Santa Clara Valley Water District

File No.: 20-0379

Agenda Date: 6/9/2020
Item No.: 5.1.

BOARD AGENDA MEMORANDUM

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

RECOMMENDATION:
Receive and discuss information on Valley Water's progress towards carbon neutrality by 2020.

SUMMARY:
This is an update on Valley Water's efforts to achieve carbon neutrality by 2020. Using the methodology presented to the Board in 2013, staff estimates that Valley Water will generate 15,500 metric tons of carbon dioxide emissions (CO_2e) in the year 2020. For that same period, it is estimated that Valley Water will offset 19,535 metric tons of CO_2e, signifying that Valley Water is on track to be carbon neutral in year 2020.

This agenda item describes Greenhouse Gas (GHG) emissions generated by Valley Water activities, reduction efforts, and progress towards achieving carbon neutrality since the latest report on January 22, 2019. Presented below is the background on the policy guidance as well as a summary of the methodology used for calculating the GHG emissions as well as our efforts towards carbon neutrality.

Background

As the primary water resources agency for Santa Clara County, Valley Water 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.

Valley Water'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 Valley Water's mission.

Board Ends Policy 4.3.1 directs the Valley Water'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 Valley Water 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.

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

a. Establishing a Valley Water-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. Efficient energy use.
e. Identifying and developing opportunities to employ sources of alternative energy that reduce greenhouse gas emissions.
f. Conducting periodic greenhouse gas emission inventories.
g. Continue to support Green Business Program.

Methodology for Calculating and Estimating GHG Emissions and Reduction

While Valley Water 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 Valley Water's GHG emission or carbon footprint and offsets. The Valley Water'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 Valley Water programs.

Updated Carbon Emission and Reduction Calculations

Table 1 provides calculated estimates of carbon emissions and offsets for years 2010 thru 2017 and adjusted the projection for Year 2020. The Year 2020 estimated emissions remain unchanged at 15,500 metric tons (MT) but offsets is estimated to be 19,535 MT.

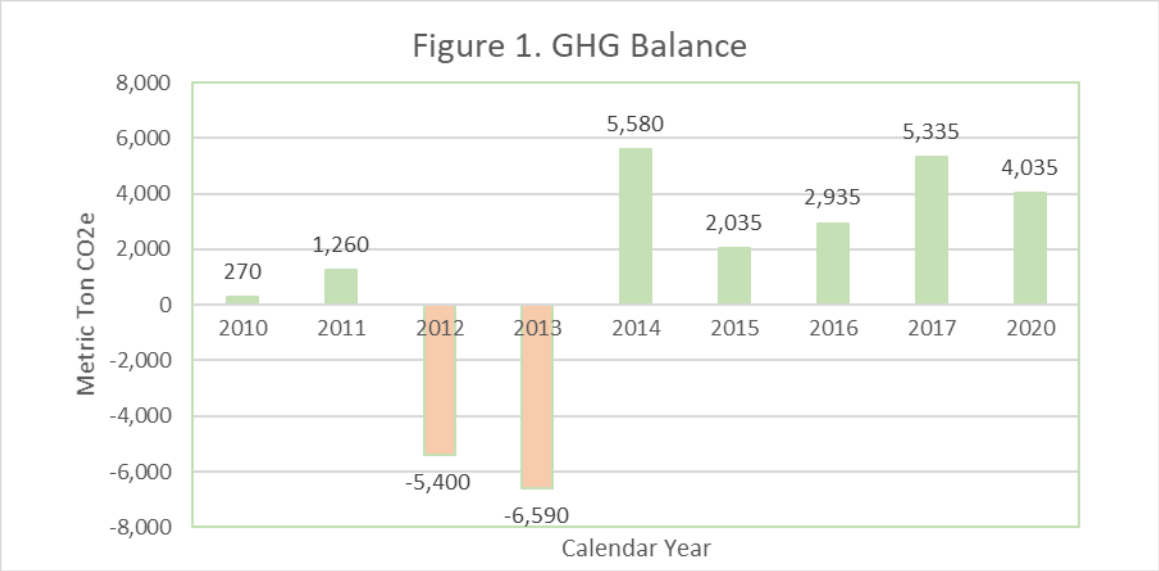
Table 1. Summary of Estimated and Projected Carbon Footprint and Offset in MT Co2e/Year

