2022-2023 Adopted Operating Budget Page	Last Budget Action (Date, Ord. No.)
501	0782	Non-Personal/Equipment	\$12,146,801	\$100,000	1036	2/14/2023, Ord. No. 30883

*Estimated funding remaining of \$225,000 for the continuation of Phase 1A Peak Rewards 2023 program expenditures in Fiscal Year 2023-2024 will be subject to the appropriation of funds as part of the upcoming 2023-2024 budget process.

COORDINATION

This memorandum has been coordinated with the City Attorney's Office and the City Manager's Budget Office.

PUBLIC OUTREACH

This memorandum will be posted on the City's Council Agenda website for the April 4, 2023 City Council meeting.

HONORABLE MAYOR AND CITY COUNCIL

March 10, 2023

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COMMISSION RECOMMENDATION/INPUT

During the meeting on January 19, 2023, the Clean Energy Community Advisory Commission agreed with staff recommendations on the 2023 programs roadmap update, which included demand response programs. The Clean Energy Community Advisory Commission further agreed with the recommendation that in the near term, before San José Clean Energy builds its operational reserves, San José Clean Energy will continue to execute existing programs and develop new educational pilots and programs that largely leverage external funding and set the groundwork for future program success. Staff should focus on cost-effectiveness and recognize that success will be driven by effective coordination with external partners and agencies.

CEQA

Not a Project, File No. PP17-008, General Procedure and Policy Making resulting in no changes to the physical environment.

PUBLIC SUBSIDY REPORTING

This item does not include a public subsidy as defined in section 53083 or 53083.1 of the California Government Code or the City's Open Government Resolution.

/s/

LORI MITCHELL

Director, Community Energy

For questions, please contact Kate Ziemba, Senior Environmental Program Manager, at kate.ziemba@sanjoseca.gov.