



UTILITIES ADVISORY COMMISSION
Regular Meeting
Wednesday, September 06, 2023
Council Chambers & Hybrid
6:00 PM

Pursuant to [AB 361](#) Palo Alto City Council meetings will be held as “hybrid” meetings with the option to attend by teleconference/video conference or in person. To maximize public safety while still maintaining transparency and public access, members of the public can choose to participate from home or attend in person. Information on how the public may observe and participate in the meeting is located at the end of the agenda. Masks are strongly encouraged if attending in person. The meeting will be broadcast on Cable TV Channel 26, live on YouTube <https://www.youtube.com/c/cityofpaloalto>, and streamed to Midpen Media Center <https://midpenmedia.org>.

VIRTUAL PARTICIPATION [CLICK HERE TO JOIN](https://cityofpaloalto.zoom.us/j/96691297246) (<https://cityofpaloalto.zoom.us/j/96691297246>)
Meeting ID: 966 9129 7246 Phone: 1(669)900-6833

PUBLIC COMMENTS

Public comments will be accepted both in person and via Zoom for up to three minutes or an amount of time determined by the Chair. All requests to speak will be taken until 5 minutes after the staff’s presentation. Written public comments can be submitted in advance to UACPublicMeetings@CityofPaloAlto.org and will be provided to the Council and available for inspection on the City’s website. Please clearly indicate which agenda item you are referencing in your subject line.

PowerPoints, videos, or other media to be presented during public comment are accepted only by email to UACPublicMeetings@CityofPaloAlto.org at least 24 hours prior to the meeting. Once received, the Clerk will have them shared at public comment for the specified item. To uphold strong cybersecurity management practices, USB’s or other physical electronic storage devices are not accepted.

TIME ESTIMATES

Listed times are estimates only and are subject to change at any time, including while the meeting is in progress. The Commission reserves the right to use more or less time on any item, to change the order of items and/or to continue items to another meeting. Particular items may be heard before or after the time estimated on the agenda. This may occur in order to best manage the time at a meeting to adapt to the participation of the public, or for any other reason intended to facilitate the meeting.

CALL TO ORDER 6:00 PM - 6:05 PM

AGENDA CHANGES, ADDITIONS AND DELETIONS 6:05 PM - 6:10 PM

The Chair or Board majority may modify the agenda order to improve meeting management.

PUBLIC COMMENT 6:10 PM - 6:25 PM

Members of the public may speak to any item NOT on the agenda.

APPROVAL OF MINUTES 6:25 PM - 6:30 PM

1. Approval of UAC Draft Minutes from July 2023

UTILITIES DIRECTOR REPORT 6:30 PM - 6:45 PM

NEW BUSINESS (a 10 minute break will be imposed during this section)

2. Discussion and Presentation - Overview of Drinking Water Quality (*DISCUSSION 6:45 PM – 7:30 PM*) Staff: Matt Zucca
3. Overview of Palo Alto Fiber and Fiber Backbone Activities and Discussion of the Fiber Expansion Plan (*DISCUSSION 7:30 PM – 8:15 PM*) Staff: Alex Harris
4. Overview of Sustainability and Climate Action Plan (S/CAP) Activities To-Date and Discussion of Reliability and Resiliency Strategic Plan Policy Guidelines (*DISCUSSION 8:15 PM – 9:45 PM*) Staff: Jonathan Abendschein

COMMISSIONER COMMENTS AND REPORTS FROM MEETINGS/EVENTS

FUTURE TOPICS FOR UPCOMMING MEETING: October 11, 2023

ADJOURNMENT

SUPPLEMENTAL INFORMATION

The materials below are provided for informational purposes, not for action or discussion during UAC Meetings (Govt. Code Section 54954.2(a)(3)).

12-Month Rolling Calendar

Public Letter(s) to the UAC

PUBLIC COMMENT INSTRUCTIONS

Members of the Public may provide public comments to teleconference meetings via email, teleconference, or by phone.

1. **Written public comments** may be submitted by email to UACPublicMeetings@cityofpaloalto.org.
2. **Spoken public comments using a computer** will be accepted through the teleconference meeting. To address the Council, click on the link below to access a Zoom-based meeting. Please read the following instructions carefully.
 - You may download the Zoom client or connect to the meeting in- browser. If using your browser, make sure you are using a current, up-to-date browser: Chrome 30 , Firefox 27 , Microsoft Edge 12 , Safari 7 . Certain functionality may be disabled in older browsers including Internet Explorer.
 - You may be asked to enter an email address and name. We request that you identify yourself by name as this will be visible online and will be used to notify you that it is your turn to speak.
 - When you wish to speak on an Agenda Item, click on “raise hand.” The Clerk will activate and unmute speakers in turn. Speakers will be notified shortly before they are called to speak.
 - When called, please limit your remarks to the time limit allotted. A timer will be shown on the computer to help keep track of your comments.
3. **Spoken public comments using a smart phone** will be accepted through the teleconference meeting. To address the Council, download the Zoom application onto your phone from the Apple App Store or Google Play Store and enter the Meeting ID below. Please follow the instructions B-E above.
4. **Spoken public comments using a phone** use the telephone number listed below. When you wish to speak on an agenda item hit *9 on your phone so we know that you wish to speak. You will be asked to provide your first and last name before addressing the Council. You will be advised how long you have to speak. When called please limit your remarks to the agenda item and time limit allotted.

CLICK HERE TO JOIN Meeting ID: 966 9129 7246 Phone:1-669-900-6833

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Utilities Advisory Commission Staff Report

From: Dean Batchelor, Director Utilities
Lead Department: Utilities

Meeting Date: September 6, 2023
Staff Report: 2308-1931

TITLE

Approval of UAC Draft Minutes from July 2023

RECOMMENDATION

Staff recommends that the UAC consider the following motion:

Commissioner moved to approve the draft minutes of the July 5, 2023 meeting as submitted/amended.

Commissioner seconded the motion.

ATTACHMENTS

Attachment A: Draft Minutes

AUTHOR/TITLE:

Janelle Kamian, Program Assistant I



UTILITIES ADVISORY COMMISSION MEETING MINUTES OF JULY 5, 2023 REGULAR MEETING

CALL TO ORDER

Vice Chair Scharff called the meeting of the Utilities Advisory Commission (UAC) to order at 6:01 p.m.

Present: Vice Chair Scharff, Commissioners Croft, Forssell (arrived 6:02 p.m.), Mauter and Phillips

Absent: Chair Segal and Commissioner Metz

AGENDA CHANGES, ADDITIONS AND DELETIONS

None

PUBLIC COMMENT

None

APPROVAL OF MINUTES

ITEM 1: ACTION: Approval of the Minutes of the Utilities Advisory Commission Meeting Held on June 7, 2023

Vice Chair Scharff invited comments on the June 7, 2023 UAC draft meeting minutes.

ACTION: Commissioner Croft moved to approve the draft minutes of the June 7, 2023 meeting as submitted.

Commissioner Phillips seconded the motion.

Motion carried 5-0 with Vice Chair Scharff, Commissioners Croft, Forssell, Mauter and Phillips voting yes.

Chair Segal and Commissioner Metz absent.

UTILITIES DIRECTOR REPORT

Dean Batchelor, Utilities Director, delivered the Director's Report.

Water Quality Report: Each year, the Utilities Department publishes an annual Consumer Confidence Report on water quality conditions for the previous year. The UAC received a copy. All customers received a postcard with instructions to call Customer Service if they were interested in receiving a copy of the water quality report or customers can view the report on the website.

Beware of Scams: City of Palo Alto Utilities (CPAU) received numerous calls from customers in the last 1½ months about a person pretending to be from CPAU instructing them to press a number on their phone to receive a rebate. All CPAU residential customers received a rebate automatically credited to their utility bill for high winter energy costs. Customers do not need to take additional action. CPAU is providing warnings against falling victim to fraud.

Outage Management System: CPAU's goal is to launch a new Outage Management System (OMS) by October. This system is an improved way to detect and respond to power outages as well as provide timely notifications and updates to our customers via text messages, phone calls and emails.

Drought Update: The San Francisco Public Utilities Commission (SFPUC) 11% voluntary water use reduction and State's emergency regulations expired in June. Palo Alto lifted the 2-day per week watering restriction. The State left some water waste restrictions in place, including no washing hardscapes, no watering within 48 hours of a rain event and a ban on the use of drinking water to irrigate decorative grass at commercial, industrial and institutional sites. Outreach over the coming months will focus on making conservation a California way of life. Educational workshops will help residents and businesses conserve water.

Recap of Spring Landscape Workshops: CPAU and the Bay Area Water Supply & Conservation Agency (BAWSCA) co-hosted a series of spring landscape workshops. Topics included how to water trees, design and conversion of lawns to drought-tolerant landscapes, installing rain gardens and available rebates.

Upcoming Events: Details and registration at cityofpaloalto.org/workshops.

- **Thu, July 6:** Save Money with an EV and EV Discount Campaign, 5 - 6 p.m.
- **Sat, July 15:** MSC Open House, 9 a.m. - 2 p.m. The City is hosting an Open House at the Municipal Services Center (MSC) to display some of the work we do for the community. There will be free ice cream. Approximately 350 attended last year.

NEW BUSINESS

ITEM 2: ACTION: Staff Requests the Utilities Advisory Commission Recommend the City Council Approve Participation in the GoGreen Home Energy Financing Program in an Amount Not-to-Exceed \$2 Million over a Term of up to Five Years, Funded by the City's Cap and Trade Reserve, by Authorizing the City Manager or Their Designee to Execute a Memorandum of Agreement with the California Alternative Energy and Advanced Transportation Financing Authority

Shiva Swaminathan, Senior Resource Planner, delivered a slide presentation on the GoGreen Home Financing Program. The program is for residential customers to finance projects related to electrification and energy efficiency. California Public Utilities Commission (CPUC) authorized the program. The Agency of the State Treasurer's Office and the California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) administer the program. It was available to all Investor-Owned Utility (IOU) residential customers but recently became available to publicly owned utilities.

Staff recommended joining the GoGreen program. Residential customers can finance up to 100% of the project cost up to \$50,000. No money down required. No collateral is needed because it is an unsecured consumer loan. The maximum term is 15 years. Competitive rates are between 4% and 8% (4% for loans

up to five years, higher interest rates for longer-term loans). There are more than 40 qualified contractors enrolled in the GoGreen program. Customers can use up to 30% of the loan amount for unrelated renovation costs. Customers submit their loan application online through California Coast Credit Union or Matadors Credit Union, which are the only two credit unions servicing Santa Clara County. Work is underway to enroll several other credit unions in the program. You do not have to be a credit union member to apply for a loan. Once the credit union approves the loan, the contractor begins work. Upon the customer certifying completion of the project, the credit union pays the contractor. GoGreen is a potential financing source for our heat pump water heater program. In the future, we may have access to CAEATFA's suite of financing programs that include commercial and multifamily.

To participate in the program, Palo Alto has to pay a \$50,000 start-up cost plus \$40,000 per year in administrative costs as well as contribute to the loan loss reserve 16% of total Palo Alto loans made. Credit unions run credit checks to reduce the likelihood of losses. Upon UAC recommendation and Council's approval in August, GoGreen Home will be available to Palo Alto residents in Fall 2023.

Renters need an agreement with approval of the property owner for home improvement loans. The renter applies for the consumer loan and the loan stays with the renter. CAEATFA provides data in aggregate but not consumer-specific. Customers can use GoGreen loans for energy efficiency projects such as building envelopes, pools, lighting, HVAC and heat pump water heaters. Loans cannot be used for EVs, EV chargers or solar.

It is the credit union's loan and they will follow their normal procedures. The credit reserve covers up to 90% of outstanding loan amounts up to 16%. GoGreen has a portfolio of 3000 loans worth \$50 million. There are \$8 million in loan loss reserves. CPAU has to contribute 16% each time there is a Palo Alto loan. Reserve funds are in an escrow account held between CAEATFA and the credit union.

Some of the benefits of this loan program are it is an unsecured loan, the loan amount and duration, minimum credit score and lower interest rates. Typical unsecured loans are for a maximum term of five years but GoGreen's maximum term is 15 years. GoGreen provides lending to customers with credit scores as low as 580. It is unknown how many people in Palo Alto might be interested or qualify.

CPAU would pay startup and administrative costs to CAEATFA per the MOU. There will be some startup-related staff effort. Staff will promote electrification technologies to our customers through our existing channels for promoting the heat pump water heater program, such as the Home Efficiency Genie.

GoGreen's minimum loans are \$2500. The average loan amount in their portfolio is \$17,000. The State outlined the projects GoGreen can and cannot fund. This does not involve on-bill financing. The lending relationship is between the lender and the customer. The Utilities role is to promote this program.