Calendar Year	2010	2011	2012	2013	2014	2015	2016	2017[i]	2020
Emissions	**22,100**	**21,800**	**29,800**	**29,700**	**18,500**	**22,200**	**16,200**	**13,900**	**15,500**
1. Direct Emissions from District Operations	2,200[a]	2,300[a]	2,500	2,800	3,000	2,100	2,100	1,800	2,200
2. Emissions from Purchased Electricity	2,200[a]	500[a]	3,400	4,000	6,000	6,300	200	100	200
3. Other Emissions	17,700	19,000	23,900	22,900	9,500	13,800	13,900	12,000	13,100
a. State Water Project	14,800	16,100	21,000	20,000	6,600[b]	10,900[b]	12,100[b]	10,300	11,500[c]
b. Employee Commute	1,500	1,500	1,500	1,500	1,500	1,500	1,700[j]	1,600	1,500
c. Business Travel	1,400	1,400	1,400	1,400	1,400	1,400	100[k]	100	100
Reduction/ Sequestration	**22,370**	**23,060**	**24,400**	**23,110**	**24,080**	**24,235**	**19,135**	**19,235**	**19,535**
1. Water Conservation Program (WCP)	17,100	17,800	18,400[d]	16,700[d]	17,600[d]	17,800[d]	13,900[d]	14,400	14,800[e]
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	0[l]
5. Energy Optimization Measures (EOMs)	70[f]	60[f]	300[f]	210[f]	80[f]	335[g]	335[g]	335[g]	335[h]
C. Carbon Neutrality (want positive)	**270**	**1,260**	**-5,400**	**-6,590**	**5,580**	**2,035**	**2,935**	**5,335**	**4,035**

Notes to Table 1:
[a] Verification completed;
[b] 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.
[c] Projection based on DWR's projected emission reduction of 33% by CY 2020 and updated water supply projection for 2020;
[d] 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;
[e] Projection based on a 45% reduction in PG&E's CY 2020 EF compared to the 3-year average of CY 2005 to 2007.
[f] This has been updated using reported energy productions and emission factors for each corresponding year.
[g] The update includes energy conservation measure completed in FY 2015 in addition to zero-emission energy production through on site solar and Anderson Hydro.
[h] Future emission reduction benefits of EOMs will be minimized as the primary sources of energy are anticipated to be carbon free.
[i] This emission factor was estimated based on a five-year average to be conservative.
[j] Employee commute data has been updated to include emissions from contract staff and interns.
[k] The factors for calculating business travel has been updated.
[l] This number is revised to reflect that funding contribution to the countywide green funding for year 2020 is being negotiated.

Figure 1 below shows a summary of the results of Valley Water'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 Valley Water activities. Since 2014, Valley Water has been carbon neutral and the overall trend of the Valley Water'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 the figure, Valley Water'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, Valley Water 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 Valley Water emissions in those years, exceeding the reductions and sequestration amounts. This will continue to be a challenge in years that Valley Water receives a large amount of water from the state. However, the California Department of Water Resources has made great strides in meeting its own GHG reduction goals; the emissions per acre-foot of delivered SWP water are expected to decrease in the coming years, making this less of a factor.



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

Valley Water 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 Valley Water 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

On March 27, 2018, the Board of Directors authorized Valley Water Counsel to accept a settlement offer from BP Solar International for the defective solar panels at the Almaden Campus carport installation. The carport solar panels were removed in January 2019 to meet the conditions of the settlement letter.

With the rehabilitation work structured as a 20-year power purchase agreement (PPA), the current proposal includes the installation of a 168 kilowatt (KW) solar installation, nearly 40% more capacity than the original system size due to the increased efficiency of modern solar panels, and is expected to produce over 240 megawatt-hours (MWh) of energy per year. This proposed system size was optimized to increase energy production of the system while reusing key infrastructure of the original system to help keep project costs competitive.

Valley Water Board of Directors authorized the CEO in April 2020 to negotiate and execute the Rate Agreement with PWRPA required for the project. Staff continue to negotiate the PPA and site license agreement with the solar developer and anticipate for construction to begin by Winter 2020.

Valley Water continues to benefit from other local solar projects, including a 260 KW solar installation at its Santa Teresa Water Treatment Plant and a 248 KW solar installation at the Penitencia Water Treatment Plant through 20-year PPAs. The water treatment plant solar installations combined to produce approximately 410 MWh of energy in 2019.

B. Utility-Scale Renewable Projects including Battery Storage

In 2018, Valley Water Board of Directors authorized the CEO to execute a 20-year Rate Agreement with PWRPA to participate in the new Recurrent Energy Slate solar project, a 330 megawatt (MW) utility-scale solar project located in Kings County. Through PWRPA, Valley Water secured a 1.5 MW allocation of the utility-scale solar development to receive carbon-free, renewable energy, and is currently negotiating to add a 500 KW battery energy storage system to supplement the solar allocation and further increase the benefits of the Project.

