City of Palo Alto (ID # 11785)

Utilities Advisory Commission Staff Report

Report Type: New Business **Meeting Date: 1/6/2021**

Council Priority: Climate/Sustainability and Climate Action Plan

Summary Title: Informational Report on 2019 Renewable and Carbon Neutral Electricity Supplies

Title: Informational Report on Annual Review of the City's Renewable Procurement Plan, Renewable Portfolio Standard Compliance, and Carbon Neutral Electric Supplies for 2019

From: City Manager

Lead Department: Utilities

Recommendation
This report is for information only. No action is required.

Executive Summary
The attached report (Staff Report 11677), which was delivered to the City Council on December 7, 2020, is for the Utilities Advisory Commission's (UAC's) information. This report provides an update on the City's accomplishments with respect to its Renewable Portfolio Standard (RPS) and Carbon Neutral Plan objectives—including an assessment of the City's electric utility emissions calculated using the recently adopted hourly emissions accounting methodology. Further, the report satisfies the reporting requirements of the City's RPS Enforcement Program.

As the report describes, the City continues to meet its objectives under the RPS Procurement Plan and the Carbon Neutral Plan, and achieved an RPS level of 37% in 2019—exceeding the state's 31% procurement mandate for the year. And although the switch to the hourly carbon accounting approach did not go into effect until 2020, it is interesting to note that even though the City had a net surplus of carbon neutral generation in 2019, on an annual basis, under the hourly accounting approach the City's electric supply portfolio is found to be responsible for a net positive amount of GHG emissions: 8,085 metric tonnes of CO2 equivalent.

Attachments:
- Attachment A: Staff Report 11677

City of Palo Alto
City Council Staff Report

(ID # 11677)

Report Type: Informational Report **Meeting Date: 12/7/2020**

Council Priority: Climate/Sustainability and Climate Action Plan

Title: Informational Report on 2019 Renewable and Carbon Neutral Electricity Supplies

Subject: Annual Review of the City's Renewable Procurement Plan, Renewable Portfolio Standard Compliance, and Carbon Neutral Electric Supplies for 2019

From: City Manager

Lead Department: Utilities

Executive Summary
Like all electric utilities in California, Palo Alto is subject to the state's Renewable Portfolio Standard (RPS) mandate of 60% by 2030. The City has also adopted a Carbon Neutral Plan, which led to the achievement of a carbon neutral electric supply portfolio starting in 2013 (and which was updated by Council in August 2020). In 2011, in compliance with state RPS regulations, the Council also formally adopted an RPS Procurement Plan and an RPS Enforcement Program that recognize certain elements of the state's RPS law applicable to publicly-owned utilities. The RPS Enforcement Program requires the City Manager, or their designee, the Utilities Director, to conduct an annual review of the Electric Utility's compliance with the procurement targets set forth in the City's RPS Procurement Plan.

This staff report satisfies the reporting requirements of the City's RPS Enforcement Program, while also providing an update on the City's compliance with the Carbon Neutral Plan. The City continues to meet both its RPS and carbon neutrality objectives—even after selling over 200,000 MWh of renewable energy in 2019.

Background
The City currently has two independent procurement targets related to renewable and carbon neutral electricity:

- RPS Procurement Plan (60% by 2030): The City's official renewable electricity goal is contained in the RPS Procurement Plan that the City was required to adopt under Section 399.30(a) of California's Public Utilities Code. This was adopted in December 2011 (Staff Report 2225, Resolutions 9214 and 9215) and updated in November 2013 (Staff Report 4168, Resolution 9381) and December 2018 (Staff Report 9761, Resolution 9802)—and is slated to be updated again in December 2020 (Staff Report 11650) . The

pending update to the RPS Procurement Plan is designed to bring it into alignment with the state's 60% RPS law (SB 100), which was signed into law in 2018.[1] The RPS Procurement Plan and RPS Enforcement Program complement each other: the Procurement Plan establishes official procurement targets, while the Enforcement Program specifies the reporting and monitoring that is required of the Utilities Director while working to achieve those targets.

