



City of Palo Alto

City Council Staff Report

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Council Priority: Environmental Sustainability

Summary Title: Electric Integrated Resource Plan Overview and Work Plan

Title: Informational Report on Staff's Efforts to Develop the City's Electric Integrated Resource Plan for the 2019 to 2030 Planning Horizon

From: City Manager

Lead Department: Utilities

REQUEST

This report and corresponding work plan (Attachment A) is being provided to Council as an informational report regarding staff's efforts towards developing a City of Palo Alto Utilities Department (CPAU) Electric Integrated Resource Plan (EIRP) for the 2019 to 2030 planning horizon. There is no requested action.

EXECUTIVE SUMMARY

In 2012, Council approved the Long-term Electric Acquisition Plan (LEAP), which addressed CPAU's strategy for meeting electric load needs and legislative and regulatory compliance requirements through the acquisition and management of conventional and alternative electric resources. The process of evaluating and planning for supply versus demand-side resources through an objective process is referred to as integrated resource planning. This process involves multiple functions related to the pursuit and management of CPAU's electric resources, consistent with State and Federal regulatory and legislative requirements, the City's climate sustainability goals, and the CPAU's strategic planning objectives.

The 2012 Council-approved LEAP focused on various initiatives to reduce the carbon intensity of CPAU's electric supply portfolio through energy efficiency, an aggressive renewable portfolio standard (RPS) and ultimately the consideration of a carbon neutral portfolio. Long-term electric plans are intended to be updated every three to five years to direct electric procurement and portfolio management efforts over a ten-year planning horizon. A new EIRP, which will replace the 2012 LEAP, is necessary to provide a basis for several key decisions and policies related to the electric portfolio in the 2019 to 2030 planning horizon. The EIRP will result in an updated set of electric portfolio objectives and strategies as well as a tactical implementation plan

detailing key analysis and/or initiatives to be carried out over the next two to three years to meet the EIRP’s objectives.

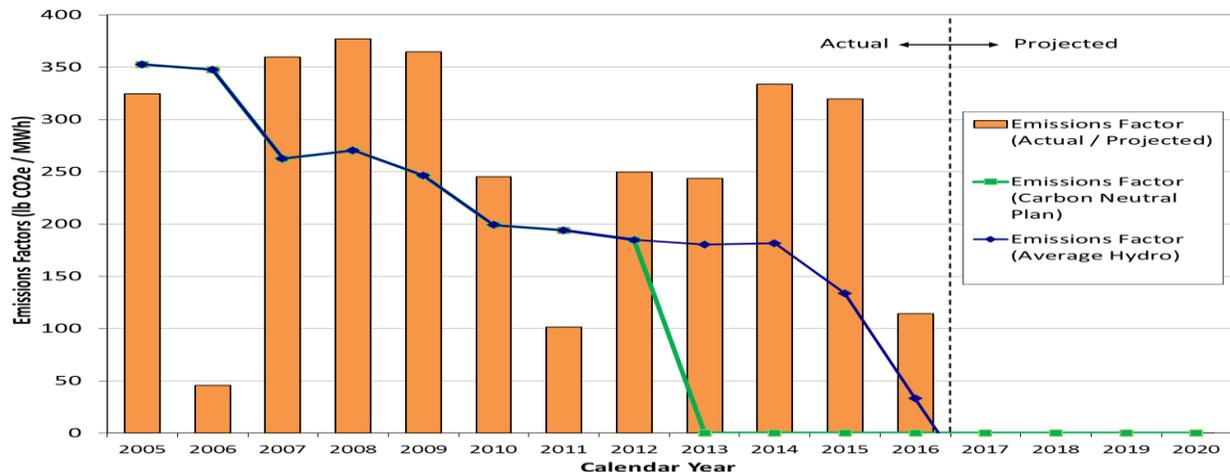
Council’s approval of the EIRP will also serve as the basis for meeting the State’s new integrated resource planning compliance requirements in California’s 2015 Clean Energy and Pollution Reduction Act, passed through Senate Bill 350 (SB 350). The law requires that larger publicly-owned utilities, such as CPAU, adopt an integrated resource plan by January 2019 and every five years thereafter. Staff is already having discussions with the Utilities Advisory Commission which will extend into early 2018 to define the plan. Staff will also bring various stages of the plan to the Finance Committee and Council throughout 2018.