Synergy is our installation contractor for the heat pump water heater program and is an approved GoGreen contractor. This financing instrument will become more useful as our suite of programs expands to include heat pump space heating, which could cost at least \$20,000. There is no current plan for bill inserts, mass emails or social media advertising. The GoGreen Multifamily program is only available to IOU customers, but staff is monitoring for changes that would allow CPAU to participate.

Discussion ensued on the not-to-exceed (NTE) amount and administrative costs. Mr. Swaminathan explained that CAEATFA's administrative cost pass-through was based on the methodology outlined in the contract on an incremental cost basis for the first two years to bring Palo Alto on plus the baseline

cost to run the program. CAEATFA's administrative cost for Years 3, 4 and 5 would be determined in the future but could be \$50,000 or \$60,000 per year. CAEATFA's administrative costs are to pay for their contractors, people who promote the program, maintain the website and maintain the bank accounts. Vice Chair Scharff opined it was more appropriate to approve what was needed for the MOU the first two years. Staff can return to discuss Years 3, 4 and 5, as it is the job of the City Council and UAC to provide more oversight.

Mr. Swaminathan addressed Vice Chair Scharff's questions about interest rates. These are unsecured loans. The credit risk increases as the duration of the loan term increases, so longer terms have higher interest rates. In response to Vice Chair Scharff's understanding that the State guaranteed the loans and the credit unions were getting 100% of their money back, Mr. Swaminathan replied correct.

GoGreen publishes statistics and current interest rates on their website. The March 2023 report provided by the State Treasurer's Office showed an average interest rate of 4.1% for GoGreen loans made over a 60-month period. For comparison, the interest rate is 10.6% for a similar unsecured loan. Credit unions typically do not provide loans for customers with credit scores lower than 640 but GoGreen can go as low as 580. There are 127 loans out of 3000 with credit scores between 580 and 640. The most recent interest rates published on the website were from March with loans at 4.99%, 5.99% and 7.99%, depending on the term.

Mr. Swaminathan stated that the loan reserves cover 90% of the outstanding loan amount up to 16% of all loans. If 100% of the loans default, the City is out-of-pocket for 16% but the credit union only receives 16%. There is \$8.6 million in the reserve. Since 2017, \$400,000 was used. Commissioner Phillips remarked it is risk subsidization; the credit unions determine the underwriting limit and the loan rate they want to offer. Vice Chair Scharff asked if there was a loss on one loan and it was less than 16% of all their loans, Palo Alto covers it 100%. Mr. Swaminathan responded that was correct. Vice Chair Scharff clarified that 100% of the loan was covered, assuming the default rate was not more than 16% of their portfolio. Dean Batchelor, Utilities Director, responded yes that was correct but they had to be Palo Alto loans. Vice Chair Scharff pointed out that the credit unions were not taking a lot of risk and Mr. Batchelor agreed. Mr. Swaminathan confirmed that the credit union loses money if the default rate is greater than 16%. The historic default rate was 4%.

Vice Chair Scharff expressed his concerns about the City promoting this program as well as older seniors, renters or people who cannot afford it applying for loans. He did not believe a renter should obtain a 15-year loan. He asked if CPAU had any safeguards in place or if we had to rely on the credit union. Commissioner Phillips remarked that most banks have an age limit for unsecured loans and asked how we would communicate that it is not available to seniors or if credit unions were waiving that requirement for this program. Vice Chair Scharff would be comforted if staff said that the credit unions' credit and income requirements were the same as they had for other loans, it will be well policed, the program's historical default percentage, if it was working well, how many cities in the Bay Area signed up and there was nothing to worry about.

Vice Chair Scharff preferred trying this program as a pilot with up to \$1 million worth of loans, then staff report to the UAC the number of loans and provide an evaluation of the program. Mr. Swaminathan replied that staff would provide a quarterly report. Vice Chair Scharff wanted staff to return to the UAC and Council six months before MOA renewal to report the good and bad as well as the number of homes electrified. Mr. Batchelor stated that staff could return to the UAC 18 months after starting the program as well as provide periodic updates. Mr. Swaminathan remarked that there were no penalties to withdraw

from the MOA and it does not automatically renew after two years. Commissioner Forssell felt it was prudent to return to Council with a program update and obtain approval after two years.

Discussion ensued on the amounts in Table 1. If the NTE amount is reached, staff can ask the UAC and Council for more money. Commissioner Phillips pointed out the administrative costs in comparison to the amount of loans. Mr. Batchelor believed this program would be successful because the City is pushing electrification. It costs \$50,000 to \$70,000 to electrify homes. Many people have a lot of investment in their home but not a lot of cash on hand and other methods of financing have higher interest rates. Palo Alto is converting from 4 kV to 12 kV in a pilot for about 500 to 600 customers. Overhead upgrades will be completed by 2026 or 2027, which is about 55% of our customers.

Vice Chair Scharff suggested that staff set realistic expectations for the number of loans during the first two years when making their presentation to Council. Mr. Swaminathan noted this program is growing. It has financed \$55 million since its existence in 2017. In March, GoGreen financed \$2.39 million.

Commissioner Croft wondered if we should wait two years to begin the program or if there was a benefit or need to start the program now. Mr. Batchelor replied that the pilot at the end of the year would allow 500 to 600 homes to electrify. Reserves funded the heat pump water heater program for this year's budget but the City will not subsidize it next year, so this is another avenue for customers.

Discussion ensued regarding the motion.

ACTION: Vice Chair Scharff moved to approve Staff recommendation to recommend Council approval of a Memorandum of Agreement with California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) for an Amount Not-to-Exceed \$300,000 over a Term of up to Two Years to provide Credit Enhancements for Palo Alto Residential Customer Home Energy Efficiency & Electrification Project Loans Facilitated by CAEATFA through Registered Participating Financing Companies (PFCs), and approve the use of the City's Cap and Trade Reserve funds to cover the cost of the Program.

Seconded by Commissioner Phillips.

Motion carried 5-0 with Vice Chair Scharff, Commissioners Croft, Forssell, Mauter and Phillips voting yes.

Chair Segal and Commissioner Metz absent.

The UAC took a break at 7:22 p.m. and returned at 7:32 p.m.

ITEM 3: DISCUSSION: Discussion of Electric Supply Portfolio Modeling Results

Jim Stack, PhD, Senior Resource Planner, presented the Electric Integrated Resource Plan (IRP) Modeling Results. He showed low, mid and high-scenario graphs of Palo Alto's electric load projections through 2045. Dean Batchelor, Utilities Director, spoke about projected increased load from two new data centers. Dr. Stack showed a table of resources in the City's electric supply portfolio. One wind project and some landfill gas projects have contracts expiring between the late 2020s and early 2030s. Solar resources have contracts extending into the 2040s. The Calpine Geothermal contract starts in 2025 and runs for 12 years. The City has two large hydroelectric resources and is a partial owner of the Collierville facility. The Western Base Resource is a contract with the federal government and is the largest resource in the portfolio. A 30-year contract was executed with Western Area Power Administration (WAPA) to start in 2025. A decision

will be made by July 1, 2024 to maintain our full share of the contract, decrease our share or exit the contract, which will be the subject of a future presentation.

Dr. Stack explained that each resource has a nameplate capacity, which is the maximum amount of power it can produce. Net qualifying capacity (NQC) refers to the amount of capacity each resource qualifies for under the State's Resource Adequacy (RA) rules. For new solar and wind resources, the amount of NQC is a small fraction of the nameplate capacity. The NQC amounts change yearly based on the resource's production and when the production occurred relative to when the grid was at its peak.

Commissioner Phillips asked about load curves and matching resources. Dr. Stack responded that it does not have to match on a monthly basis, although it is preferred because of exposure to market price risk when you have large surpluses and deficits offsetting each other. A generic product is bought at a trading hub, so it is unclear where the energy is coming from, but it is assumed that the resource filling the gaps in the winter comes from combined cycle gas turbines. CPAU puts our additional clean energy onto the grid in the spring months to offset the environmental impact of the combined cycle emissions.

Commissioner Phillips queried about the matching of supply and demand load over 24 hours. Dr. Stack does not have that slide with him tonight but he could provide that information. The City has large surpluses of solar during the daylight hours and hydro resources peak in the evening hours. There are gaps in the late night and early morning hours. The portfolio does not include nuclear but among the resources under consideration are small modular reactors.

Solar and wind are the least costly resources. Due to the Inflation Reduction Act, prices are expected to decrease and level off until about 2030 and then increase in the late 2030s. Small modular reactors and offshore wind projects are a long way from commercialization. New hydroelectric resources were not included in the portfolio analysis because there are no new dams expected in the west. Occasionally, an opportunity could arise when an existing hydro resource has a contract expire.

Commissioner Forssell inquired about the drivers for investing in storage versus generation resources. Dr. Stack replied that generation resources provide energy that adds to your resource mix. Because of efficiency losses, storage is a net consumer of energy. The reasons for investing in storage are to meet your capacity requirements, regulatory compliance for RA purposes, and its economic value. The cost of the investment, in dollars per kilowatt-month, is compared to the RA revenue and energy arbitrage value or the storage resource can be used for frequency regulation in the ancillary services market.

Commissioner Phillips asked for further explanation on why demand response (DR) was costly. He noted that about 70% of the City's consumption is commercial, so he wondered if there were any interruptible contracts or priority commercial contracts. He thought we would have AMR by the end of the year and the potential to use it creatively. Dr. Stack responded that he is not a DR expert. CPAU had a DR pilot program in past years, and it was not cost effective because it required a lot of staffing and overhead cost to maintain its reliability and for customer communication.

Commissioner Croft was very interested in seeing the hourly load curves. She thought the City wanted clean energy so the purpose of batteries was to bank energy during the day to use during the night instead of buying gas-powered energy; however, batteries were discussed as a financial play. Dr. Stack replied that the portfolio does not include any batteries but the strategy for utilizing batteries was based on the market price signal, so they were an energy play or a value play. If you have energy from a clean resource stored in the battery, you want to put it onto the grid when market prices are highest. A 10-hour battery

has a greater amount of capacity in RA requirements and more energy can be stored. A 10-hour battery has to charge for 10 hours, so you do not get as large a price delta when buying and selling. With a four-hour battery, you can buy in the four least expensive hours and discharge in the four most expensive hours so you get the biggest price delta. Capacity is bought and sold monthly.

Commissioner Mauter asked if there was a plan to grow a DR program within the department or outsource elements of DR management in the future. Dr. Stack does not know the DR long-term plan.

Commissioner Croft wondered if projects were under consideration in Palo Alto to generate our own electricity, through investment in solar or harvested from wastewater treatment. Dr. Stack replied that since 2012 or 2013 there has been a feed-in tariff program to buy energy from larger solar installations in town over a long-term basis. About 3 megawatts of solar are under contract. The challenges are no open land available in Palo Alto for a big generation resource as well as costs for infrastructure and land. Installing something at the treatment plant or golf course parking lot may be considered in the future.

Our resources are profitable overall. Ascend's preliminary modeling results recommended adding the following to the portfolio to meet our gaps: 25 megawatts of solar in 2030 and another 25 the following year, additional solar in the late 2030s and into the 2040s as well as some storage capacity in the 2040s.

Geothermal is a 12-year contract starting in 2025 with 5 megawatts for two years and 10 megawatts the next 10 years. When the geothermal contract expires, it might be available for renewal, but it could be at a higher price and would compete with other alternatives. The WAPA contract looks competitive and will be the subject of a future presentation. The model preferred contracting for new low-cost resources using stand-alone solar and adding storage in later years when we become capacity short. Solar is not the best fit for the portfolio because it exacerbates our summer surpluses and does not help much with the winter deficits. Staff is questioning whether the model might be overestimating the value of new standalone solar. Solar, wind and storage costs were expected to come down over the next few years.

Staff will work with Ascend to refine the model results to reflect our portfolio preferences. Staff will analyze the WAPA contract to determine its value. In the coming years, staff will seek new baseload or flexible resources that better fit our load shape. Staff will explore demand-side programs. With AMR coming online, staff wants to institute a time-of-use rate (TOU) to encourage load-shifting to solar hours when we have surpluses and explore other programs such as DR to improve load flexibility. Dr. Stack will return to the UAC in September or October with additional analysis results, including candidate portfolio options and supply cost data. Staff will present the final Integrated Resource Plan (IRP) report to the Finance Committee and City Council for approval by the end of the calendar year per State requirements.

Commissioner Mauter queried about planning for the mid-range load instead of the high-range scenario. Dr. Stack replied that there is a risk in undershooting and not buying at attractive prices now if prices go up in the future but there is the risk of overshooting and selling excess resources at a loss if you plan for the high load scenario. The electrification and EV load numbers shown in the high scenario are extremely aggressive and will be very difficult to achieve.

In reply to Commissioner Mauter's asking what fraction of the load municipal services consumes, Dr. Stack thought municipal was around 5% and Mr. Batchelor concurred it was about 5% to 6%.