The procurement requirement in the version of the City's RPS Procurement Plan being considered by Council in December is that the City acquire renewable electricity supplies equal to 60% of retail sales by 2030, which is in line with the state's current RPS mandate[2]. The RPS Procurement Plan also contains interim targets for six separate periods (2011-2013, 2014-2016, 2017-2020, 2021-2024, 2025-2027, and 2028-2030).

- Carbon Neutral Plan (100% Carbon Neutral Electricity by 2013): The Carbon Neutral Plan was adopted in March 2013 (Staff Report 3550, Resolution 9322) and updated in August 2020 (Staff Report 11556, Resolution 9913), and requires that the City procure a carbon neutral electric supply portfolio starting in calendar year (CY) 2013. In general, this goal is expected to be achieved primarily through purchases made under the City's long-term renewable power purchase agreements (PPAs) and output from its hydroelectric resources. However, when the City Council approved an update to the Carbon Neutral Plan in August 2020, they also approved a new procurement strategy whereby the City does not keep all of the output of its long-term, in-state PPAs, but instead exchanges that output for less expensive out-of-state renewable generation.

Discussion

The City continues to meet its objectives under the RPS Procurement Plan and the Carbon Neutral Plan, and achieved an RPS level of 37% in 2019—exceeding the state's 31% procurement mandate for the year. Below is a summary of CPAU's progress toward satisfying its renewable energy and carbon neutral procurement targets, with additional detail provided in Exhibit A.

RPS Procurement Plan Compliance

In CY 2019, the City initially received 535,145 MWh of renewable energy through its long-term contracts for wind, solar, landfill gas, and small hydro resources (which represents 62.1% of the City's total retail sales for that period). Additionally, the City received 665,359 MWh of large hydroelectric generation (representing 77.2% of the City's total retail sales), which is not classified as eligible renewable generation by the state. Because of the favorable hydro conditions for the year the City had a large surplus of carbon neutral generation overall, and,

[1] Although SB 100 became law in 2018, the California Energy Commission (CEC) has yet to formally adopt regulations implementing the new law. The pending update to the City's RPS Procurement Plan is based on the current RPS regulations, which CEC adopted on Oct. 14, 2015 with an effective date of April 12, 2016; however, it is possible that the City will need to update its RPS Procurement Plan again in 2021 if the adopted RPS regulations differ significantly from the draft version of the regulations.

[2] CA Public Utilities Code Sec. 330.3(c)(2).

based on feedback from the Utilities Advisory Commission, staff decided to sell the majority of this surplus from the renewable energy supplies (because this generation is more valuable to other utilities than the large hydro generation). Ultimately the City sold 216,110 MWh of renewable energy supplies, yielding $3.34 million in sales revenue. Accounting for these sales, the City's net renewable energy supplies totaled 319,035 MWh, which represents 37.0% of the City's total retail sales for 2019.

For CY 2020, staff has currently contracted to sell about 324,000 MWh of renewable generation, and projects that the City's remaining renewable electricity supplies from in-state resources will equal 26.0% of retail sales. However, after accounting for the purchase of out-of-state renewable supplies, the City's total renewable electricity supplies are projected to equal 55.4% of retail sales.

In accordance with the state's RPS Program requirements, CPAU's Procurement Plan develops a renewable electric supply portfolio that balances environmental goals with system reliability while maintaining stable and low retail electric rates. The state RPS program requires retail electricity suppliers like CPAU to procure progressively larger renewable electricity supplies across a series of separate multi-year Compliance Periods. CPAU's procurement targets, as well as its actual/projected procurement volumes and RPS levels, for the first three Compliance Periods are summarized in Table 1 below. For these three compliance periods, the City has increasingly purchased more renewable electricity supplies than the respective procurement targets.

