



# City of Palo Alto

## Utilities Advisory Commission Staff Report

(ID # 14908)

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**Meeting Date: 12/7/2022**

**Report Type:**

**Title: Informational Update on Electric Supply Portfolio Optimization and Rebalancing Initiatives**

**From: Director of Utilities**

**Lead Department: Utilities**

### **REQUEST**

This is an informational report to the Utility Advisory Commission (UAC); no action is required.

### **EXECUTIVE SUMMARY**

While the City's total electric supply matches closely with the City's electrical demand on an annual basis, considerable load-resource imbalances exist within the portfolio on a seasonal and daily basis. This seasonal/daily imbalance has existed since 2005, when the current 20-year Western Base Resource (WBR) hydro contract became effective. Over the past 18 years the City has balanced its loads and generation supplies by: a) entering into long-term renewable resource contracts, b) making monthly market purchases and sales to address seasonal imbalances, and c) making daily/hourly market purchases and sales to address intraday imbalances. (See Attachments A and B for graphs depicting the seasonal and daily load-resource balances.)

While this strategy has worked to date, staff has been seeking ways to better balance loads and resources to minimize cost uncertainty associated with managing the portfolio, while minimizing the overall cost of electric supply. The decline in market electricity prices during periods of high solar production (when Palo Alto's electric supply portfolio is in surplus) and the projected increase in night-time electricity prices (when Palo Alto's portfolio is in deficit), and projection for these trends to continue in the future, is expected to reduce the value of the City's supply portfolio and increase its exposure to market price volatility. In response, staff is actively exploring ways to rebalance the portfolio to minimize its market price exposure and increase its value.

### **DISCUSSION**

The City's 2018 Integrated Resource Plan (IRP) included a Work Plan (Attachment C) with several new initiatives, including one on portfolio rebalancing: to "evaluate the merits of rebalancing the electric supply portfolio to lower seasonal and daily market price exposure by more closely matching the City's hourly and monthly electric loads." Along those lines, in recent months staff

has explored procuring firm, baseload geothermal energy and simultaneously selling surplus solar generation in the spring and summer months. The City currently has an opportunity to enter into a 12-year agreement to procure 10-20 MW of output from the Calpine Geothermal project, as part of a larger purchase with other Northern California Power Agency (NCPA) members. Staff is also exploring a sale of 40-80 MW of solar output during Q2 and Q3 from one or more of the City's long-term contracts. These combined transactions will more closely balance the City's loads and resources on a daily/monthly basis to better hedge market energy price shifts in the long-term while maintaining the portfolio's annual energy position close to current levels.

In addition to the above rebalancing strategies, staff is also exploring agreements to add energy storage systems at existing solar project sites. Such resources would help the City meet its long-term resource adequacy capacity obligations while also shifting a portion of the City's solar generation from lower-priced to higher-priced hours. Staff has also recently evaluated procuring output from another hydroelectric project, but ultimately chose not to participate in that project, finding the contract price to be not very competitive and in view of the fact that the resource would add to the City's already heavy reliance on hydroelectric resources.

Another important initiative included in the City's 2018 IRP Work Plan was evaluating the merits of committing to a new 30-year WBR contract starting in 2025. (Although the City has officially executed the new WBR contract, it retains the ability to reduce its share of the contract or even opt out entirely until the end of June 2024.) Staff's preliminary analysis suggests that it may be best to retain the City's share of the WBR contract in 2025, while continuing to evaluate the option to reduce City's share or exit the contract in 2030 if the resource becomes uncompetitive.<sup>1</sup>

The third major initiative in the City's 2018 IRP Work Plan was to evaluate how to best utilize the City's share of the California-Oregon Transmission Project (COTP) when the long-term layoff of this asset ends in 2024. On this front, staff's preliminary analysis suggests that utilities outside of the California Independent System Operator (CAISO) balancing area may be better able to maximize the value of the resource than the City. As such, staff is exploring options to further lay-off the asset to such utilities until 2039; at that point the COTP layoffs of several other NCPA members will also be coming to an end, and the City will be able to consider the long-term use of this resource with these other members in a more coordinated fashion.