The rates manager was not present at the meeting, so Mr. Swaminathan addressed Commissioner Mauter's questions regarding commercial customers and demand-side programs. CPAU had a couple

large commercial customers on TOU rates. Commercial customers are charged average cost based but you could provide a signal for marginal DR. The limits on capacity are small for DR.

Mr. Swaminathan answered Commissioner Phillips' questions regarding batteries and DR. The assumption was that the battery's developer would own the batteries but CPAU would have control to dispatch it according to our preferences through a long-term contract. Dr. Stack was bullish on the potential for using TOU to incentivize EV customers to charge their cars during the day when they can take advantage of solar rather than at night, although there is no data to determine the net impact. Maybe in a couple years the analysis can be refined to provide that data.

Commissioner Croft was disappointed with the 2025 and 2045 monthly charts to see landfill gas and geothermal, which are flatter energy sources throughout the year, replaced by solar and hydro that are very seasonal. Keeping in mind the environmental impact of our actions, she would love to see generation better matched with our load. She thought DR should be used to change the load. She suggested having the S/CAP committee's input on our energy resources. Generating closer to our load curve decreases our exposure to market pricing. She was interested in seeing a model where load matched generation to evaluate the cost of that approach. Dr. Stack replied that when the basic IRP is complete, the next step is for Ascend to analyze the incremental cost of more fully matching our supply to our load on an hourly basis and that analysis will be shared with the UAC in the coming months.

Commissioner Forssell queried what where our commercial TOU rates and the peak times in our current rate structure. Dr. Stack thought the peak period was 4 to 9 p.m. Mr. Swaminathan clarified that was the legacy rate and a new rate had not been developed. The peak for commercial customers was 4 to 6 p.m. For residential, the rates under consideration for implementing in a couple years when AMI is in place would have off-peak 10 a.m. to 2 p.m. and on-peak 4 to 9 p.m. Commercial has a capacity component. Commissioner Forssell viewed EV charging as one of the greatest potentials for load-shifting by incentivizing workplaces to offer onsite vehicle charging. Demand charges might be a disincentive for employers to offer charging and should be evaluated during the Cost of Service Analysis (COSA).

Vice Chair Scharff inquired about the battery storage process. Dr. Stack replied that batteries could be located anywhere on the grid, depending on the response when the City solicits for storage projects. The City incurring the capital cost to own a storage facility may be considered. Mr. Swaminathan pointed out that with residential TOU rate implementation, the delta in prices may justify energy storage at the residential customer level to store during the daytime and dispatch at night.

ACTION: None

COMMISSIONER COMMENTS and REPORTS from MEETINGS/EVENTS

None

FUTURE TOPICS FOR UPCOMING MEETING

None

NEXT SCHEDULED MEETING: August 2, 2023

ADJOURNMENT

Vice Chair Scharff moved to adjourn.

Commissioner Phillips seconded the motion.

Motion carried 5-0 with Vice Chair Scharff, Commissioners Croft, Forssell, Mauter and Phillips voting yes.

Chair Segal and Commissioner Metz absent.

Meeting adjourned at 8:46 p.m.



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Utilities Advisory Commission Staff Report

From: Dean Batchelor, Director Utilities
Lead Department: Utilities

Meeting Date: September 6, 2023
Staff Report: 2306-1603

TITLE

Discussion and Presentation - Overview of Drinking Water Quality

RECOMMENDATION

Staff recommends that the Utilities Advisory Commission receive a presentation on the City of Palo Alto's drinking water quality.

ATTACHMENTS

Attachment A: Presentation

AUTHOR/TITLE:

Matthew Zucca, Assistant Director, Water Gas Wastewater



Overview of Drinking Water Quality

Presentation Outline

Brief History of Drinking Water Treatment

Overview of Current Water Laws and Regulations

Regional and Palo Alto Source Water Quality

Common Water Quality Complaints

Considerations for Additional Treatment

Anticipated Future Water Quality Challenges

History of Drinking Water Treatment

Time

- 1850-1900s - Advancement of science developed germ theory
 - Added chlorine treatment for microorganisms (e.g., cholera, typhoid)
 - Eliminated waterborne diseases with 30-50% mortality rates
- 1970s - Advancement of science identified carcinogenic disinfection byproducts (DBPs) from the use of chlorine
 - 1979: Interim DBP Rule
 - 1998-2006: More regulatory changes (Stage 1 & 2 DBP Rule, LT2SWTR)
 - Changed to monochloramine as a residual disinfectant to reduce DBPs
- 2000s - Advancement of science identified, for some source waters, carcinogenic compounds resulting from the use of monochloramine and ozone (e.g., NDMA)
 - For those source waters, changed primary disinfection techniques to UV light to prevent NDMA formation

Reduction in Risk

Federal Drinking Water Regulations by Contaminant Type

Target	Regulation
Chemical contaminants	<ul style="list-style-type: none"> • Arsenic rule • Chemical contaminant rules • Lead and copper rule • Radionuclides rule • Variance and exemptions rule • Stage 1 disinfectant/disinfection byproducts rule • Stage 2 disinfectant/disinfection byproducts rule
Microbial contaminants	<ul style="list-style-type: none"> • Aircraft drinking water rule • Groundwater rule • Surface water treatment rules • Total coliform rule and revised total coliform rule
Right-to-Know	<ul style="list-style-type: none"> • Consumer confidence report rule • Public notification rule

SFPUC Regional Water System and Source Water Quality



Crystal Springs Dam

SFPUC Regional Water System



Source Water Quality

- 85 percent of SFPUC's drinking water comes from Hetch Hetchy (HH) Reservoir situated in a high-elevation, pristine granite rock watershed
- HH water is of such exceptional quality that the US EPA granted the SFPUC a Filtration Avoidance Waiver that allows disinfection treatment without filtration of the surface water
- Only five (5) agencies in the country qualify for Filtration Avoidance Waiver

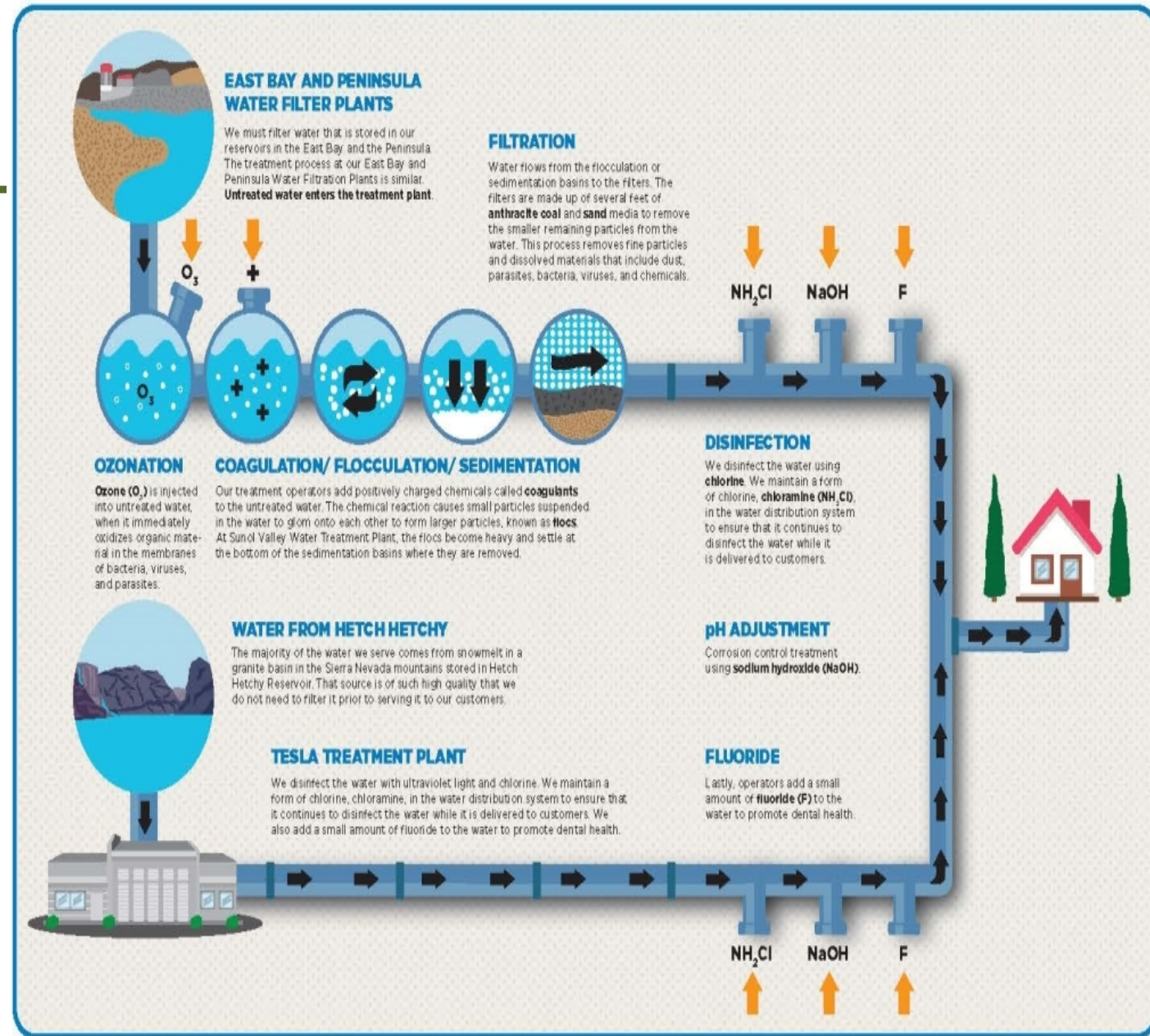


SFPUC Filtration Avoidance Waiver

- USEPA Surface Water Treatment Rule allows for filtration avoidance waivers of extremely pristine water sources
- In 1993, USEPA approved SFPUC's ability to comply with federal filtration avoidance regulations
- Essentially, HH water meets all applicable treated water criteria without using filtration
 - Prior to disinfection, source water must meet bacteriological requirements
 - Turbidity must remain less than 5 NTU
 - Disinfection must be sufficient to ensure that the total treatment process of the system achieves at least:
 - 99.9% (3-log) inactivation of *Giardia lamblia*
 - 99.99% (4-log) inactivation of viruses.
- In rare events where source water exceeds, water is treated at Sunol Valley WTP

SFPUC Water Treatment

- Traditional surface water treatment for some sources of water
- Hetch Hetchy water has a Filtration Avoidance Waiver, so only chemical disinfection
- UV light and chlorine addition for primary disinfection
- Monochloramine residual disinfectant in the distribution system
- pH adjustment and fluoridation
- Water we receive can be a blend of filtered and unfiltered water from different sources



City of Palo Alto Water Quality Data for Year 2021 ⁽¹⁾

This report offers a snapshot of last year's water quality. The tables below list detected contaminants in our drinking water in 2021 as well as information about their typical sources. Contaminants that are below detection limits for reporting are not shown, in accordance with regulatory guidance. The City holds a SWRCB monitoring waiver for some contaminants in the surface water supply and therefore their monitoring frequencies are less than annual.