Table 1: RPS Compliance Period Procurement Targets and Actual/Projected Procurement

RPS Compliance Period	Years	Retail Sales (MWh)	Procurement Target (MWh)	Actual/Projected Procurement* (MWh)	Target % of Retail Sales	Actual/Projected % of Retail Sales
1	2011-2013	2,837,773	567,555	607,740	20%	21.4%
2	2014-2016	2,801,056	605,949	826,855	21.7%	29.5%
3	2017-2020	3,458,925	1,033,933	1,667,716	30%	48.2%
TOTALS		9,097,754	2,207,437	3,102,311		34.1%

*Procurement totals for Compliance Periods 1 and 2 are actuals; procurement totals for Compliance Period 3 are a combination of actual data (for 2017-2019) and projected data (for 2020), and account for executed sales of 324,000 MWh of renewable supplies for 2020.

Carbon Neutral Plan

In CY 2019, CPAU achieved its goal, set forth in the Carbon Neutral Plan, of an electric supply portfolio with zero net greenhouse (GHG) emissions for the sixth consecutive year, without the need to purchase unbundled renewable energy certificates (RECs) in the market. Carbon neutrality was achieved in CY 2019 through existing hydro and renewable generation (wind, solar, and landfill gas). Due to favorable hydro conditions, the City had a large surplus of energy, allowing for the sale of 216,000 MWh of renewable energy while still maintaining a carbon neutral supply portfolio (when evaluated using an annual carbon accounting framework).

When the City Council approved an update to the Carbon Neutral Plan in August 2020, the primary change was to adopt an *hourly* carbon accounting methodology as the basis for determining whether the City has met its carbon neutrality objective. Although this change did not apply to the City's electric supply portfolio for CY 2019, it is interesting to note how the City's supply portfolio would have fared under this accounting framework. Under the annual accounting approach, the City had an overall surplus of 85,569 MWh of carbon neutral generation compared to its load (equal to 9.4% total load), and thus substantially *exceeded* the carbon neutrality standard. However, under the hourly carbon accounting approach,[3] the City's electric supply portfolio is found to be responsible for a net positive amount of GHG emissions for CY 2019: 8,085 metric tonnes of CO2 equivalent.

For CY 2020, slightly below average hydro conditions are expected to result in about 46% of the City's electric supply needs being supplied by hydroelectric resources, with the remainder coming from non-hydro renewable energy resources (including purchases of out-of-state unbundled RECs).

Policy Implications

This report implements Sections 4 and 5 of the City's RPS Enforcement Program, which require an annual review of the Electric Utility's compliance with the CPAU RPS Procurement Plan to ensure that CPAU is making reasonable progress toward meeting the compliance obligations established in the CPAU RPS Procurement Plan.

Environmental Review

The Council's review of this report does not meet the definition of a "project" pursuant to Public Resources Code Section 21065, thus California Environmental Quality Act review is not required.

Attachments:

- Exhibit A: Renewable and Carbon Neutral Electricity Supply Procurement Details (PDF)

[3] The City's hourly carbon accounting methodology entails calculating the City's net surplus or deficit carbon neutral supply position relative to its load in every hour of the year. The grid average electricity emissions intensity for each hour is then applied to each of these hourly surpluses or deficits to yield a net emissions contribution (or reduction) that the City's electric supply portfolio is responsible for in that hour. These hourly emissions totals are then summed across the entire year to yield the City's annual emissions total for the year.

EXHIBIT A

Renewable and Carbon Neutral Electricity Supply Procurement Details

Renewable Energy Goals

In CY 2019, the City initially received 535,145 MWh of renewable energy through its long-term contracts for wind, solar, landfill gas, and small hydro resources (which represents 62.1% of the City's total retail sales for that period). After accounting for the sale of 216,110 MWh of this generation, the City's net renewable energy supplies totaled 319,035 MWh, which represents 37.0% of the City's total retail sales for 2019.

For CY 2020, staff has currently contracted to sell about 324,000 MWh of renewable generation, and projects that City's remaining renewable electricity supplies from in-state resources will equal 26.0% of retail sales. However, after accounting for the purchase of out-of-state renewable supplies, the City's total renewable electricity supplies are projected to equal 55.4% of retail sales.

Table 1 shows the renewable resources currently under contract, the status of the projects, their annual output in Gigawatt-hours (GWh), and the rate impact of each resource that was calculated at the time it was added to the electric supply portfolio.

