



UTILITIES ADVISORY COMMISSION
Regular Meeting
Wednesday, December 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 or to adapt to the participation of the public.

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

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

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

PUBLIC COMMENT 6:10pm - 6:25pm

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

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

1. Approval of the Minutes of the Utilities Advisory Commission Meeting Held on October 11, 2023
2. Approval of the Minutes of the Utilities Advisory Commission Meeting Held on November 1, 2023

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

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

3. Staff Requests the Utilities Advisory Commission Recommend the City Council Approve the Continuation of the Cross-Bore Verification Program (**ACTION 6:45pm – 7:45pm**)
Staff: Aaron Perkins
4. Recommendation to Adopt a Resolution Approving an Amendment to the City's 2009 California-Oregon Transmission Project Long-Term Layoff Agreement to Extend the City's Layoff of its Share of the California Oregon Transmission Project (COTP) until 2034 and to Receive Annual Market Payments
5. S/CAP Strategic Plan on the Reliability and Resiliency for the Electric Distribution Utility (**ACTION 8:30pm – 9:30pm**) Staff: Jonathan Abendschein

COMMISSIONER COMMENTS AND REPORTS FROM MEETINGS/EVENTS

FUTURE TOPICS FOR UPCOMMING MEETING: January 3, 2024

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)).

INFORMATIONAL REPORTS
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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CITY OF
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Utilities Advisory Commission Staff Report

From: Dean Batchelor, Director Utilities
Lead Department: Utilities

Meeting Date: December 6, 2023
Staff Report: 2310-2143

TITLE

Approval of the Minutes of the Utilities Advisory Commission Meeting Held on October 11, 2023

RECOMMENDATION

Recommended Motion

Staff recommends that the UAC consider the following motion:

Commissioner _____ moved to approve the draft minutes of the October 11, 2023 meeting as submitted/amended.

Commissioner _____ seconded the motion.

ATTACHMENTS

Attachment A: 10-11-2023 DRAFT UAC Minutes

AUTHOR/TITLE:

Jenelle Kamian, Program Assistant I



UTILITIES ADVISORY COMMISSION MEETING MINUTES OF OCTOBER 11, 2023 SPECIAL MEETING

CALL TO ORDER

Chair Segal called the meeting of the Utilities Advisory Commission (UAC) to order at 6:02 P.M.

Present: Chair Segal, Vice Chair Scharff, Commissioners Croft, Forssell, Metz, and Phillips

Absent: Commissioner Mauter

AGENDA REVIEW AND REVISIONS

None

ORAL COMMUNICATIONS

Jerry Smith asked if the fiber project would be discussed in this meeting.

Dean Batchelor, Utilities Director, responded that the Finance Committee would discuss fiber and the grid modernization projects together on November 7th.

Hamilton Hitchings was concerned about mitigating risk to the fiber hut and felt City Hall would be unsafe in the case of a large earthquake. With an estimated 20% chance of a 7.5 earthquake in the Bay Area in the next 30 years, placing the fiber hut inside City Hall creates a 20% chance risk of losing half the fiber network indefinitely. He suggested other locations for the fiber hut that would be accessible after a major earthquake.

APPROVAL OF THE MINUTES

ITEM 1: ACTION: Approval of the Minutes of the Utilities Advisory Commissioner Meeting Held on September 6, 2023

Chair Segal invited comments on the September 6, 2023, UAC draft meeting minutes. There were no changes.

ACTION: Commissioner Croft moved to approve the draft minutes of the September 6, 2023, meeting as submitted.

Commissioner Phillips seconded the motion.

The motion carried 6-0 with Chair Segal, Vice Chair Scharff, Commissioners Croft, Forssell, Metz, and Phillips voting yes.

Commissioner Mauter absent.

UNFINISHED BUSINESS

None

UTILITIES DIRECTOR REPORT

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

Council Decision Regarding Winter 2023-2024 Gas Purchasing: City Council, at its regular meeting on September 18, 2023, adopted a resolution which will modify the gas purchasing strategy for this upcoming winter. Staff will implement the capped-price winter natural gas purchasing strategy in October 2023 for the gas year November 2023-October 2024. The amended rate schedules associated with this implementation will be effective November 1, 2023. The impact on customers of what is, in essence, an insurance policy will be limited to 15 cents per therm. The full Staff Report for is [HERE](#).

Text Messaging for Enhanced Outage Communication: CPAU's new power Outage Management System now provides mobile texting with customers for outage alerts and status updates. We encourage utility customers to log into their [MyCPAU account](#) or contact Customer Service directly to ensure we have the best number to effectively communicate in the event of an unplanned or planned utilities service disruption. Find information on outages and mobile texting at cityofpaloalto.org/outages

Residential Electric and Water Customer Satisfaction Surveys: CPAU is participating as a member of the California Municipal Utilities Association (CMUA) in customer satisfaction surveys for residential electric and water customers. CMUA's contractor, GreatBlue Research, completed a statewide survey last month of municipal and investor-owned utilities customers so we can benchmark trending results across the state. We are now about to begin what is called an "oversample" survey of Palo Alto residents so we can gain greater insight into some specific areas of interest in Palo Alto. We will also retain very similar questions to the statewide surveys for comparison purposes. If you receive a survey from GreatBlue Research, we appreciate you taking the time to answer the questions!

Advanced Metering Infrastructure (AMI) Update: By now every commissioner should have an advanced meter (AMI) installed at their home. We invite you to share your feedback with us. AMI is an important component of our customer service and technology offerings to provide better and more timely information on energy and water usage. Learn more at cityofpaloalto.org/AMI

Sanitary Sewer Replacement Project 31: Earlier this summer, CPAU began Sanitary Sewer Replacement Project 31 which involves replacing sanitary sewer pipelines along sections of El Camino Real and Page Mill Road. Work in these streets is governed by Caltrans and the County who require daytime and nighttime work to minimize impacts to residents, businesses, and major traffic corridors. The project is scheduled to be complete by summer of 2024. During October through December, daytime work will be performed on El Camino and night work (8:30 P.M. to 5:00 A.M.) will be performed on Page Mill Road from El Camino Real to Ash Street. This will be a major undertaking and we wish to thank the public in advance for their patience during the nighttime work. The City set up a webpage with information about the project (visit cityofpaloalto.org/utilityprojects), a weekly newsletter to share updates, dedicated email inbox and phone number for community members to contact us with any questions or concerns.

Wooden Utility Pole Inspections: CPAU is inspecting, testing, and reinforcing utility poles in our service area. We have contracted with company Osmose to perform this work on public streets and private property over a three-year period. The inspections begin this month and are expected to be complete by December 2026. Utility project information can be found at cityofpaloalto.org/utilityprojects

Increasing Load with Tesla: City engineers are working with Tesla for additional load, expected to come online sometime in 2024 at the Hanover Substation, which is in a design and install phase right now. Staff is also working out the details of a public-private partnership with Tesla and will bring it to Council in the coming months. It is mostly a data center, but they are also testing different charging systems and bringing in large charging systems for large transportation trucks. The partnership is inside the substation portion of the project, upgrading a transformer with economy of scales.

Public Power and Natural Gas Week Campaigns: Last week we highlighted two national campaigns to raise awareness about the benefits of public utilities. Staff promoted Public Power and Public Natural Gas Week in our communication channels. Some customers may question why we are highlighting natural gas, considering our sustainability goals to transition from fossil fuels to clean electricity for buildings and transportation. We continue to talk about natural gas and our natural gas utility employees as we still own, operate and maintain a gas system in Palo Alto. It is imperative that we continue to safely operate and maintain this system if customers are still connected to gas.

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

- October 5: New Models and Inside Tips for Going EV
- October 11: e-Bike Essentials Workshop (e-Bike discount campaign is available through end of 2023)
- October 12: SunShares Discount Solar and Battery Storage Program Webinar.
- October 14: EV Expo at the Electric Home Tour

- October 22: Sustainability Faire at Congregation Beth Am
- October 25: Heat Pump Water Heater Day – a campaign the City will promote
- October 28: Succulent Gardening Workshop at Rinconada Library
- October 29: Frunk and Treat EV Expo at the California Ave. Farmers Market

NEW BUSINESS

ITEM 2: ACTION: Utilities Advisory Commission Recommendation that the City Council Adopt a Resolution Approving the 2023 Integrated Resource Plan

PUBLIC COMMENT:

Hamilton Hitchings stated that he is in the process of electrifying his house and noted that his utility bill said 50% of the power was retired unbundled RECs. He explained the problem with RECs is that you are not burning less fossil fuels or generating more renewable, which is why they are so cheap. He stated unbundled RECs are often considered "greenwashing," essentially not really green. He recommended moving away from unbundled RECs to things like hydro.

Jim Stack, PhD, Senior Resource Planner, discussed the background of an Integrated Resource Plan, a long-term plan forecasting electric demand and how to satisfy it with a portfolio of supply- and demand-side resources. The key reason for an IRP is to demonstrate the City is on track to help the State meet its greenhouse gas reduction and renewable procurement targets. Other things accounted for in the plan are minimizing ratepayer bills, ensuring system and local reliability, procuring energy efficiency and demand response, energy storage, and planning for transportation electrification. He displayed a chart showing the resources the recommended portfolio indicates should be added in the coming years, with solar added through the 2030s and also battery capacity in the 2040s. The actual resources that will be contracted for in the future will depend on market conditions, how existing resources change over time, as well as the proposals received when the City decides to buy new resources.

Commissioner Phillips questioned what other types of resources were available to consider.

Dr. Stack responded that a wide variety of resources that are available now or expected to be available during the planned period were considered, including geothermal, biomass, offshore wind, and small modular nuclear reactors.

Vice Chair Scharff questioned if other public utility plans are the same.

Dr. Stack stated other public utilities' resource needs in the future look relatively close to this. Some of their plans include adding storage a little earlier; some of them include different types of resources.

Commissioner Phillips was surprised to see solar given there seems to be too much solar on the system at certain times.

Dr. Stack stated there is a greater move toward broader regional integration of the grid and the ability to export solar out to other areas more rather than just curtailing it, which might mitigate those trends.

Commissioner Croft questioned whether there was any thinking in the model about where the energy purchased for the shoulder periods was coming from, preferring stored solar power to power generated by natural gas.

Dr. Stack explained that when buying market power from the grid due to a deficit, the current carbon neutral plan factors in that that power is "dirtier" than during surplus periods. The IRP does not take that into account. It does a projection of the value of the generation in each hour compared to its cost and the value of the resource adequacy from it.

Commissioner Croft asked if it was possible to do analysis to match the energy supply with the load requirements in terms of price.

Dr. Stack noted there was also separate modeling being done to try to come up with a better match between the load and the resources. That is still a work in progress.

Commissioner Forssell questioned how the different options were priced in the model and asked about the availability of geothermal and landfill gas and extending those contracts when they expire.

Dr. Stack showed a slide of the prices used in the model.

Lena Perkins, PhD, Senior Resource Planner, added that there is a lot of market projection in the model, with assumptions in terms of battery growth and volatility of prices. She also noted there are 6 GW of batteries in California compared to 200 MW 4 years ago. There are assumptions that batteries are coming online, which will help in the evening ramp period. Collierville is also a very dispatchable resource. Pumped hydro is currently seasonal storage because the pumps are not cycled very often, but there are investigations on whether it may be worth upgrading the old pumps so they can actually be cycled more frequently.

Chair Segal asked if power purchased on the open market was projected to get cleaner over time.

Dr. Perkins explained Palo Alto is actually net clean especially on the margins, close to 90% on an hourly basis in average hydro years, which does not show up in the power content label because of the arbitrage. There are valid concerns about out-of-state RECs, but in general, other states are also taking on very aggressive RPS requirements. Ideally, those would converge.

Dr. Stack added that extending the existing contracts when they expire was a possibility that would be discussed with the suppliers. He displayed a slide on the long-term energy balance for the recommended portfolio. The load is projected to increase substantially in the coming years, with some holes in the portfolio to fill. He also showed the projected long-term RPS compliance,

leveling out around 60% in 2030 and exceeding the state's requirement level. He presented a slide of the monthly load resource balance for 2025 and 2045. The recommended portfolio continues the seasonal pattern of surplus/deficit positions, which will be considered when doing the procurement as there are advantages to better matching the load and resources.

Vice Chair Scharff asked why just buying more solar and more storage would not match it. He asked what base resource would bring it up in the winter.

Dr. Stack explained that storage is charged and discharged within the day and would not do anything seasonally to affect the summer and winter disparities. Dramatically over-procuring and using storage to match it hourly could be done but would be expensive. He noted there were complementary resources like out-of-state wind that produce more in the winter than summer.

Dr. Perkins noted wind at competitive prices was considered. The unpredictability of wind hurts its value. The inflexibility of base load resources in the middle of the day would lose money; whereas solar will create negative prices even in December and January.

Commissioner Croft questioned if this mirrored what was going on in California and what the solution was if everyone wants the same resources.

Dr. Stack stated the State was pushing for offshore wind to be developed and more connections between California and the rest of the West will help.

Dr. Perkins explained that interconnection is important, with a west-wide regional transmission organization as a central planner to make use of existing transmission as efficiently as possible. California is 20% hydro and Palo Alto 60% hydro with more base load, so not the same issues.

Commissioner Croft encouraged looking into pumped hydro. She asked if the analysis of the cost of storage, last done in 2020, was being done this year and was part of this planning.

Dr. Perkins responded that that requirement was rolled into the IRP and was evaluated as part of this. She explained that pumped hydro was extremely rare and expensive. The Western Area Power Administration is looking into using the San Luis Reservoir in tandem with batteries for seasonal storage and lowering the exposure to market volatility within the day as well.

Commissioner Phillips asked if hydrogen had been considered in non-battery storage.

Dr. Stack answered that hydrogen was not included in this mix but is being very actively pursued by the Northern California Power Agency, and Staff will be looking into that with them.

Chair Segal asked how much cost was weighted when running the models and how much price was the barrier in weighting more for some kind of clean energy for the half the year that solar is not sufficient.

Dr. Stack stated price was the factor that caused the model to choose more solar rather than geothermal or offshore or out-of-state wind.

Dr. Perkins explained that it was always better to have flexible resources. Hydrogen is expensive, and the projects being evaluated by the NCPA are 10% hydrogen and 90% natural gas by energy, with a 50/50 split by volume. She stated she believes price is a signal of what the grid needs, and helping the grid in what it needs and having a flexible portfolio means bringing everyone along for electrifying everything.

Commissioner Phillips asked what demand response is and why it is not in the chart.

Dr. Stack explained that demand response was not selected under the base portfolio but it was on another scenario. Demand response is essentially calling on larger commercial customers to reduce usage during certain periods, but it is a minimal benefit compared to the overall needs. He explained the scenarios look at different hydro outcomes as that is 50% to 60% of the portfolio and the biggest source of uncertainty. The four scenarios were the base case (recommended portfolio), reduced hydro output for regulatory reasons, dry year/high prices, wet year/low prices. The model showed similar recommendations for both the dry and wet year scenarios. The second scenario suggested adding renewable and new storage capacity earlier, as well as adding wind in one year. He felt it was unlikely that the City would be able to react quickly enough to potential adverse changes to get a resource in place by 2025.

Dr. Perkins explained that that scenario would be the outcome of extended relicensing or federal action, long processes with 2 to 3 years of lead time.

Vice Chair Scharff asked whether the model assumed restriction now and what was put into the model that led it to suggest 2025, as there is nothing like that on the horizon right now.

Dr. Perkins stated this was more of a worst-case scenario but was still useful to see the net cost impacts of forcing the model into a capacity deficit.

Dr. Stack showed a chart of the average financial performance of each model. He noted the mark to market, which represents the value of the overall portfolio compared to its cost. The base case has slightly more value than its cost; the dry and wet year scenarios, the mark to market actually increases; the reduced hydro scenario, which assumes the same hydro contracts even with the regulatory risk, has a negative mark to market. He also explained the risk premium, with the highest risk being the dry year scenario. He then reviewed the overall findings of the IRP. Under the base case, Western looks competitive. The model picks low-cost resources (solar) and also storage in later years. Solar is not the best fit for matching the load and increases market exposure. Other resources will be considered during procurement. Demand-side resources are also competitive. City loads are expected to increase and resource costs expected to decrease, so there should be new procurement in the coming years. He explained the timeline going forward.

Commissioner Forssell asked what happens after this is submitted to the CEC.

Dr. Stack stated the CEC staff reviews each IRP when they receive it. They can request adjustments or additional analysis or information if they find any shortfalls. The plan will be updated every 5 years. There will be updated analysis any time a new resource needs to be procured.

Commissioner Forssell noted a program at Green Mountain Power for utility customers to host a Power Wall battery, regarding demand response. There was further discussion about this.

Commissioner Metz felt the plan needed to be redone. He understood there were regulatory constraints related to the RPS but wanted the published plan to be a real one if this was not what would likely end up being procured. He stated the grid has to balance the amount of energy that goes in and out and felt the plan did not work technically or economically in terms of generating energy when it is convenient and taking energy out at other times. He was concerned about being forced to load match over the long term. He felt central solar costs were likely to be much higher than estimated because interest rates will stay up for a long time and the value of solar would be lower, making it less favorable. He recommended grabbing all the hydro and geothermal possible and not losing the existing contracts, as well as intensifying efforts on energy conservation and demand management. He stated the approach of making short-term market purchases to make up the gaps was the approach that caused trouble with gas this past winter.

