



Santa Clara Valley Water District

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Item No.: 5.2.

BOARD AGENDA MEMORANDUM

SUBJECT:

Climate Change Mitigation - Update on Progress Towards Carbon Neutrality by 2020.

RECOMMENDATION:

Receive and discuss information on the District's progress towards carbon neutrality by 2020.

SUMMARY:

This is an update on District efforts to achieve carbon neutrality by 2020. Using the methodology presented to the Board in 2013, staff estimates that the District will generate approximately 15,500 metric tons of carbon dioxide emissions (CO₂e) in the year 2020. For that same period, it is estimated that the District will offset approximately 20,735 metric tons of CO₂e, signifying that the District is generally on track to be carbon neutral in year 2020.

This agenda item describes Greenhouse Gas (GHG) emissions generated by District activities, reduction efforts, and progress towards achieving carbon neutrality since the last report on June 13, 2017. This report is divided into 4 sections:

- 1) Methodology for Calculating and Estimating GHG Emissions and Reduction
- 2) Updated Carbon Emission and Reduction Calculations
- 3) Energy Optimization Plan
- 4) Continuing Efforts towards Carbon Neutrality by 2020

Background

As the primary water resources agency for Santa Clara County, the District manages an integrated water resources system that includes the supply of clean safe water, natural flood protection, and stewardship of streams on behalf of Santa Clara County's 1.9 million residents.

The District's ability to provide these services is challenged by the potential of warmer temperatures, changing precipitation and runoff patterns, reduced snow pack, and rising sea levels. Managing climate change-related uncertainties, vulnerabilities, and risks to local water resource management are critical to fulfilling the District's mission.

Board Ends Policy 4.3.1 directs the District's Chief Executive Officer (CEO) to reduce greenhouse

gas emissions to achieve carbon neutrality by 2020. Over the past few years, this policy has been guiding District actions to reduce emissions and to implement energy saving projects. In addition, in September 2018, the Governor signed SB 100 - The 100 Percent Clean Energy Act of 2018. This increases the Renewables Portfolio Standard (RPS) requirement to 60% by 2030 and plans for 100% of total retail sales of electricity in California to come from eligible renewable energy resources and zero-carbon resources by December 31, 2045.

Governor Brown also signed Executive Order B-55-18 to Achieve Carbon Neutrality. This Executive Order works with SB 100 to establish a new statewide goal to achieve carbon neutrality no later than 2045 and net negative emissions thereafter.

For the District, GHG emission reduction refers to activities that reduce greenhouse gas emissions generated by District activities. Mitigation refers to reducing indirect emissions, such as those associated with the power used by District facilities and offsetting emissions through conservation and other activities. The District's strategies towards achieving carbon neutrality include:

- a. Establishing a District-wide internal carbon offset methodology to facilitate emission reduction including properly crediting emission reductions from water conservation programs, habitat restoration or enhancements, renewable energy production and contributions to countywide emission reduction efforts.
- b. Increasing fleet fuel use efficiency.
- c. Maintaining a portfolio of alternative renewable energy supplies.
- d. Increasing energy use efficiency.
- e. Identifying and developing opportunities to employ sources of alternative energy that reduce greenhouse gas emissions.
- f. Conducting periodic greenhouse gas emission inventories.
- g. Providing funding for management of the County Green Business Program.

1. Methodology for Calculating and Estimating GHG Emissions and Reduction

While District operations generate GHG emissions, they also provide opportunities to avoid, reduce and sequester GHG. On March 26, 2013, staff presented to the Board a methodology for calculating the District's GHG emission or carbon footprint and offsets. Attachment 2 provides details on this methodology. The District's carbon footprint includes direct emissions from its vehicle fleet, from onsite energy uses, and from emissions related to imported water. Carbon offsets come from conservation and green practices or activities, such as water conservation, water recycling, green business programs, and carbon sequestration from wetland and riparian restoration.

When calculating the carbon offsets for water conservation activities, the Board directed staff to account for carbon offsets from water savings that are directly attributable to District programs.