BACKGROUND

CPAU has a long history of analyzing alternative strategies to meet long-term energy needs and developing long-term plans consistent with the community’s environmental and financial sustainability goals. In 1992, the City adopted its first electric integrated resource plan and since then has consistently developed and approved new long-term plans every three to five years or as needed. The last such effort culminated in Council’s approval of the current LEAP in 2012 (Attachment B) with a focus on reducing the carbon intensity of CPAU’s electric portfolio through an RPS of at least 33 percent by 2015 with up to a 0.5 cents per kilowatt hour rate impact. Due to favorable market conditions for renewable resources, CPAU expects to achieve an RPS of approximately 60 percent in 2017.

In 2013, Council approved the Carbon Neutral Plan which defined carbon neutrality for CPAU’s electric portfolio, demonstrated a transparent and verifiable protocol to measure carbon content and established a goal to achieve carbon neutrality by 2013 (Attachment C). As a result CPAU has neutralized all greenhouse gas emissions associated with the City’s electric portfolio since 2013, putting the City on track to achieve its Sustainability and Climate Action Plan GHG reduction goal of 80 percent emissions reduction from 1990 levels by 2030. Figure 1 shows the electric portfolio’s actual and projected carbon intensity since 2005.

Figure 1 – City of Palo Alto Utilities Electric Supply Emissions



With the objective of ensuring that the state of California is on track to meet its energy policy goals and GHG emission reductions of 40 percent from 1990 levels by 2030, on October 7, 2015, Governor Edmund G. Brown, Jr. signed Senate Bill 350 - California's Clean Energy and Pollution Reduction Act (SB 350) into law. SB 350 increased the State's RPS from 33 percent by 2020 to 50 percent by 2030, set a goal to double energy efficiency targets by 2030, and required publicly owned utilities (POUs) serving loads greater than 700,000 megawatt hours (MWh) per year, such as Palo Alto, to submit an integrated resource plan (IRP) to the California Energy Commission (CEC) every five years, with the first one adopted no later than January 1, 2019 and submitted to the CEC by April 30, 2019.

Utilities Advisory Commission Discussion on EIRP

At the June 2017 UAC meeting, staff provided a [memorandum](#) summarizing past electric supply long-term planning and policies efforts, load and resource balance projections and key planning and/or policy issues during the 2019 to 2030 planning horizon, including the upcoming decision to renew the City's current hydroelectric resource contract with the Western Area Power Administration ("Western"), which is set to expire at the end of 2024. Staff also proposed and sought feedback on a work plan to develop the new EIRP (Attachment A). The UAC unanimously supported staff's proposed work plan ([UAC June 2017 Minutes](#)).

At the August 2017 UAC meeting, staff provided an overview of the California wholesale energy market and a summary of the top electric cost drivers and uncertainties ([memorandum](#)). At the same meeting, in a separate report, staff presented its efforts towards developing a distributed energy resource (DER) plan (as described below) and long-term forecasting of electric energy and peak demand needs ([memorandum](#)). UAC concurred with staff's proposed strategic principles to promote or enable DERs and approach to forecast electrical loads given DER adoption rates.

DISCUSSION

Key Drivers and Planning Issues

Through the development and approval of a new EIRP, staff seeks direction on several key decisions, policies and strategies related to the electric portfolio in the 2019 to 2030 planning horizon including:

- Planning for and integrating the impacts from DERs and electrification on CPAU's long-term electric load needs;
- The amount of large hydroelectric resource supply to pursue in light of the upcoming opportunity for renewal of the Western Base Resource (WBR) contract for hydroelectricity with Western;
- Modifications to the City's RPS to meet new legislative and planning requirements; and

- Assessment of alternative electric portfolio mixes to best deliver a carbon neutral portfolio which meets GHG reduction goals set forth in City’s Sustainability and Climate Action Plan and maintains the financial health of CPAU’s Utilities.

Distributed Energy Resources

DERs in Palo Alto are electrical energy resources connected to CPAU’s electric distribution grid that can significantly change the character, timing, and magnitude of electric loads and that can potentially be used to replace or complement services traditionally provided by utility-scale generating resources. DERs tend to be smaller than typical utility-scale resources (less than 1MW in Palo Alto) and may include resources such as solar photovoltaics (PV), electric vehicles (EV), energy efficiency (EE) measures, customer demand response (DR), energy storage (ES) systems, smart thermostats, and high-efficiency electric heat-pumps (HP) for water and space heating of building loads.¹ DERs could be deployed by customers at their premises, behind CPAU’s electricity meter, or by CPAU within CPAU’s distribution system network. Except for a handful, all current DERs in Palo Alto are customer-sited behind-the-meter resources.