Table 1: Summary of Contracted Renewable Electricity Resources

Resource	Delivery Begins	Delivery Ends	Annual Generation (GWh)	Rate Impact (¢/kWh)
Small Hydro	Before 2000	N/A	10.0	0
High Winds	Dec. 2004	Jun. 2028	42.7	0.012
Shiloh I Wind	Jun. 2006	Dec. 2021	57.3	(0.041)
Santa Cruz Landfill Gas (LFG)	Feb. 2006	Feb. 2026	9.0	0.003
Ox Mountain LFG	Apr. 2009	Mar. 2029	42.5	(0.040)
Keller Canyon LFG	Aug. 2009	Jul. 2029	13.8	(0.020)
Johnson Canyon LFG	May 2013	May 2033	10.4	0.064
San Joaquin LFG	Apr. 2014	Apr. 2034	27.5	0.127
Kettleman Solar	Aug. 2015	Aug. 2040	53.5	0.099
Hayworth Solar	Dec. 2015	Dec. 2042	63.7	0.026
Frontier Solar	Jul. 2016	Jul. 2046	52.5	0.011
Elevation Solar C	Dec. 2016	Dec. 2041	100.8	(0.044)
W. Antelope Blue Sky Ranch B	Dec. 2016	Dec. 2041	50.4	(0.002)
CLEAN Program Projects	Varies	Varies	5.0	0.027
Total Operating Resources			**539.0**	**0.223**
Golden Fields Solar III	Jan. 2023	Dec. 2047	75.0	(0.056)
Total Non-Operating Resources			**75.0**	**(0.056)**
Total Committed Resources			**614.0**	**0.168**

RPS Procurement Plan Compliance

Annually, the Utilities Director reviews CPAU's RPS Procurement Plan to determine compliance with the state's RPS Program. Under the state RPS Program, the California Energy Commission (CEC) developed portfolio balancing requirements, which dictate what percentage of renewable procurement must come from resources interconnected to a California Balancing Area (as opposed to an out-of-state transmission grid balancing area). These requirements also determine the eligibility criteria for renewable resource products as determined by their eligible Portfolio Content Categories[1], found in the CEC Enforcement Procedure RPS (CA Code of Regulations, Title 20, Section 3203). The CEC Enforcement Procedures apply to publicly owned utilities (POUs), such as CPAU.

In accordance with the state's RPS Program requirements, CPAU's Procurement Plan develops a renewable electric supply portfolio that balances environmental goals with system reliability while maintaining stable and low retail electric rates. The state RPS program requires retail electricity suppliers like CPAU to procure progressively larger renewable electricity supplies across three separate Compliance Periods, as outlined below.

1. Compliance Period 1 (2011 – 2013)

For Compliance Period 1 (2011-2013) retail electricity providers were required to procure renewable electricity supplies equaling 20% of total retail sales, which CPAU did. In this period, CPAU supplied 21.4% of the City's retail electricity sales volumes from renewable energy sources. The procurement results for Compliance Period 1 are displayed in Table 2 below:

Table 2: Compliance Period 1 RPS Procurement Details

Year	Retail Sales (MWh)	Procurement Target (MWh)*	Actual Procurement (MWh)	% of Retail Sales
2011	949,517	189,903	207,974	21.9%
2012	935,021	187,004	200,621	21.5%
2013	953,235	190,647	199,145	20.9%
TOTAL	2,837,773	567,555	607,740	21.4%

* Annual procurement targets are "soft" targets. The RPS Procurement Plan requires that the target be met for the compliance period as a whole, not in each year of the compliance period.

All of the renewable energy procured in Compliance Period 1 came from resources whose contracts were executed before June 1, 2010. The RPS Procurement Plan considers these contracts "grandfathered," and since all of the renewable energy procurement for Compliance Period 1 was from these types of contracts, there was no need to meet the Portfolio Balancing Requirements included in Section B.4 of the RPS Procurement Plan.

[1] RPS Portfolio Content Categories are defined as follows: Category 1 is energy and RECs delivered to a California Balancing Authority (CBA) without substituting electricity from another source, Category 2 is energy and RECs that cannot be delivered to a CBA without substituting electricity from another source, and Category 3 is unbundled RECs.