2. Updated Carbon Emission and Reduction Calculations

Table 1 provides calculated estimates of carbon emissions and offsets for years 2010 thru 2016 and projections for Years 2017 and 2020. The Year 2020 estimated emissions have been reduced to 15,500 metric tons (MT) from previous estimates after revising the State Water Project emissions

estimate compared with a total anticipated offset of 20,735 MT.

Table 1. Summary of Estimated and Projected Carbon Footprint and Offset in MT Co2e/Year

Calendar Year	2010	2011	2012	2013	2014	2015	2016	2017 ⁹	2020
Emissions	22,100	21,800	29,800	29,700	18,500	22,200	16,200	15,300	15,500
1. Direct Emissions from District Operations	2,200 ¹	2,300 ¹	2,500	2,800	3,000	2,100	2,100	2,400	2,200
2. Emissions from Purchased Electricity	2,200 ¹	500 ¹	3,400	4,000	6,000	6,300	200	200	200
3. Other Emissions	17,700	19,000	23,900	22,900	9,500	13,800	13,900	12,700	13,100
a. State Water Project	14,800	16,100	21,000	20,000	6,600 ²	10,900 ²	12,100 ²	11,000	11,500 ³
b. Central Valley Project	0	0	0	0	0	0	0	0	0
c. Import from SFPUC	0	0	0	0	0	0	0	0	0
d. Employee Commute	1,500	1,500	1,500	1,500	1,500	1,500	1,700 ¹⁰	1,600	1,500
e. Business Travel	1,400	1,400	1,400	1,400	1,400	1,400	100 ¹¹	100	100
Reduction/Sequestration	22,370	23,060	24,400	23,110	24,080	24,235	19,135	19,235	20,735
1. Water Conservation Program (WCP)	17,100	17,800	18,400 ⁴	16,700 ⁴	17,600 ⁴	17,800 ⁴	13,900 ⁴	14,400	14,800 ⁵
2. Recycled water	2,500	2,500	3,000	3,500	3,700	3,400	3,200	2,800	3,900
3. Carbon sequestration	500	500	500	500	500	500	500	500	500
4. Green Business Program	2,200	2,200	2,200	2,200	2,200	2,200	1,200	1,200	1,200
5. Energy Optimization Measures (EOMs)	70 ⁶	60 ⁶	300 ⁶	210 ⁶	80 ⁶	335 ⁷	335 ⁷	335	335 ⁸
C. Carbon Neutrality (want positive)	270	1,260	-5,400	-6,590	5,580	2,035	2,935	3,935	5,235

Notes to Table 1:

¹ Verification completed;

² District specific emission factor (EF) based on reported EF for CY 2014 through 2016 for the State Water Project; It should be noted that these numbers differ from EFs calculated from CA ISO EFs.

³ Projection based on DWR's projected emission reduction of 33% by CY 2020 and updated water supply projection for 2020;

⁴ Adjusted based on decreases in Pacific Gas and Electric's (PG&E) emission factors as compared to the 3-year averages of CY 2005 to 2007;

⁵ Projection based on a 45% reduction in PG&E's CY 2020 EF compared to the 3-year average of CY 2005 to 2007.

⁶ This has been updated using reported energy productions and emission factors for each corresponding year.

⁷ The update includes energy conservation measure completed in FY 2015 in addition to zero-emission energy production through on site solar and Anderson Hydro.

⁸ Future emission reduction benefits of EOMs will be minimized as the primary sources of energy are anticipated to be carbon free.

⁹ These are preliminary numbers for 2017 using currently available data and estimations using three year averages and 2016 emission factors.

¹⁰ Employee commute data has been updated to include emissions from contract staff and interns.

¹¹ The factors for calculating business travel has been updated.