Staff has issued (or plans to issue in the near future) several Requests for Proposals to competitively purchase, sell, or lay-off various resources as described above. Palo Alto has also retained Ascend Analytics to more rigorously model and analyze the economics and portfolio fit of the options staff is exploring. Staff expects to return to the UAC in the coming months to

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<sup>1</sup> Staff's preliminary analysis of Western's value relative to other resource accounts for the fact that Western's output has trended downward in recent years due to the effects of drought and climate change, as well as the impact that weather-related volatility has on the City's overall supply cost uncertainty and the need for a Hydro Rate Adjuster mechanism.

present the results of this analysis and share staff's recommendations, all in conjunction with the development of the City's 2023 IRP.

### **STAKEHOLDER ENGAGEMENT**

Staff discussed the process of developing the Integrated Resource Plan with the UAC in June 2022 ([Staff Report 14279](#)). The current report further informs the community on the progress made on this front in the past six months. In the next 12 months, staff will continue engaging community stakeholders on these initiatives via several upcoming meetings with the UAC. Input would be sought on ways to optimally procure and rebalance the City's electric supply portfolio to cost-effectively and sustainably meet the City's growing electricity demand.

### **POLICY IMPLICATIONS**

This update on staff's efforts to optimize and rebalance the electric supply portfolio is in line with the Utilities Strategic Plan, the City's Energy Risk Management Policy, its 2018 Electric IRP, and its Sustainability and Climate Action Plan (S/CAP) goals.

### **ENVIRONMENTAL REVIEW**

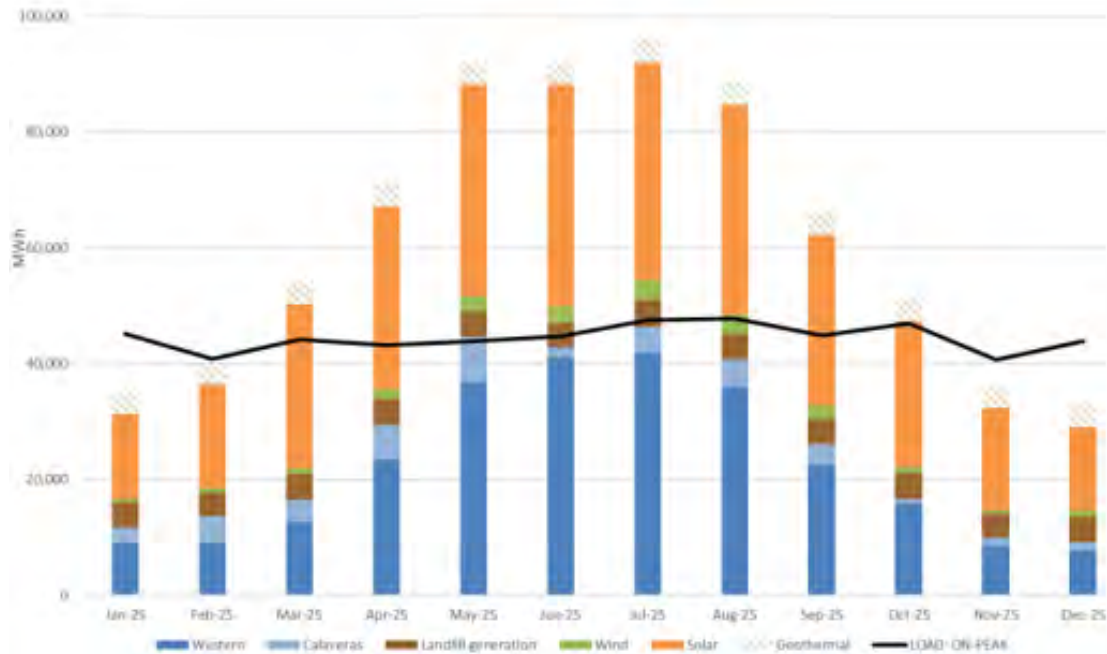
The Utilities Advisory Commission's review of this update on electric supply portfolio optimization and rebalancing does not meet the definition of a project under Public Resources Code 21065 and therefore California Environmental Quality Act (CEQA) review is not required.