Palo Alto Consumer Confidence Report

- Required annually by federal and state regulations to all Palo Alto customers
- Provides a plain language explanation of water sources and water quality
- Lists detected contaminants in drinking water in 2021 as well as information about their typical sources

DETECTED CONTAMINANTS	Unit	MCL/TT	PHG or (MCLG)	Range or Level Found	Average or [Max]	Typical Sources in Drinking Water
TURBIDITY						
Unfiltered Hetch Hetchy Water	NTU	5	N/A	0.2 - 0.4 ⁽⁴⁾	[3.3]	Soil runoff
Filtered Water from Sunol Valley Water Treatment Plant (SVWTP)	NTU	1 ⁽⁶⁾	N/A	-	[0.4]	Soil runoff
	-	Min 95% of samples ≤ 0.3 NTU ⁽⁴⁾	N/A	99.8% - 100%	-	Soil runoff
DISINFECTION BYPRODUCTS AND PRECURSOR						
Total Trihalomethanes	ppb	80	N/A	14 - 46	34.5 ⁽⁶⁾	Byproduct of drinking water disinfection
Five Haloacetic Acids	ppb	60	N/A	11 - 38	26 ⁽⁶⁾	Byproduct of drinking water disinfection
Bromate	ppb	10	0.1	ND - 1.9	[2.1] ⁽⁵⁾	Byproduct of drinking water disinfection
Total Organic Carbon ⁽⁷⁾	ppm	TT	N/A	1.2 - 2.2	1.8	Various natural and man-made sources
BACTERIOLOGICAL						
Fecal coliform and E. coli	-	0 Positive Sample	(0)	-	0	Human or animal fecal waste
Giardia lamblia	cyt/L	TT	(0)	0 - 0.04	0.01	Naturally present in the environment
INORGANICS						
Fluoride (source water) ⁽³⁾	ppm	2.0	1	ND - 0.8	0.4 ⁽⁶⁾	Erosion of natural deposits; water additive to promote strong teeth
Chloramine (as chlorine)	ppm	MRDL = 4.0	MRDLG = 4	0.43 - 3.74	2.75 ⁽⁷⁾	Drinking water disinfectant added for treatment

NON-REGULATED WATER QUALITY PARAMETERS	Unit	ORL	Range	Average
Alkalinity (as CaCO ₃)	ppm	N/A	4.5 - 79	37
Boron	ppb	1000 (NL)	ND - 123	ND
Calcium (as Ca)	ppm	N/A	3 - 17	9.5
Chlorate ⁽⁸⁾	ppb	800 (NL)	28 - 420	162
Hardness (as CaCO ₃)	ppm	N/A	7.7 - 60	34
Magnesium	ppm	N/A	<0.2 - 5.5	2.9
pH	-	N/A	8.6 - 9.7	9.2
Phosphate (ortho)	ppm	N/A	<0.3 - 0.3	<0.3
Potassium	ppm	N/A	0.4 - 1.1	0.7
Silica	ppm	N/A	3 - 5.9	4.8
Sodium	ppm	N/A	3.1 - 17	12
Strontium	ppb	N/A	14 - 181	83

KEY
< / s = less than / less than or equal to
AL = Action Level
Max = Maximum
Min = Minimum
N/A = Not Available
ND = Non-detect
NL = Notification Level
NoP = Number of Coliform-Positive Sample
NTU = Nephelometric Turbidity Unit
ORL = Other Regulatory Level
pCi/L = picocurie per liter
ppb = part per billion
ppm = part per million
µS/cm = microSiemens/centimeter

10 City of Palo Alto Public Utilities | 2021 Annual Water Quality Report

Common Water Quality Concerns

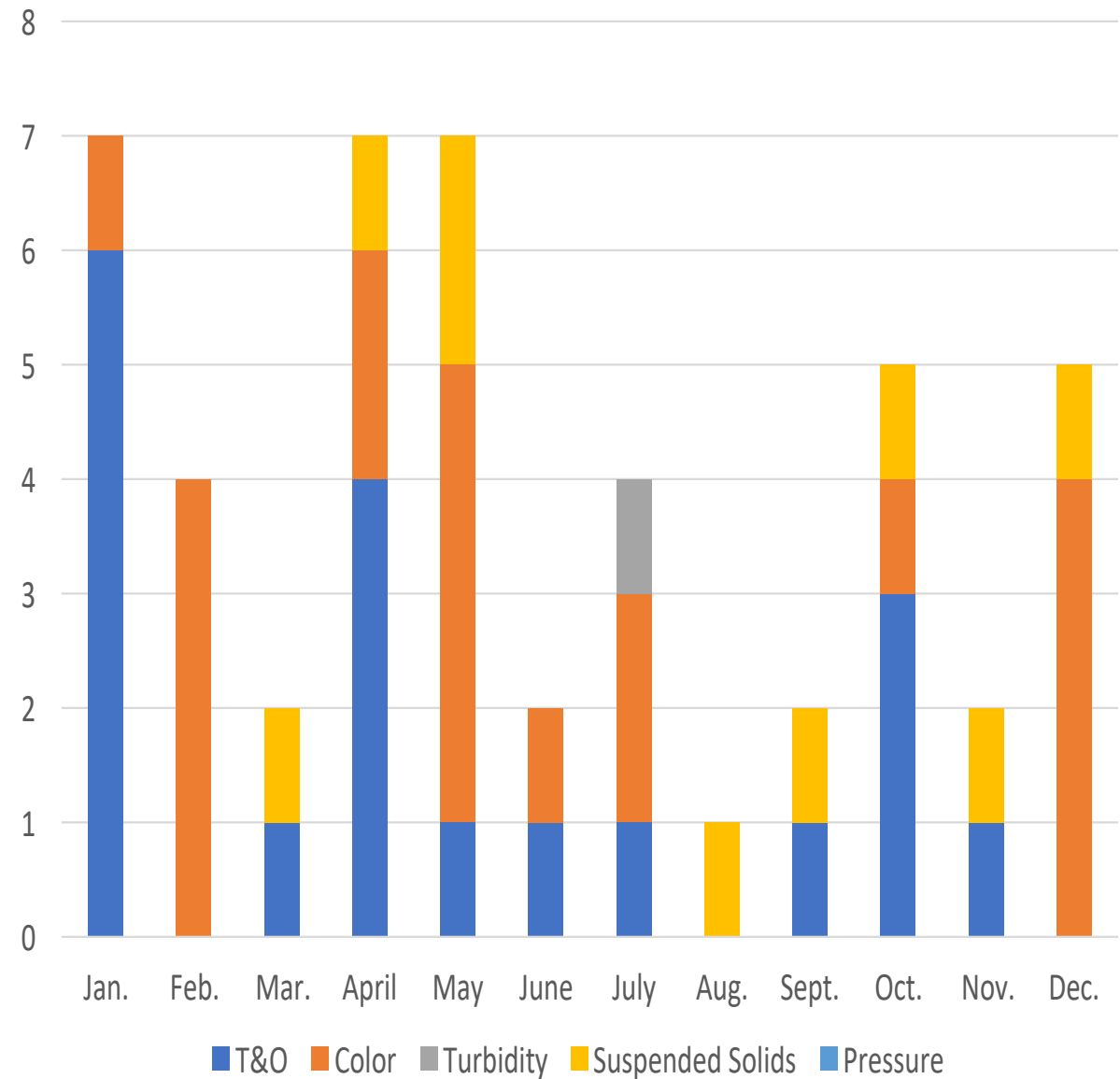


- **Dirty/Discolored Water (Rusty, Yellow, Brown)** -rust or sediment from piping materials from:
 - Breaks in the water mains or hydrants
 - High water flow situations such as system tests or maintenance, construction activities or firefighting activities
 - Rust from plumbing in the water mains, homes, or other buildings
- **Milky/Cloudy Water** - May indicate the presence of air bubbles in the water.
- **White Particles in Water** - White particles that float to the surface may indicate deterioration of the dip tube in the hot water heater
- **Black Particles in Water** - black particles that float to the surface, degradation of rubber (elastomer) plumbing parts
- **Sandy Water** - can be caused by particles that have accumulated over time in the distribution system or from unfiltered water systems

Water Quality Calls to Utilities

- Calls from Palo Alto residents mostly related to taste & odor and color
- All reported to SWRCB
- Most water quality calls related to taste & odor and color
- Turbidity and suspended solids are relatively infrequent

Total Monthly Water Quality Calls
(2018-2023)



Considerations for Additional Treatment



Additional Treatment of SFPUC Water

- Palo Alto is served via two pipelines from five turnouts
- Additional City treatment would require five separate systems
- Currently, no regulatory driver to consider additional treatment for SFPUC water
- Any treatment would require property, infrastructure, staffing, and additional energy consumption

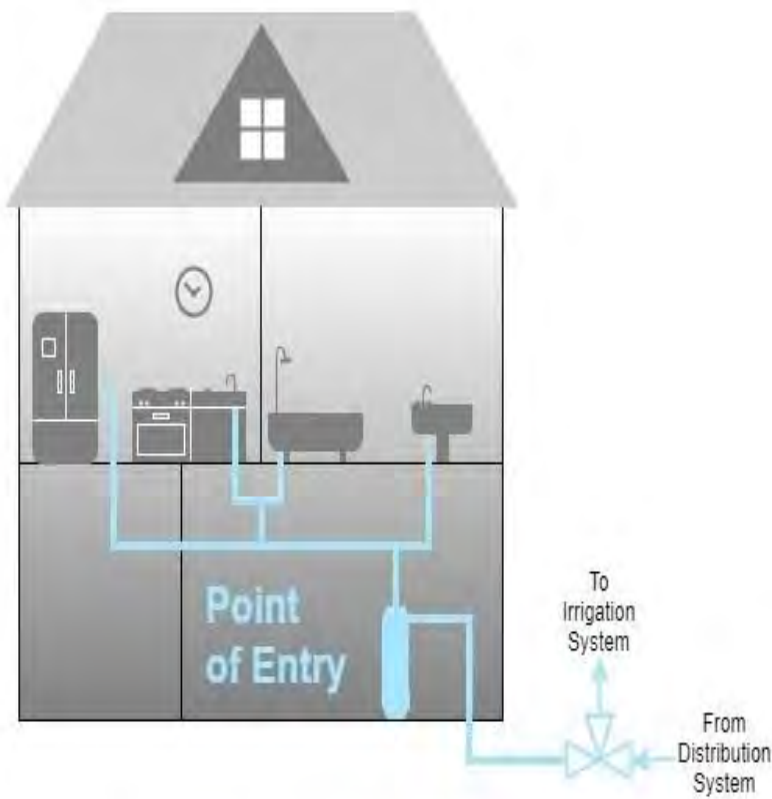


Conceptual Cost Estimate – USEPA Model

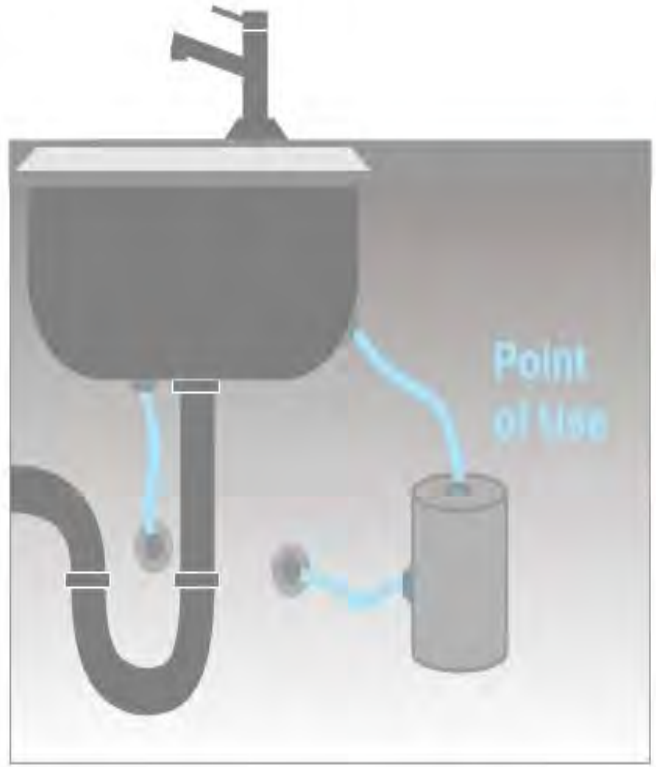
- USEPA cost model for carbon filtration (\$2021)
- Simplistic model used for evaluating costs of water treatment as part of regulations
- Total model capital cost estimate: ~\$50+ million
- Nationwide model that doesn't account for local costs
- Staff believes this likely underestimates actual costs

OUTPUT SUMMARY	
Parameter	Value Units
Contaminant	Gen X
System Size Category	large
Technology	GAC
Design Type	Pressure
Design Flow	7.365 MGD (excludes bypass flow)
Average Flow	3.2 MGD (excludes bypass flow)
# of treatment trains	8 trains
# of contactors in series	2 (i.e., parallel or series operation)
# of contactors	18 (including redundancy)
Total EBCT	25 minutes at design flow
EBCT per contactor	12.5 minutes at design flow
Carbon life	13.4 months at average flow
Bed depth	7 feet
Vessel geometry	upright
Height (straight)	11 feet
Diameter	14 feet
Component level	low cost
System automation	fully automated
Retrofit (operational modification)?	no
New carbon life after retrofit	not applicable
Resulting Costs (in year 2021 dollars)	
Direct Capital Cost	\$ 4,459,194 Details
Add-on Cost	\$ 2,219,120 Details
Indirect Capital Cost	\$ 2,882,982 Details
Total Capital Cost	\$ 9,561,295 Details
Annualized Capital Cost (per year over 36.2 years at 7%)	\$ 732,553 Details
Annual O&M Cost (per year)	\$ 622,000 Details
Total Annualized Cost (per year, 54% capital, 46% O&M)	\$ 1,354,553 Details
Annualized cost per 1,000 gallons average flow	\$ 1.16

Point of Use (POU) vs. Point of Entry Treatment (POE)



Point of Entry (POE) Treatment



Point of Use (POU) Treatment

Point-of-Use (POU) or Point-of-Entry (POE) Water Treatment Devices



- City-provided tap water is considered safe to drink and meets or surpasses state and federal standards
- For City, POU/POE water treatment not allowed by state and federal regulations for compliance
- Customers may use POU/POE water treatment devices if they are concerned about old plumbing in their residence, for personal preference to improve the taste of the water, or for personal health reasons
- Water treatment technologies include filtration, distillation, activated carbon, ion exchange, ultraviolet radiation, and reverse osmosis

Point-of-Use (POU) Or Point-of-Entry (POE) Water Treatment Devices

- When a POU and POE water treatment device claims a health and safety benefit, the manufacturer is required to register the device with the California Water Treatment Device Registration Program.
- A list of registered Water Treatment Devices for specific contaminants such as arsenic, chromium, lead, and nitrate, can be found at the following link:

waterboards.ca.gov/drinking_water/certlic/device/watertreatmentdevices.shtml.