Currently customer decisions to adopt DERs are based on a variety of factors, including customer preferences, incentives available to customers, and availability of programs to facilitate adoption. Well managed and integrated DERs with built-in sensing, controlling, and communicating controls could be leveraged to provide distribution and transmission systems services, potentially lowering costs to the DER owner and all CPAU customers. However, unmanaged DER adoption could increase costs for CPAU by increasing uncertainty in balancing loads and resources, as well as causing adverse impacts on the distribution system. CPAU will develop for Council approval, broad strategic principles to ensure pragmatic and cost-effective integration of DERs in Palo Alto. Based on these principals, a DER Plan will be developed to help CPAU mitigate risks and facilitate customer adoption of these technologies to the benefit of the entire Palo Alto community over the next 5-10 years.

The EIRP will include an assessment of the impacts on load from DERs over the 2019-2030 planning horizon and test the electric portfolio’s sensitivity to different DER deployment rates.

Western Base Resource – Large Hydroelectric Commitment

Since the 1960’s CPAU’s participation as a power customer of the Central Valley Project (CVP) has been an instrumental component in delivering low carbon electricity to Palo Alto at low rates. A key topic for consideration in the EIRP is the City’s WBR contract with Western for hydroelectric resources from the CVP, which expires at the end of 2024. Western’s proposed 2025 Power Marketing Plan was submitted to the United States Federal Register Notification ([U.S. FRN No 38675](#)) and approved by the Department of Energy. The 2025 Power Marketing Plan will allow current WBR power customers to renew up to ninety-eight percent of their

¹ [PUC §769](#) defines “distributed resources” as distributed renewable generation resources, energy efficiency, energy storage, electric vehicles, and demand response. Palo Alto definition of DER is slightly boarder, including smart thermostats and heat pump technologies.

existing allocation for a thirty-year term (2025-2054) under similar contract terms and conditions to their existing contracts.

The process for extending this contract is well underway and is expected to take five to seven years to complete. CPAU staff has been actively involved in the process by providing informal and formal comments in response to the 2025 Western Power Marketing Plan and by working with WAPA staff and other WBR contract customers to develop a better model of long-term generation and cost projections. Pending approval of the 2025 Power Marketing Plan, Western will seek commitments through execution of the new WBR contract in 2020 – although participants may have an option to reduce participation and/or terminate their contract in 2024.

CPAU currently receives 12.3 percent of all the WBR product output and is obligated to pay 12.3 percent of all the CVP's revenue requirements as allocated to power customers, regardless of the amount of energy received. Under normal precipitation and hydrological conditions, WBR meets approximately 40% of CPAU's energy needs. However, since 2005 the amount has varied from a low of 22% to a high of 64%. The corresponding cost per MWh has been \$22 to \$61/MWh.

The analysis necessary to aid Council in its decision of whether or not to renew its participation in WBR and if so at what level, will need to consider the cost and the value of the resource going forward, which are both highly uncertain. This is due in large part to the nature of the CVP and supply availability, which is dependent on unpredictable precipitation conditions, long-term effects of climate change and the potential for new environmental policies and/or projects which threaten to erode generation value.

The costs associated with participating in the WBR are also highly uncertain. First, the U.S. Bureau of Reclamation, which is charged with the operation, maintenance and stewardship of the CVP, has yet to update the cost allocation study necessary to establish rates for CVP power under the existing contract, and it is unclear when such rates will be published for the post-2024 period. Additionally, funding requirements under the Central Valley Project Improvement Act (CVPIA)² and the appropriateness of the allocation of Restoration Fund collections between water and power customers is of serious concern to CPAU and other power customers. As such, CPAU and other Northern California Power Agency (NCPA) members have filed suit with respect to the collection and use of Restoration Funds under the CVPIA.³

Lastly, the changes to local and State RPS requirements, portfolio mandates and/or carve-outs for baseload renewables and the potential for loss of load due to distributed energy resources

² The Central Valley Project Improvement Act was passed by the U.S. Congress in 1992 to establish the Restoration Fund, funding requirements and goals to restore the habitat of the area impacted by the CVP. Water and power customers are obligated to pay into the Restoration Fund. <https://www.usbr.gov/mp/cvpia/docs/public-law-102-575.pdf>

³ Northern California Power Agency, City of Redding, City of Roseville, and City of Santa Clara v. the United States, Court of Federal Claims no. 14-817C

and/or load defection, increase the risk of a renewed WBR contract becoming a stranded resource, unless proper termination provisions are included in the future WBR contract.

The EIRP and corresponding implementation plan will include discussion and evaluation of the right amount of large hydroelectric resources, specifically related to WBR, to be included in the City's carbon neutral electric portfolio. It will also include discussion of what alternative resources could be used to continue to achieve carbon neutrality in the event that the Council opts for a reduced WBR allocation – such as an even more aggressive RPS, increased deployment of distributed energy resources, and/or acquisition of non-RPS eligible, in-state or out-of-state, carbon-free resources.