#### **Attachments:**

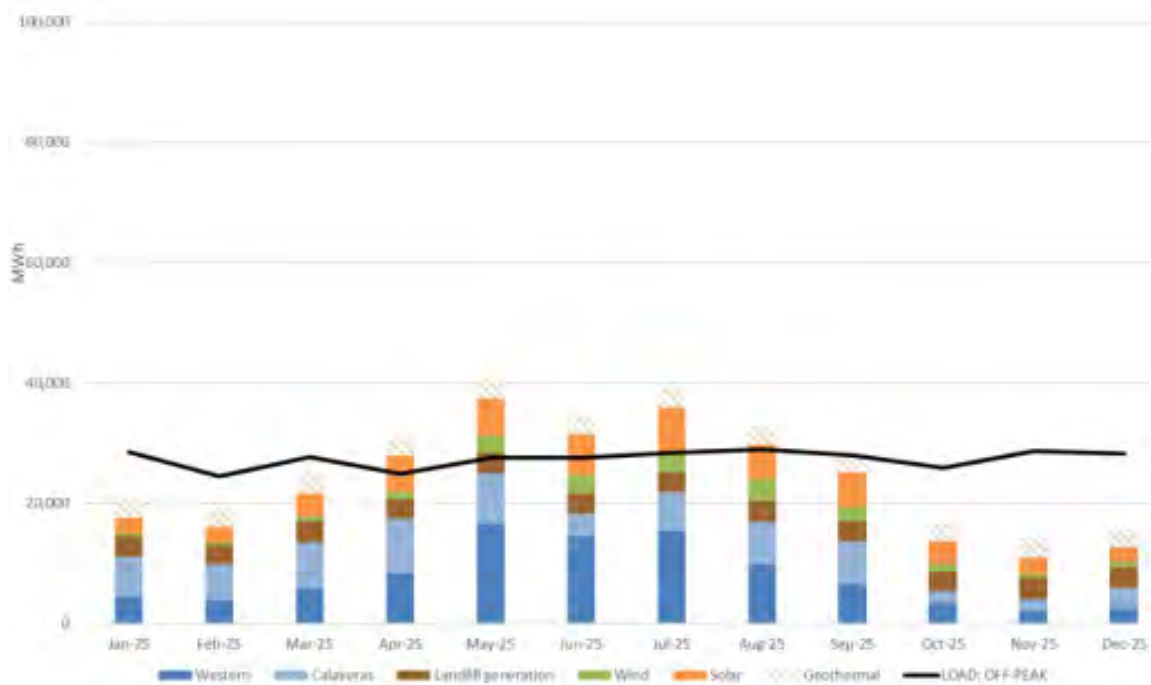
- Attachment A: Monthly Load-Resource Balances for 2021
- Attachment B: Daily Load-Resource Balances for 2021
- Attachment C: 2018 Electric IRP Work Plan