The addition of a battery energy storage system provides greater flexibility in managing the generated output of Valley Water's solar allocation to adapt to changing market and demand conditions. The battery energy storage system will also help increase the capacity of the overall project and provide a cost-effective option to meet resource adequacy regulations set in place by the California Public Utilities Commission to ensure safe and reliable operation of the utility power grid. In addition to using the generated renewable energy more effectively, all available cost-benefit analysis shows a positive value for the battery energy storage system.

Valley Water continues to benefit from participation in two existing utility-scale solar

developments currently in operation: a 400 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.

C. Local Battery Storage

Valley Water is evaluating a recent California Public Utilities Commission (CPUC) decision to expand an existing Self-Generation Incentive Program (SGIP) by establishing an Equity Resiliency Budget designed to provide rebates for battery storage systems installed for critical customers of its regulated electric utilities located in high fire-threat districts. Primarily, this incentive would help Valley Water respond to extended power interruptions including PG&E Power Safety Power Shutoff (PSPS) events.

Staff estimates that 10-20 remote sites may qualify for the SGIP Equity Resiliency Budget to fully, or close to fully subsidize the cost of a battery storage system and help the sites stay operational during a PSPS event. Valley Water is gathering preliminary data from battery storage developers and PG&E to confirm site eligibility, system requirements, and resulting costs to determine battery storage feasibility for the remote sites.

D. Community Choice Aggregation

Valley Water secures power for large facilities through PWRPA, however also manages approximately 150 minor facilities and remote turnouts that use PG&E electric services. For many of these accounts, Valley Water benefits from community choice aggregation (CCA) in which a public, locally controlled, electric generation service provider offers 100% carbon-free energy for approximately 1% less than average PG&E costs.

Since the participation is location specific based on service territories, Valley Water currently has 47 minor services enrolled in Silicon Valley Clean Energy (SVCE) and has 50 minor services enrolled in the new San Jose Clean Energy (SJCE), which launched in spring 2019. Valley Water has opted out of CCA participation for 40 minor sites in order to benefit from similar carbon-free and renewable energy programs through PG&E, which do not allow concurrent participation in a CCA. Staff continue to evaluate Valley Water remote sites for opportunity to increase participation in CCA to further benefit from the carbon-free energy provided.

E. Energy Optimization Plan

Valley Water 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. Attachment 1 lists 7 EOMs (e.g., lighting, chiller replacements) currently in progress and 5 EOMs (e.g., motor pump replacement project) deferred until after commissioning of the RWTP Reliability Improvement Project (RIP). With full implementation of these 49 EOMs, Valley Water is estimated to save up to 3,220 MWh of energy annually.

Effective energy management and efforts from the Energy Optimization Plan help lower Valley Water's direct and indirect emissions presented in Table 1. Increasing the percentage of renewable resources in Valley Water'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.

Continuing Efforts towards Carbon Neutrality by 2020

Valley Water'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 Valley Water 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. DWR lowered its GHG emissions by 50 percent below 1990 levels in 2015 and, based on the recent reporting, 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, Valley Water continues to explore opportunities to develop additional local and utility scale solar projects at a competitive cost. Staff plans to re-evaluate potential solar development options at Rinconada Water Treatment Plant (RWTP) following the RWTP Reliability Improvement Project (RIP). Staff is also monitoring the various community choice aggregations for opportunities to further reduce the carbon intensity of the power for Valley Water's minor facilities.

C. Conservation/Efficiency Programs: Over two thirds of the carbon offsets come from Valley Water'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: Valley Water 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. Climate Change Action Plan (CCAP): Valley Water is developing a Climate Change Action

Plan. The purpose is to guide Valley Water's climate change response through the development of goals and strategies that address both mitigation (greenhouse gas reduction) and adaptation efforts (including sea level rise) to respond to the challenges that climate change will create for Valley Water's mission areas. Based on a review of projected climate impacts and an assessment of Valley Water's specific vulnerabilities to climate impacts, the CCAP builds upon Valley Water's existing climate change efforts and presents a set of goals, strategies and actions to continue and expand implementation of these efforts. The Plan provides an opportunity to update the greenhouse gas emission reduction and adaptation goals and strategies. Valley Water's CCAP development has continued to make significant additional progress, however, due to the impacts of COVID-19, the anticipated completion of the plan is delayed from summer 2020 to fall 2020. The CCAP team continues to finalize the strategies and develop the planning document in collaboration with staff throughout Valley Water.

FINANCIAL IMPACT:
There is no direct fiscal impact from the recommended action to receive information on Valley Water'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: EOMs to Be Completed

UNCLASSIFIED MANAGER:
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