Renewable Portfolio Standard

SB 350, among other things, increased the State RPS from 33% by 2020 to 50% by 2030; and while CPAU is easily on track to achieve this RPS, Council must formally adopt the RPS (along with any new regulatory reporting requirements). With Council adoption, staff would also seek input on other policy priorities the Council may have for CPAU's RPS, such as diversification of renewable technologies, contract term limits to reduce the risk of stranded assets, or a project location requirement to minimize concentration risk and the cost of achieving the RPS. Also, Senate Bill 100, which is currently under consideration in the California State Assembly, seeks to accelerate the SB 350 RPS targets to 50% by 2026 and 60% by 2030, along with establishing a non-binding goal of achieving 100% clean energy by 2045. Should SB 100 pass, CPAU would again need to modify its own RPS.

The analysis going forward will evaluate the impacts of these necessary RPS changes plus any other optional changes to RPS.

Carbon Neutral Plan

The Carbon Neutral Plan defines carbon neutrality for CPAU's electric supply portfolio as a supply portfolio that demonstrates annual net zero greenhouse gas (GHG) emissions, measured at Citygate, in accordance with The Climate Registry's Electric Power Sector protocol for GHG emissions measurement and reporting. In doing so, the Carbon Neutral Plan established a transparent and verifiable protocol to measure and neutralize the carbon content associated with the City's electric supply portfolio. The Carbon Neutral Plan directs staff to pursue carbon neutrality on an annual basis with a rate impact of no more than 0.15 cents per kilowatt hour through the use of preferred resources (e.g., energy efficiency and solar distributed generation), large hydroelectric resources and long-term RPS-eligible renewable resources. The plan also allowed for the use of short-term renewable products, other carbon-free resources and/or renewable energy certificates (RECs) to neutralize the electric portfolio's carbon content until the long-term renewable resources were on-line and during dry hydroelectric years.

Possible modifications to the City's Carbon Neutral Plan may be warranted based on the decision CPAU makes with respect to its commitment to long-term hydroelectric resources, changes to its RPS, and/or other modifications deemed consistent with CPAU's GHG reduction

and financial sustainability goals. For example, the UAC has expressed the need to explore the carbon neutrality definition and the implications of the City's renewable resources not being aligned to its load in real-time, given the fact that for Palo Alto carbon neutrality is calculated on an annual basis. This counting convention allows for CPAU, at certain times of the year or even hours of the day, to operate with surplus carbon-free resources, which can then be used to offset periods when CPAU has a deficiency of carbon-free resources and must rely on the market for generic energy (which would most likely be fossil-fuel based). Since CPAU's carbon neutral portfolio consists of mostly intermittent renewables, a portfolio with a greater dependence on baseload renewables, such as geothermal or biomass, would reduce the magnitude of CPAU's reliance on the market for balancing its portfolio positions.

The EIRP will explore alternative portfolio mixes to achieve carbon neutrality and evaluate these portfolios against several metrics, including the ability to meet community-wide GHG emission reductions, cost and rate impacts, cost variability and long-term uncertainty, portfolio resiliency, and ease of management under various conditions.

Other Issues

The EIRP will explore other portfolio planning and management issues and recommend appropriate strategies related to:

- Management of supply variability and market risk, including operational risks associated with intermittent renewable resources;
- Management and planning for increased transmission and delivery costs;
- Maximizing the value of the City's share in the California-Oregon Transmission Project; and
- Maximizing the value of the City's share of the Calaveras Hydroelectric Project.

Uncertainties

These key policies directives will need to be assessed in the context of a highly uncertain legislative and regulatory environment, particularly with respect to the following issues:

- Proposed 100% renewable or "clean" energy bill (SB 100) with potential modifications to the RPS, including mandates to purchase specific technologies;
- On-going modifications and challenges to the state's Cap and Trade regulations;
- State Water Fix and/or Unimpaired Delta Flow Criteria which threaten to erode the value of hydroelectric resources;
- Expansion of the CAISO's Energy Imbalance Market and Regionalization and the impacts on transmission costs; and
- Competition or alternative providers such as community choice aggregation, direct access and/or distributed generation which increase the risk of stranding assets.