Future Water Quality Challenges



Unregulated Contaminant Monitoring Rule (UCMR)

- The SDWA includes a process that EPA must follow to name unregulated contaminants that may require regulation in the future.
- EPA uses the Unregulated Contaminant Monitoring Rule (UCMR) to collect data for contaminants that are suspected to be present in drinking water and do not have health-based standards set under the Safe Drinking Water Act (SDWA)
- EPA must publish the “Contaminant Candidate List,” or CCL, every five years and decide whether to regulate at least five or more of the contaminants on the list
- Currently preparing to sample for UCMR-5

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)

- Commonly referred to as “forever chemicals” given their environmental persistence
- State Water Board Division of Drinking Water issued Order DW 2022-0001-DDW to require certain water agencies to sample for PFAS based on the risk of their source water
 - SFPUC source water is not considered a risk for PFAS and no sampling is required under the General Order
- UCMR 5 requires PFAS sampling by all regulated water suppliers. Palo Alto is scheduled to sample four quarters starting September 2023
- UCMR 5 reporting is scheduled for completion by USEPA in 2026
- March 14, 2023, EPA announced the proposed National Primary Drinking Water Regulations (i.e., enforceable regulations) for six PFAS compounds

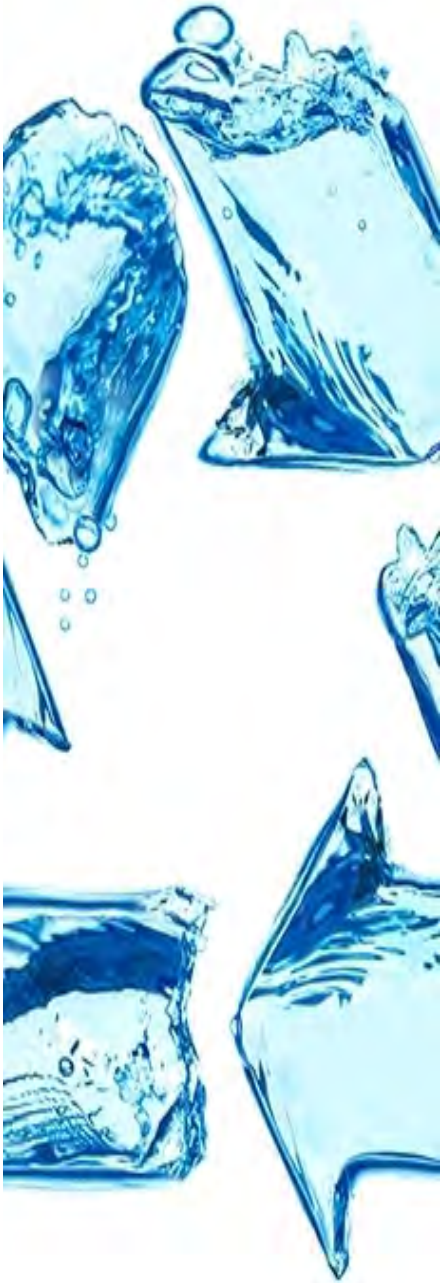


Lead and Copper

- State law prohibits the use of any pipe, pipe or plumbing fitting or fixture, solder, or flux that is not “lead free”, in the installation or repair of any public water system (DTSC)
- Lead and Copper Rule and Revisions (SWRCB - DDW)
 - Federal and state regulations intended to protect from metals that can adversely affect public health
 - USEPA issued Lead and Copper Rule Revisions:
 - Develop inventory of service line materials connected to the water system
 - Compliance deadline is October 2024 for service lines
 - Adds LCR requirements in elementary schools and childcare facilities
 - Sample at 20% of elementary schools and 20% of childcare facilities per year
 - Sample at secondary schools on request for 1 testing cycle (5 years)
 - Sample on request of all schools and childcare facilities thereafter
 - Sampling starting 2025

Groundwater

- Currently only available for emergencies where pipes would otherwise be empty
- Non-emergency use of groundwater will require disinfection and treatment of some naturally occurring compounds
- Iron & Manganese:
 - Present at greater than Secondary MCLs in groundwater
 - Requires treatment typically involving use of greensand filters
- Dissolved Solids (TDS):
 - Present at concentrations greater than Secondary MCLs
 - Treatment requires reverse osmosis or blending with higher quality water



Purified Water

- Indirect Potable Reuse (IPR)
 - The planned use of purified water to replenish drinking water supplies with a suitable environmental barrier.
 - Two types of IPR projects: Groundwater Replenishment Reuse Projects (GRRP) and Surface Water Source Augmentation Projects (SWSAP)
- Direct Potable Reuse (DPR)
 - The planned introduction of purified water either directly into a public drinking water system, or into a raw water supply immediately upstream of a drinking water treatment plant
 - Regulations still evolving and currently not allowed, but being considered by the SWRCB
- Water quality concerns will be substantial prior to incorporation of either IPR or DPR as a water supply

The background image shows a large concrete dam with water cascading over its spillways into a reservoir. The scene is set against a backdrop of rugged, rocky hills. A large, semi-transparent grey triangle is overlaid on the right side of the image, containing the word 'QUESTIONS' in white capital letters.

QUESTIONS



Utilities Advisory Commission Staff Report

From: Dean Batchelor, Director Utilities
Lead Department: Utilities

Meeting Date: September 6, 2023
Staff Report: 2308-1933

TITLE

Overview of Palo Alto Fiber and Fiber Backbone Activities and Discussion of the Fiber Expansion Plan

RECOMMENDATION

This memorandum and presentation are for discussion purposes only; no action is requested at this time.

EXECUTIVE SUMMARY

On December 19, 2022, City Council directed staff to proceed with the Fiber Expansion Plan to implement the Fiber Rebuild project and Phase 1 of the Fiber-to-the-Premises (FTTP) project. In Phase 1, FTTP would be built out in selected areas of the city, and expanded gradually ([Staff Report ID # 14800](#))¹. Construction of the fiber backbone and last mile infrastructure to provide FTTP broadband internet to the community will be a significant undertaking for the City. Before the City begins construction, staff needs to address the below items to control project costs, minimize construction impacts to the community, and prevent major delays:

✓ Align fiber and grid modernization projects - The citywide engineering design for the electric grid modernization project is currently underway. The grid modernization project will overlap with the Fiber Expansion Plan in engineering make-ready work and construction. Staff will analyze the projects to identify opportunities for alignment, which may help minimize costs and reduce community disruptions, while trying to minimize impacts to the Fiber Expansion Plan's timeline.

✓ California Environmental Quality Act (CEQA) - The City must analyze and evaluate the potential impacts of the project on various environmental factors and identify whether those impacts can be mitigated.

¹ Staf Report 14800 <https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/agendas-minutes/city-council-agendas-minutes/2022/20221219/20221219pccsm-amendedtime.pdf>

✓ Coordination with AT&T - The existing joint pole agreement with AT&T requires coordination between the City and AT&T to relocate 3rd party telecom equipment on utility poles and provide space for new fiber attachments, while remaining in compliance with California Public Utilities Commission General Order 95 (GO 95) requirements for overhead electric line construction to insure electric utility service and secure personnel safety.

PROJECT DESCRIPTION

The proposed Fiber Expansion Plan is to construct a new fiber optic backbone and implement Phase 1 of fiber-to-the-premises (FTTP) infrastructure (passing ~ 20% of homes and businesses) to provide communication services throughout the City of Palo Alto. However, the proposed plan will be dynamic in nature as efforts to align grid modernization and fiber projects increase in priority and impact the designs and timelines. For informational purposes, the initial plan for fiber construction includes installation of approximately 83 miles of fiber optic cables, consisting of about 48 miles of below-ground cable installations and 35 miles of aerial cable installations using ~6,000 existing utility poles; one fiber hut (20' x 40') for networking equipment; underground utility vaults (36" x 48" x 34"); and above ground utility cabinets (17" x 17" x 36").

BACKGROUND

City Council considered three courses of action for a City-owned FTTP service and directed staff to proceed with the phased build approach. Under this approach, FTTP will be built out in selected areas of the city using \$34 million from the Fiber Fund and \$13 million from the Electric Fund, and the project will expand gradually from there to eliminate the need for debt financing. Building the fiber backbone and last-mile infrastructure to provide FTTP broadband internet to the community will require significant planning, coordination, communication and construction over the next 18 – 24 months. With the electric grid modernization project approved in the FY 2024 budget, staff needs to determine how to align the grid modernization project and projects under the Fiber Expansion Plan to help minimize utility engineering pole make-ready work, pole replacements, noise disruption, and construction activity in neighborhoods.

On May 1, 2023, City Council approved Amendment Number 4 to Contract Number C20176363 with Magellan for Fiber program management, organizational change management, network operations and technical support, and utility pole electric make-ready engineering (Staff Report #2303-1215)². Although the phased build approach to FTTP will decrease the City's financial risk and increase Council's control over the velocity of the buildout, the City does not have the inhouse staffing to fully pursue the fiber backbone project and first phase of FTTP while coordinating with electrification grid modernization efforts. These projects require significant staffing and specialized skill sets over the next few years. While it is economically prudent to

² Staff Report 2303-1215 Item Number 8

<https://cityofpaloalto.primegov.com/Portal/Meeting?meetingTemplateld=1455>

utilize available staffing resources, the City must also strategically invest in external resources for a successful roll-out.

On May 30, 2023, the Finance Committee reviewed the FY 2024 Budget during the budget approval process. The FY 2024 Budget included a new Capital Improvement Project, the Grid Modernization for Electrification Project (EL-24000).

On June 19, 2023, the City Council approved the FY 2024 budget with the new Grid Modernization for Electrification Project. The approval of the electrification project accelerated efforts to align electrification and fiber construction, which has begun to impact the Fiber Expansion Plans.

ANALYSIS

Align fiber and grid modernization projects

The City recently conducted an electrification study to evaluate the impacts of projected electrification loads on Palo Alto's distribution and substation transformers, primary/secondary distribution circuits, and to propose upgrades needed to mitigate overloads. The estimated cost to construct the necessary electric system upgrades for a 100% electrification scenario is between \$220 million to \$306 million, depending on the approach. Specifically, the grid modernization project involves replacing and upgrading over a thousand single phase pole top transformers. Approximately 300,000 circuit feet of open wire secondary conductors in the distribution system will be replaced with aluminum aerial cable. The workplan for this project is a staged, multi-year approach designed to accomplish the upgrade of the electric distribution system to meet the City's goal of being ready for full-scale electrification by 2030.

Currently, staff is in the process of implementing a pilot project (~600 customers) to convert a 4kV area to 12 kV and upgrade the transformers and secondary networks to facilitate electrification. This work is expected to be completed by the beginning of 2024, depending on other factors which impact project timelines, such as material lead times, pole make ready, and alignment with the fiber projects. The purpose of the pilot project is to determine the feasibility of electrification design and construction methods, explore opportunities to align with fiber expansion, and implement best practices to facilitate the most cost-effective deployment of resources.

After the pilot project, the first four years of the electrification project will make approximately 70% of the electric system ready to accept full-scale electrification by residents. This will be accomplished by upgrading over one hundred miles of the overhead electric system that serves these residents and upgrading substation transformers to meet the increased demand. After the overhead electric system is upgraded, the City will upgrade underground residential systems for additional capacity with tentative completion by 2030.

Given the hundreds of miles of overhead and underground construction activity between FTTP and electric grid modernization, staff is exploring various construction phasing options to minimize disruption, construction activity, and construction costs within neighborhoods while

avoiding prolonged deployments. In addition to construction constraints, staff does not have construction for both projects in parallel.

Staff is currently engaged in discussions with an electric engineering consultant to assess the feasibility of utilizing the fiber engineering make-ready work previously prepared by Magellan for the grid modernization project. If feasible, the City of Palo Alto Utilities (CPAU) may be able to expand the pilot area of the grid modernization, accelerate the design, and align construction of grid modernization with phase one of FTTP. Staff will be analyzing the cost savings, timeline, and resources (staffing and contractors) required for project alignment.