### Monthly On-Peak and Off-Peak Load-Resource Balances for CY 2021

**Figure A-1: Monthly On-Peak Load-Resource Balance for CY 2021, with Potential Calpine Geothermal Output Included**

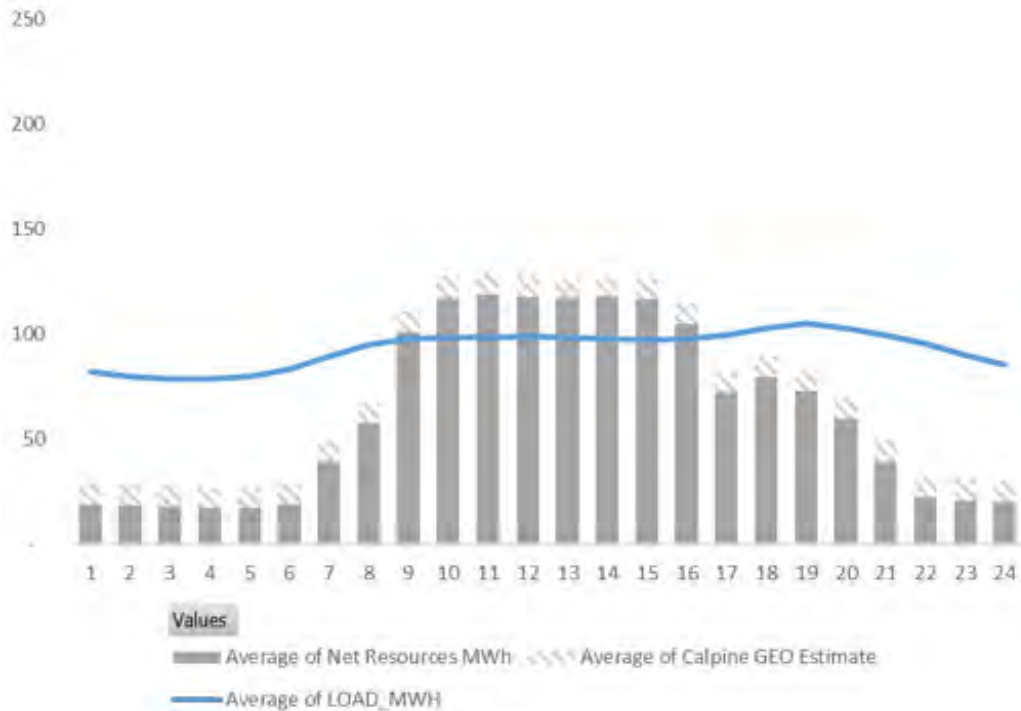


**Figure A-2: Monthly Off-Peak Load-Resource Balance for CY 2021, with Potential Calpine