Senate Bill 350

Passage of SB 350 requires the development and adoption of an IRP no later than January 1, 2019. The IRP must be consistent with CEC guidelines that are still in development ([CEC's](#)

[Proposed IRP Guidelines](#)). At a minimum, Sections 9621 and 454.52 of the State Public Utilities Code require that CPAU's IRP:

1. Meet GHG emissions targets that reflect the electricity sector's contribution to achieving the economy-wide GHG emissions reductions of 40 percent from 1990 levels by 2030;
2. Ensure procurement of at least 50 percent eligible renewable energy resources by 2030;
3. Meet the following goals:
 - a. Serve customers at just and reasonable rates;
 - b. Minimize impacts on ratepayers' bills;
 - c. Ensure system and local reliability;
 - d. Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities;
 - e. Enhance distribution systems and demand-side energy management; and
 - f. Minimize localized air pollutants and other GHG emissions, with early priority on disadvantaged communities;
4. Address the following procurement topics:
 - a. Energy efficiency and demand response resources;
 - b. Energy storage;
 - c. Transportation electrification;
 - d. A diversified procurement portfolio consisting of both short-term and long-term electricity, electricity-related, and demand response products; and
 - e. Resource adequacy requirements.

The EIRP and/or other planning initiatives, such as the Utilities Strategic Plan, will address the above-mentioned IRP requirements to the extent possible.

EIRP Work Plan

Figure 2 illustrates the process for developing and approving the new EIRP; the details of the various discussion and action items are provided in Attachment A. The work plan is structured in four phases followed by implementation as follows:

Phase 1 – Information and discussion on various electric portfolio planning elements, including:

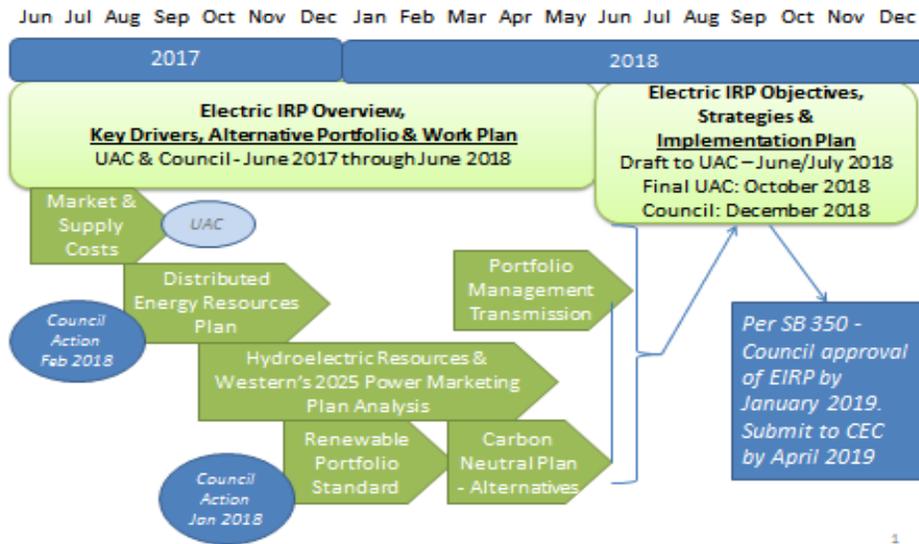
- Distributed energy resources;
- Market overview and cost drivers;
- Large hydroelectric resources;
- Renewable portfolio standard;
- Carbon neutral portfolio alternatives; and
- Portfolio and transmission cost management;

Phase 2 – Analysis of electric portfolio alternatives;

Phase 3 – Update of EIRP Objectives, Strategies and Implementation Plan; and

Phase 4 – Council approval of the EIRP and submittal to the CEC.

Figure 2 – EIRP Development



NEXT STEPS

The attached EIRP work plan summarizes discussion and action items planned for the UAC, Finance Committee and Council. Staff will bring several items to Council in the upcoming months related to the EIRP, including modifications to CPAU’s RPS to meet state requirements; approval of a strategy to manage hydroelectric variability; and approval of guidelines for distributed energy resources. Staff’s analysis of carbon neutral portfolios will be provided to Council in spring 2018. Council will see an initial set of objectives and strategies and implementation plan by fall 2018 with the goal of factoring in Council’s feedback and developing a final EIRP for Council approval by January 2019.

RESOURCE IMPACT

There is no direct resource impact as a result of this informational report and proposed EIRP work plan. Work will be performed with existing staff and consultant support which has been budgeted for under the Electric Utility’s fiscal year 2018 operating budget.

POLICY IMPLICATIONS

There is no direct policy impact associated with the proposed work plan, but any changes made through the EIRP will affect policy related to electric portfolio management. Staff will also update the EIRP to ensure consistency with CPAU’s sustainability goals as established in its Sustainability and Climate Action Plan. Further, the EIRP will need to coordinate with the update of the Utilities Strategic Plan to ensure consistency in objectives and/or goals.

ENVIRONMENTAL REVIEW

This informational report on the EIRP and corresponding work plan does not meet the definition of a project under Public Resources Code 21065 and therefore California Environmental Quality Act (CEQA) review is not required.