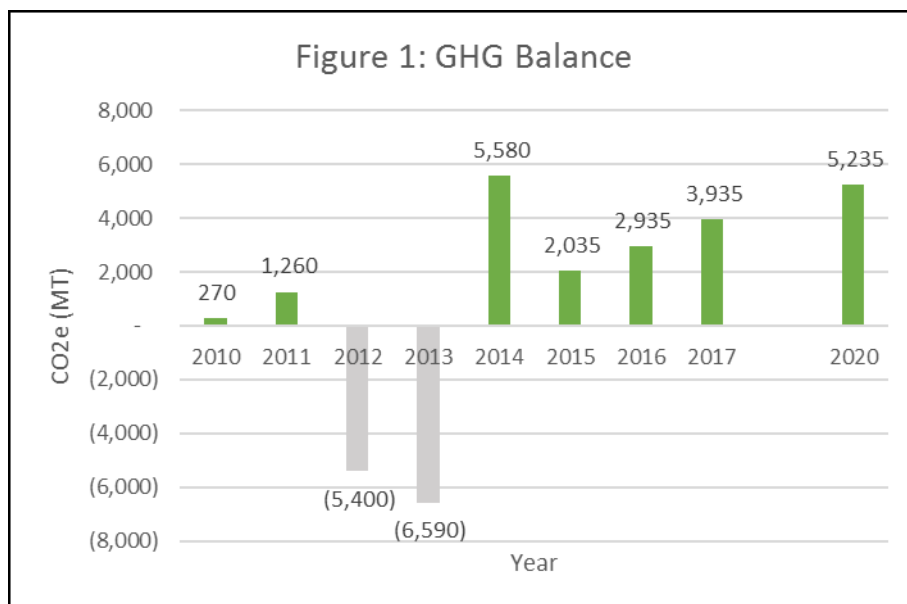


Figure 1 below shows a summary of the results of the District's carbon neutrality efforts as calculated in Table 1, with a positive number indicating that reduction/sequestration efforts were greater than GHG emissions associated with District activities. Since 2014, the District has been carbon neutral and the overall trend of the District's carbon neutrality program is positive and is expected to continue to improve into the future. The biggest reduction is achieved through water conservation, however, as shown in Figure 1, the District's overall carbon emission neutrality can vary significantly from year to year. The largest contributor to emissions continues to be the State Water Project and the corresponding emissions resulting from the electrical power used by the state to pump water. For example, in years 2012 and 2013, the District received large quantities of water through the State Water Project (SWP). Combined with higher than current emissions factors (metric tons per acre-foot), resulted in high District emissions in those years, exceeding the reductions and sequestration amounts. Whereas, in 2014, when initial water allocations from the state were zero and later increased to 5%, the District received much less water from the state resulting in very low GHG emissions and an overall positive GHG balance. This will continue to be a challenge in years that the District receives a large amount of water from the state, but as the state continues making progress on its own GHG reduction goals, the emissions per acre-foot of delivered SWP water are expected to decrease making this less of a factor.

3. Emission Reduction through Energy Management

This section outlines the status of the energy optimization effort, which includes the development of renewable energy projects, and energy efficiency and conservation efforts.

Overview of Renewable Energy Projects

The District is a member of the Power and Water Resources Pooling Authority (PWRPA), a joint powers authority (JPA), to collectively manage electrical loads and generation assets. PWRPA is subject to the State of California “Renewable Portfolio Standard” (RPS) mandate, whereby electric utilities must serve a RPS percentage of retail sales with renewable resources within a given Compliance Period. In addition to supporting the Board’s governance policy to achieve carbon neutrality, the local and utility-scale renewable energy projects pursued by the District through PWRPA also contribute to PWRPA’s requirement to meet the RPS mandate. The status of these efforts is described below.

A. Local Renewable Projects

In 2016, the District completed construction of a local 260 kilowatt (KW) solar installation at its Santa Teresa Water Treatment Plant (STWTP) and a local 248 KW solar installation at the Penitencia Water Treatment Plant (PWTP) through 20-year power purchase agreements (PPA) with a third-party solar developer.

Due to reduced operating time to accommodate extended maintenance shutdowns that occurred at each water treatment plant, the solar installations combined to produce approximately 635 megawatt-hours (MWh) of energy in Calendar Year (CY) 2017. During typical years, the solar installations are expected to combine to generate approximately 850 (MWh) of energy annually over the 20-year duration of the projects.