Dr. Perkins explained that the California-Oregon Intertie was one of the strongest interconnections and a natural hydrologic hedge. Regarding concerns of free riding, Palo Alto is exporting solar and turning off other dirty resources more broadly, bringing cost down for everyone. Now that the surrounding states have renewable portfolio standards, the imports are also cleaner and cleaner. There was some discussion about this.

Vice Chair Scharff stated he supported the plan because he was confident in the deep knowledge of Dr. Stack and Dr. Perkins and the work they have done on this plan.

Commissioner Croft asked if it would make sense to have a scenario showing what the portfolio would look like if hourly matching was attempted.

Dr. Stack stated that hourly matching is a subset of the base case but optimized toward meeting the load rather than around price and emissions reductions.

Dr. Perkins added that the existing portfolio is at 88% hourly matching already. She stated that a discussion about hourly matching should be kept separate from the IRP.

Commissioner Phillips supported the plan with reservations. The consistent messaging is that we are carbon neutral, which gets incorrectly interpreted by the public as saying any added electricity is carbon neutral. He felt the communications were misleading.

Dr. Perkins agreed it was a hard line to walk and that even renewable energy is not without cost to the environment.

Chair Segal supported the plan. This is a government reporting obligation and does not commit to a certain portfolio or process. There has been consistent feedback from commissioners on what they would like to see going forward. Noting Commissioner Phillips' concern about messaging, she felt it might be time for another conversation about how to keep customers apprised.

Commissioner Croft stated the graph changes over time but always has months that are negative. She asked why the graphs did not show what it would look like to spread the hydro in a way that would accurately match.

Dr. Perkins explained that shaping hydro in a way that loses money and actually emits more carbon on the margin to line up the hours was not something that had ever been considered. Hydro keeps off natural gas plants, lowering emissions. Following the load with the hydro, the natural gas plants would have to be on even more to serve the market load.

Commissioner Forssell added that she learned a lot this evening and has more comfort that what the model is predicting could be the best for Palo Alto and the grid as well as removing carbon emissions from the larger system.

ACTION: Commissioner Scharff move to approve Staff recommendation that the Utilities Advisory Committee (UAC) recommend that the City Council adopt a resolution (Attachment A):

1. Approving the 2023 Electric Integrated Resource Plan (IRP) (Attachment B), which includes the four standardized tables required under the California Energy Commission's (CEC) IRP Guidelines; and
2. Approving the IRP Objective and Strategies to guide future analysis and decisions (Attachment C).

Commissioner Croft seconded the motion.

The motion carried 5-1 with Chair Segal, Vice Chair Scharff, Commissioners Croft, Forssell, and Phillips, voting yes.

Commissioner Metz voting no.

Commissioner Mauter absent.

The UAC took a break at 8:12 pm and returned at 8:24 pm.

ITEM 3: DISCUSSION: Update and Discussion on Undergrounding of the Electrical Distribution System and Electrification Goals

PUBLIC COMMENT:

Hamilton Hitchings supported Staff's position on undergrounding. He agreed with the City's current policy of undergrounding wires in selected areas and noted that insulating wires to mitigate wildfire risk is many times less expensive than undergrounding. He felt it should be put to a ballot if it is planned to incur \$½B cost to underground.

Tomm Marshall, Assistant Director of Utilities Electric Engineering and Operations, reviewed the current underground policy and reviewed some utility statistics related to undergrounding, with about 18,000 housing units that would need to be undergrounded. He presented the rough costs of undergrounding, \$645M to \$990M total, taking 18 years at 1000 homes per year. The City Council's SCAP goal is to achieve wide-scale electrification by 2030; to underground at the same time would delay electrification upgrades to 2041. He showed a map of the underground conversion project. The green is on the map is what is in the plan; the gray areas were undergrounded when they were installed.

Commissioner Phillips asked what the public communication on this has been. He stated some people have an expectation that Palo Alto is going ahead with undergrounding while this suggests most of it will not get undergrounded in our lifetime.

Mr. Marshall stated it was always expected to be 40-50 years and did not think the message had changed but felt there was interest from the community. It would take a policy change to move it a lot faster.

Commissioner Croft asked about the cross section of an undergrounded segment. She questioned whether the conduit was accessed often on an ongoing basis. She asked if the trenches would have to be dug up for the grid modernization project.

Mr. Marshall explained that in the street will be primary and secondary conduits, vaults they pass through, and telephone and cable TV in their own conduits. Once installed, it is not touched very often unless some major development happens. Existing conduits would be used where possible, but there could be some trenching or the need to install a new vault or put a pad-mounted transformer somewhere to add additional capacity in the neighborhoods.

Council Member Lauing questioned the phrase "property owners must construct the service infrastructure." He felt the report was very informative in that it explains the priorities and the much greater need of having to redo the grid and get the city electrified.

Mr. Marshall explained that the City only constructs the utility infrastructure in the street area. The Customer would have to trench from their meter location out to the box in the street. The way the program is set up today is that is paid by the customer. It can run between \$4000 and \$10,000.

Dean Batchelor, Utilities Director, added that the plan is to go to Council with discussion on whether Council wants to change the policies and/or priorities.

Commissioner Croft asked for clarification on the sentence, "In the long term the coordination of undergrounding and electrification could result in savings of between \$150M and 220M due to elimination..." She asked where the savings comes from.

Mr. Marshall explained it was from avoiding having to upgrade the overhead system.

Chair Segal questioned the survey of poles noted in the report as there had been a recent survey by Magellan. She noted a November 2011 Finance Committee report that talked about a public opinion survey about undergrounding; she wondered what had happened with that.

Mr. Marshall explained the poles were tested to see if they were rotten or needed to be treated in the field. About a tenth of the system is done each year, and the poles go onto a replacement list if they are rotten. The recent survey with Magellan looked at the conductors on the poles. He explained that when forming an underground district, a survey will be done in the neighborhood to see if there is interest, with the information typically going back to Council at the time of formation of the district. He thought that might be what was referred to.

Commissioner Croft asked why the green sections are scheduled for undergrounding.

Mr. Marshall explained the green areas are areas believed to qualify under the CPUC rules requiring AT&T to pay a portion of the costs in the underground district, making it lower cost for the City. He explained there are ways for them to go through an assessment district process to form underground districts, but it is very rare.

ACTION: None

COMMISSIONER COMMENTS AND REPORTS FROM MEETINGS/EVENTS

None

FUTURE TOPICS FOR UPCOMING MEETINGS:

Commissioner Forssell suggested a discussion topic on 24/7 load following, which could be agendized for a future meeting if there was interest in recommending a policy.

Commissioner Metz additionally wanted to address distributed energy resources, demand management, storage, all the possibilities that flow from having to match load.

Commissioner Phillips suggested discussing gas hedging.

Dean Batchelor, Utilities Director, stated gas hedging would be added to either the November meeting or the beginning of next year.

Commissioner Metz also suggested grid modernization connected with some of those topics, including discussion of the \$300M cost.

Commissioner Croft stated it was mentioned at the last meeting talking to contractors that could do that together with fiber. She asked if the plan comes before talking to the contractors or as a result of that.

Mr. Batchelor believed the costs had been discussed, with that \$300M for design, equipment, labor, and upgrades to substations. The fiber and grid mod projects will be running parallel at this point, and this could be discussed in December alongside the SCAP discussion.

Commissioner Croft stated there is a figure 2 in the DSM that talks about the composition of net electric efficiency savings in fiscal year 2022 and the majority comes from nonresidential lighting. She was interested in more about the segments using the electricity to determine efficiency targets. She asked if there was a way the City could help people understand how to improve the envelope of a house. The Genie did not address that part of it. She had suggestions on what to do within her house but did not know how to take the next step and wondered if the City had ways to make that easier.

Mr. Batchelor stated it could be a discussion item or a report to the entire Commission.

Commissioner Croft was happy to have a discussion with Staff and report back to the Commission if she learned anything important to share.

NEXT SCHEDULED MEETING: November 1, 2023

Vice Chair Scharff moved to adjourn.

Commissioner Phillips seconded the motion.

Motion carries 6-0 with Vice Chair Scharff, Vice Chair Scharff, Commissioners Croft, Forssell, Metz and Phillips voting yes.

Commissioner Mauter absent.

Meeting adjourned at 9:00 p.m.

Respectfully Submitted
Jenelle Kamian
City of Palo Alto Utilities



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**PALO
ALTO**

Utilities Advisory Commission Staff Report

From: Dean Batchelor, Director Utilities
Lead Department: Utilities

Meeting Date: December 6, 2023
Staff Report: 2311-2212

TITLE

Approval of the Minutes of the Utilities Advisory Commission Meeting Held on November 1, 2023

RECOMMENDATION

Staff recommends that the UAC consider the following motion:

Commissioner _____ moved to approve the draft minutes of the November 1, 2023 meeting as submitted/amended.

Commissioner _____ seconded the motion.

ATTACHMENTS

Attachment A: 11-01-2023 DRAFT UAC Minutes

AUTHOR/TITLE:

Jenelle Kamian, Program Assistant I



UTILITIES ADVISORY COMMISSION MEETING MINUTES OF NOVEMBER 1, 2023 REGULAR MEETING

CALL TO ORDER

Chair Segal called the meeting of the Utilities Advisory Commission (UAC) to order at 6:02 p.m.

Present: Chair Segal, Commissioners Croft, Forssell, Mauter (joined virtually, arrived 6:05 pm), Metz and Phillips

Absent: Vice Chair Scharff

AGENDA CHANGES, ADDITIONS AND DELETIONS

None

PUBLIC COMMENT

None

APPROVAL OF MINUTES

None

UTILITIES DIRECTOR REPORT

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

Department of Energy Grant Applications for Electrification Infrastructure Upgrades: Earlier this year, staff submitted two grant applications to the Department of Energy's (DOE) Grid Resilience and Innovation Partnerships (GRIP) program for electric grid modernization and Advanced Metering Infrastructure (AMI). The City did not receive the \$110M grant or the \$400,000 Buildings Upgrade prize for affordable housing electrification. This month, the City will receive a letter from DOE explaining why they denied the grants. Staff will reapply for grants in 2024.

New Limited Time Price Adjustments for Heat Pump Water Heaters: The Heat Pump Water Heater (HPWH) program has limited-time price adjustments thanks to additional funding through TECH Clean California. TECH is a statewide initiative accelerating the adoption of clean water and space heating technology to help California meet its goal of being carbon-neutral by 2045. For a limited time, residents can receive higher rebates and discounts on HPWH installations. If you hire your own contractor, you can receive \$1,500 from the City and up to \$3,800 from the State for a total rebate of \$5,300. The full-service program offers a standard 65-gallon HPWH installation for \$1,900 and up to \$1,500 in credit toward site preparation costs (including permits). This discounted pricing is available for six months; after that, the City will offer smaller discounts until State TECH funding runs out. To learn more, go to www.cityofpaloalto.org/switch or call (650) 713-3411.

Heat Pump Water Heater Day Campaign: October 25 was Heat Pump Water Heater Day, a day dedicated to HPWH education and awareness. Residents were encouraged to take a picture with a HPWH and share it on social media using hashtags #PaloAltoHPWHselfie and #HeatPumpItUp. There is a display in the City Hall lobby.

Water Supply and Hydro Conditions: Scientists predict a strong El Nino this year, which may result in wetter weather for the watersheds providing hydroelectric generation and water supply to Palo Alto. October 1 was the start of the water year and staff will provide updates throughout the winter.

Energy Prices: Compared to this time last year, in-state gas storage is better. Forward gas prices have decreased to about \$2/MMBtu, so staff anticipated winter gas bills and wholesale electric costs to be in the normal range. In accordance with Council direction, staff purchased insurance against higher prices for December through February. Staff will provide more details under New Business.

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

- November 2: Edible Gardening Online Workshop
- November 11: Multilingual EV Financial Incentives Clinic with EV Expo at Mitchell Park
- November 16: EV Charging Online Workshop
- December 2: EV 102 Online Workshop

NEW BUSINESS

ITEM 1: DISCUSSION: Discussion of Utilities Annual Report for FY2023

Telecom manager interviews took place today and should conclude tomorrow. The position was in the budget for about six years. The fiber pilot is waiting for CEQA and coordination with grid modernization.

The last SEIU contract provided compensation for hard-to-fill positions. The City had four linemen last year. Since January 2023, six linemen were hired. A system operator will start on 11/13/2023. There were five full operators and one operator in training. CPAU will move to 24/7 operator coverage instead of relying on PD's assistance. CPAU was considering 24/7 on weekends and/or holidays. The new OMS system was working well. The OMS provides operators with outage maps.

Dean Batchelor, Utilities Director, expressed his concern about two open senior engineer positions. Approximately one year ago, CPAU hired three engineers from college who have been learning quickly. A fully trained engineer left a couple months ago and staff wanted to fill that position with a senior engineer. An electric manager with about 27 years of experience was recently hired.

Staff planned to analyze employee surveys and share the results with the UAC but they are behind in that process. A little over 100 employees (about half of the 210 filled positions) took the survey.

Mr. Batchelor addressed the Commission's questions regarding Capital Improvement Plans on Packet Page 13. In the middle of October, CPAU contracted with VIP, a dock crew from Canada, for the East Meadow Circuit 4 to 12 kV conversion project related to grid modernization. VIP will initially work on 50 poles. Magellan was bought by ENTRUST, an electric design house. CPAU is working with ENTRUST because they have detailed information on our fiber design and can easily overlay it onto the electric design. Related to grid modernization is the replacement of about 1300 wood poles from East Bayshore to Alma due to age or not enough space to add fiber. The replacement of a 60 kV breaker was for an update unrelated to grid modernization.

About half of the 11 miles of Foothill undergrounding was completed and switched to the underground system with fiber in the conduits. CPAU can switch power to the overhead line in an emergency. Staff expected this project to be completed and the overhead de-energized by late spring or early summer 2024. The lowest bidder to design and build this project was \$25M. To date, the City spent \$1.3M performing the work in-house and using a contractor for the dirt work of installing conduit. Staff estimated the total cost for this project would be about \$3M.

Regarding the electricity bill comparison in Figure 3 on Packet Page 14, Commissioner Phillips asked if there were rates for average commercial use to compare CPAU's rates with PG&E and Santa Clara. Eric Wong, Resource Planner, explained it was difficult to find averages for commercial customers because of variabilities in customer types and sizes. For gas, commercial customers generally paid more compared to PG&E. For electricity, Mr. Wong was not sure but staff would try to include it in future reports.

Karla Dailey, Acting, Assistant Director Resource Management, addressed Commissioner Phillips's query as to why Santa Clara was 30% to 50% less than CPAU. One reason was Santa Clara's customer base included many large commercial loads that are less expensive to serve and require fewer connections.

In response to the Commission's questions about more outages occurring in 2022 than 2023, Mr. Batchelor replied there were many outages in 2021 and 2022 partly due to less tree trimming. The majority of last year's outages were due to trees but also some electrical pieces failed. Staff took a proactive approach in 2023 and trimmed as many trees as possible.

Commissioner Metz asked about problems with Heat Pump Water Heater (HPWH) installations. Ms. Dailey explained that Palo Alto had many older and unique homes requiring nonstandard installations. Commissioner Metz expressed his concern that electrification was expensive and energy intensive. Ms. Dailey thought we as a community needed to address it. CPAU will apply lessons learned from the HPWH program to design future programs for whole-home electrification.

Chair Segal read from the packet about some of the challenges of HPWH installations (long circuit runs, electrical panels without additional capacity, complex condensate management and water heater relocation requirements). Mr. Batchelor thought CPAU and the City of Palo Alto had ownership to meet the goals they set. The S/CAP committee set a goal for 1000 HPWH and they spoke to Council about some of the challenges. One area of improvement was increasing communication to customers, so a consulting firm was hired that is more familiar with these types of installs as well as some of these challenges. Staff discussed internally about using social media and bill inserts. One idea was to create a flyer for field service representatives to give to customers when they visit homes to relight pilots and check gas stoves, giving representatives the opportunity to talk about the program and answer customers' questions. At stakeholder meetings with the community on upgrading areas to the smart grid and fiber, CPAU can mention incentives for customers to electrify.

Commissioner Croft noted that of the 440 HPWH interest forms, 147 site assessments were made but only 16 installations were completed. Commissioner Croft and Chair Segal related their personal experiences with this process. Mr. Batchelor thought the program needed more installers, although some customers did not proceed with the installation process due to lack of resources or the cumbersome process. Staff was considering changes to make the HPWH program more efficient to avoid encountering the same problems with whole-home electrification or changing out furnaces. Chair Segal

suggesting using a flow chart outlining the steps to solve problems with installations or using an installer with experience in addressing these issues.

Commissioner Phillips queried if the comparison of gas rates in Figure 12 on Packet Page 23, Report Page 20, included the winter rebate. In FY2023, Palo Alto's median usage of 402 therms was \$1064, PG&E \$930. Mr. Wong confirmed that Palo Alto's estimated bill amount included the winter rebate.