Attachments:

- Attachment A: EIRP work plan
- Attachment B: LEAP Objectives and Strategies April 2012
- Attachment C: Carbon Neutral Plan

ATTACHMENT A

Item	Purpose & Objectives	UAC	Council
EIRP Overview and Work Plan	Provide a high level framework for what will be discussed, time line; guiding principles; and key drivers.	June 2017 (discussion) DONE	October 2017 INFO ONLY
Market Overview and Portfolio Cost Drivers	Overview of the California energy market, the City’s participation, Northern California Power Agency; Portfolio cost drivers and uncertainties.	August 2017 (discussion)	
Load Forecast - Needs Assessment	Overview of electric load forecast and– energy, demand and impacts from EE, EV and PV	August 2017 (discussion)	
Distributive Energy Resources Strategy and Planning for Growth	Distributive Energy Resources Plan - energy efficiency, Local Solar Plan, distributed generation, electrification, electric vehicles, storage and distribution system planning	August 2017 November 2017, January 2018 (action)	March 2018 (action)
Hydroelectric Resources	Overview of Palo Alto’s hydroelectric resources; hydro risk management; Western Area Power Administration’s 2025 Power Marketing Plan; Calaveras Project; key decisions; and direction.	September 2017 (discussion)	
Portfolio Alternatives	Overview of alternative resource portfolios to be evaluated and metrics.	September 2017 (discussion)	
Renewable Portfolio Standard	Overview of RPS; update to meet SB 350 requirements; renewable over-generation and curtailments; and other RPS modifications.	December 2017 (action)	January/ February 2018 Finance Committee/ Council (action)
Carbon Neutral Plan	Overview and updates – dependent on RPS and large hydro direction; assessment of alternative portfolios and scenarios	February 2018 (discussion)	March/April Finance Committee/ Council (discussion)
Transmission	<i>Transmission planning in California; California Oregon Transmission Project; Second Transmission line update</i>	<i>February/March 2018 (discussion)</i>	
Proposed EIRP Objectives, Key Strategies and Implementation Plan	Draft EIRP objectives, key strategies and implementation plan;	<i>June 2018 (possible action)</i>	<i>Aug/Sep 2018 Finance Committee/Council (possible action)</i>
Final EIRP	Approval of EIRP objectives; strategies and implementation plan; and SB 350 IRP submittal to CEC	<i>October 2018 (action)</i>	<i>Nov/Dec 2018 Finance Committee/Council (action)</i>

ATTACHMENT B

Long-term Electric Acquisition Plan (LEAP)

Approved March 7, 2011 (Staff Report 1317, Resolution 9152)
Modified by Council March 19, 2012 (Staff Report 2581, Resolution 9237)
Modified by Council April 16, 2012 (Staff Report 2710, Resolution 9241)

LEAP Objectives:

1. Meet customer electricity needs through the acquisition of least total cost energy and demand resources including an assessment of the environmental costs and benefits
2. Manage supply portfolio cost uncertainty to meet rate and reserve objectives.
3. Enhance supply reliability to meet City and customer needs by pursuing opportunities including transmission system upgrades and local generation.

LEAP Strategies:

1. **Resource Acquisition** – Pursue the least total cost resources including an assessment of environmental costs and benefits to meet the City’s needs in the long term by:
 - a. Evaluating each potential resource on an equal basis by evaluating rate impacts and establishing costs and values for location, time of day and year, carbon, value of renewable supplies and any secondary benefits attributed to the resource; and
 - b. Including all resources – conventional energy, local and remote renewable energy supplies, energy efficiency, cogeneration, and demand reduction – in the evaluation.
2. **Electric Energy Efficiency and Demand Reduction** – Fund programs that maximize the deployment of cost-effective, reliable and feasible energy efficiency and demand reduction opportunities as the highest priority resources by:
 - a. Every three years, preparing a ten-year energy efficiency plan that identifies all cost-effective energy efficiency opportunities;
 - b. Using the cost of long-term renewable energy resources adjusted for time of day factors and location as the avoided cost when evaluating cost effectiveness of energy efficiency measures;
 - c. Designing and making energy efficiency programs available to all customers; and
 - d. Considering the impacts (costs, benefits and GHG emissions) of substituting electricity-using appliances for natural gas-using appliances and vice versa in the ten-year energy efficiency plan.
3. **Renewable Portfolio Standard (RPS)** – Reduce the carbon intensity of the electric portfolio by acquiring renewable energy supplies by:
 - a. Pursuing a minimum level of renewable purchases of at least 33% of retail sales by 2015 with the following attributes:
 - i. The contracts for investment in renewable resources shall not exceed 30 years in term.
 - ii. Pursue only renewable resources deemed to be eligible by the California Energy Commission (CEC).
 - iii. Evaluate use of Renewable Energy Certificates (RECs) to meet RPS.
 - b. Ensuring that the retail rate impact for renewable purchases does not exceed 0.5 ¢/kWh on average; and
 - c. Performing an ongoing evaluation of the Palo Alto Clean Local Energy Accessible Now (CLEAN) program.