Geothermal Output Included**

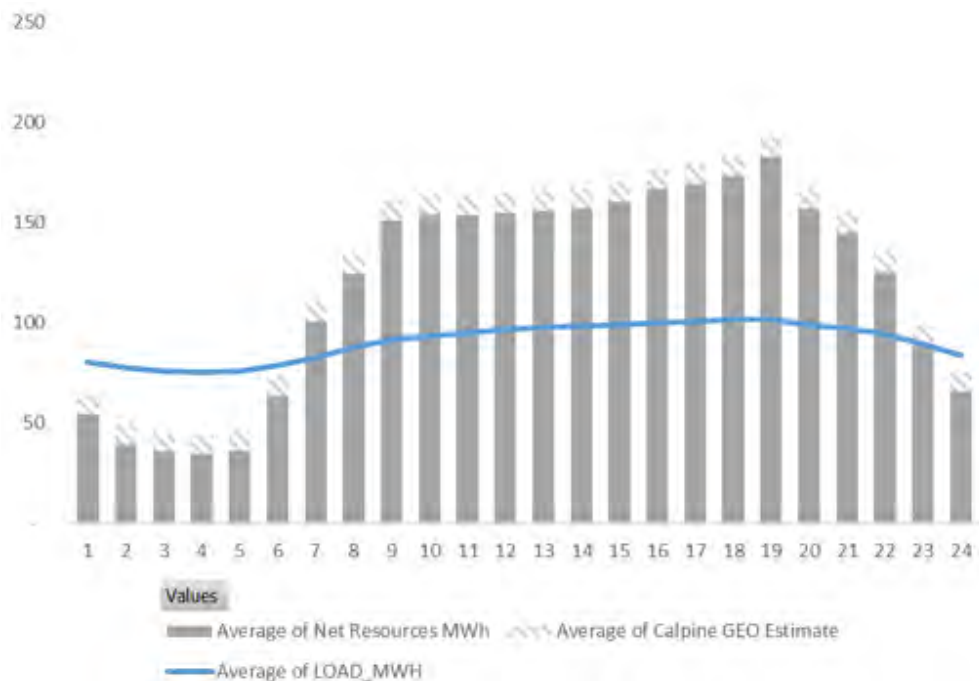


### Daily Load-Resource Balances for CY 2021 (January, April, July, and October)

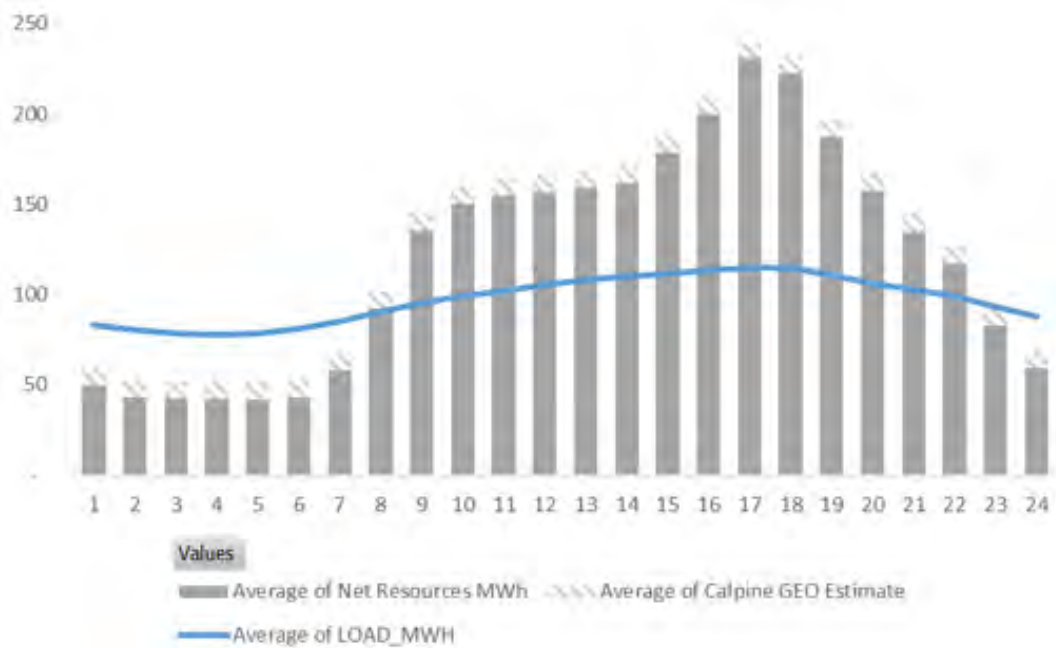
**Figure B-1: Average Hourly Load-Resource Balance for January 2021, with Potential Calpine Geothermal Output Included**