Packet Page 17 referred to a letter Mayor Kou sent to Governor Newsom to support the request for a federal investigation and Commissioner Forssell asked about the status. Ms. Dailey responded the results of the federal investigation might take a couple years at least.

Commissioner Forssell wanted to know how to respond when asked about Palo Alto's carbon offset. Packet Page 21 listed the projects. Ms. Dailey replied some people do not like offsets. The program was designed to ensure usage of the highest quality offsets possible. The program adopted California Air Resources Board's (CARB) criteria for compliance offsets but the City does not require CARB certification. The City used offsets voluntarily, not for compliance reasons. It was a self-imposed program by the City of Palo Alto Council. One example of CARB's compliance requirements is project types. The City uses three registries for third-party verification of offsets and only buys from CARB-approved project types in the U.S.

Commissioner Forssell asked for further explanation about cap and trade mentioned on Packet Pages 21 and 22 and funds from CPAU auctioning gas utility allowances. Ms. Dailey explained that CPAU had an obligation as a gas utility to cover greenhouse gas emissions with allowances, although a tiny percentage can be offsets. CPAU received yearly free allowances but the amount decreases every year. A percentage of free allowances covered our compliance obligation but the percentage decreases over time. CPAU must sell the balance of allowances into the auction. Utilities can use the revenue for sustainability projects or distribute it evenly to customers but cannot base it on volumetric usage. PG&E customers receive a climate credit every year. CPAU does not distribute its revenue to customers. CPAU uses the money in accordance with guidelines approved by Council.

CPAU buys on the allowance market to cover gas usage within the boundaries of Palo Alto, which the program has designed to become increasingly more expensive. The electric portfolio can choose more or less carbon intensive sources, resulting in increased or decreased need for allowances. Efficiency and electrification also decrease gas usage.

The City works with large customers' sustainability goals. The City is building relationships with not only facility managers but also sustainability managers and CFOs because they are the people making decisions about changes at their facilities.

Commissioner Croft asked about commercial gas uses and targets. Ms. Dailey answered gas was mostly for space heating. Some of Palo Alto's hotels have large boilers that would require a large, expensive project to change. Mr. Wong commented gas usage was about 55% commercial and 45% residential.

Commissioner Mauter pointed out that Palo Alto's water consumption was below estimates. Revenue shortfall this year was around \$6M. Per Packet Page 30, FY23 had 11.3% lower revenues than budgeted because of water conservation. Commissioner Mauter wondered if there was rebound data on water in Palo Alto and if staff expected a rebound. Ms. Dailey replied that staff was working on next fiscal year's

financial plans as well as evaluating rebound over the past few months and assessing its effect on projections in our financial plans.

Commissioner Mauter opined the drought as well as incentive programs and mandates to curtail water usage would result in very slow rebound, so she urged staff to be conscious of that when making projections. Commissioner Mauter asked if CPAU would close the gap through increased rates or delayed maintenance. Mr. Batchelor responded that staff had internal conversations a few days ago about saving money. Staff may seek bond financing for rehabbing two reservoirs in 2026 and 2027. Otherwise, water needed much larger increases. Staff does not want to cut back on system maintenance but may spread out the size of the CIP.

Commissioner Mauter thought seismic resilience upgrades were important and recommended including seismic resilience in the water utility's goals.

Commissioner Mauter noted that backflow prevention was listed as an area needing improvement and was curious what fraction of customers had backflow prevention devices in the system. Mr. Batchelor replied there were close to 6000 backflow devices tracked in the system, of which 400 to 500 were City-owned, so about 5500 customers had backflow devices. Yearly, around 90% of customers do inspections. Inspections, repairs and replacements were the customer's responsibility. Some neighboring cities do things differently than Palo Alto. Staff was thinking about charging customers for testing, repairs and replacement of backflows. Currently, CPAU does not perform repairs or replacements. About a quarter of customers have backflow prevention but legislation may change to require 100% of customers to have backflow on their home.

Commissioner Mauter thought it was advantageous to make immediate use of any AMI data to improve leak detection especially because water has a budgetary shortfall and asked if there had been any progress in visualization or analysis of AMI metering data. Ms. Dailey responded that staff was working with WaterSmart and the AMI vendor to ensure the systems were communicating with each other and to deploy WaterSmart's leak detection features as soon as possible. Mr. Batchelor remarked there were two meter read routes receiving data from electric, water and gas devices over the collectors. CPAU read the routes manually to confirm AMI meters were reading properly. About 800 meters were fully deployed and tracked for electric, water and gas. There were a few more water and gas meters than electric because of supply chain issues. AMI would be fully launched by October next year, unless electric meters arrive sooner.

Dave Yuan, Strategic Business Manager, addressed Commissioner Croft's questions regarding the AMI vendor and software. The AMI network used Sensus. Badger Meter endpoints make it AMI capable. The MDM system is SmartWorks Compass and it can track leak alerts. In the first quarter of 2024, customers with AMI meters should have the ability to view their interval consumption by hour in the WaterSmart portal, download data and can subscribe to WaterSmart leak alerts. All AMI data (including electricity) will be available on a one-day delay but leak alerts should be the same day.

Packet Page 62 mentioned City wells were rehabilitated in 2013 but needed maintenance. The City was evaluating adding generators for wells. Commissioner Metz thought emergency wells had generators. Mr. Batchelor clarified some of the wells had generators but there was not on-site generation for every emergency well. Staff was evaluating the size of the pumps compared to necessary generation. The pumps for the water system had large diesel generation onsite. In an emergency, those larger generations would move on trailers to emergency wells.

Commissioner Croft asked if residents could view their data real-time instead of a one-day delay. Mr. Yuan replied that customers could purchase a ZigBee radio and have it installed onto their meter. There is a shortage of ZigBee radios. There is a waiting list for interested customers. CPAU had one test unit but planned to purchase 500 devices.

In response to Commissioner Croft's questions regarding costs for wastewater facility improvement, Ms. Dailey responded that Public Works would study the allocation of costs among partners.

Commissioner Mauter was excited to note the water purification facility was at 90% design and wondered when staff would brief the UAC on Carollo's progress. Mr. Batchelor explained that Public Works was running the project, he did not know when it would be finished but he would get the answer by the UAC's next meeting.

Mr. Yuan addressed Chair Segal's inquiries about fiber rates and revenue. Revenue was \$2.8M and expenses \$2.7M. Before COVID, revenue was \$1M over expenses. Since COVID, many companies left the city or consolidated connection services. Last year, there were a couple disconnections that CPAU did not have the records of, resulting in a credit back to the date they disconnected. Going forward, staff forecasted close to \$0.75M profit yearly if there were no new disconnections and should return to pre-COVID level by 2025. Mr. Yuan thought the rates were appropriate given the amount of reserves but there had not been a recent cost-of-service study. Staff's focus was on fiber-to-the-premise (FTTP); therefore, they had not spent much time on dark fiber rates. Expenses increased recently from the Magellan contract for the FTTP project. Expenses were about \$0.5M to \$0.75M higher than the run rate. Dark fiber rates (EDF-3) were set around 2006 or 2009 per Mr. Yuan's recollection. Fees were a fixed unit amount based on mileage footage to connection points.

Commissioner Croft asked if the WaterSmart portal had any effect on control residences' usage. Ms. Dailey replied she had not seen results from Palo Alto's experiment but she could follow up with Commissioner Croft on when to expect that information.

Commissioner Croft inquired about usage changes from employers remaining hybrid or remote and was interested in the efficiencies they might experience. Ms. Dailey was unaware of data on the hybrid work environment or identifying those customers.

In reply to Commissioner Croft's query if CPAU included smart building technology in its efficiency programs, Mr. Batchelor did not think so but staff would follow up with a definite answer. Mr. Batchelor thought electrical and water usage lessened when commercial and industrial customers were hybrid but staff would have to look at each customer individually to provide a comparison.

Commissioner Croft read there were substantial efficiency savings achieved with smart buildings and daylight savings. Commercial comprised 80% of the electricity load, so Commissioner Croft was interested in including smart buildings within CPAU's programs. Ms. Dailey remarked CPAU had a program for a contractor to perform energy assessments for large customers. There was rebate money available for energy efficiency and electrification projects.

Commissioner Phillips found the lack of commercial data concerning, given the size of its electric usage, and asked about increasing visibility. Ms. Dailey remarked that a second Utilities Program Services Manager position was added last fall to focus more on programs and outreach to commercial

customers. There had been a Key Account Program for many years with two Key Account Representatives who know CPAU's largest customers well (VA Hospital, Tesla and Stanford Hospital). That has allowed a lot of visibility into their business operations and strong relationships.

Commissioner Phillips requested a presentation on the commercial electricity strategy for different commercial segments (large office, retail, data center). Ms. Dailey commented on the combination packs for electric cooling and gas heating on rooftops. Staff was evaluating ways to reach those customers before they replace their units with another gas unit and incentivize them to switch to heat pumps. There is a ceremony tomorrow at 11 a.m. at the Peninsula Conservation Center on East Bayshore for replacing their unit to a heat pump.

Commissioner Forssell wondered if fiber was priced to value or cost. Chair Segal pointed out the City recently spent a lot of money in the downtown upgrade dark fiber expansion. Commissioner Forssell asked if the UAC could see a comparison of our fiber rates with competitors within Palo Alto or neighboring communities. Mr. Yuan replied that staff looked for data but it was very difficult because it was a unique business. AT&T and Comcast offer managed service, not dark fiber service. Our fiber utility provides conduit and fiber strands but the customer provides equipment and manages it themselves. Staff could contact Santa Monica and other municipalities with the same business model as ours.

Commissioner Croft wanted more initiatives to have EV charging readily available to the public in Palo Alto. She expressed her frustration with charging her EV when traveling. The City encouraged EVs and she believed EV capability should match our residents' high interest in EVs. The Technical Assistance Program's goal was 180 to 360 ports but only 15 ports have gone in. She urged staff to move faster.

ACTION: None

The UAC took a break at 7:42 p.m. and resumed at 7:50 p.m.

ITEM 2: DISCUSSION: Winter 2023-24 Natural Gas Price Uncertainty Management Council Decision Implementation

Karla Dailey, Acting Assistant Director Resource Management, stated that gas commodity prices change monthly for Palo Alto ratepayers because price tied to a published market index. City Council is the only body that can legally approve rates. In the past, Council set the rate schedule maximum at \$2/therm. From 2012 until January 2023, market price remained below \$2/therm. In December 2022, Council increased the maximum commodity charge to \$4/therm but the monthly price index for January 2023 was almost \$5/therm. Almost \$2M was taken from the operating reserve to cover the difference.

Jason Huang, Resource Planner, presented this winter's Capped-Price Winter Gas Purchasing Strategy. The CPUC investigation and Federal Energy Regulatory Commission investigation would take about 36 months. Investigation findings may be available in spring 2026. For December 2023, January 2024 and February 2024, the Capped-Price Winter Gas Purchasing Strategy was to purchase gas baseload volumes tied to a published monthly index with a \$2/therm cap. If the monthly index was below \$2/therm, our purchase price was the monthly index. If the monthly index was above \$2/therm, the City's purchase price was \$2/therm. The strategy applied to December 2023, January 2024 and February 2024 because they were typically the coldest and most expensive months for gas in California with the most risk for dramatic gas price volatility due to winter supply and market fundamentals. Last winter from December through February, indexes were at the highest levels from \$1.25/therm to almost \$5/therm compared to usually below \$1.00/therm. Staff recommended to Council to buy caps for our baseload volumes for

December through February and continue to purchase gas without price caps for the remaining months of the year. Council approved the strategy in September.

CPAU buys gas supply from November through October. On November 1, customers' bills will include price cap insurance. Staff was able to purchase 50% of the gas baseload volumes for December, January, and February with the \$2/therm cap in place, resulting in \$1.5M cost for the caps. The \$1.5M total cost for buying caps for December, January and February would be divided on customers' bills over 12 months, resulting in a monthly increase of about \$1.81 in the median monthly residential bill. This insurance policy protects reserves and customers from price spikes, although the policy adds cost if market prices are below \$2/therm. Up to \$4/therm can be passed onto customers. Staff contacted our major gas suppliers to request a cap and received this offer from one of our largest gas suppliers. In response to Commissioner Phillips querying why the City did not use a financial institution, Ms. Dailey replied that the City's energy risk management policy forbids us from engaging in financial transactions and Council approved the policy.

Commissioner Phillips urged staff to consider long-term alternatives. This \$1.5M policy would have saved the City \$2M if it were in place for January 2023. Commissioner Phillips suggested the City could self-insure by saving \$1.5M, cut out the middleman and use the money to reduce customers' bills if high gas prices occurred in the future. Mr. Huang remarked that staff considered that option. Ms. Dailey commented that staff wanted to implement something quickly in response to the community's and Council's needs. Self-insuring was a possibility. A separate reserve could be created for this purpose after exploring how much money we wanted to keep but it would take time to accumulate money.

Fixed price gas purchases could be added to our portfolio but rates needed to change because buying fixed price and tying our commodity rate to the monthly market was a mismatch. A full-laddering strategy was another option. Owning our gas production can control costs but does not fit with the City's risk profile or expertise. Gas storage can arbitrage winter price spikes but was very expensive because of costs for injection, holding and withdrawal. It was not cost effective when staff evaluated gas storage a number of years ago but it could be a useful tool for reliability and staff can reevaluate it. One of Council's ideas was purchasing costless collars, a cap and floor on the price that offset each other such that you do not pay any insurance but the downside is if prices fall then you hit the floor price and customers cannot take advantage of falling prices. Staff will return to the UAC with alternatives moving forward or continue passing through market price and taking the chance of high winter gas prices.

Mr. Huang explained that gas was procured by the full year or season, depending on volatility at the time. The past two or three years, CPAU bought seasonally for winter (November through April) and summer (May through October) based on the monthly price set before the month started. Ms. Dailey remarked that the transaction was to buy this much gas based on this published index and CPAU obtained quotes for gas at index plus an add-on but we do not know how the price until the month starts. Mr. Huang mentioned there was a daily published index to buy gas on a daily basis. Ms. Dailey stated we buy and sell on the daily market because our baseload was never exactly the amount used.

Commissioner Phillips asked when staff would provide a long-term recommendation to the UAC. Ms. Dailey replied that was not on the calendar and they needed to hire a resource planner. Mr. Huang was providing analysis for gas and electric. On the self-insurance strategy, it would take years to build up reserves, so there needed to be an interim strategy.

Council approved the Capped-Price Winter Gas Purchasing Strategy for one year. Customers will not see it on their bills as a separate line item. The cost was embedded in the commodity charge and the \$1.5M cost commitment would be recouped by October 31. Our website will have more details. Ms. Dailey pointed out that the \$2M taken from reserves last year also needed to be paid back.

CPAU sent communications to advise customers their gas bills were likely to be very high last winter. Commissioner Mauter asked if customers responded by reducing their gas use. Mr. Huang responded no and he thought the reason was December was a lot colder so there was more than average consumption. Ms. Dailey replied no and she thought it was because most people did not pay attention until they saw their bill. Mr. Batchelor thought the cold weather caused higher use, even though CPAU sent messages to advise customers to cut back.

Commissioner Mauter saw this as a warning to the UAC around the challenges we would see in transitioning off gas if rising prices, interventions such as heat pump water heater programs and other incentive programs to help customers get off gas did not encourage transition.

Chair Segal was troubled by the mixed signals. We are trying to discourage gas use while saying do not worry about winter gas prices, it is going to be expensive but we are going to take care of you. Chair Segal did not want that language in our long-term plan. Having a gas reserve to protect against future prices was problematic because current customers pay for future customers. Rates are per therm, so you receive more of a discount if you use more therms, which Chair Segal thought should be inverted.

Council Member Lauing commented that staff should plan now for next year so the UAC can be involved in the process. He urged staff to get it on the timeline. Council approved the Capped-Price Winter Gas Purchasing Strategy in spite of costs. Council determined the risk was too high this year because we did not know what caused high gas prices last winter and to avoid the risk of residents paying high gas prices two years in a row, particularly because reserves were down.

Commissioner Croft thought customers would remember last winter's price spike and may cut back gas usage this year and perform insulation improvements. She saw a Nextdoor conversation about heat pump water heaters. It would be helpful to see a price comparison of energy from electricity versus gas. If electricity was more attractive than gas, we need to make that financial argument.

ACTION: None

COMMISSIONER COMMENTS and REPORTS from MEETINGS/EVENTS

Commissioner Metz stated there was an S/CAP meeting scheduled next week on the heat pump water heater strategy.

Chair Segal thanked Dean Batchelor, Utilities Director, for participating in the League of Women Voters conversation about S/CAP.

FUTURE TOPICS FOR UPCOMING MEETING

Commissioner Metz urged staff to have a 12-month rolling calendar as required by our bylaws. He wanted to include the topic of grid modernization. A Reliability and Resiliency Strategic Plan Update was scheduled for December. Commissioner Metz requested staff to address if the plan included resiliency when the grid was operating or if it also addressed what to do in a major grid failure.

Commissioner Forssell requested a dark fiber utility rate comparison to understand the financials better.

Commissioner Phillips wanted a presentation on commercial electricity segmentation and plans specific to the commercial sector.