2. Compliance Period 2 (2014 – 2016)

In Compliance Period 2, renewable procurement must equal or exceed the sum of the three annual RPS procurement targets described by the following equations:

2014 RPS Target = 20% × (Retail Sales in 2014)
2015 RPS Target = 20% × (Retail Sales in 2015)
2016 RPS Target = 25% × (Retail Sales in 2016)

As shown in Table 3 below, CPAU easily exceeded this mandated procurement level as well. Renewable electricity procurement equaled 29.5% of retail sales for Compliance Period 2 overall.

Table 3: Compliance Period 2 RPS Procurement Details

Year	Retail Sales (MWh)	Procurement Target (MWh)*	Actual Procurement (MWh)	% of Retail Sales
2014	953,386	190,677	210,250	22.1%
2015	932,922	186,584	241,262	25.9%
2016	914,748	228,687	375,343	41.0%
TOTAL	2,801,056	605,949	826,855	29.5%

* Annual procurement targets are "soft" targets. The RPS Procurement Plan requires that the target be met for the compliance period as a whole, not in each year of the compliance period.

Also in Compliance Period 2, the RPS Portfolio Balancing Requirements applied to the procurement levels described above. The specific requirements are: (1) CPAU must procure at least 65% of its renewable supplies from Portfolio Content Category 1, and (2) no more than 15% from Portfolio Content Category 3 (unbundled RECs). CPAU easily met the Compliance Period 2 overall procurement requirement and the RPS Portfolio Balancing Requirement, as five new solar projects came online in 2015 and 2016, and all of these projects are considered Portfolio Content Category 1 resources.

3. Compliance Period 3 (2017 – 2020)

For Compliance Period 3, CPAU is subject to "soft" targets to supply at least 27% of its retail sales volume from renewable resources in 2017, with that level increasing by 2% each year until reaching 33% in 2020, as described by the following four equations:

2017 RPS Target = 27% × (Retail Sales in 2017)
2018 RPS Target = 29% × (Retail Sales in 2018)
2019 RPS Target = 31% × (Retail Sales in 2019)
2020 RPS Target = 33% × (Retail Sales in 2020)

The overall Compliance Period 3 target is equal to the sum of these four annual soft targets. CPAU is expected to easily comply with the Compliance Period 3 overall procurement requirement, as well as the Portfolio Balancing Requirement that at least 75% of the renewable electricity supplies come from Portfolio Content Category 1 and no more than 10% come from Portfolio Content Category 3. Staff projects that renewable electricity supplies will satisfy nearly 50% of

retail sales for Compliance Period 3, even after accounting for the 540,000 MWh of RPS supplies sold in 2019 and 2020, and that all of these supplies will come from either Portfolio Content Category 1 or "grandfathered" resources.

Table 4: Compliance Period 3 RPS Procurement Details

Year	Retail Sales (MWh)	Procurement Target (MWh)*	Actual/Projected Procurement (MWh)	% of Retail Sales
2017	884,422	238,794	554,206	62.7%
2018	888,033	257,530	574,475	64.7%
2019	861,561	267,084	319,035	37.0%
2020**	797,589	263,204	220,000	27.6%
Total	3,431,605	1,026,612	1,667,716	48.6%

* Annual procurement targets are "soft" targets. The RPS Procurement Plan requires that the target be met for the compliance period as a whole, not in each year of the compliance period.
** Projected annual 2020 data: reflects executed sales of 324,000 MWh.

Finally, as required by the CEC RPS Enforcement Procedures and Section D of the City's Procurement Plan, staff reported all of the above information to the California Energy Commission in August 2020.

Carbon Neutral Plan

In CY 2019, CPAU achieved its goal, set forth in the Carbon Neutral Plan, of an electric supply portfolio with zero net greenhouse (GHG) emissions for the sixth consecutive year, without the need to purchase unbundled renewable energy certificates (RECs) in the market. Carbon neutrality was achieved in CY 2019 through existing hydro and renewable generation (wind, solar, and landfill gas). Due to favorable hydro conditions, the City had a large surplus of energy, allowing for the sale of 216,000 MWh of renewable energy while still maintaining a carbon neutral supply portfolio (when evaluated using an annual carbon accounting framework).