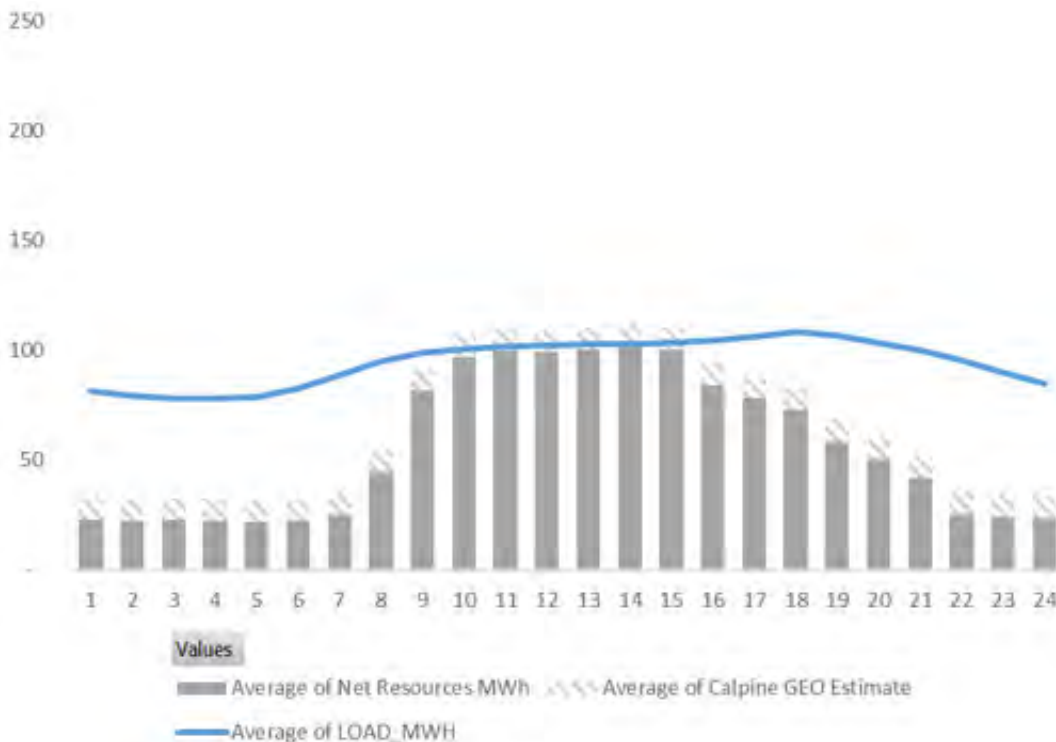
**Figure B-2: Average Hourly Load-Resource Balance for April 2021, with Potential Calpine Geothermal Output Included**



**Figure B-3: Average Hourly Load-Resource Balance for July 2021, with Potential Calpine Geothermal Output Included**



**Figure B-4: Average Hourly Load-Resource Balance for October 2021, with Potential Calpine Geothermal Output Included**



## 2018 Electric IRP Strategies & Related New Initiatives

There are a number of new initiatives and numerous on-going tasks related to implementing the EIRP Strategies. These activities are supported by about six to eight CPAU staff, both from the supply side and demand-side (or customer) programs. In addition, CPAU relies on joint action agencies and external service providers to implement programs and initiatives. Supply and customer program staff also coordinates with retail rate development, distribution system engineering, and operations staff to implement programs and investments in an integrated manner.

Described below are the nine strategies and eight new initiatives that are expected to be undertaken in the next three to six years. Work tasks related to on-going activities have not been called out separately.

### EIRP Strategies & Related New Initiatives

1. **Pursue an Optimal Mix of Supply-side and Demand-side Resources:** When procuring to meet demand, pursue an optimal mix of resources that meets the EIRP Objective, with cost-effective energy efficiency, distributed generation, and demand-side resources as preferred resources. Consider portfolio fit and resource uncertainties when evaluating cost-effectiveness.
  - a. **Initiative #1:** Evaluate the merits of committing to a new 30-year contract with Western starting in 2025. [Recommendation on initial commitment to the UAC in early 2020; recommendation on final commitment in early 2024.]
  - b. **Initiative #2:** Evaluate the merits of rebalancing the electric supply portfolio to lower its seasonal and daily market price exposure, by more closely balancing the City's long-term supplies with its hourly and monthly electric loads. [Initial scoping assessment report to the UAC by December 2019.]
  - c. **Initiative #3:** Evaluate how to best utilize the City's share of the California-Oregon Transmission Project (COTP), when the long-term layoff of this asset ends in 2024. [Initial assessment report to UAC by December 2019, in tandem with Initiative #2 initial scoping assessment report.]
  - d. Continue ongoing evaluation of all cost-effective distributed energy resources (DERs), such as energy efficiency, distributed generation, energy storage, and demand response. Update forecasts of DER impacts on retail sales and load shapes for use in strategic planning, rate-making, and budget forecasting. [Initial assessment to be completed in Distributed Energy Resource (DER) and Customer Program Plan for Council approval by June 2019.]
2. **Maintain a Carbon Neutral Supply:** Maintain a carbon neutral electric supply portfolio to meet the community's greenhouse gas (GHG) emission reduction goals.
  - a. **Initiative #4:** In addition to ensuring 100% of City's annual electricity energy needs are met with carbon neutral supplies (on a kWh basis), evaluate the carbon content of the electric portfolio on an hourly basis, and recommend the merits of buying carbon offsets to ensure the carbon content of the cumulative