Chair Segal noted it was time for a security meeting on physical and digital security, as either an additional meeting or closed-door session.

NEXT SCHEDULED MEETING: December 6, 2023

ADJOURNMENT

Commissioner Phillips moved to adjourn.

Commissioner Forssell seconded the motion.

Motion carried 6-0 with Chair Segal and Commissioners Croft, Forssell, Mauter, Metz and Phillips voting yes.

Vice Chair Scharff absent.

Meeting adjourned at 8:36 p.m.



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Utilities Advisory Commission Staff Report

From: Dean Batchelor, Director Utilities
Lead Department: Utilities

Meeting Date: December 6, 2023
Staff Report: 2310-2173

TITLE

Staff Requests the Utilities Advisory Commission Recommend the City Council Approve the Continuation of the Cross-Bore Verification Program

RECOMMENDATION

Staff recommends the Utilities Advisory Commission recommend the City Council approve the continuation of the Cross-Bore Verification Program to complete the remaining 966 sewer laterals over the next two years for an estimated \$1,352,400

BACKGROUND

A “cross-bore” occurs when a pipe is installed by trenchless technology and inadvertently penetrates a pre-existing pipe in its path. Cross-bores create an intersection of infrastructure that compromises the integrity of one or both pipes involved, with potentially severe consequences. In rare cases, if cross-bores have occurred between sewer laterals and gas lines, a potentially hazardous situation can be created during sewer lateral cleaning or plumbing work whereby the sewer cleaning breaks the gas line resulting in the unrestricted release of gas into the sewer and home. Proactive investigation and prompt repair reduce risk of potentially hazardous cross-bores.

During 2011, the City of Palo Alto Utilities (CPAU) Department launched a cross-bore verification program for all active sanitary sewer laterals in the City. The main purpose of the cross-bore verification program was to help ensure natural gas pipelines or other utilities were not unintentionally installed through sewer laterals. The first phase of the program (Phase I Cross-Bore Verification Program) concluded in 2013. During Phase I, the City’s contractor successfully inspected a total of 7,192 City and private sewer laterals. A total of 26 natural gas cross-bores were identified during Phase I of the program and CPAU Operations promptly repaired all identified cross-bores.

During August 2019, the City started the second phase of the cross-bore verification program (Phase II Cross-Bore Verification Program). Initially, 2,500 sewer laterals were scheduled for inspection, but the parties terminated the contract during the COVID-19 pandemic because the original bid price did not include the additional expenses to meet Santa Clara County’s COVID-

19 safety requirements and the contractor would not execute a contract change order for the additional expenses. As a result, the City's contractor inspected 408 of the highest priority City and private sewer laterals, and no natural gas cross-bores were identified during Phase II of the program.

The Phase III Cross-Bore Verification Program began during April 2021. Phase III of the program was completed during September 2022 and the City's contractor inspected a total of 1,480 City and private sewer laterals. Only one natural gas cross-bore was observed during Phase III and CPAU Operations repaired the cross-bore on the same day it was identified.

ANALYSIS

The CPAU cross-bore verification program has been prioritized based on factors that contribute to greater risk of a cross-bore occurring. For example, gas services installed close to sewer laterals pose a greater cross-bore risk than those with a greater separation. CPAU staff reviewed the existing utility asset database to create a list of sewer laterals that could potentially contain a natural gas cross-bore. The criteria created are as follows.

- The property has a natural gas service that is 1" in diameter and the pipeline material is polyethylene (PE). The presence of PE pipe is a risk factor because this type of pipe is typically bored underground whereas other pipe materials were installed using open-trench construction methods, which do not pose a cross-bore risk.
- The 1" PE gas service was installed by a trenchless operation or identified as "unknown" installation method. If the PE gas service was installed by open-trench construction, it does not pose a cross-bore risk.
- The installation date was prior to 2001, if it was installed by a city contractor, or prior to 2011, if it was installed by a city crew, as after these dates CPAU had a cross-bore inspection program in place.

The above criteria will result in a total of 10,046 out of 17,830 sewer laterals (56%) that were included in the CPAU cross-bore verification program (Phase I through Phase IV). The cross-bore inspection was further prioritized to address the type of property served. Other evaluating factors include the following.

- Whether the property is in a densely populated or "high-consequence" area.
- Whether the gas service has an emergency safety shut-off valve that automatically stops the uncontrolled release of gas.
- Location of the gas meter: A gas meter at the house poses a greater risk as the gas service was drilled onto private property and the potential to damage a private sewer lateral is greater. A curb meter location poses a reduced risk as the gas service is not installed on private property.
- The proximity of the gas service to the sewer lateral.

As CPAU continues to complete the higher-priority locations, staff expects the number of natural gas cross-bores to continue to decrease. There are 966 remaining sewer laterals to be inspected on Phase IV Cross-Bore Verification Program. CPAU has estimated it will take 2 years to complete these inspections for a total of \$1,352,400. The final Phase IV Cross-Bore Verification project has

not yet been budgeted and staff is seeking concurrence from UAC to continue with the program despite the reduction in identified natural gas cross-bores observed during Phase II and Phase III.

Although cross-bore inspections in Phases I through III has greatly reduced the likelihood of discovering a cross-bore within the remaining unverified sewer laterals, the risk has not been eliminated. A single natural gas cross-bore could have a devastating effect if damaged by a plumber while clearing a sewer blockage or cleaning a sewer pipe. While inspecting all 10,046 sewer laterals does not guarantee a natural gas cross-bore is not present within a sewer lateral, the cross-bore verification program will capture and document the inspection of approximately 56% of the sewer laterals in the collection system that meet the criteria for the potential presence of a natural gas cross-bore.

Staff will continue to assess the number of sewer laterals that meet the criteria for cross-bore inspection and remove addresses of laterals being inspected internally as some of the gas services may be replaced through Operations maintenance programs. Historical data, yearly inflation, and COLA (cost-of-living adjustment) are used to prepare the engineering estimate for the multi-year contract of the Phase IV Cross-Bore Verification Program. Staff will complete all remaining inspections of sewer laterals identified as meeting the criteria for potential natural gas cross-bores within this multi-year contract. Staff estimates there are 966 remaining laterals requiring inspection.

FISCAL/RESOURCE IMPACT

Currently Phase IV of the cross-bore verification program is not budgeted. Staff estimates it will require a total of \$1,352,400 to complete the remaining higher-priority lateral inspections for all gas services installed prior to the Department implementing a cross-bore lateral inspection program. The estimated cost of inspection has increased by 40% due to the estimated cost aggregated over a two year period and inflation and labor increases over a 4 year span between bids from Phase III to Phase IV.

Phase	Contract Duration (months)	Total Final Contract Expenditure	Laterals Inspected	Gas Cross-bore Discovered	Other Cross-bore Discovered	Inspections Performed per Cross-bore Found	Cost per Cross-bore	Avg. Cost per Inspection
I	29	\$2,946,297	7,192	26	31	126 (0.8%)	\$51,689	\$410
II	9	\$245,743	408	0	1	408 (0.2%)	\$245,743	\$512
III	18	\$1,251,200	1,480	1	0	1480 (0.07%)	\$1,251,200	\$845
Historical	56	\$4,443,240	9,080	27	32	154	\$75,309	\$485
IV	24	\$1,352,400	966	-	-	-	-	\$1,400

With 966 sewer laterals to be inspected to complete all legacy gas service installations prior to the in-line sewer inspection practice and the inherent risk of cross-bores and the devastating affect a damaged gas pipeline in a sewer pipe can have, staff recommends the UAC recommend

the City Council approve the continuation of the Cross-Bore Verification Program to complete the remaining sewer laterals over the next two years, with a contractor, and to include the work in the operating budget.

For discussion purposes, staff provided three options for completing the cross-bore program, which are as follows:

- Option 1 – Continue the Cross-Bore Inspection Program and complete the remaining 966 higher-priority sewer laterals over the next 2 years.
- Option 2 – Scale back the Cross-Bore Inspection Program and complete the remaining 966 higher-priority sewer laterals over the next 10 years.
- Option 3 – Discontinue the 3rd-party Cross-Bore Inspection Program based on the remaining expense and risk reduction achieved to date.

ATTACHMENTS

Attachment A: Presentation

APPROVED By:

Dean Batchelor, Director of Utilities

Staff: Aaron Perkins – Principal Engineer, Utilities

CROSS-BORE UPDATE

December 06, 2023

Cross-bore Background

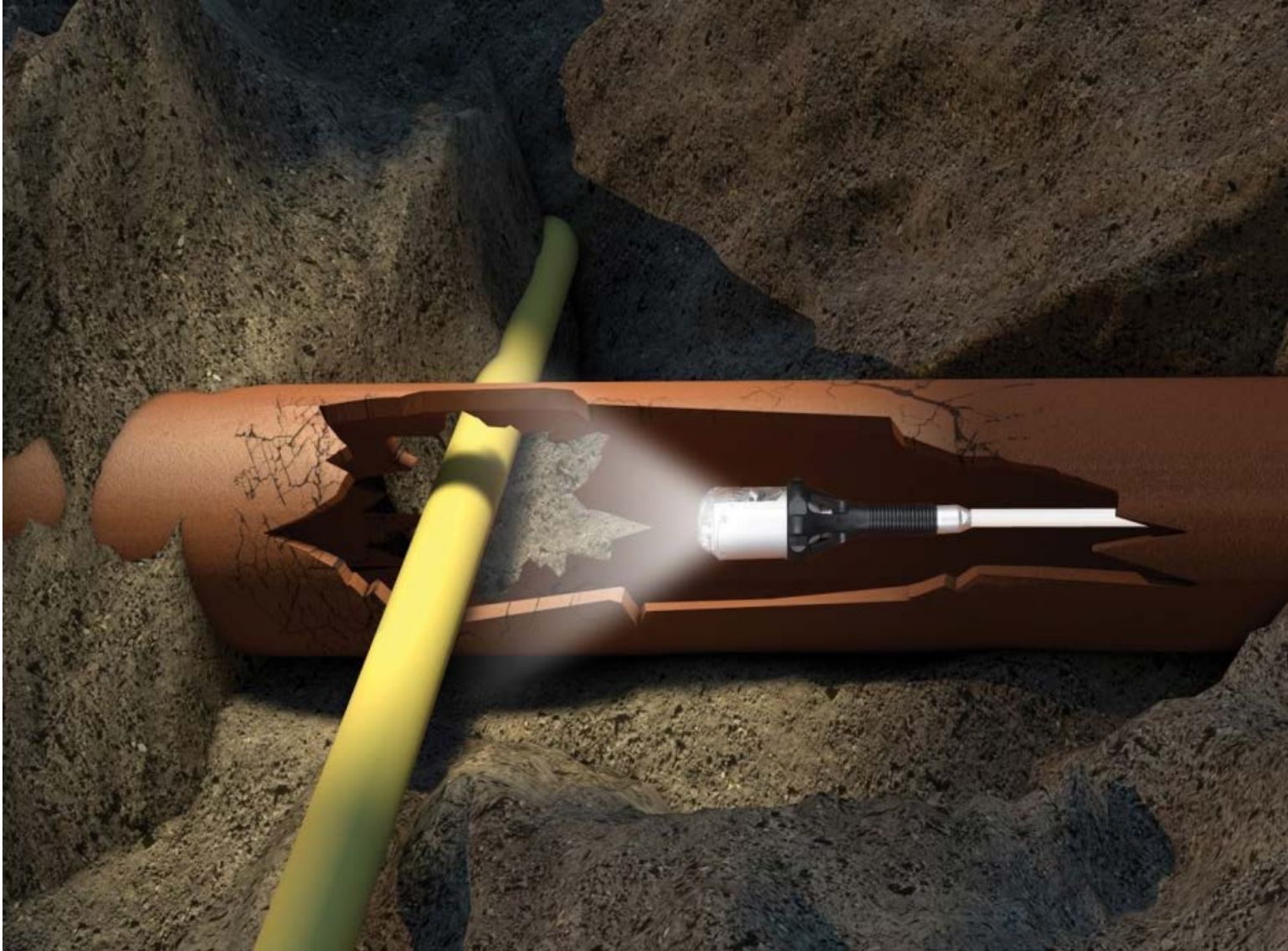
Cross-bore

The unintentional drilling of a new pipeline through an existing underground pipeline using trenchless drilling method. Cross-bore between sewer laterals and gas lines are rare but could happen. This poses a potential hazard during sewer line cleaning or plumbing work.

Crossbore Intersection



Crossbore Inspection



Grouping of Laterals and Proximity

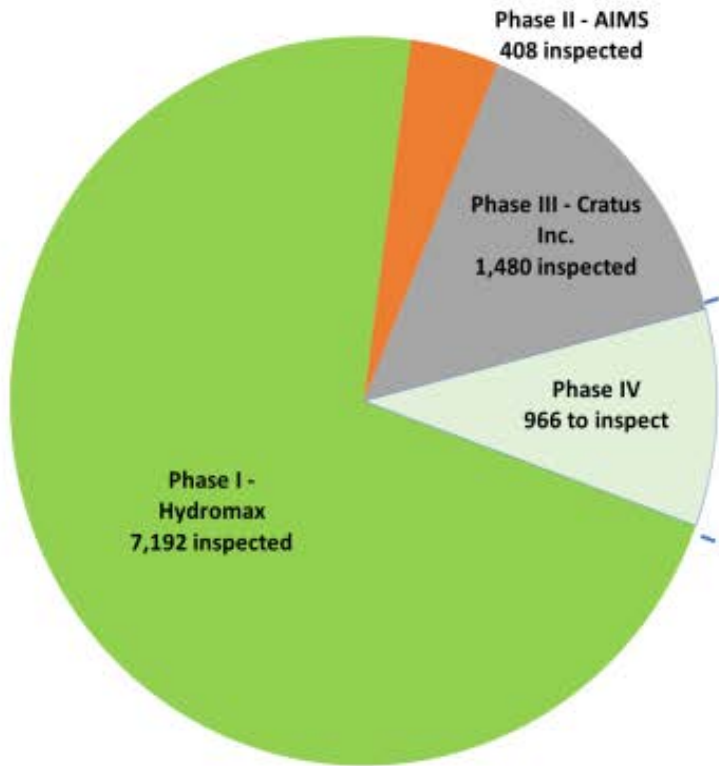
Phase IV Inspections

Group	Proximity Range Between Gas Service and Sewer Lateral					
	0 ≤ 5'	6' ≤ 10'	11' ≤ 15'	16' ≤ 20'	21' ≤	Total
1	15	6	9	6	76	112
2	2	1	5	1	40	49
3	59	52	39	40	87	277
4	94	52	54	53	220	473
5	3	0	1	2	13	19
6	9	9	3	2	13	36

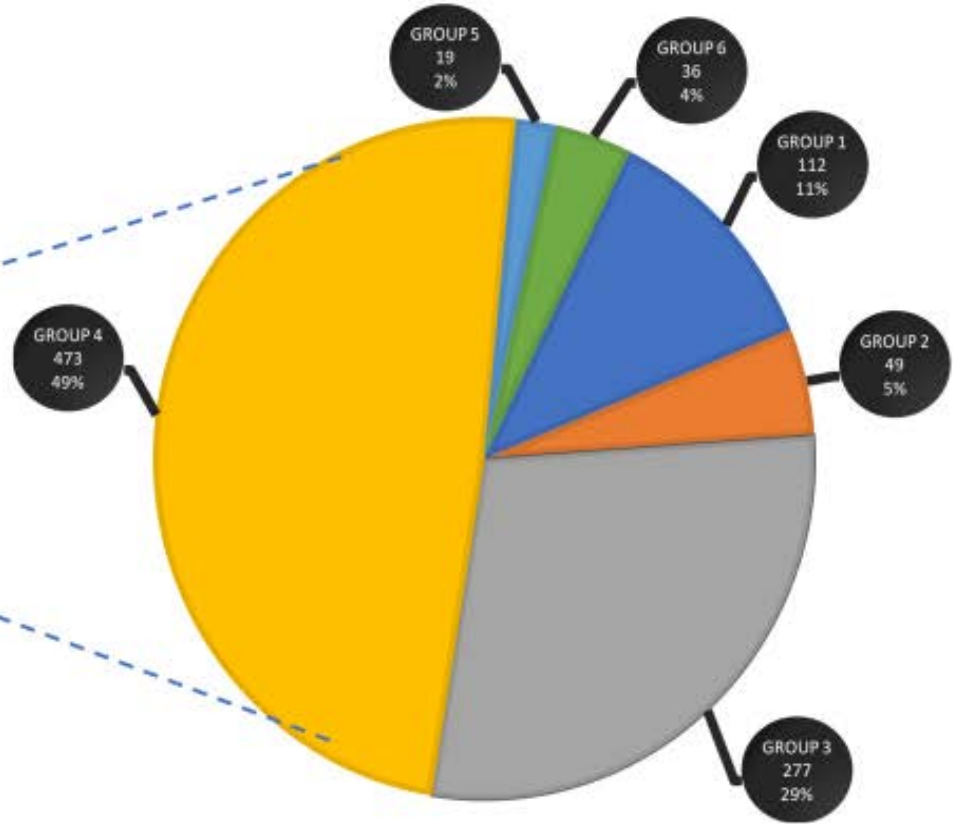
GROUP	CRITERIA	METER	PROTECTION	MAIN CROSSES SS LATERAL	
1	PE Gas services installed via Horizontal Direction Drilling (HDD) All schools, hospitals, churches and Parcels within a Business District	A	HOUSE	NO EFV	YES
		B	CURB	NO EFV	YES
		C	HOUSE	NO EFV	NO
		D	CURB	NO EFV	NO
2	PE Gas services installed via Horizontal Direction Drilling (HDD) All schools, hospitals, churches and Parcels within a Business District	A	HOUSE	VALVE	YES
		B	CURB	VALVE	YES
		C	HOUSE	VALVE	NO
		D	CURB	VALVE	NO
3	PE Gas services installed via Horizontal Direction Drilling (HDD) All schools, hospitals, churches and Parcels within a Business District	A	HOUSE	WITH EFV	YES
		B	CURB	WITH EFV	YES
		C	HOUSE	WITH EFV	NO
		D	CURB	WITH EFV	NO
4	PE Gas services installed via Horizontal Direction Drilling (HDD) Residential, Commercial or Multi Family	A	HOUSE	NO EFV	YES
		B	CURB	NO EFV	YES
		C	HOUSE	NO EFV	NO
		D	CURB	NO EFV	NO
5	PE Gas services installed via Horizontal Direction Drilling (HDD) Residential, Commercial or Multi Family	A	HOUSE	VALVE	YES
		B	CURB	VALVE	YES
		C	HOUSE	VALVE	NO
		D	CURB	VALVE	NO
6	PE Gas services installed via Horizontal Direction Drilling (HDD) Residential, Commercial or Multi Family	A	HOUSE	WITH EFV	YES
		B	CURB	WITH EFV	YES
		C	HOUSE	WITH EFV	NO
		D	CURB	WITH EFV	NO

Phase IV Inspection Data

TOTAL LATERALS INSPECTED INCLUDING PHASE IV



LATERALS TO BE INSPECTED BY GROUP



Staff Summary

- Staff recommends the UAC recommend the City Council approve the continuation of the Cross-Bore Verification Program to complete the remaining 966 sewer laterals over the next two years for an estimated \$1,352,400

- Questions?