California Environmental Quality Act (CEQA)

The preliminary assessment, or Initial Study, will evaluate the project's potential impacts on various environmental factors and identify whether those impacts can be mitigated. If the project's impacts can be mitigated to a less-than-significant level, then the City may issue a Mitigated Negative Declaration (MND) or Negative Declaration (ND). If the preliminary assessment of the project determines one or more significant impacts on the environment despite mitigation, a full environmental impact report (EIR) will be required, which involves a more comprehensive and detailed analysis of the project's impacts and alternatives. CPAU is seeking to retain a CEQA consultant to prepare a CEQA Initial Study in accordance with local, state, and federal statutes. The Initial Study identifies physical, biological, social and economic factors that might be affected by the fiber expansion project. Some environmental factors that could potentially be affected by this project include aesthetics, air quality, geology/soils, hazardous materials, noise, utilities services, and hydrology/water quality. Specific examples of likely CEQA analysis include:

- o Hydrological analysis to see if any proposed fiber lines would run through areas near bodies of water and show that there would not be significant impacts to waters of the state or waters of the US, as well as provide recommendations for how to protect nearby waterbodies even if there are no direct impacts (e.g. through proper stormwater protection measures)

- o Air quality analysis (including understanding how to run claimed calcs for the proposed project to evaluate air quality emissions and GHG emissions)

- o Noise modeling (including analysis of potential impacts on nearby sensitive receptors from construction noise and vibrations)

- o Hazardous materials analysis (including evaluation and mitigation if necessary, of potential impacts to construction workers and sensitive receptors especially if any of the dark fiber runs through areas of the city runs through a plume)

Coordination with AT&T

CPAU currently has a long-standing joint pole agreement with AT&T executed in 1918. The current joint pole agreement and pole intent process (including billing) may not be feasible to accommodate the increased volume of pole transactions expected with the grid modernization

and Fiber Expansion Plan. This issue will likely cause significant delays in both projects, so CPAU is reevaluating membership in the Northern California Joint Pole Association (NCJPA). The NCJPA is a 100+ year old non-profit organization formed to support members and provide standardized cost-sharing methodologies for utility poles. Members have “joint pole equity” and voluntarily share expenses for pole ownership, maintenance, use, setting, replacement, dismantling, relinquishment or removal of jointly owned poles. Municipalities that join the NCJPA are required follow “NCJPA rules” for their pole assets. In the past, CPAU operated without membership with the NCJPA because the volume of pole replacements was manageable by staff and there were additional costs associated with becoming a member. Given the anticipated increase in pole work, NCJPA membership may be necessary to ensure pole work related to the long-term fiber and electrification projects is conducted in a methodical, timely and cost-efficient manner. CPAU may need to add resources to manage the volume of pole make-ready work and replacements.

Other Updates

Make-Ready Engineering

Magellan completed the survey of approximately 6,000 utility poles in Palo Alto. The survey identified the current load and condition of each pole in preparation for the new fiber backbone and FTTP. The survey included detailed fielding and walk-out of all routes to validate running lines, existing utilities, and constructability. For aerial construction, Magellan provided makeready engineering pole data to determine pole preparation and pole replacement, as well as timeframes for the work to be completed. For the new fiber backbone and phase one of FTTP, CPAU will be passing 1750 existing poles, attaching to 1300 poles, replacing 100 poles, and coordinating with third parties to move their telecom equipment lower on 325 poles. In addition to the fiber expansion project, CPAU has a recurring Wood Pole Replacement capital improvement project to replace approximately 100 deteriorated wood poles annually. Wood poles are used to support overhead utility lines throughout the City of Palo Alto. Though poles are inspected, tested, and treated to maintain their integrity, over time poles will deteriorate to the point that they are no longer in compliance with GO 95 requirements or safe for community and utility workers.

Fiber Hut Sites:

Fiber huts are usually a prefabricated building (10' x 20') containing electronics and network equipment that connects fiber to neighborhoods. The hut also has backup generators and HVAC systems to maintain equipment within its operating environmental specifications. Two fiber huts are recommended for the citywide network for Palo Alto Fiber. Staff and Magellan evaluated potential fiber hut sites and considered their proximity to strategic areas, planning/land use requirements, and existing infrastructure. As a result, staff narrowed down the potential locations to the Colorado substation and anticipated space at City Hall. The Colorado substation was previously identified as an ideal location due to its proximity to the area it serves and its current use for utilities. City Hall is anticipated to have vacated space after the Police Department moves to the new Public Safety Building. City Hall would be an ideal location for a secondary hut.

Due to the centralized location and potential square footage, this site may also be considered for a future data center, further securing the future of the City's data infrastructure.

Equinix/Data Center:

Equinix is currently the City's data center provider. They are a vendor-neutral multitenant data center provider where numerous internet service providers and content delivery networks can interconnect and exchange internet traffic between their networks. As the City expands its fiber footprint, more data center space will be needed. For FTTP, the City will have to increase the number of leasing cabinets (vertical racks sited next to each other, each capable of holding multiple termination/switching boxes in stacked configurations) from five to 12 cabinets. The City is undergoing discussions with Equinix to lease additional space available in their Palo Alto location and to explore other Equinix locations. The City may also consider increasing the size of the data center at City Hall.

Invitation for Bid (IFB) Construction Package:

If opportunities exist to align FTTP and grid modernization, CPAU and Magellan may gather and consolidate all supporting documents to bid out construction of FTTP and grid modernization. The IFB package will include construction-ready prints for fiber and power, construction details, splice details, pole make-ready details, construction standards as well as all documentation needed to complete the bid package. This shall include a written summary and scope of work, estimated costs to construct, as well as labor estimates, bill of materials, and the vendor list.

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Staffing:

As the City solidifies staffing plans in parallel with contracted services, the Director of Information Technology will take on the responsibilities of an Assistant Director for Palo Alto Fiber on an interim basis. In the FY 2024 adopted budget, four (4) new FTE positions for the dark fiber expansion and implementation of FTTP were created. These positions will be recruited and filled as needed during the various stages of the project.

- Assistant Director - To provide the vision and strategy for the new fiber business and lead a high-performance team to quickly execute. Responsibilities include and are not limited to: overseeing fiber enterprise fund budget timelines and milestones (including the dark fiber optic business), managing the roll out and expansion of the fiber optic network, Internet Service Provider (ISP) operations, customer service operations, and business development.

- Manager Utilities Telecommunications / "Outside Plant Manager" - To lead the construction process, installation and repair service technicians, and ensure the outside plant processes run efficiently and smoothly. Responsibilities include and are not limited to: overseeing construction, managing engineers and contractors, achieving construction budget timelines and milestones.
- Manager Information Technology / "Sr. Network Engineer/Architect" – To lead the development process of the overall architecture of the broadband system and manage the system. Responsibilities include and are not limited to: managing the network and supporting technical needs across the organization.
- Manager Utilities Telecommunications / "Sales and Marketing Manager" - To develop the marketing strategy and lead marketing initiatives. Responsibilities include and are not limited to: meeting revenue objectives, cultivating strong partnerships, and maintaining retention rates.

FISCAL/RESOURCE IMPACT

This report is for informational purposes so there is no resource impact. Based on Council and UAC input, staff will return with specific actions associated with efforts to align the fiber expansion and electric grid modernization projects.

STAKEHOLDER ENGAGEMENT

On November 2, 2022, the UAC unanimously recommended to build fiber backbone and FTTP under a phased approach with existing funds (\$34 million from Fiber and \$13 million from Electric). The UAC expressed the goal of FTTP is to provide ubiquitous or citywide high-speed internet access to all residents and businesses in Palo Alto. If financially self-sustaining, and deemed successful, the first phase of FTTP can become a springboard to a citywide FTTP deployment within five years.

On December 19, 2022, City Council directed staff to proceed with the Fiber Expansion Plan to implement the Fiber Rebuild project and Phase 1 of the Fiber-to-the-Premises (FTTP) project without debt financing. Included in the Council's motion was direction to: a) maximize number of homes and businesses passed; b) consider promotional rates to increase take rate; c) define leading indicators and metrics to determine success; and d) recommend future Council action to accelerate expansion if metrics are positive, including a potential bond to streamline construction and compress construction time as much as feasible.

ENVIRONMENTAL REVIEW

The UAC's discussion of the fiber expansion project and its potential alignment with the grid electrification project is not a project requiring California Environmental Quality Act review, because it is an administrative governmental activity which will not cause a direct or indirect physical change in the environment.

ATTACHMENTS

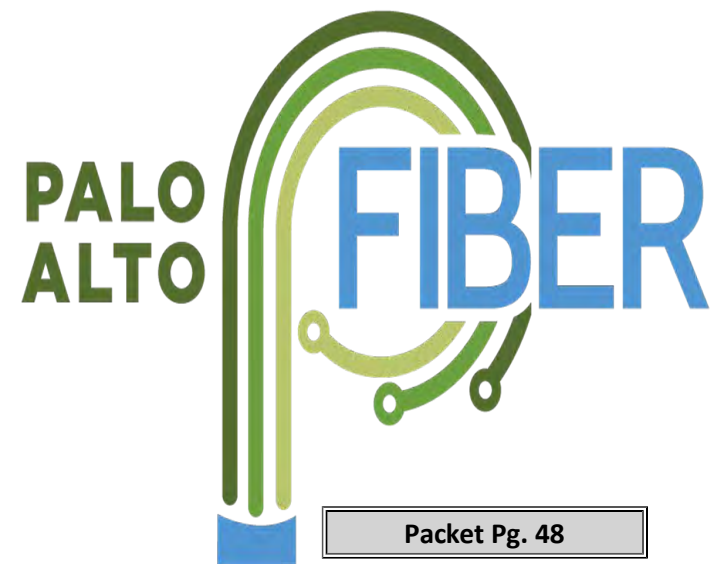
Attachment A: Presentation

AUTHOR/TITLE:

Dave Yuan, Strategic Business Manager

Palo Alto Fiber Update

September 6, 2023



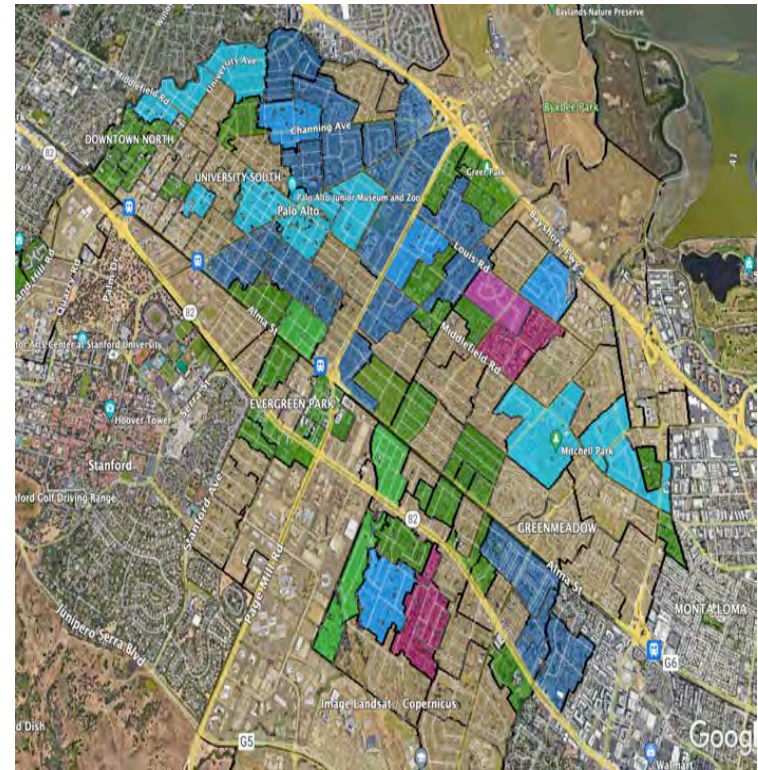


AGENDA

- Council-approved Project(s) Recap
 - Fiber Backbone Expansion “Rebuild” Project
 - Fiber-to-the-Premises (FTTP) Project
 - Grid Modernization for Electrification Project
- Informational Updates
 - Alignment of Fiber Expansion and Grid Modernization Analysis
 - California Environmental Quality Act (CEQA) Initial Study
 - Joint Pole Ownership Coordination with AT&T
 - Other Updates

HOW DID WE GET HERE?