Long-term Electric Acquisition Plan (LEAP)

4. **Local Generation** – Promote and facilitate the deployment of cost-effective local resources by:
 - a. Using the renewable market price referent (MPR) adjusted for time of day factors and location as the avoided cost when evaluating cost effectiveness of local resources;
 - b. Considering energy delivery cost uncertainty and strategic value options when evaluating opportunities;
 - c. Evaluating a Feed-in-Tariff to promote locally sited renewable resources;
 - d. Evaluating cost-effective energy storage resources; and
 - e. Evaluating the feasibility of developing a 25 to 50 MW generating facility connect to the City's distribution system.
5. **Climate Protection** – Reduce the electric portfolio's carbon intensity by:
 - a. Supporting the City municipal government's climate protection goals;
 - b. Promoting the use of technologies (e.g. incentives for cogeneration systems, promotion of EVs, in-home energy displays) and programs that will reduce the community's carbon footprint at a cost of up to the City's value of carbon;
 - c. Continuing to offer a renewable resource-based retail rate for all customers who want to voluntarily select an increased content of non-hydro renewable energy; and
 - d. Evaluating quantitative goals for possible future implementation.
6. **Hydro Resource Management** – Actively monitor and manage cost uncertainty related to variations in hydroelectric supply and maximize value of hydro resources by:
 - a. Planning for an average hydro year on a long-term basis;
 - b. Utilizing cost effective hydro resource management products; and
 - c. Implementing opportunities to maximize benefits and reduce costs of the Western Base Resource and Calaveras hydroelectric resources.
7. **Market Price Exposure Management** – Actively monitor and manage operational, counterparty and wholesale energy price risk in the short-term (up to three to five years) by:
 - a. Maintaining an adequate pool of creditworthy suppliers; and
 - b. Diversifying supply purchases across commitment date, start date, duration, suppliers and pricing terms in alignment with rate stability objectives and reserve guideline.
8. **Transmission and Reliability** – Pursue the reliability of supply at fair and reasonable transmission and delivery costs by:
 - a. Actively participating through collaborative efforts with other entities, in local, regional, statewide and federal regulatory and legislative forums;
 - b. Participating in transmission and reliability market design forums to ensure that adopted market designs result in adequate reliability, workably competitive markets and equitable cost allocation;
 - c. Evaluating interconnection options to the City to increase service reliability and lower delivery costs; and
 - d. Exploring transmission opportunities and strategies to meet long-term renewable portfolio objectives beyond 2020.

City of Palo Alto Utilities
Electric Supply Portfolio Carbon Neutral Plan
Adopted by Council on March 4, 2013 ([Staff Report 3550](#), [Resolution 9322](#))

1. Carbon Neutral Definition

A carbon neutral electric supply portfolio will demonstrate annual net zero greenhouse gas (GHG) emissions, measured at the Citygate¹, in accordance with The Climate Registry's Electric Power Sector protocol for GHG emissions measurement and reporting.

2. Carbon Neutral Plan Objective

Reduce the City of Palo Alto's overall community GHG emissions by achieving carbon neutrality for the Electric Supply Portfolio starting in calendar year 2013 within an annual rate impact not to exceed 0.15 cents per kilowatt-hour (¢/kWh) primarily through the: 1) engagement of customers to increase energy efficiency; 2) expansion of long-term renewable resource commitments; 3) promotion of local renewable resources; 4) continued reliance on existing hydroelectric resources; and 5) meeting short-term balancing requirements and/or neutralizing residual carbon through the use of short-term purchases of renewable resources and/or renewable energy certificates (RECs).

3. Resource Strategies*a. Energy Efficiency*

- i. Continue to pursue energy efficiency strategies as identified in the Council-approved ten-year Energy Efficiency Plan.

b. Long-term Renewable Resources

- i. Continue to pursue the City's Renewable Portfolio Standard (RPS) goal to purchase renewable energy to supply at least 33% of retail sales by 2015 while ensuring that the retail rate impact of these purchases does not exceed 0.5 ¢/kWh.
- ii. Continue to pursue local renewable resources through the Palo Alto CLEAN and PV Partners programs.
- iii. Pursue additional RPS-eligible, long-term renewable resources (beyond the RPS goals) to achieve a target of 100% carbon-free resources based on average year hydroelectric generation.

c. Short-term Renewable Resources and Renewable Energy Certificates

- i. For calendar years 2013 through 2016, procure short-term renewables, if the price is comparable to that of an un-bundled REC;
- ii. For calendar years 2013 through 2016, procure RPS-eligible, un-bundled RECs as needed to achieve carbon neutrality based on actual load and resources;

¹ Citygate is the location of the City's main meter where the City interconnects to the Pacific Gas and Electric transmission system. Emissions associated with the output of the locally sited fossil gas fired combustions units (COBUG), while not measured at Citygate, will be neutralized.