Slide Title



CITY OF
**PALO
ALTO**

Aaron Perkins

Principal Gas Engineer

Aaron.Perkins@cityofpaloalto.org

(650) 566-4521



Utilities Advisory Commission Staff Report

From: Dean Batchelor, Director Utilities
Lead Department: Utilities

Meeting Date: December 6, 2023
Staff Report: 2310-2161

TITLE

Recommendation to Adopt a Resolution Approving an Amendment to the City's 2009 California-Oregon Transmission Project Long-Term Layoff Agreement to Extend the City's Layoff of its Share of the California Oregon Transmission Project (COTP) until 2034 and to Receive Annual Market Payments

RECOMMENDATION

Staff recommends the UAC recommend the City Council adopt a Resolution approving Amendment No. 3 to the City's 2009 California-Oregon Transmission Project Long-Term Layoff Agreement to extend the term for 10 years until 2034 and to receive annual market payments, as shown in Exhibit A to the attached Resolution.

EXECUTIVE SUMMARY

In 1984 the City of Palo Alto was a founding member of the Transmission Agency of Northern California (TANC), a joint powers agency formed in 1984 to facilitate the construction and joint ownership of transmission projects. TANC invested in construction of a high-voltage transmission line from just north of the California Oregon border to Tracy in the Central Valley called the California Oregon Transmission Project. The purpose of this line was to ensure publicly owned utilities had sufficient transmission capacity outside of the PG&E-owned transmission system. With the formation of the California Integrated System Operator (ISO), the City of Palo Alto Utilities and several other publicly owned utilities joined the ISO. However, there were other publicly owned electric utilities, along with the federal hydroelectric project the Western Area Power Authority, which elected to not join the ISO and instead jointly decided to keep the COTP outside of the ISO market and transmission planning process. This decision stranded Palo Alto's share of the COTP in a different balancing authority and limited the value of the asset to Palo Alto.

Since the value streams from the COTP were preserved for those utilities not in the ISO, in 2009 Palo Alto entered into a 15-year temporary ownership agreement (or "layoff") of its share of COTP to three of these utilities who had not joined the ISO: Turlock Irrigation District (TID), Modesto Irrigation District (MID), and the Sacramento Municipal Utilities District (SMUD). The

2009 layoff term ends February 1, 2024 unless extended or replaced. Upon expiration in 2024 the City of Palo Alto Utilities Electric Portfolio would have been required to pay the TID, MID, and SMUD approximately \$1M (which is the value of the remaining useful life of existing capital replacements). Staff briefed the UAC on the history and options for Palo Alto's share of the COTP in May 2023 ([Staff Report: 2301-0795](#)¹). The current 2009 Long-Term Layoff Agreement (2009 LTLA) and both of its amendments are included as Attachments B, C, and D.

Staff negotiated with current layoff recipients TID, MID and SMUD to extend the 2009 LTLA for ten years until February 1, 2034 and add an annual market payment to the City of \$550k in years 2024-2028 and \$800k in 2029-2033. Amendment No. 3, approved by the TANC Commission on November 15, 2023, is included for review as Attachment A. Following approval by TID, MID and SMUD's governing boards, Amendment No. 3 will be considered by Palo Alto's City Council on January 16, 2024. Staff recommends that the Utilities Advisory Commission recommend the Council adopt a resolution authorizing the City Manager to execute Amendment No. 3.

¹Staff Report 2301-0795 <https://www.cityofpaloalto.org/files/assets/public/v1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2023/05-may-2023/05-03-2023-2301-0795-info.pdf>

BACKGROUND

The COTP is a 340-mile, 500-kV AC transmission line between Southern Oregon and Central California. The COTP became operational in March 1993, and has a total rated capacity of 1,600 MW.

From its northern end at the Bonneville Power Administration's Captain Jack Substation in Southern Oregon, the COTP continues south to the Western Area Power Administration's Tracy Substation and on towards the Tesla Substation (owned and operated by PG&E) in the CAISO balancing area.

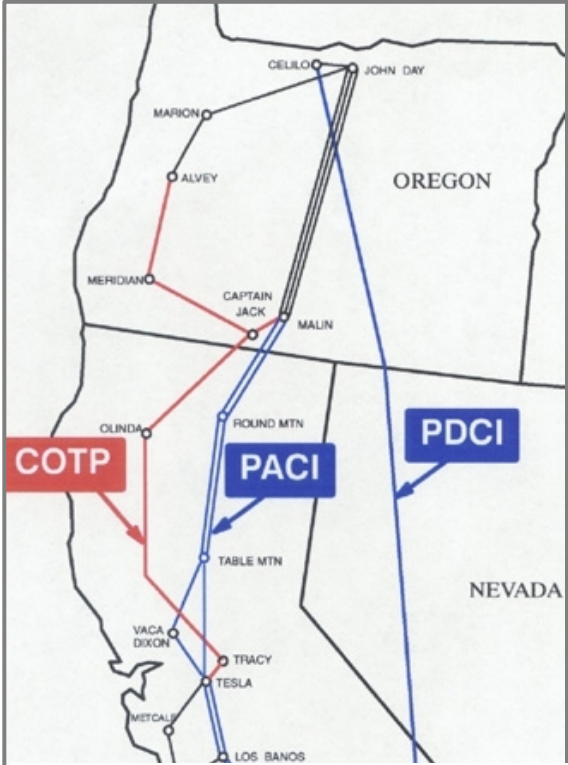


Figure 1. Map of COTP as part of the California-Oregon Intertie.

The Transmission Agency of Northern California (TANC) is a California Joint Powers Agency, formed in 1984 to facilitate the construction and joint ownership of transmission projects. Palo Alto was a founding member of TANC. Other members include MID, TID, SMUD and the Cities of Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Redding, Roseville, Santa Clara, and Ukiah.

TANC currently owns and operates approximately 87 percent of the COTP. Palo Alto is a signatory to TANC's 1990 Project Agreement No. 3 (PA3) (Resolution No. 6877, adopted March 26, 1990), which provides the City a 3.6815%, or approximately 50 MW, share of TANC's current entitlement to transfer capability on the COTP. That line is expected to be increased in rating in 2025, increasing Palo Alto's share to 54 MW for north to south transmission.

Palo Alto decided to lay off its share of the line in 2009 to MID, SMUD, and TID, and that layoff will come to end February 1, 2024 if not extended.

DISCUSSION

Analysis

In 2009 laying off the COTP at cost to non-ISO public utilities was a reasonable choice; however, several fundamental policy and market changes have occurred in the last 15 years. These market changes have made transmission both more expensive and more valuable.

Some of the market changes include high renewable electricity mandates, large increases in transmission costs to deliver renewable electricity, greater electricity market integration with neighboring states, and the California ISO's 2020 creation of a revenue stream for ISO utilities who make their portion of the COTP available to the ISO. Overall these changes increased the value of the COTP to both Palo Alto and the utilities who currently operate Palo Alto's share of the COTP under the 2009 layoff agreement.

There are also substantial upcoming capital and operating expenses planned for the COTP to which Palo Alto would need to contribute if it took back its share, and uncertainties around future value streams which could make value of the City's share of the COTP lower than the City's cost of ownership, as shown in Table 1.

Changes to the Current Layoff in the Amendment

Staff from Utilities and the City Attorney's office negotiated the terms of a 10-year amendment and extension of the 2009 layoff agreement with MID, TID and SMUD. Specifically, besides extending the layoff term until 2034, the amendment includes an annual market payment of \$550k in years 2024-2028 and \$800k in 2029-2033 from MID, TID and SMUD to Palo Alto. In addition, extending the layoff term would ensure that all the operating costs and a large percentage of the capital costs for the next 10 years would continue to be allocated to MID, TID and SMUD.

Over the course of the current 15-year layoff PA3 participants have approved many required capital projects to the COTP, which have mostly been replacements to existing facilities. As detailed in the 2009 LTLA (Attachment B), the portion of the useful life of the capital replacements that extend beyond the duration of the current layoff will be the responsibility of the layoff entities, including Palo Alto. To date, approximately \$1M of these capital obligations would be payable by the City at the end of the layoff term in February 2024. Again, this \$1M represents the City's share of the capital replacements whose life exceeds the duration of the layoff, were the City to end the current layoff in 2024. If the City amends the layoff agreement in accord with the terms in Amendment No. 3, then these previously accrued capital obligations would be reduced substantially and be due in 2034 instead. This reduction is shown in Table 1.

The annual payments to the City from the Districts receiving the layoff of \$550k will start in 2024, changing to \$800k in 2029 through 2033.

Comparison of Amended Layoff Agreement and Bringing COTP Back

A summary table with approximation of the annual costs and value streams is below, for the 10-year layoff agreement, from February 1, 2024 to January 31, 2034. This table compares the different costs and values of bringing the COTP back to Palo Alto’s electric portfolio versus amending and extending the layoff agreement. The terms of the current layoff are shown as a comparison, although an extension of the current layoff without the annual payments to Palo Alto is not being considered.

Table 1. Financial comparison of current estimates of value for bringing COTP Back versus the proposed terms for the Amended Layoff. The “Current Layoff Terms” are shown for comparison only, if the current layoff were extended, which is not under consideration, but simply shown for comparison purposes. All numbers are presented on an annual basis for the ten-year term covered by the proposed Amendment.

Annual Cost or Revenue	Bring COTP Back to Portfolio (2024-2034)	RECOMMENDED Layoff Extension (2024-2034)	Current Layoff Terms (2009-2024)
O&M Obligations	-\$1,400,000	-	-
New Capital Obligations	-\$600,000	-\$350,000	-\$350,000
Prior Capital Obligations	-\$100,000	-\$40,000	-\$40,000
CRR Options Revenue	\$920,000	-	-
Energy Transfer System Resources Revenue	\$480,000	-	-
Average Layoff Payment	-	\$675,000	-
Low Cost Renewables Value	<i>unclear</i>	-	-
Total Cost (-) or Value (+) per year	-\$700,000	\$285,000	-\$390,000

Detailed Estimates of Costs and Values

The prior capital obligation for repayment of about \$1M (accrued from 2009 to 2024) is shown on an annual basis for different options for the duration. If the City were to bring the resource back rather than amend and extend the current layoff agreement, the City would be required to pay roughly \$1M in prior capital obligations (shown in the table above as \$100k per year over 10 years), effective February 1, 2024.

The City is exempt from all operation and maintenance obligations related to PA3 during the current layoff, and that will continue with this layoff extension. Under the current 2009 LTLA Section 3.g. which remains unchanged via the potential extension, the City will be responsible for paying the Districts back at the end of the layoff for the percentage of the useful life of that capital replacement that extends beyond the term of the layoff agreement (in other words, when the COTP share returns to the City).

There are substantial capital replacements planned for the next ten years, which TANC has preliminarily decided to finance. Staff projects that the expected capital costs to the City without a layoff extension will be approximately \$600k per year for the 10 years covered by the proposed extension. Approximately \$1M of that total of \$6M over ten years is anticipated to be funded by TID, MID, and SMUD under a long-term layoff. Of the remaining \$5M in capital expenditures from 2024-2034, Utilities staff, TANC staff, and NCPA staff are estimating approximately 70% of the

capital replacements will need to be paid back to Districts in 2034, which is roughly \$3.5M. This is estimated from the anticipated expenditures based on the timing of the expenditures and the lifetime of the actual equipment. These capital expenditures are shown in Table 1. These are for planned capital expenditures, and actual capital expenditures could potentially be higher.

Under the 2009 layoff agreement, Palo Alto relinquishes “all of Palo Alto’s use of its interests, rights, and obligations under TANC Project Agreement No. 3” unless TID, MID, and SMUD default, and this would remain so under the amendment extending the current agreement.

Two revenue streams which are both volatile and uncertain are Congestion Revenue Rights (CRR) Options, and Energy Transfer System Resources (ETSRs). The ISO made CRR options available to Palo Alto in 2020²; they are available to COTP owners so that entities can turn over their percentage of the COTP on a monthly or annual basis to the ISO and collect both CRR value for north to south and south to north throughout the year. This is essentially allowing the ISO to optimize that portion of the COTP within the ISO full network model to minimize costs for all, and then pass the value of the cost minimization to the respective COTP rights-holders.

ETSRs are the difference between the energy component of the locational marginal price at different locations between Balancing Authorities beyond ISO, but within the Western Energy Imbalance Market (WEIM) and the Extended Day Ahead Market (EDAM). EDAM is under development and is expected to launch with PacifiCorp in 2025, and SMUD in approximately 2026. ETSRs essentially pass on the energy value to transmission owners who are connecting lower cost resources to higher cost generation areas.

The COTP CRR options for public utilities like Palo Alto have averaged about \$17k/MW per year. Palo Alto’s current 51MW share will likely increase to 54MW by 2025, which staff estimates will generate approximately \$920k/yr in CRR Options revenue. The revenue from ETSRs is harder to estimate and requires both that Palo Alto put its share of the COTP in the EDAM and that transmission owners to the north do the same with their transmission. The City’s consultants have also advised that there are additional nuances regarding how ETSRs are collected and distributed that may impact these estimates. CAISO has not yet finalized the EDAM rules.

The potential value from lower cost renewable resources comes from the fact that there might be high-quality wind resources able to directly connect on the COTP, which would be of value to Palo Alto if the City opted to bring the asset back. However, securing transmission rights from the COTP’s northern end at Captain Jack further north to where the resources are located is very difficult. In addition, the COTP process for direct interconnection is only now being developed and is likely to take years and require expensive power flow studies.

Alternatives

² Explanation of the CRR Options developed for the COTP in 2020
<https://www.youtube.com/watch?v=lo2ig60i9wo&t=146s>

Staff explored bringing the COTP share back and issued an RFP for renewables with preference for interconnection at Captain Jack intertie. The City did not receive any offers, although there was some potential for projects which would take several years to develop.

Staff also considered an outright sale of the City's share of the COTP, but the regulatory uncertainty with EDAM and other issues greatly diminished the value. There is also long-term interest in maintaining the City's share of the COTP to maintain flexibility of resources into the future given the uncertain regulatory environment and the difficulty in siting and constructing new transmission lines.

FISCAL/RESOURCE IMPACT

The recommended action to amend and extend the 2009 Layoff will not require payments from Palo Alto until 2034, and Palo Alto will receive annual payments May 1st of \$550k each year from 2024 to 2028 and then \$800k from 2029 to 2033. The terms are the same as current cost obligations meaning that PA3-related operations and maintenance costs during the layoff will not be Palo Alto's responsibility, while capital replacements made during the layoff will continue to be allocated as described in Section 3.g. of the 2009 LTLA (Attachment B). In 2034 Palo Alto will need to pay its share of capital investments covering the time after the layoff expires (2034 and onward) as well the City's portion of capital costs and obligations that were prefunded by the Districts during the layoff, if applicable. As shown in Table 1 these capital costs which are being prefunded by the Districts from 2024-2034 can be tracked annually and funds can be set aside for that repayment.

POLICY IMPLICATIONS

This proposed layoff amendment is consistent with the Utilities Strategic Plan, the Utilities Electric Integrated Resources Plan, Sustainability Implementation Plans, and the City's Sustainability and Climate Action Plan (S/CAP).