To support additional local solar development, staff released a Request for Proposals (RFP) through PWRPA in January 2018 to solicit interest in developing new solar installations at the Almaden Campus, Rinconada Water Treatment Plant (RWTP), and Silicon Valley Advanced Water Purification Center (SVAWPC). Given that the cost of smaller local projects is typically higher than larger utility scale projects, even with the avoidance of transmission and distribution costs, it is challenging to develop cost effective local solar projects. However, under a new PPA, the District will be replacing the solar panels at its existing Headquarters campus solar installation with new, more efficient, panels which will increase power generation and extend the life of the facility. A future installation at the Rinconada Water Treatment Plant will be developed after completion of the ongoing plant construction project. In the meantime, the District is continuing to explore ways to make these projects more cost competitive and to develop more renewable energy projects.

B. Utility-Scale Renewable Projects

Participation in utility-scale solar projects through PWPRA increases the renewable energy in the District’s electrical generation portfolio and provides renewable energy to the District with the same environmental benefits as the solar projects located at the District’s water treatment plants, and at a lower cost to the District.

In 2018, the District Board of Directors authorized the CEO to execute a 20-year Rate Agreement with PWRPA to participate in a new utility scale solar project located in Kings County. Through PWRPA, the District negotiated a 1.5 MW allocation of the utility-scale solar development to receive carbon-free, renewable energy. PWRPA continues to negotiate in the best interest of its members.

In addition to this new project, the District continues to benefit from two existing utility-scale solar developments currently in operation: a 400 kilowatt (KW) allocation of the 75 MW utility-scale Astoria 2 Solar project located in Kern County; and a 750 KW allocation in the 20 MW Whitney Point Solar Project in Fresno County.

Staff continues to evaluate opportunities to participate in local and utility-scale renewable projects through PWRPA to further reduce the carbon intensity of the energy the District purchases from PWRPA.

C. In-Conduit Hydroelectric - Anderson Hydroelectric Facility

The previous PPA that allowed the District to export energy generated by the Anderson hydroelectric facility back to PG&E expired near the end of 2018. A 2016 study by NLine Energy, Inc. (NLine) presented multiple options with various alternative equipment configurations for transitioning the facility upon the expiration of the PPA.

Due to anticipated interruptions during the upcoming Anderson Dam Seismic Retrofit Project, staff will continue to support the existing equipment configuration and transitioned the facility to PG&E's Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) Program. The RES-BCT program is a low-risk option that allows the District to get credit for any energy generated by the hydroelectric facility and use the energy credit to offset the energy bill of other District PG&E sites throughout the county. There is no long-term obligation and the District can leave the program at any time.

No other feasible sites have been identified for in-conduit hydro-electric energy development, but staff will continue to evaluate energy recovery and other emerging energy-efficient technologies that may be compatible with District operations.

D. Community Choice Aggregation

While the District secures power for large facilities through PWRPA, the District has approximately 140 minor facilities and remote turnouts that have PG&E electric services. 43 of the District's 140 minor PG&E electric services are currently enrolled in Silicon Valley Clean Energy (SVCE). SVCE is a new public, locally controlled, electric generation service provider that offers 100% carbon-free electricity for approximately 1% less than average PG&E costs.

Participation in SVCE is location specific and is available in the following communities within Santa Clara county: Campbell, Cupertino, Gilroy, Los Altos, Los Altos Hills, Los Gatos, Monte Sereno, Morgan Hill, Mountain View, Saratoga, Sunnyvale and unincorporated County of

Santa Clara.

The majority of the District's remaining minor facilities that do not meet the location requirements of SVCE may qualify for the City of San Jose's upcoming community choice aggregation program. On May 16, 2018, the San Jose City Council voted to establish San José Clean Energy (SJCE), a community choice aggregation expected to launch in early 2019 that will offer carbon-free energy at a competitive price, similar to SVCE.