- iii. Neutralize anthropogenic GHG emissions associated with renewable resources with unbundled-RECs, which may or may not be RPS-eligible.
- d. *Banking and Truing Up*
 - i. In the event that there are surplus renewables beyond the load in a particular year, bank as many RECs as allowable under the TCR EPS protocol from qualifying renewables from that year to minimize the need for purchasing RECs in subsequent years.
 - ii. Neutralize emissions associated with market purchases resulting from deviations between expected and actual load and renewable and hydroelectric generation resources with unbundled-RECs, which may or may not be RPS-eligible.

4. Hydroelectric Resources

- a. Continue to preserve and advocate for existing carbon-neutral hydroelectric generation resources that provide approximately 50% of average year resource needs.
- b. Plan for and acquire carbon neutral resources assuming average hydroelectric conditions going forward.
- c. Under adverse hydroelectric conditions, procure unbundled-RECs, which may or may not be RPS-eligible, to achieve carbon neutrality up to the 0.15 ¢/kWh rate impact limit and seek Council direction if carbon neutrality cannot be achieved within the rate impact limit.
- d. Under favorable hydroelectric conditions, where carbon neutral resources are expected to be surplus to needs, even after allowable banking, then pursue selling short-term renewable energy, or the renewable attributes, associated with one or more carbon-neutral resources in the portfolio.

5. Financial and Rate Payer Impacts

- a. In addition to the RPS annual rate impact limit of 0.5 ¢/kWh, the cost of achieving carbon neutrality shall not exceed 0.15 ¢/kWh based on an average hydro year.
- b. Revenues collected from surplus energy sales related to hydroelectric resources under favorable conditions (e.g. wet years), will be maintained within reserves to adjust for the cost of achieving carbon neutrality under adverse hydroelectric years.
- c. To the extent available and allowable, revenues from the auction of cap-and-trade allowances may be used to fund resources acquired to meet the carbon neutrality goals.

6. Reporting and Communication

- a. Develop a communication plan for stakeholders to inform them of the City's efforts towards achieving a carbon neutral electric supply.
- b. Submit an annual, verified report of the carbon content of the electric supply portfolio to The Climate Registry.
- c. Provide customers a report of the electric supply portfolio's carbon content to supplement the mandated Power Content Label.
- d. Inform large commercial and/or corporate customers of the City's carbon neutral portfolio and its relevance to their individual corporate sustainability goals.

7. Implementation Plan

The tasks that need to be completed in the next two years pending Council approval of the Carbon Neutral Plan in February 2013 are listed in the table below.

Item	Timeframe
1. Modify electric supply portfolio models and Energy Risk Management Policies, Guidelines and Procedures to account for Carbon Neutral objectives, balancing, banking of renewable attributes, reporting and financial impacts.	By April 2013
2. Modify the Long-term Electric Acquisition Plan (LEAP) to include the carbon neutral objective	By June 2013
3. Develop communication plan to inform customers and stakeholders of Carbon Neutral Plan and efforts.	February to April 2013
4. Based on response to the Fall 2012 request for proposals, seek approval of new renewable power purchase agreements to meet the City's RPS up to approximately 100% of the long-term resource needs in average hydro years.	December 2012 to June 2013
5. Determine resource needs for CY 2013 through CY 2016 and develop plan to acquire short-term renewable resources.	By June 2013
6. Determine long-term renewable purchase volumes for beyond CY 2016 and develop plan to acquire long-term renewable resources.	By September 2013
7. Procure RECs as needed to neutralize carbon emissions based on actual load and resources for CY 2013.	By May 2014
8. Along with annual Power Content Label, produce and report to customers the carbon intensity of the electric supply portfolio.	May/June 2014 and annually thereafter
9. Produce and submit Electric Power Sector (EPS) and Local Governments Operation Protocol (LGOP) reports to The Climate Registry (TCR) for CY 2013.	July and October 2014 and annually thereafter
10. Get independent verification of TCR reports and submit audited reports to TCR.	By December 2014 and annually thereafter
11. Redesign the PaloAltoGreen program according to Council direction.	By December 2013