ENVIRONMENTAL REVIEW

Staff's recommendation does not require California Environmental Quality Act review, because it does not meet the definition of a project under Public Resources Code Section 21065 and CEQA Guidelines Section 15378(b)(5), as an administrative governmental activity which will not cause a direct or indirect physical change in the environment. TANC certified the Final Environmental Impact Report for the COTP in 1988.

NEXT STEPS

Staff will present Staff recommendation and UAC recommendation to City Council January 16, 2024.

ATTACHMENTS

Attachment A: Resolution

Attachment B: Current 2009 Long-Term Layoff Agreement

Attachment C: Amendment No. 1 to the 2009 Long-Term Layoff Agreement

Attachment D: Amendment No. 2. to the 2009 Long-Term Layoff Agreement

AUTHOR/TITLE:

Dean Batchelor, Director of Utilities

Staff: Lena Perkins, PhD, Senior Resource Planner

NOT YET APPROVED

Resolution No.

Resolution of the Council of the City of Palo Alto Approving
Amendment No. 3 to the 2009 California-Oregon Transmission
Project Long-Term Layoff Agreement with Certain Other Members of
the Transmission Agency of Northern California to Extend the Term
for 10 Years Until 2034 and to Receive Annual Market Payments

R E C I T A L S

- A. The City of Palo Alto (“City”), a municipal utility and a chartered city, became a founding member of the Transmission Agency of Northern California (“TANC”) in 1984, to facilitate construction and joint ownership of transmission projects.
- B. The City of Palo Alto, the California cities of Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Redding, Roseville, Santa Clara, and Ukiah; the Modesto Irrigation District (“MID”); the Turlock Irrigation District (“TID”); and the Sacramento Municipal Utility District (“SMUD”) are also members of TANC.
- C. TANC currently owns approximately 87 percent of the California-Oregon Transmission Project (“COTP”), a 500-kV transmission line that interconnects with the Bonneville Power Administration at the Captain Jack Substation in Southern Oregon and with Pacific Gas & Electric Company in California at the Tesla Substation.
- D. The City became a participant in the COTP in 1990, by executing Project Agreement No. 3 (PA3) and has a 3.6815%, or approximately 50 MW, share of TANC’s current entitlement to transfer capability on the COTP.
- E. Due to changes in the value of the COTP to the City’s electric portfolio in 2009 the City, along with the City of Roseville, executed the Long-Term Lay-off Agreement (“2009 LTLA”) to transfer each party’s full COTP entitlement and obligations to MID, TID and SMUD for fifteen years (Resolution No. 8900).
- F. Amendment No. 1 to the 2009 LTLA returned Roseville’s COTP interests, rights, and obligations from MID, TID, and SMUD back to Roseville, and clarified the City’s voting rights under TANC PA 3.
- G. At TANC’s January 27, 2016 meeting, TANC approved a resolution authorizing the issuance of California-Oregon Transmission Project Revenue Refunding Bonds, 2016 Series, (“the 2016 COTP Bonds”). On March 9, 2016 TANC issued and sold its \$173,920,000 California-Oregon Transmission Project Revenue Refunding Bonds, 2016 Series A (the “2016A Bonds”), which have a maturity date of May 1, 2039.
- H. Amendment No. 2 to the 2009 LTLA provided that in the absence of a default by MIDTID, and SMUD, Debt Service for the 2016A Bonds and any extension thereof associated with City’s 3.6815 Participation Percentage in TANC’s entitlement to Transfer Capability on the COTP would be paid by MID, TID, and SMUD.

NOT YET APPROVED

I. The Parties have agreed to execute this Amendment No. 3 to the 2009 LTLA, attached as Exhibit A, to extend the 2009 LTLA for approximately an additional ten years to January 31, 2034 to ensure that all of City’s interests, rights, and obligations associated with its Participation Percentage under TANC PA 3 continue to be laid off to MID, TID, and SMUD for the extended term of the 2009 LTLA in the absence of a default by MID, TID, and SMUD, and to add an annual market payment to City from MID, TID, and SMUD. This Amendment No. 3, by modifying the term of the 2009 LTLA, will also extend the term of ROSEVILLE’s layoff of its South of Tesla (“SOT”) allocation, originally described in Section 4 of the 2009 LTLA.

The Council of the City of Palo Alto RESOLVES as follows:

SECTION 1. The Council approves Amendment No. 3 to the 2009 Long Term Layoff Agreement by and Among the Transmission Agency of Northern California and Certain of its Members, attached as Exhibit A to this resolution.

SECTION 2. As permitted by Section 2.30.290 of the City’s Municipal Code, the Council delegates authority to the City Manager, or his designee, to execute further amendments to the 2009 Long Term Layoff Agreement as needed to maintain the value of the City’s laid-off COTP share through the remaining term of the 2009 Long Term Layoff Agreement. Any further amendments shall be in writing, accomplished in accordance with the terms of the 2009 Long Term Layoff Agreement, as amended, and shall not exceed the limits of the authority granted by the Council. Further amendments shall also require approval by the City Attorney’s Office, TANC and the other 2009 Long Term Layoff Agreement participants.

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NOT YET APPROVED

SECTION 3. The Council finds that the adoption of this resolution does not constitute a project under Public Resources Code Section 21065 and CEQA Guidelines Section 15378(b)(5), as an administrative governmental activity which will not cause a direct or indirect physical change in the environment. TANC certified the Final Environmental Impact Report for the COTP in 1988.

INTRODUCED AND PASSED:

AYES:

NOES:

ABSENT:

ABSTENTIONS:

ATTEST:

City Clerk

Mayor

APPROVED AS TO FORM:

APPROVED:

Assistant City Attorney

City Manager

Director of Utilities

Director of Administrative Services

Amendment No. 3
Long-Term Layoff Agreement
By and Among
the
Transmission Agency of Northern California
and certain
of its Members
namely
The City of Palo Alto
The City of Roseville
The Modesto Irrigation District
The Turlock Irrigation District
and
The Sacramento Municipal Utility District

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This Amendment No. 3 of the February 1, 2009 Long Term Layoff Agreement By and Among the Transmission Agency of Northern California and certain of its members (“LTLA”), is entered into as of the Effective Date defined in Section 1 of this Amendment No. 3, by and among the Transmission Agency of Northern California (“TANC”) and certain of its members, namely the City of Palo Alto, referred to as “PALO ALTO”, and, the City of Roseville (“ROSEVILLE”), the Modesto Irrigation District (“MODESTO”), the Turlock Irrigation District (“TURLOCK”), and the Sacramento Municipal Utility District (“SMUD”), with references to each entity individually and collectively as “Party” or “Parties”. Capitalized terms used in this Amendment No. 3 are defined in TANC Project Agreement No. 3, unless otherwise specifically defined in this Amendment No. 3.

RECITALS:

- A. PALO ALTO, MODESTO, ROSEVILLE, TURLOCK, and SMUD are each Participants in and parties to TANC Project Agreement No. 3 (“TANC PA 3”), entered into March 1, 1990.
- B. In the LTLA, PALO ALTO and ROSEVILLE laid off their entitlement to TANC’s Transfer Capability on the California-Oregon Transmission Project (“COTP”) associated with their Participation Percentages under TANC PA 3 to MODESTO, TURLOCK, and SMUD for the fifteen-year term of the LTLA.
- C. In the LTLA, MODESTO, ROSEVILLE, TURLOCK, and SMUD accepted and assumed all of PALO ALTO and ROSEVILLE’s Participation Percentages under TANC PA 3 for the term of the LTLA.
- D. Amendment No. 1 to the LTLA returned ROSEVILLE’s COTP interests, rights, and obligations from MODESTO, TURLOCK, and SMUD back to ROSEVILLE, and clarified PALO ALTO’s voting rights under TANC PA 3.

- E. At TANC's January 27, 2016 meeting, TANC approved a resolution authorizing the issuance of California-Oregon Transmission Project Revenue Refunding Bonds, 2016 Series, ("the 2016 COTP Bonds"). On March 9, 2016 TANC issued and sold its \$173,920,000 California-Oregon Transmission Project Revenue Refunding Bonds, 2016 Series A (the "2016A Bonds"), which have a maturity date of May 1, 2039.
- F. Amendment No. 2 to the LTLA provided that in the absence of a default by MODESTO, TURLOCK, and SMUD, Debt Service for the 2016A Bonds and any extension thereof associated with PALO ALTO's 3.6815 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP would be paid by MODESTO, TURLOCK, and SMUD.
- G. The Parties have agreed to execute this Amendment No. 3 to the LTLA to extend the LTLA for approximately an additional ten years to January 31, 2034 to ensure that all of PALO ALTO's interests, rights, and obligations associated with its Participation Percentage under TANC PA 3 continue to be laid off to MODESTO, TURLOCK, and SMUD for the extended term of the LTLA in the absence of a default by MODESTO, TURLOCK, and SMUD, and to add an annual market payment to PALO ALTO from MODESTO, TURLOCK, and SMUD. This Amendment No. 3, by modifying the term of the LTLA, will also extend the term of ROSEVILLE's layoff of its South of Tesla ("SOT") allocation, originally described in Section 4 of the LTLA.
- H. The Parties agree that except as amended and modified by Amendment No. 1 and Amendment No. 2, which remain in effect, and this Amendment No. 3, the LTLA remains in full force and effect, without any other changes to any of its provisions.

NOW THEREFORE, in consideration of the premises described in the Recitals, and in consideration of the terms, covenants, and conditions that are set out below, the Parties have entered into this Amendment No. 3 to the LTLA.

AGREEMENT:

Section 1. Effective Date.

This Amendment No. 3 shall become effective and enforceable on January 30, 2024 at 0001 hours Pacific Prevailing Time following the due execution and delivery of this Amendment No. 3 to TANC, or the date on which this Amendment No. 3 is duly executed by all of the Parties and delivered to TANC, if January 30, 2024 passes without such execution and delivery (hereinafter "Effective Date").

Section 2. Modification of Section 2, "Term".

Section 2 of the LTLA, entitled "Term", is hereby modified as follows:

“The term of this Agreement shall be approximately twenty five (25) years commencing on the Effective Date and terminating at 0000 hours Pacific Prevailing Time on January 31, 2034, unless the Parties mutually agree in writing to extend the term of the Agreement for another five (5) years (hereinafter “Term”).

Section 3. Addition of Section 3.k, “Annual Market Payment”.

Section 3.k, “Annual Market Payment.” is hereby added:

“Starting May 1, 2024, and on each May 1 thereafter for the term of the LTLA, MODESTO, TURLOCK, and SMUD, in aggregate, will pay PALO ALTO an annual fixed payment of \$550,000 per year to PALO ALTO for the 5 years from 2024 through 2028 (\$61,820 from MODESTO or 11.24%, \$244,090 from TURLOCK or 44.38%, and \$244,090 from SMUD or 44.38%), and \$800,000 per year for the 5 years from 2029 through 2033 (\$89,920 from MODESTO or 11.24%, \$355,040 from TURLOCK or 44.38%, and \$355,040 from SMUD or 44.38%). While this payment will be administered by TANC in accordance with section 3.f of the LTLA, MODESTO, TURLOCK and SMUD shall be jointly and severally liable to make the payment annually.”

Section 4. Integration.

Except as amended and modified by Amendment No. 1 and Amendment No. 2, which remain in effect, and this Amendment No. 3, the LTLA remains in full force and effect, without change to any of its provisions other than the text expressly altered by this Amendment No.3. On the Effective Date this Amendment No. 3 and the LTLA shall be one, integrated Agreement.

The Parties have duly executed and delivered this Amendment via their authorized representatives set forth below.

SIGNATURES:

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

By:

Its:

Dated:

CITY OF PALO ALTO

By:

Its:

Dated:

TURLOCK IRRIGATION DISTRICT

By:

Its:

Dated:

SACRAMENTO MUNICIPAL

UTILITY DISTRICT

By:

Its:

Dated:

MODESTO IRRIGATION DISTRICT

By:

Its:

Dated:

CITY OF ROSEVILLE

By:

Its:

Dated:

Long-Term Layoff Agreement

By and Among

the

Transmission Agency of Northern California

and certain

of its Members

namely

The City of Palo Alto

The City of Roseville

The Modesto Irrigation District

The Turlock Irrigation District

and

The Sacramento Municipal Utility District

EXECUTION ORIGINAL

Approved _____ 08 2000

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This Long-Term Layoff Agreement ("Agreement") is entered into by and among the Transmission Agency of Northern California, a California public entity and joint powers agency ("TANC"), and certain of its members, namely the City of Palo Alto, a California charter city and municipal corporation ("PALO ALTO"), the City of Roseville, a California charter city and municipal corporation ("ROSEVILLE"), the Modesto Irrigation District, a California irrigation district ("MODESTO"), the Turlock Irrigation District, a California irrigation district ("TURLOCK"), and the Sacramento Municipal Utility District, a California municipal utility district ("SMUD"), referred to as "Party" or "Parties" in this Agreement, as of the Effective Date, defined in section 1 of this Agreement, with regard to the following

RECITALS:

- A. ROSEVILLE, PALO ALTO, MODESTO, TURLOCK, and SMUD are each Participants in and parties to TANC Project Agreement No. 3, entered into as of March 1, 1990.
- B. Pursuant to section 7.1 of TANC Project Agreement No. 3, ROSEVILLE and PALO ALTO each desire to make their entitlement to TANC's Transfer Capability on the California-Oregon Transmission Project (COTP), in their respective Participation Percentages, available to a Participant (hereinafter "layoff") in accordance with the terms and conditions relating to layoffs by

Participants under the Intertie Agreements, under TANC's Long-Term Layoff Procedures, and this Agreement.

- C. MODESTO, TURLOCK and SMUD are willing to accept the PALO ALTO and ROSEVILLE Participation Percentages of TANC's entitlement to Transfer Capability on the COTP.
- D. ROSEVILLE, TURLOCK and SMUD are each SOT Members and parties to the South of Tesla Agreement (SOT Agreement) between TANC and its Members, dated as of February 14, 1993.
- E. ROSEVILLE desires to voluntarily transfer its SOT Allocation of TANC's entitlement to firm bidirectional Tesla-Midway Transmission Service from PG&E as a Long-Term Reallocation pursuant to section 4 of the SOT Agreement and in accordance with this Agreement.
- F. TURLOCK and SMUD are willing to accept the ROSEVILLE SOT Allocation of TANC's entitlement to Tesla-Midway Transmission Service.

NOW THEREFORE, in consideration of the premises described in the recitals, and in consideration of the terms, covenants, and conditions that are set out below, the Parties have entered into this

AGREEMENT:

Section 1. Effective Date.

This Agreement shall become effective and enforceable on its effective date, which date shall commence at 0001 hours Pacific Prevailing Time on the first day of the month following the due execution and delivery of this Agreement to TANC (hereinafter "Effective Date").

Section 2. Term.

The term of this Agreement shall be fifteen (15) years commencing on the Effective Date and terminating at 0000 hours Pacific Prevailing Time on the day before the 15th anniversary of the Effective Date, unless the Parties mutually agree in writing to extend the term of the Agreement for another five (5) years (hereinafter "Term").

Section 3. COTP Layoffs.

This section 3 does not apply to or affect any provision of section 4, SOT Layoffs, of this Agreement. Section 4 shall not be construed with reference to this section 3. Section 3 is intended to stand alone. Section 3 and section 4 are included in this single Agreement to make the administration, management, and recordkeeping of layoffs under the TANC programs efficient and economic. Terms in section 3 of

this Agreement that begin with capitalized letters are defined in TANC Project Agreement No. 3, unless otherwise specifically defined in this Agreement.

a. Layoff of ROSEVILLE's COTP Interests, Rights, and Obligations.

Except as otherwise set forth in this Agreement, on the Effective Date, and for the Term of this Agreement, ROSEVILLE hereby lays off and relinquishes to TANC all of ROSEVILLE's use of its interests, rights, and obligations under TANC Project Agreement No. 3, except its interests, rights and obligations in the event of a default pursuant to section 6 of Project Agreement No. 3 and this Agreement, associated with ROSEVILLE's 2.1119 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP. TANC hereby transfers at that instant: (i) 0.2373 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP to MODESTO; (ii) 0.9373 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP to TURLOCK; and (iii) 0.9373 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP to SMUD. MODESTO, TURLOCK, and SMUD hereby accept and assume at that instant for the Term of this Agreement all of the use of the ROSEVILLE interests, rights, and obligations under the provisions of TANC Project Agreement No. 3.

b. Return of ROSEVILLE's Interests, Rights, and Obligations.

Unless earlier relinquished because of a default under this Agreement by MODESTO, TURLOCK and/or SMUD, upon the end of the last hour of the last day of the Term of this Agreement, all of the ROSEVILLE interests, rights, and obligations in ROSEVILLE's Participation Percentage adjusted for any changes in such Participation Percentages during the Term of this Agreement (presently 2.1119 as of the Effective Date of this Agreement) under TANC Project Agreement No. 3 shall automatically and without any action of the Parties be relinquished by MODESTO, TURLOCK, and SMUD through TANC to ROSEVILLE, and ROSEVILLE hereby accepts its interests, rights, and obligations at that instant in the future.

c. Layoff of PALO ALTO's COTP Interests, Rights, and Obligations.