Staff will evaluate new and existing minor PG&E services for the opportunity to benefit from local community choice aggregations to increase the percentage of carbon-free electricity in the District's portfolio.

E. Energy Optimization Plan

The District continues to implement the energy optimization measures (EOMs) recommended by the Energy Optimization Plan, a comprehensive energy audit conducted by Black & Veatch in 2013. Of the original 49 EOMs recommended by the Energy Optimization Plan, staff has completed 37 EOMs as shown in Attachment 3. There are currently 7 EOMs in progress, and 5 EOMs were deferred until after commissioning of the RWTP Reliability Improvement Project (RIP).

Effective energy management and efforts from the Energy Optimization Plan help lower the District's direct and indirect emissions presented in Table 1. Increasing the percentage of renewable resources in the District's energy portfolio through local and utility-scale solar projects helps to lower the emission factor of PWRPA, which results in lower indirect emissions from purchased energy. Enrolling qualifying PG&E sites in local community choice aggregations can further reduce indirect emissions by converting small remote sites to 100% carbon-free energy.

4. Continuing Efforts towards Carbon Neutrality by 2020

The District's GHG emission reduction framework provides continued guidance in ways to reduce direct emissions and GHG reduction strategies for achieving carbon neutrality. Though the current estimates demonstrate that the District is on track to be carbon neutral by 2020, these strategies continue to be instrumental for maintaining carbon neutrality for years beyond 2020. Continued monitoring will help to identify and leverage opportunities for further reductions and maintaining neutrality. Future opportunities include:

- A. Diversified water supply portfolio: About two thirds of imported water comes from zero-emission sources; the federal Central Valley Project and the gravity-fed Hetch Hetchy system. In 2010, about three-fifths of the energy used by the SWP was zero-emission hydroelectricity. California Department of Water Resources (DWR) is continuing its efforts to reduce GHG emission for the SWP. In 2015, energy sources used by the SWP were 65% carbon free, a 5% rise in carbon free energy compared to 2010. In 2016, DWR accelerated its path towards achieving a 33% total GHG emission reduction by 2020, and added close to 146-MW of renewable energy contracts to its portfolio. Staff anticipates further reduction in GHG emission related to the District receiving imported water from the SWP.

- B. Cost effective and renewable energy sources: Through PWRPA, the District continues to explore opportunities to develop additional local and utility scale solar projects at a competitive cost. Staff is also monitoring the various community choice aggregations for opportunities to further reduce the carbon intensity of the power for the District's minor facilities.
- C. Conservation/Efficiency Programs: Over two thirds of the carbon offsets come from the District's water conservation program. Water and Energy efficiency and conservation continues to be the most cost effective way of achieving emission reduction. The water conservation program, along with the energy optimization plan, will continue to play an important role in future GHG emission reduction.
- D. Efficiency Planning: The District continues to implement energy conservation measures identified in the Energy Optimization Plan. Staff are developing a scope of work for a new energy efficiency study with a focus on pumping efficiency and evaluation of the SVAWPC for opportunities to further improve energy efficiency.
- E Other efforts: The District also supports green business practices and the District's Green Team Employee Resources Group to promote green practices through the way we work and live. Data collected and lessons learned can be shared and leveraged to provide GHG reductions for years beyond 2020. They could also be incorporated into the upcoming Climate Change Action Plan for furthering GHG reduction.

FINANCIAL IMPACT:

There is no direct fiscal impact from the recommended action to receive information on the District's progress towards achieving carbon neutrality by 2020. Implementation of unfunded elements of the Energy Optimization Plan may be presented to the Board for funding in future fiscal years.

CEQA:

The recommended action does not constitute a project under CEQA because it does not have a potential for resulting in direct or reasonably foreseeable indirect physical change in the environment.

ATTACHMENTS:

Attachment 1: PowerPoint

Attachment 2: Methodology

Attachment 3: Status of Energy Optimization Plan

UNCLASSIFIED MANAGER:

Kurt Arends, 408-630-2284