- **What has Council Approved?**
 - **Dec 19, 2022 approved staff to**
 - Proceed with dark fiber backbone expansion “rebuild”
 - Build FTTP Phase 01 in multi-phased approach without debt financing
 - **Jun 19, 2023 approved staff to**
 - Proceed with new Grid Modernization for Electrification project in the FY 2024 Adopted Budget





PROJECT(S) RECAP

FIBER BACKBONE REBUILD	FIBER-TO-THE-PREMISES	GRID MODERNIZATION
Estimated cost \$25.6M	Estimated cost for Phase 1 \$20M; Citywide \$102M	Estimated cost \$220M to \$306M
Funded by Electric and Fiber funds	Funded by Fiber Fund	Funded by the Electric Fund; debt financing and/or grants
<p>Supports the City's fiber licensing service and internal needs:</p> <ul style="list-style-type: none"> ▪ Improve fiber and electric system reliability, security and capacity ▪ Enable more connectivity for City departments ▪ Internal communication needs for SCADA, AMI, DA and other critical infrastructure 	<p>Supports the City's high speed broadband internet needs:</p> <ul style="list-style-type: none"> ▪ Provides City-owned high-speed internet service ▪ Provides new capacity for dark fiber licensing ▪ Community investment in its own broadband network 	<p>Supports City's S/CAP goals and future demand</p> <ul style="list-style-type: none"> ▪ 100% residential electrification ▪ Upgrade existing substations, replace transformers, convert existing 4 kVa lines to 12 kVa to increase capacity and meet future demand.

INFORMATIONAL UPDATES

Topics to address prior to construction

- ✓ **Conduct analysis opportunities to align fiber and grid modernization project**
 - Pole make-ready and replacement
 - Construction phasing and timeline
 - Material lead time and warehousing
 - Shared costs (cost savings)
 - Internal resources to implement and coordinate projects

- ✓ **Conduct CEQA Initial Study to evaluate potential impacts**
 - Identify physical, biological, social and economic factors
 - Provide mitigation efforts

- ✓ **Joint Pole Ownership Coordination with AT&T**
 - Approximately 5,400 poles shared with AT&T
 - Upcoming replacements and coordination will overwhelm staff
 - Explore Northern California Joint Pole Association membership



INFORMATIONAL UPDATES (cont'd)

- **Other Updates**

- **Make-ready Engineering**

- Pole survey conducted
- Fiber backbone rebuild and FTTP poles identified

- **Fiber Hut Sites**

- Colorado substation (previously identified)
- City Hall vacated space (newly identified)

- **Equinix/Data Center**

- Increase number of leasing cabinets from five to 12
- Consider expanding data center at City Hall

- **Invitation for Bid (IFB)**

- Identify opportunities to align projects and bid out construction for both fiber expansion and electric grid modernization projects

- **Staffing**

- Four new Fiber positions added in FY 2024 budget
- Positions to be recruited as needed during various stages of the project



Utilities Advisory Commission Staff Report

From: Dean Batchelor, Director Utilities
Lead Department: Utilities

Meeting Date: September 6, 2023
Staff Report: 2308-1934

TITLE

Overview of Sustainability and Climate Action Plan (S/CAP) Activities To-Date and Discussion of Reliability and Resiliency Strategic Plan Policy Guidelines

RECOMMENDATION

This is a discussion item and no Utilities Advisory Commission (UAC) recommendation is requested

EXECUTIVE SUMMARY

On June 5, 2023 the City Council adopted the S/CAP and the 2023 – 2025 S/CAP Work Plan (Staff Report 2303-1158)¹. Some background on the activities leading to adoption of these documents is included below, as well as an overview of City programs currently in progress that contribute to achieving the S/CAP goals, Work Plan items relevant to the City's utilities, and an overview of how the Work Plan is being implemented.

The S/CAP Work Plan includes a work plan item to complete an evaluation of the reliability and resiliency of the electric infrastructure and systems necessary to support planned electrification (1.B. Reliability and Resiliency Strategic Plan, see page 6 of the Work Plan). The UAC will be the primary oversight body involved in this study. On June 5, 2023, as part of the Work Plan, Council adopted the Policy Guidelines for Reliability and Resiliency Strategic Plan Development (Appendix D of the Work Plan, page 40, also included in Attachment A). Staff intends to develop the Reliability and Resiliency Strategic Plan in line with these Policy Guidelines. This staff report describes how staff tentatively intends to proceed. Staff is seeking feedback from the UAC on its implementation plan and any technologies, processes, or policies that it wants staff to ensure are included in the plan, consistent with the policy guidelines.

¹ Staff Report 2303-1158 Item 14

<https://cityofpaloalto.primegov.com/meeting/document/1906.pdf?name=Item%2014%20Staff%20Report>

BACKGROUND

In April 2016, City Council adopted the goal of reducing GHG emissions 80 percent below 1990 levels by 2030² (the “80 x 30” goal), and in October 2022 Council adopted the ambitious goal of achieving carbon neutrality by 2030³. In November 2016 Council adopted the S/CAP Framework⁴, which has served as the road map for achieving Palo Alto’s sustainability goals. In December 2017, Council accepted the 2018-2020 Sustainability Implementation Plan “Key Actions” as a summary of the City’s work program⁵.

In early 2020, the City launched an S/CAP update to determine the goals and key actions needed to meet its sustainability targets, including the 80 x 30 goal. While GHG emissions reduction is not the only goal of the S/CAP, it is the major one. On October 3, 2022 the Council accepted the Goals and Key Actions recommended by the S/CAP Committee. Staff began California Environmental Quality Act (CEQA) review of the S/CAP based on these Goals and Key Actions. In parallel, the 2023-2025 Work Plan was reviewed by the Council Ad Hoc S/CAP Committee and Working Group recommended approval to Council. On June 5, 2023 the S/CAP was approved, including the Goals and Key Actions, along with the CEQA review and the 2023-2025 S/CAP Work Plan. Attachment B provides a detailed history of the S/CAP to date.

The City already operates a variety of programs and projects that further the current S/CAP goals. These include programs central to reducing GHG emissions, including active transportation programs, the purchase of renewable energy, and programs to help residents electrify their homes and vehicles. One prominent program is the Advanced Heat Pump Water Heater Pilot Program. These programs have been operated using existing City staff augmented by additional positions approved by Council in the FY 2022 Mid-Year Budget Amendment Ordinance and the FY 2023 Budget. The programs use a variety of funding sources including the General Fund, utility funds, grants, and dedicated revenue sources such as Low Carbon Fuel Standard revenues and revenues related to the City’s participation in the State’s Cap and Trade program.

The implementation of these programs is currently a cross-departmental effort led by the Office of Sustainability, part of the City’s Public Works Department. The Utilities Department is heavily involved in the community-focused aspects of the Climate Action section of the plan.

As a result of various City-led initiatives, programs, and activities focused on climate change and sustainability, by the end of 2021 Palo Alto reduced GHG emissions an estimated 53.9 percent from the 1990 baseline, despite a population increase of 19.5 percent during that same time.

² Staff Report 6754 Item 10 <https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/reports/city-manager-reports-cmrs/year-archive/2016/id-6754.pdf>

³ Staff Report 14720 Item 9 <https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/agendas-minutes/city-council-agendas-minutes/2022/20221003/20221003accsm-amended-presentations.pdf#page=131>

⁴ Staff Report 7304 Item 9 <https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/agendas-minutes/city-council-agendas-minutes/2022/20221003/20221003accsm-amended-presentations.pdf#page=131>

⁵ 2018-2020 Sustainability Implementation Plan <https://www.cityofpaloalto.org/files/assets/public/sustainability/policies-and-plans/2018-2020-sustainability-implementation-plan-with-council-amendments.pdf>

ANALYSIS

Work Item 1.B. (Reliability and Resiliency Strategic Plan) in the 2023-2025 S/CAP Work Plan⁶ is to

develop a Reliability and Resiliency Strategic Plan using the Policy Guidelines in Appendix D of the Work Plan⁷. These Policy Guidelines include the following objectives:

- Maintain and improve electric system reliability
- Improve utility outage communication
- Prepare the electric system for increased penetration of solar, batteries, electric vehicles and chargers, electrified building equipment, and similar new technologies
- Optimize the use of local grid capacity in a cost-effective way
- Promote technologies and behaviors that contribute to the efficient and reliable operation of the statewide and local electric system

The Policy Guidelines also includes a number of concepts to be explored as part of the Strategic Plan. Based on these objectives and concepts staff expects to divide the work on the Reliability and Resiliency Strategic Plan as follows, with the results of all tasks summarized in a final document:

Task 1: System Reliability, Outage Response, and Capacity Building

This task includes evaluating measures to improve system reliability and outage communication and prepare the electric grid for new technologies and widespread electrification:

- Addressing utility workforce issues
- Replacing aging infrastructure as part of a grid modernization plan
- Installing additional switching and other solutions to improve reliability and recovery from outages as part of a grid modernization effort
- Improving utility outage management system and communications protocol
- Increasing transformer capacity to accommodate higher loads
- Continuing to pursue a second transmission line and other grid-level resiliency strategies.

These types of issues are already being addressed through workforce planning efforts, the grid modernization effort, and other efforts. The Strategic Plan would summarize these efforts and identify any gaps and potential mitigations.

Task 2: New Technology Integration

⁶ 2023-2025 S/CAP Work Plan, page 6

⁷ 2023-2025 S/CAP Work Plan, page 40, Policy Guidelines for Reliability and Resiliency Strategic Plan Development

In this task staff would perform an analysis on what is needed to integrate new technologies and prepare the electric grid for widespread vehicle and building electrification. The results of this analysis will be integrated into the Reliability and Resiliency Strategic Plan. This analysis is already in progress and is expected to be completed in fall of 2023. It will include:

- An assessment of the grid impacts of high penetrations of distributed energy technologies and any additional equipment that would need to be added to the electric distribution system to accommodate them.
- A review of customer demand management technologies and the potential distribution system benefits and impacts.
- A review of utility scale technologies to reduce peak system load and provide other distribution system benefits.

Task 3: Customer and Neighborhood Resiliency

Several of the concepts listed in the Policy Guidelines address customer and neighborhood resiliency. Staff's goal in the Reliability and Resiliency Strategic Plan would be to review existing literature on these types of solutions and identify possible projects for future follow-up and the resources that would be needed to analyze them. Whether to move forward with any individual project would require Council policy guidance (with recommendations from the UAC):

- Technologies like vehicle to load or vehicle to home for home resiliency
- Equity in resiliency – how to provide resiliency to income-qualified residents
- Neighborhood-level resiliency solutions such as microgrids and local utility-scale battery storage
- Community emergency center resiliency
- Mobile battery strategies, such as large electric vehicles that could double as emergency resiliency solutions

Task 4: Efficient Electrification

And lastly, part of the Reliability and Resiliency Strategic Plan will be a review of low-wattage electrification solutions and discussion of business process and regulatory changes that might be needed to accommodate them, including any resource needs. This will include both technological solutions (e.g. smart panels, right-sizing appliances, circuit pausers) and behavioral solutions (e.g. encouraging equipment use at particular times of day, setting equipment for efficiency, setting vehicles to charge at particular times or at lower rates of charge)

Timelines

The tasks would be completed on the following timelines:

- Task 1 (System reliability and outage management): In progress, staff would summarize progress and identify any gaps by the end of 2023
- Task 2 (New technology integration): In progress, staff would complete the analysis by early 2024
- Task 3 (Customer and neighborhood resiliency): Study to be completed by fall of 2024.
- Task 4 (Efficient electrification): Efficient electrification strategies to be identified and programs / outreach implemented by fall of 2024.
-

Staff is looking for feedback from the UAC on staff's approach to implementation of this work plan item. Possible questions to consider may be:

- Is staff's implementation in line with the Policy Guidelines?
- Are the right topics included? Is there a need for any additions, deletions, or clarifications?
- Are there any technologies, processes, or policies that UAC wants staff to ensure are included in the plan?
- Are the timelines appropriate?

FISCAL/RESOURCE IMPACT

The total staff time and non-salary budget required to complete the Reliability and Resiliency Strategic Plan is estimated to be 0.7 FTE and \$80,000 to \$130,000, respectively. This will be fulfilled using previously approved budgets and staffing. Projects to fulfill the goals of the Reliability and Resiliency Strategic Plan require more resources, much of which is already budgeted. For examples, grid modernization and the utility outage management system updates require significant staff time and capital / operating expenditures, some of which is already budgeted and some of which will be included in future years. Other items are not yet budgeted and would require additional resources to complete (e.g. resiliency projects identified in Task 3). The resources needed to complete the Reliability and Resiliency Plan include:

- Task 1 (System reliability and outage management): This includes a minimal amount of staff time to summarize the following efforts already budgeted and in progress:
 - Workforce recruitment and retention efforts
 - The grid modernization, projected to cost up to \$300 million and requiring about 5-8 FTE annually over seven years, which includes replacement of aging infrastructure that would be required regardless of electrification (\$100 million to

\$150 million based on very approximate estimates), expansion of capacity to increase distribution system capacity to accommodate electrification, and addition of various systems to improve reliability.