Except as otherwise set forth in this Agreement, on the Effective Date and for the Term of this Agreement, PALO ALTO hereby lays off and relinquishes to TANC all of PALO ALTO's use of its interests, rights, and obligations under TANC Project Agreement No. 3, except its interests, rights and obligations in the event of a default pursuant to section 6 of Project Agreement No. 3 and this Agreement, associated with PALO ALTO's 3.6815 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP. TANC hereby

transfers at that instant: (i) 0.4137 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP to MODESTO; and (ii) 1.6339 Participation Percentage in TANC's entitlement to Transfer Capability in the COTP to TURLOCK; and (iii) 1.6339 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP to SMUD. MODESTO, TURLOCK, and SMUD hereby accept and assume at that instant for the Term of this Agreement all of the use of the PALO ALTO interests, rights, and obligations under the provisions of TANC Project Agreement No. 3.

d. Return of PALO ALTO's Interests, Rights, and Obligations.

Unless earlier relinquished because of a default under this Agreement by MODESTO, TURLOCK and/or SMUD, upon the end of the last hour of the last day of the Term of this Agreement, all of the PALO ALTO interests, rights, and obligations in PALO ALTO's Participation Percentage adjusted for any changes in such Participation Percentages during the Term of this Agreement (presently 3.6815 as of the Effective Date of this Agreement) under TANC Project Agreement No. 3 shall automatically and without any action of the Parties be relinquished by MODESTO, TURLOCK, and SMUD through TANC to PALO ALTO, and PALO ALTO hereby accepts its interests, rights, and obligations at that instant in the future.

e. Project Agreement No. 3 Appendix C.

The TANC Commission by resolution has approved a revised version of APPENDIX C of TANC Project Agreement No. 3, showing the effect of the layoffs on the Participation Percentages of ROSEVILLE, PALO ALTO, MODESTO, TURLOCK, and SMUD during the Term of this Agreement, for the purposes of delineating voting rights, billings, and obligations during the Term of this Agreement. The version of APPENDIX C approved by the TANC Commission and attached to and incorporated into this Agreement as ATTACHMENT A has been created solely for the convenience of the Parties, and does not affect the interests, rights, or obligations of ROSEVILLE or PALO ALTO if MODESTO, TURLOCK, or SMUD were to default in their obligations under this Agreement. Notwithstanding anything to the contrary in this Agreement, title to the interests, rights and obligations of ROSEVILLE and PALO ALTO in their respective Participation Percentages shall remain vested in ROSEVILLE and PALO ALTO during the Term of this Agreement, while the right of use of those interests, rights, and obligations shall be vested in MODESTO, TURLOCK, and SMUD in their respective layoff shares acquired hereunder. Nothing in this Agreement is intended to alter or amend any interest, right or obligation of any Participant under TANC Project Agreement No. 3. The failure to give due and timely notice of a default or potential default pursuant to section 3(h) of this Agreement shall

not absolve the obligation of any Party to this Agreement to comply with its responsibilities under TANC Project Agreement No. 3.

Regardless of any default on the part of MODESTO, TURLOCK, or SMUD, neither ROSEVILLE nor PALO ALTO shall be excused from their respective obligations under TANC Project Agreement No. 3.

f. Billings and Payments.

During the Term of this Agreement, and in the absence of a default under this Agreement by MODESTO, TURLOCK, or SMUD, all billings and payments shall be made in accordance with the provisions of TANC Project Agreement No. 3, with ATTACHMENT A of this Agreement employed by TANC to assure that, in the absence of a default by MODESTO, TURLOCK, or SMUD, ROSEVILLE and PALO ALTO will not be billed for any TANC Project Agreement No. 3 costs, including but not limited to TANC Project Agreement No. 3's O&M Costs, Indebtedness, Debt Service, or Capital Improvement Costs, during the Term of this Agreement; provided, however, that ROSEVILLE and PALO ALTO shall remain responsible under the TANC Joint Powers Agreement for any costs unrelated to TANC Project Agreement No. 3. During the Term of this Agreement, TANC shall bill SMUD, and SMUD shall pay, for TANC Project Agreement No. 5 costs, expenses, fees, and charges otherwise allocable to ROSEVILLE and PALO ALTO pursuant to section 3 of TANC Project

Agreement No. 5 for the portion of TANC's entitlement to Transfer Capability on the COTP laid off to SMUD in this Agreement.

g. Additions, Betterments, and Replacements.

(i) Use of Additions, Betterments, and Replacements during Term of Agreement.

Additions, Betterments, and Replacements, as defined in TANC Project Agreement No. 3, that are approved by TANC during the Term of this Agreement in regards to the use of the acquired shares of the COTP interests, rights, and obligations laid off to MODESTO, TURLOCK and SMUD under this Agreement (referred to in this section 3g as "layoff portions"), shall be available for MODESTO, TURLOCK and SMUD's sole use and at their sole expense during the Term hereof.

(ii) Responsibility For and Use of Betterments at End of the Term of this Agreement.

At the end of the Term of this Agreement, MODESTO, TURLOCK, and/or SMUD shall be solely and severally responsible for the layoff portions of Betterments approved and financed by them during the Term of this Agreement, and the layoff portions of such Betterments shall remain available for their sole use and benefit for the life of the COTP.

- (iii) Responsibility For and Use of Additions that Exceed the Adjusted Cost Index at End of the Term of this Agreement.

At the end of the Term of this Agreement, MODESTO, TURLOCK, and/or SMUD shall be solely and severally responsible for the layoff portions of Additions approved and financed by them that exceed the adjusted cost index defined in section 3.1.2.2.2 of TANC Project Agreement No. 3 (hereinafter "Adjusted Cost Index"). Such layoff portions of such Additions shall remain available for MODESTO, TURLOCK, and/or SMUD's sole use and benefit for the life of the COTP.

- (iv) Responsibility For and Use of Additions Up to the Adjusted Cost Index at End of the Term of this Agreement.

At the end of the Term of this Agreement, PALO ALTO and ROSEVILLE shall be solely and severally responsible for the layoff portions of Additions approved by TANC during the Term of this Agreement in an amount up to the Adjusted Cost Index, and the layoff portions of such Additions shall be available for their sole use and benefit in their respective Participation Percentage, adjusted for any changes in such Participation Percentages during the Term of this Agreement for the life of the COTP. For the purposes of clarification, to the extent that an Addition exceeds the Adjusted Cost Index, PALO ALTO and ROSEVILLE shall be responsible for any amount up to the Adjusted Cost Index pursuant to this subsection 3(g)(iv), and MODESTO, TURLOCK, and/or SMUD, as applicable shall be

responsible for the remaining amount that exceeds the Adjusted Cost Index, in accordance with subsection (3)(g)(iii).

- (v) Responsibility For and Use of Replacements at End of the Term of this Agreement.

At the end of the Term of this Agreement, PALO ALTO and ROSEVILLE shall be solely and severally responsible for the layoff portions of Replacements approved by TANC during the Term of this Agreement. Such layoff portions of such Replacements shall be available for their sole use and benefit in their respective Participation Percentage, adjusted for any changes in such Participation Percentages during the Term of this Agreement for the life of the COTP.

- (vi) Allocation of Capital Costs and Associated Financing Costs.

The Parties agree that the capital costs and associated financing costs of any portions of Additions that do not exceed the Adjusted Cost Index and all Replacements put into service during the Term of this Agreement shall be allocated on a straight-line financial basis over the expected useful life of such Additions and Replacements. Capital costs and associated financing costs and the expected useful life of such Additions and Replacements shall be determined at the time the Additions and Replacements are put into service.

(vii) Payment of True-Up Adjustments.

If the expected useful life of any portions of Additions that do not exceed the Adjusted Cost Index and all Replacements put into service during the Term of this Agreement extend beyond the Term of this Agreement, the Parties agree to make "true-up adjustments" via true-up payments for the capital costs and associated financing costs paid or incurred for such Additions or Replacements put into service during the Term of this Agreement. The "true-up adjustments" will be based on the cost differences between the costs calculated on a straight line financial basis, and the actual payment method(s) used. Upon the end of the Term of this Agreement the Parties shall make such true-up payments to each other, as calculated in accordance with subsection 3(g)(viii), below, to effect their mutual intention that costs for such Additions and Replacements with long lives be allocated among the Parties on a straight-line financial basis. These true-up payments will effect the required true-up adjustments referenced above.

(viii) Calculation of True-Up Adjustments.

Prior to the end of the Term of this Agreement, unless the Parties otherwise agree, TANC shall determine from its books and records, and recommend to the Parties an allocation of the capital costs and associated financing costs for any portions of Additions that do not

exceed the Adjusted Cost Index and all Replacements during the Term of the Agreement that have been (aa) paid or incurred during the Term of the Agreement plus (bb) those that remain to be paid beyond the Term of the Agreement. The true-up adjustments shall be calculated by TANC in a manner consistent with the examples in Attachment C, which are incorporated herein by reference. Any disagreement regarding the calculation of the true-up adjustments shall be resolved by the TANC Commission.

h. Default.

In the event of a default by MODESTO, TURLOCK, or SMUD under this Agreement, TANC shall immediately and simultaneously notify each of the Parties in accordance with the provisions of section 13 of this Agreement. If a default remains uncured for twenty (20) days after the date notice is first given under section 13, then ROSEVILLE and PALO ALTO shall cure any monetary default not later than three (3) business days following the 20th day. Upon ROSEVILLE and PALO ALTO's completion of the cure of a monetary default or, in the instance of a non-monetary default arising out of a breach of sections 5 or 6, below, by MODESTO, TURLOCK and/or SMUD that remains uncured for twenty (20) days after the date notice is first given under section 13 use of the interests, rights, and obligations laid off shall be automatically relinquished to ROSEVILLE and PALO ALTO at that

instant, and without any action of the Parties. TANC shall provide notice of the default to each of the Parties to this Agreement, but TANC shall have no responsibility to otherwise respond to the default.

i. Voting Rights.

During the Term of this Agreement:

- (i) In the absence of a default under this Agreement, neither PALO ALTO nor ROSEVILLE shall have rights to vote on any matter related to TANC Project Agreement No. 3.
- (ii) In the event of a default under this Agreement by either MODESTO, TURLOCK, or SMUD, the defaulting Party may not vote on any matter related to TANC Project Agreement No. 3 with respect to the use of their acquired shares of the COTP interests, rights, and obligations laid off to them under this Agreement. The Parties adversely affected by the default may vote on any matter related to TANC Project Agreement No. 3 with respect to their shares of the COTP interests, rights, and obligations that were laid off to the defaulting Party under this Agreement.

- (iii) Any new TANC program or project shall be governed by the agreements that pertain to such programs or projects.

Section 4. SOT Layoff.

This section 4 does not apply to or affect any provision of section 3, COTP Layoffs, of this Agreement. Section 3 shall not be construed with reference to this section 4. Section 4 is intended to stand alone. Section 3 and section 4 are included in this single Agreement to make the administration, management, and recordkeeping of layoffs under the TANC programs efficient and economic. Terms in section 4 of this Agreement that begin with capitalized letters are defined in the SOT Agreement, unless otherwise specifically defined in this Agreement.

a. Layoff of ROSEVILLE's SOT Interests, Rights, and Obligations.

Except as otherwise set forth in this Agreement, on the Effective Date and for the Term of this Agreement, ROSEVILLE hereby voluntarily transfers to TANC all of ROSEVILLE's use of its interests, rights, and obligations, except its interests, rights and obligations in the event of a default pursuant to section 10 of the TANC SOT Agreement and/or this Agreement, associated with ROSEVILLE's 1.786 percent SOT Allocation (expressed as a percentage of TANC's Tesla-Midway Transmission Service), and TANC hereby makes a Long-Term Reallocation and transfers at that instant 62.71 percent of the

ROSEVILLE SOT Allocation (1.120 percent of the total SOT Allocations) to TURLOCK and 37.29 percent of the ROSEVILLE SOT Allocation to SMUD (0.666 percent of the total SOT Allocations). TURLOCK and SMUD hereby accept and assume at that instant for the Term of this Agreement the use of all of the ROSEVILLE interests, rights, and obligations under the provisions of the TANC SOT Agreement.

b. Return of ROSEVILLE's Interests, Rights, and Obligations.

Unless relinquished earlier because of a default under this Agreement by TURLOCK and/or SMUD, upon the end of the last hour of the last day of the Term of this Agreement, all of ROSEVILLE's interests, rights, and obligations under the TANC SOT Agreement, including ROSEVILLE's 1.786 percent SOT Allocation, shall automatically and without any action of the Parties be relinquished by TURLOCK and SMUD through TANC to ROSEVILLE, and ROSEVILLE hereby accepts its interests, rights, and obligations at that instant in the future.

c. SOT Agreement Appendix B-2.

The TANC Commission by resolution has approved a revised version of Appendix B-2 of the TANC SOT Agreement, showing the effect of the transfer on the SOT Allocations and the Cost Sharing Percentages

for the purposes of delineating voting rights, billings, and payments during the Term of this Agreement. The revision of Appendix B-2 approved by the TANC Commission and attached to and incorporated into this Agreement as ATTACHMENT B has been prepared solely for the convenience of the Parties, and does not affect the interests, rights, and obligations of ROSEVILLE, if TURLOCK or SMUD were to default in their obligations under this Agreement. Notwithstanding anything to the contrary in this Agreement, title to the interests, rights and obligations of ROSEVILLE in its SOT Allocation shall remain vested in ROSEVILLE during the Term of this Agreement, while the right of use of those interests, rights, and obligations of ROSEVILLE's SOT Allocation shall remain vested in TURLOCK and SMUD during the Term of this Agreement.

d. Billings and Payments.

During the Term of this Agreement, and in the absence of a default by TURLOCK or SMUD under this Agreement, all billings and payments shall be made in accordance with the provisions of the TANC SOT Agreement, with ATTACHMENT B of this Agreement employed by TANC to assure that, in the absence of a default by TURLOCK or SMUD, ROSEVILLE will not be billed for any costs, SOT Service Charges, or other expenses associated with the SOT Agreement during the Term of this Agreement.

e. Increases in SOT Allocation, Interests, or Obligations.

Any increases in SOT Allocations, interests, rights or obligations approved by TURLOCK or SMUD during the Term of this Agreement shall be available for their sole use and at their sole expense during the Term hereof, and at the end of the Term of this Agreement, such increases in SOT Allocations, interests, rights or obligations shall remain with TURLOCK or SMUD.

f. Default.

In the event of a default by TURLOCK or SMUD under this Agreement, TANC shall immediately and simultaneously notify each of the Parties in accordance with the provisions of section 13 of this Agreement. If a default remains uncured for twenty (20) days after the date notice is first given under section 13 of this Agreement, then ROSEVILLE shall cure any monetary default not later than three (3) business days following the 20th day. Upon ROSEVILLE's completion of the cure of a monetary default or, in the instance of a non-monetary default arising out of a breach of sections 5 or 6, below, by TURLOCK and/or SMUD that remains uncured for twenty (20) days after the date notice is first given under section 13 use of the interests, rights, and obligations laid off shall be automatically relinquished to ROSEVILLE

at that instant, and without any action of the Parties. TANC shall provide notice of the default to each of the Parties to this Agreement, but TANC shall have no responsibility to otherwise respond to the default.

Section 5. No Assignment Without Consent.

During the Term of this Agreement, MODESTO, TURLOCK and/or SMUD shall not assign the rights to the use of the interests, rights or obligations of PALO ALTO and ROSEVILLE acquired pursuant to this Agreement, or delegate any obligations that have been undertaken by MODESTO, TURLOCK and/or SMUD pursuant to this Agreement, including but not limited to the obligation to pay as set forth in sections 3 and 4 of this Agreement and the obligations set forth in sections 5 or 6, to any entity, including but not limited to a TANC Member (hereinafter "Assign" or "Assignment"), without the advance written consent of the respective boards, commissions and/or councils with requisite authority (hereinafter "Council") of TANC, PALO ALTO and ROSEVILLE, or their authorized representatives. The Parties agree that such consent shall not be unreasonably withheld, and further agree that best efforts shall be utilized by the Parties to bring the issue of a proposed Assignment to Council within ninety (90) days following the Parties' receipt of written notice requesting permission to Assign. It is the intent of the Parties that any proposed Assignment by MODESTO, TURLOCK and/or SMUD must result in a complete assumption of that which was acquired by the assigning

Party under this Agreement. Partial Assignments by MODESTO, TURLOCK and/or SMUD are expressly prohibited.

Section 6. Long-Term Layoff to Third Parties Not an Assignment.