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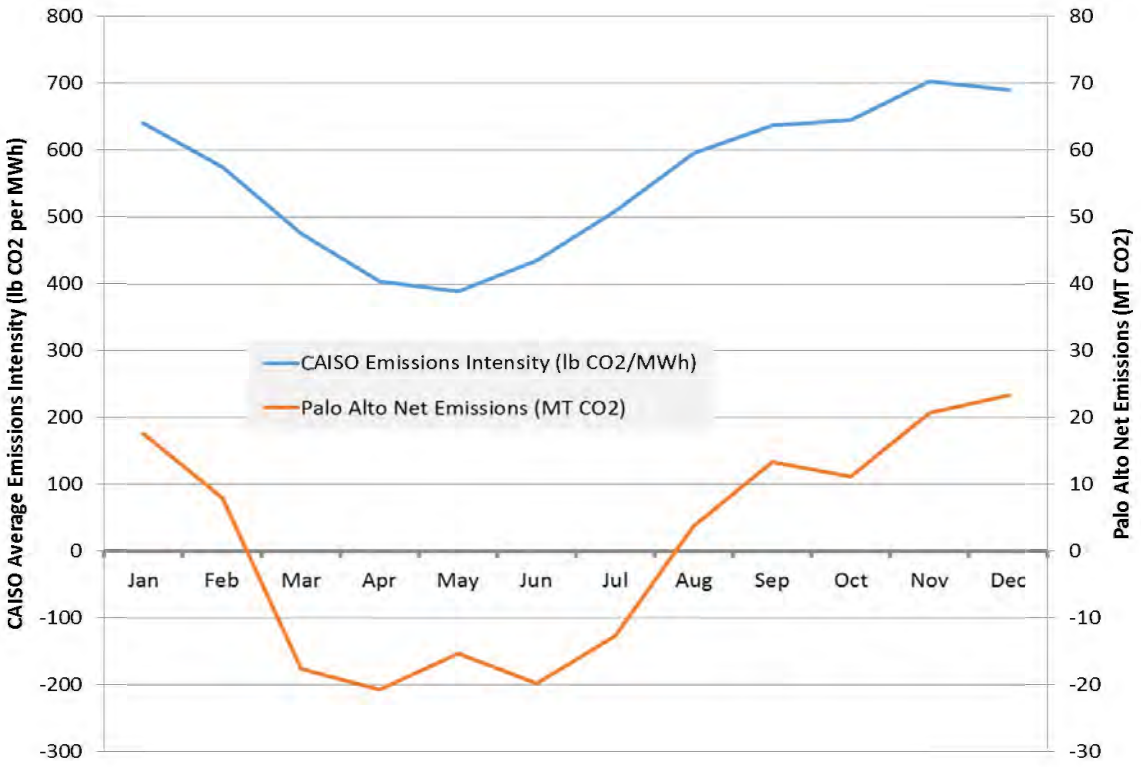
Figure 1 below illustrates the City's average monthly gross load (total electric consumption as measured at Citygate) and net load (Citygate load less generation from carbon neutral supply resources) for 2019.

Figure 1: CPAU Monthly Average Gross & Net Load for 2019

Figure 2 below depicts the average monthly emissions intensities for the California Independent System Operator (CAISO) grid, as well as the City's average monthly net electric emissions totals for 2019. The emissions totals are the result of applying the hourly average CAISO emissions intensity values to the City's hourly net load (the monthly average of which is depicted in Figure 1 above).

Figure 2: Monthly Average CAISO Emissions Intensity & CPAU Net Emissions for 2019



For CY 2020, slightly below average hydro conditions are expected to result in about 46% of the City's electric supply needs being supplied by hydroelectric resources, with the remainder coming from non-hydro renewable energy resources (including purchases of out-of-state unbundled RECs).