hourly portfolio is zero on an annual basis. Also evaluate the manner in which the City communicates with customers about the carbon content of the electric portfolio. [Initial staff recommendation to the UAC by December 2019.]

3. **Actively Manage Portfolio Supply Cost Uncertainties:** Structure the portfolio or add mitigations to manage short-term risks (e.g. market price risk and hydroelectric variability) and build flexibility into the portfolio to address long-term risks (e.g. resource availability, customer load profile changes, and regulatory uncertainty) through diversification of suppliers, contract terms, and resource types.
  - a. This is an on-going active management strategy; no new initiatives are planned.
4. **Manage Electric Portfolio to Ensure Lowest Possible Ratepayer Bills:** Pursue resources in a least-cost, best-fit approach in an effort to ensure ratepayer bills remain as low as possible, while achieving other Council-adopted sustainability, rate, and financial objectives.
  - a. **Initiative #5:** Investigate the merits and economics of monetizing excess renewable energy certificates to minimize the cost of maintaining an RPS compliant and carbon neutral electricity supply portfolio. [Initial staff recommendation to the UAC by December 2019.]
5. **Partner with External Agencies to Implement Optimization Opportunities:** Actively engage and partner with external agencies to maximize resource value and optimize operations.
  - a. **Initiative #6:** Explore greater synergistic opportunities with NCPA and other agencies – such as newly formed community choice aggregators – to lower Palo Alto’s operating costs and rebalance the supply portfolio. [Initial assessment to UAC by December 2019.]
6. **Manage Supplies to Meet Changing Customer Loads and Load Profiles:** Maintain electric supply resource flexibility in anticipation of potential changes in customer loads due to distributed energy resources, efficiency, electrification, or for other reasons. At the same time, use retail rates and other available tools to influence customer load changes in a manner that minimizes overall costs and achieves other Council objectives.
  - a. **Initiative #7:** Implement 2018 Utilities Strategic Plan Priority 4, Strategy 4, Action 2 by undertaking a competitive assessment for the electric utility within the context of the large proliferation of customer-sited DER technologies, electrification initiatives, changing customer expectations, and potential regulatory changes. Develop contingencies to address the potential for large changes in the City’s load level or load profile. [Initial assessment to UAC in December 2020.]
7. **Ensure Reliable and Low-cost Transmission Services:** Work with the transmission system operator to receive reliable service in a least-cost manner.
  - a. This is an on-going activity; no new initiatives are planned.



8. **Support Local Electric Supply Resiliency:** Coordinate supply portfolio planning with utility-wide efforts to support local measures and programs that enhance community electric supply resiliency.
  - a. On-going supporting role in utility-wide efforts.
9. **Comply with State and Federal Laws and Regulations:** Ensure compliance with all statutory and regulatory requirements for energy, capacity, reserves, GHG emissions, distributed energy resources, efficiency goals, resource planning, and related initiatives.
  - a. Ongoing activities in collaboration with NCPA, CMUA and other joint action agencies.