- Utility outage management system updates (a project expected to cost \$630,000, including five years of annual maintenance, and requiring 0.65 FTE up front and 0.25 FTE ongoing).
- Task 2 (New technology integration): \$72,000 in consulting work and 0.1 FTE. This would cover the analysis, not any subsequent implementation.
- Task 3 (Customer and neighborhood resiliency): This section is still being scoped, but is expected to cost up to \$50,000 to \$80,000 and 0.25 FTE in staff time. This is just to do the plan. Resources for project implementation would require additional salary and non-salary budgets, which would be estimated as part of this task.
- Task 4 (Efficient electrification): This review is expected to cost up to \$30,000 to \$50,000 and take up to 0.25 FTE in staff time

STAKEHOLDER ENGAGEMENT

The 2023-2025 S/CAP Work Plan was reviewed by the Council Ad Hoc S/CAP Committee and a variety of stakeholders working with the committee. Staff expects to solicit stakeholder feedback on Tasks 3 and 4 of the Reliability and Resiliency Strategic Plan as they are developed. When the Strategic Plan is complete it will require public communications and community support. Electric system reliability and resiliency are routine topics of concern in public discussions of electrification, and the measures identified in these studies are expected to provide information that can be used in these discussions. Work on efficient electrification will also inform future program design and communication of efficient electrification solutions to the community.

ENVIRONMENTAL REVIEW

Development of a Reliability and Resiliency Strategic Plan is exempt from the California Environmental Quality Act (CEQA) because it can be seen with certainty that completing a study will not result in any environmental impacts.

ATTACHMENTS

Attachment A: Reliability and Resiliency Strategic Plan Guidelines

Attachment B: Timeline of the Sustainability and Climate Action Plan to-date

Attachment C: Presentation

AUTHOR/TITLE:

Jonathan Abendschein, Assistant Director of Resource Management

Appendix D: Policy Guidelines for Reliability and Resiliency Strategic Plan Development

Work item 1B calls for the development of a reliability and resiliency strategic plan, which would guide implementation of reliability and resiliency work items. This would be coordinated with development of an electric vehicle strategic plan.

Objectives

1. Maintain and improve electric system reliability
2. Improve utility outage communication
3. Prepare the electric system for increased penetration of solar, batteries, electric vehicles and chargers, electrified building equipment, and similar new technologies
4. Optimize the use of local grid capacity in a cost-effective way
5. Promote technologies and behaviors that contribute to the efficient and reliable operation of the statewide and local electric system

Concepts to explore adding to Strategic Plan

- Addressing utility workforce issues
- Replacing aging infrastructure as part of a grid modernization plan
- Installing additional switching and other solutions to improve reliability and recovery from outages as part of a grid modernization effort
- Improving utility outage management system and communications protocols
- Technologies like vehicle to load or vehicle to home for home resiliency
- Equity in resiliency – how to provide resiliency to income-qualified residents
- Neighborhood-level resiliency solutions such as microgrids and local utility-scale battery storage
- Community emergency center resiliency
- Mobile battery strategies, such as large electric vehicles that could double as emergency resiliency solutions
- Promoting low-wattage electrification solutions to reduce grid impacts of vehicle and building electrification Time of day pricing and other ways to encourage shifting electric use to times of day with lower emissions, lower utility cost, and lower local grid impact
- Increasing transformer capacity to accommodate higher loads

Attachment B: Background on Sustainability and Climate Action Plan (S/CAP) Development

- **April 18, 2016:** City Council adopted the ambitious goal of reducing GHG emissions to 80 percent below 1990 levels by 2030¹ (the “80 x 30” goal) - 20 years ahead of the State of California 80 x 50 target, and an interim step towards California’s statewide goal of achieving carbon neutrality by 2045².
- **November 28, 2016:** City Council adopted the S/CAP Framework³, which has served as the road map for achieving Palo Alto’s sustainability goals.
- **December 11, 2017:** City Council accepted the 2018-2020 Sustainability Implementation Plan “Key Actions” as a summary of the City’s work program⁴.
- **June 16, 2020:** The City launched an S/CAP update to determine the goals and key actions needed to meet its sustainability goals, including the 80 x 30 goal.⁵
- **April 19, 2021:** Staff presented a preliminary impact analysis and Council directed the Mayor to form an S/CAP Ad Hoc Committee.⁶
- **August 2021 to April 2022:** The S/CAP Committee held several public meetings with City staff.⁷
- **November 17, 2021:** The S/CAP Ad Hoc Committee held the first meeting of its S/CAP Working Group, which assembled knowledgeable members of the community to consult with Council members and City staff on S/CAP implementation priorities.
- **December 13, 2021:** Staff presented a Progress Report on the Sustainability and Climate Action Plan Update and S/CAP Ad Hoc Committee Work⁸ to Council.
- **March 7, 2022:** Council and the Utilities Advisory Commission (UAC) held a joint study

¹ City Council, April 18, 2016; Agenda Item #10; SR #6754,

<https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/reports/city-manager-reports-cmrs/year-archive/2016/id-6754.pdf>

² In September 2018, Governor Brown signed California Executive Order B-55-18, setting the goal of achieving carbon neutrality as soon as possible, and no later than 2045. The state is to maintain net negative net emissions after 2045, meaning that GHG sinks must exceed GHG sources. The Executive Order explains that the carbon neutrality goal is layered on top of the state’s existing commitments to reduce greenhouse gas emissions 40% below 1990 levels by 2030 (as codified in SB 32), and 80% below 1990 levels by 2050.

³ City Council, November 28, 2016; Agenda Item #9; SR 7304

<https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/reports/city-manager-reports-cmrs/year-archive/2016/id-7304.pdf>

⁴ City Council, December 11, 2017; Agenda Item 15; SR #8487,

<https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/reports/city-manager-reports-cmrs/year-archive/2017/id-8487.pdf>

⁵ City Council, June 16, 2020; Agenda Item 1; SR #11404,

https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/reports/city-manager-reports-cmrs/year-archive/2020/id-11404-climate_sustainability-and-climate-action-plan.pdf?t=59513.75

⁶ City Council, April 19, 2021; Agenda Item 7; SR #12009,

<https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/reports/city-manager-reports-cmrs/year-archive/2021/id-12009.pdf>

⁷ S/CAP Ad Hoc Committee Website, <https://www.cityofpaloalto.org/scapadhoc>

⁸ City Council, December 13, 2021, Agenda Item 19; SR #13765

<https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/reports/city-manager-reports-cmrs/2021/id.-13765-s-cap-update.pdf>

session⁹ to discuss sustainability and utility related items.

- **April 11, 2022:** Staff presented the Earth Day Report¹⁰ to Council on April 11, 2022. The Earth Day Report described the work of the S/CAP Ad Hoc Working Group teams.
- **June 14, 2022:** The S/CAP Ad Hoc Working Group Teams held a public meeting to discuss their progress on three areas that would advance residential building electrification goals:
 - *Engagement.* The work of this team included fine-tuning messaging on residential building electrification and developing a strategy and timeline for engagement.
 - *Technology.* The work of this team included reviewing current and emerging technologies and their feasibility for meeting the demands of a typical home and developing a strategy. The team also considered the influence of electrification technologies that are implemented on the electrical grid improvements that are needed.
 - *Finance.* The work of this team included prioritizing the most feasible funding strategies and developing a strategy for financing S/CAP Implementation.

The working group teams also discussed an outline of a proposed Advanced Heat Pump Water Heater Pilot Program at the June 14 meeting. They agreed to have staff develop the outline into a more defined proposal.

- **September 27 and October 3, 2022:** Staff and the S/CAP Committee recommended, and Council accepted, the S/CAP Goals and Key Actions that would be used for environmental review. Staff and the S/CAP Committee recommended the creation of an Advanced Heat Pump Water Heater Pilot program and Council took several actions to enable the program to be launched.¹¹
- **June 5, 2023:** Staff and the S/Cap Committee recommended, and Council adopted, the S/CAP (including the S/CAP Goals and Key Actions), the S/CAP environmental review, and the 2023-2025 S/CAP Work Plan¹²

⁹ City Council and Utilities Advisory Commission, March 7, 2022; Agenda Item 3; SR #14076

<https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/agendas-minutes/city-council-agendas-minutes/2022/20220307/20220307pccsmamendedfinal-linked.pdf#page=42>

¹⁰ City Council, April 22, 2022; Agenda Item 2; SR # 14174,

<https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/reports/city-manager-reports-cmrs/2022/id.-14174-earth-day-report-2022-edr22.pdf>

¹¹ City Council, October 3, 2022; Agenda Item #9; SR # 14720

<https://www.cityofpaloalto.org/files/assets/public/agendas-minutes-reports/agendas-minutes/city-council-agendas-minutes/2022/20221003/20221003accsm-amended-presentations.pdf#page=131>

¹² City Council, June 5, 2023; Agenda Item #14; SR # 2305-1158

<https://cityofpaloalto.primegov.com/meetings/ItemWithTemplateType?id=2276&meetingTemplateType=2>



Reliability and Resiliency Strategic Plan Guidelines

Utilities Advisory
Commission

Context: Sustainability and Climate Action Plan (S/CAP) History

- Council Ad Hoc S/CAP Committee established April 2021
 - Involves community stakeholders via Working Group (and teams)
 - UAC members have been / are part of the Working Group Teams
- March 7, 2022 Joint UAC / Council Study Session
 - No specific action, but positive comments from Council about UAC involvement in grid modernization and related infrastructure topics
 - Agreed to include UAC members on Working Group Teams

Reliability and Resiliency Strategic Plan Guidelines

- S/CAP (and 2023-2025 Work Plan) adopted June 6, 2023
 - Was developed 2016-2023, various milestones along the way
 - A lot of implementation proceeded in parallel
- 2023-2025 S/CAP Work Plan included work item to develop Reliability and Resiliency Strategic Plan
 - Guidelines for plan development included in Appendix D
 - Adopted with S/CAP on June 6, 2023

Staff Approach to Plan Development

Plan development includes four semi-independent tasks

Reliability and Resiliency Strategic Plan Tasks:

- Task 1: System Reliability, and Outage Response, and Capacity Building
- Task 2: New Technology Integration
- Task 3: Customer and Neighborhood Resiliency
- Task 4: Efficient Electrification

Staff is requesting UAC feedback...

Staff is looking for feedback from the UAC on staff's approach to implementation of this work plan item. Possible questions to consider may be:

- Is staff's implementation in line with the Policy Guidelines?
- Are the right topics included? Is there a need for any additions, deletions, or clarifications?
- Are there any technologies, processes, or policies that UAC it wants staff to ensure are included in the plan?
- Are the timelines appropriate?
- How does the UAC want to be kept informed?

**FORECAST
12-MONTH ROLLING CALENDAR**

	Utilities Advisory Commission	City Council
September 2023	<ul style="list-style-type: none"> - Discussion and Update on the Palo Alto Fiber Project - Discussion and Update on the S/CAP and Reliability and Resiliency Strategic Plan Policy Guidelines - Water Quality Sediment Update 	<ul style="list-style-type: none"> * WMR 29 (C) * GoGreen Home Financing Program (C) * 2022 Annual Power Source Disclosure and Power Content Label Reports Resolution (C) * Annual Review of the City's Renewable Procurement Plan (C) * Natural Gas Purchasing and Pass-Through Commodity Rate Strategy (C)
October 2023	<ul style="list-style-type: none"> - Discussion and Update on Undergrounding Program - Approval of the Final 2023 Electric Integrated Resource Plan - Recommendation on California Oregon Transmission Project - FY23 Utilities Informational Report - FY22 DSM Report 	<ul style="list-style-type: none"> * Approval of the Final 2023 Electric Integrated Resource Plan (FDM) * Recommendation on California Oregon Transmission Project (FCM) * AMI Grant Award Notification (C)
November 2023	<ul style="list-style-type: none"> - Discussion and Update on Projects from 2015 to 2020 in WGW and Electric 	<ul style="list-style-type: none"> * Approval of the Final 2023 Electric Integrated Resource Plan (C) * Solid Dielectric Switches REQ (C)
December 2023	<ul style="list-style-type: none"> - Tesla Project - Reliability and Resiliency Strategic Plan Update 	<ul style="list-style-type: none"> * Consultant Contract for S/CAP Funding Study (C) * Recommendation on California Oregon Transmission Project (C) * Electrification Grant Award Notification (C) * Approval of Consultant Contract for Reliability and Resiliency Strategic Plan (C)

To be Scheduled

- 60kV Breaker Contract (C) (*currently under review in the RFP process*)
- Educational Update on any Type of New Technology or Terminology
- Projects with a Resiliency Component
- Quarterly Reports (Q1-3 Info Rpts)(Q4 Discussion Summary of the year)
 - Financial Report
 - Utilities Programs Update
 - Informational EV Charger Installation Updates
 - Informational Bucket 1 REC Sales Updates
 - Informational Fiber Updates
- Recycled Water Purple Pipe
- GM Update: Fiber Hut Count (update June 2023)
- DER discussion
- Second transmission line update
- Resiliency update (September)