To the extent that either MODESTO, TURLOCK, and/or SMUD, as applicable (hereinafter "Layoff Party") intend to layoff or transfer the use of the interests, rights, and obligations received from ROSEVILLE and PALO ALTO under this Agreement to a third party ("Acquiring Party") for a period of more than one (1) year, and such layoff or transfer is not otherwise an Assignment as defined and discussed in section 5 of this Agreement, and provided the conditions of sections 7.1, 7.2, and 7.4 of Project Agreement No. 3 have been satisfied, the Layoff Party shall do all of the following: (1) provide written notice to ROSEVILLE, PALO ALTO and TANC prior to the effective date of such layoff; (2) include in its layoff agreement with the Acquiring Party provisions specifying (i) that such layoff agreement shall be terminated immediately upon a default under this Agreement by MODESTO, TURLOCK and/or SMUD, as applicable, that remains uncured for twenty (20) days after the date notice is first given under section 13; (ii) that the Acquiring Party is not a third-party beneficiary of this Agreement between ROSEVILLE and PALO ALTO on the one hand and MODESTO, TURLOCK and/or SMUD, as applicable, on the other; and (iii) that the Acquiring Party shall have no recourse against ROSEVILLE, PALO ALTO and TANC in the event of a default by MODESTO, TURLOCK and/or SMUD

under this Agreement and the layoff agreement; and (3) provide ROSEVILLE, PALO ALTO and TANC with a copy of the executed layoff agreement.

Section 7. Dispute Resolution.

In the event of any controversy or claim between the Parties, whether based in contract, tort or otherwise, arising out of, based upon, or relating to this Agreement, except for any controversy or claim based upon a default of the obligations to make payments as set forth in sections 3 or 4 of this Agreement or a breach of the obligations set forth in sections 5 or 6 of this Agreement (hereinafter "Dispute"), the Parties shall attempt to resolve such Dispute in the following manner:

a. Negotiation.

The Parties shall attempt in good faith to resolve the Dispute promptly by negotiations between duly authorized representatives of the Parties who have authority to resolve the Dispute. When a Party believes there is a Dispute, that Party shall give the other Party written notice describing the Dispute with reasonable particularity. Within fifteen (15) calendar days following the receipt of such notice, the receiving Party shall submit a written response to the noticing Party. The authorized representatives shall meet in person and attempt to resolve the Dispute.

b. Mediation.

If the Dispute is not resolved within fifteen (15) calendar days following receipt of the receiving Party's response given pursuant to subsection a, above, or such additional time, if any, that the Parties mutually agree to in writing, the Parties shall try in good faith to resolve the Dispute by mediation. The form of mediation and the mediator selected to mediate the Dispute shall be acceptable to both Parties, which acceptance shall be confirmed by the Parties in writing.

c. Additional Rights.

If the Dispute is not resolved through mediation within ninety (90) calendar days of the noticing Party's written notice of the Dispute pursuant to subsection a above, or such additional time, if any, that the Parties mutually agree to in writing, the Party or Parties involved in the dispute shall be free to pursue any and all legal and equitable actions or remedies.

Section 8. Attorney Fees.

In any mediation, arbitration, or litigation to enforce or defend any interest, right, or obligation of this Agreement, the prevailing Party shall be entitled to an award of reasonable attorneys' fees and other litigation expenses.

Section 9. California Law.

This Agreement was made in and will be performed in California, and the law of California shall apply in the interpretation and enforcement of this Agreement.

Section 10. Integrated Agreement.

This Agreement is the whole, integrated agreement of the Parties, superseding prior negotiations and replacing and terminating the Principles for Long-Term Layoff of Palo Alto and Roseville Transmission Entitlements. This Agreement does not amend Project Agreement No. 3 or the TANC SOT Agreement in any respect. In the event of any conflict between this Agreement, TANC Project Agreement No. 3, or TANC SOT Agreement, the provisions of TANC Project Agreement No. 3 or the TANC SOT Agreement shall control.

Section 11. No Third-Party Beneficiaries.

There are no third-party beneficiaries to this Agreement, and this Agreement shall not impart any rights enforceable by any person or entity that is not a Party to this Agreement.

Section 12. TANC Liability.

TANC and its officers, agents, and employees, as well as the other members and commissioners of TANC (hereinafter "Indemnitees"), undertake no legal liability to the Parties to this Agreement and each Party releases, holds harmless, and covenants not to sue the Indemnitees for any cause, claim, injury, damage, or death arising from a negligent act or omission of an Indemnitee in connection with this Agreement.

Section 13. Notices.

Notices required under this Agreement shall be given by TANC to each Party to this Agreement using all of the four following methods on the same day, if possible: facsimile, email, overnight delivery, and a personal phone call from the TANC General Manager to each Chief Executive Officer of each Party.

Contact information for the purposes of notice for each Party shall be maintained by TANC as ATTACHMENT D of this Agreement, attached to and incorporated herein.

Each Party shall be responsible for maintaining current contact information with TANC.

Section 14. Severability.

Any provision of this Agreement determined by a court of competent jurisdiction to be invalid shall not be severed from this Agreement if severance would materially adversely affect any Party, and if any Party in good faith concludes that severance would result in materially adverse consequences, such Party may give notice under the notice provisions hereof, that this Agreement shall terminate on a date all of the Parties consider appropriate, and if no agreement is reached on an appropriate early termination date, then at the last hour of the day that is one hundred and twenty (120) days after the date notice was first given.

Section 15. Discharge of Obligations.

All obligations unsatisfied at the end of the Term of this Agreement shall be promptly discharged by the responsible Party.

Section 16. Modifications.

This Agreement may only be modified or amended in writing by the Parties following receipt of all necessary approvals.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

By: [Signature]
Its: _____
Dated: 01/23/09

TURLOCK IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

CITY OF PALO ALTO

By: _____
Its: _____
Dated: _____

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____
Its: _____
Dated: _____

CITY OF ROSEVILLE

By: _____
Its: _____
Dated: _____

MODESTO IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

Section 16. Modifications.

This Agreement may only be modified or amended in writing by the Parties following receipt of all necessary approvals.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

By: _____

Its:

Dated: _____

TURLOCK IRRIGATION DISTRICT

By: *Sam Williams*

Its: *Gen. Mgr.*

Dated: *1/22/09*

CITY OF PALO ALTO

By: _____

Its:

Dated: _____

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____

Its:

Dated: _____

CITY OF ROSEVILLE

By: _____

Its:

Dated: _____

MODESTO IRRIGATION DISTRICT

By: _____

Its:

Dated: _____

Section 16. Modifications.

This Agreement may only be modified or amended in writing by the Parties following receipt of all necessary approvals.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

By: _____
Its: _____
Dated: _____

TURLOCK IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

CITY OF PALO ALTO

By: Pete Drahmer
Its: _____
Dated: 1/28/09

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____
Its: _____
Dated: _____

CITY OF ROSEVILLE

By: _____
Its: _____
Dated: _____

MODESTO IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

Section 16. Modifications.

This Agreement may only be modified or amended in writing by the Parties following receipt of all necessary approvals.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

TURLOCK IRRIGATION DISTRICT

By: _____

By: _____

Its: _____

Its: _____

Dated: _____

Dated: _____

CITY OF PALO ALTO

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____

By: [Signature]

Its: _____

Its: GM + CEO

Dated: _____

Dated: JANUARY 22, 2009

[Signature]
(legat)

CITY OF ROSEVILLE

MODESTO IRRIGATION DISTRICT

By: _____

By: _____

Its: _____

Its: _____

Dated: _____

Dated: _____

Section 16. Modifications.

This Agreement may only be modified or amended in writing by the Parties following receipt of all necessary approvals.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

TURLOCK IRRIGATION DISTRICT

By: _____

By: _____

Its:

Its:

Dated: _____

Dated: _____

CITY OF PALO ALTO

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____

By: _____

Its:

Its:

Dated: _____

Dated: _____

CITY OF ROSEVILLE

MODESTO IRRIGATION DISTRICT

By: *W. Craig Roberts*

By: _____

Its:

Its:

Dated: 1.22.09

Dated: _____

Section 16. Modifications.

This Agreement may only be modified or amended in writing by the Parties following receipt of all necessary approvals.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

TURLOCK IRRIGATION DISTRICT

By: _____

By: _____

Its:

Its:

Dated: _____

Dated: _____

CITY OF PALO ALTO

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____

By: _____

Its:

Its:

Dated: _____

Dated: _____

CITY OF ROSEVILLE

MODESTO IRRIGATION DISTRICT

By: _____

By: Allen Short

Its:

Its: GM

Dated: _____

Dated: 1-28-09

ATTACHMENT A

APPENDIX C-1 OPERATIONS AND MAINTENANCE

TANC Entitlement	Percent	MW	Third-Party Layoffs*	MW Scheduling Rights
MID	21.2960%	295.9351	5.9629	290
Redding	8.4120%	116.8950	2.3553	115
SMUD	27.5631%	383.0252	7.7177	375
Santa Clara	20.4745%	284.5201	5.7329	278
TID	12.5393%	174.2501	3.5110	171
Alameda	1.2272%	17.0531	0.3436	17
Healdsburg	0.2456%	3.4132	0.0688	3
Lodi	1.9201%	26.6817	0.5376	26
Lompoc	0.1865%	2.5911	0.0522	3
Palo Alto	3.6815%	51.1594	1.0308	50
Plumas	0.1479%	2.0555	0.0414	2
Roseville	2.1119%	29.3482	0.5913	29
Ukiah	0.1945%	2.7026	0.0545	3
Total	100.0000%	1389.6304	28.0000	1362

*Includes Western 27 MW and San Juan 1 MW assignments

APPENDIX C-1a

OPERATIONS AND MAINTENANCE (To accommodate Palo Alto and
Roseville 2008 Long-Term Layoffs)

TANC Entitlement	Pre-Layoff Percentage	TANC Member Layoff	Net TANC Member Percentage	North to South MW Scheduling Rights	South to North MW Scheduling Rights
MID	21.2960%	0.6509%	21.9469%	299	229
Redding	8.4120%	0.0000%	8.4120%	115	88
SMUD	27.5631%	2.5713%	30.1344%	410	314
Santa Clara	20.4745%	0.0000%	20.4745%	278	212
TID	12.5393%	2.5713%	15.1106%	206	157
Alameda	1.2272%	0.0000%	1.2272%	17	13
Healdsburg	0.2456%	0.0000%	0.2456%	3	3
Lodi	1.9201%	0.0000%	1.9201%	26	20
Lompoc	0.1865%	0.0000%	0.1865%	3	2
Palo Alto	3.6815%	-3.6815%	0.0000%	0	0
Plumas	0.1479%	0.0000%	0.1479%	2	2
Roseville	2.1119%	-2.119%	0.0000%	0	0
Ukiah	0.1945%	0.0000%	0.1945%	3	2
Total	100.0000%	0.0000%	100.0000%	1362	1042

APPENDIX C-2

ORIGINAL COTP DEBT SERVICE

TANC Member	Percent
MID	21.1200%
Redding	8.2810%
SMUD	27.1330%
Santa Clara	20.7030%
TID	12.4220%
Alameda	1.3330%
Healdsburg	0.2670%
Lodi	1.8900%
Lompoc	0.1840%
Palo Alto	4.0000%
Plumas	0.1610%
Roseville	2.2950%
Ukiah	0.2110%
Total	100.0000%

APPENDIX C-2a

COTP DEBT SERVICE (To accommodate Palo Alto and Roseville 2008 Long-Term Layoffs)

TANC Member	Percent	TANC Member Layoff	Net TANC Member Percentage
MID	21.1200%	0.7073%	21.8273%
Redding	8.2810%	0.0000%	8.2810%
SMUD	27.1330%	2.7938%	29.9269%
Santa Clara	20.7030%	0.0000%	20.7030%
TID	12.4220%	2.7938%	15.2158%
Alameda	1.3330%	0.0000%	1.3330%
Healdsburg	0.2670%	0.0000%	0.2670%
Lodi	1.8900%	0.0000%	1.8900%
Lompoc	0.1840%	0.0000%	0.1840%
Palo Alto	4.0000%	-4.0000%	0.0000%
Plumas	0.1610%	0.0000%	0.1610%
Roseville	2.2950	-2.2950%	0.0000%
Ukiah	0.2110%	0.0000%	0.2110%
Total	100.0000%	0.0000%	100.0000%

ATTACHMENT B

APPENDIX B-1

PERMANENT ALLOCATIONS of SOTP

	(A) Expressed in percentages	(B) Expressed in Megawatts
City of Alameda	2.104	6.31
City of Healdsburg	0.236	0.71
City of Lodi	2.069	6.21
City of Lompoc	0.266	0.80
Modesto Irrigation District	34.000	102.00
Plumas-Sierra Rural Electric Cooperative	0.235	0.70
City of Redding	10.333	31.00
City of Roseville	1.786	5.36
Sacramento Municipal Utility District	15.333	46.00
City of Santa Clara	27.000	81.00
Turlock Irrigation District	6.334	19.00
City of Ukiah	0.304	0.91
TOTAL	100.000	300.00

APPENDIX B-1a

PERMANENT ALLOCATIONS of SOTP
(To accommodate Roseville's 2008 Long-Term Layoff)

	(A) Expressed in percentages	(B) Expressed in Megawatts
City of Alameda	2.104	6.31
City of Healdsburg	0.236	0.71
City of Lodi	2.069	6.21
City of Lompoc	0.266	0.80
Modesto Irrigation District	34.000	102.00
Plumas-Sierra Rural Electric Cooperative	0.235	0.70
City of Redding	10.333	31.00
City of Roseville	0.000	0.00
Sacramento Municipal Utility District	15.999	48.00
City of Santa Clara	27.000	81.00
Turlock Irrigation District	7.454	22.36
City of Ukiah	0.304	0.91
TOTAL	100.000	300.00

ATTACHMENT C

True-Up Methodology for Replacements and Additions

The Parties have identified a desire to provide for equitable allocation of costs between the Districts (MID, TID, and SMUD) and Cities (Roseville and Palo Alto) for the laid-off shares of Replacements and those Additions (all Additions approved by TANC up to the threshold limit and the portion of those greater than the limit up to the threshold limit) that, at the end of the term of the layoff, will revert from a right and responsibility of the Districts to that of the Cities.

TANC developed the following methodology, which has been approved by the Parties. TANC will treat all Replacements and Additions (at least up to the PA 3 Threshold Amount) as if they were financed using "typical municipal financing" (i.e. levelized payments composed of principal and interest, at the prevailing municipal cost of money at the time of the Replacement or Addition, over the *useful life* of the Replacement/Addition). The TANC Commission will make a determination of the useful life and the cost of financing at the time of approving a Replacement and/or Addition.

If a payment structure or financing were used that were different from the form of a "typical municipal financing," then a transfer payment may be necessary to account for an accelerated or decelerated (relative to typical municipal financing) payoff of principal as of the end of the term of the layoff.

EXAMPLES:

The following assumptions apply to the examples provided below:

1. End of term of layoff: 2/1/2024
2. Timing of Replacement (or Addition): 2/1/2014
3. Applicable cost threshold for Section 3.1.2.2.2: \$52.7M
5. Cost of Replacement or Addition: \$25M
6. Estimated useful life of Replacement or Addition at 1/1/2014: 20 years
7. Remaining term of layoff at 2/1/2014: 10 years
8. Estimate useful life of Replacement or Addition remaining after layoff: 10 years
9. Prevailing municipal cost of money, 2/1/2014: 6 percent (20-year term)

Using the assumptions listed above, TANC examined five different payment structures and the potential need for a transfer payment under each. These are described below and a summary table is included at the end of this section

Example #1: TANC Pays Cash at time of Replacement (Addition)

As of February 1, 2024, all principal would have been paid off and there would be no outstanding obligations for the Addition. With typical municipal financing, there would have been ten years of levelized payments remaining for principal and interest at

\$2.180M/yr with respect to the full \$25M cost for the Addition. The NPV of this payment stream as of 2/1/2024 comes to \$16.04M.¹ Cities should pay the respective Districts their laid off participation percentages times \$16.04M.

Example #2: TANC Borrows \$25 million and makes interest only payments:

As of February 1, 2024, no principal would have been paid off. With typical municipal financing, there would have been approximately \$9M of principal paid off at the end of the layoff; and the Districts should pay the respective Cities their laid off participation percentages times \$8.96 million.

Example #3: Levelized payments over life of Addition:

As of February 1, 2024, there would have been \$8.96 million principal retired. Since financing used typical municipal financing, this is the expected amount of principal to be paid off at the end of the layoff, and no transfer payment is needed.

Example #4: Levelized payments over longer than life of Addition:

As of February 1, 2024, assuming a 25-year financing term, there would have been about \$6M of principal paid off. With typical municipal financing, there would have been about \$9M of principal paid off at the end of the layoff. Districts should pay the respective Cities their laid off participation percentages times \$3M.

Example #5: Levelized payments over shorter than life of Addition:

As of February 1, 2024, assuming a 15-year financing term, there would have been about \$14.2M of principal paid off. With typical municipal financing, there would have been about \$9M of principal paid off at the end of the layoff. Cities should pay the respective Districts their laid off participation percentages times \$5.2M.

	Example #1	Example #2	Example #3	Example #4	Example #5
	Cash Payment	Interest Only	"Typical" Maturity	Longer Maturity	Shorter Maturity
Loan Amount	\$ 25,000,000	\$ 25,000,000	\$ 25,000,000	\$ 25,000,000	\$ 25,000,000
Interest Rate	6.00%	6.00%	6.00%	6.00%	6.00%
"Typical Term" - years	20	20	20	20	20
Annual Payment	\$2,179,614	\$2,179,614	\$2,179,614	\$2,179,614	\$2,179,614
Target Balance 1/1/2024	\$16,042,148	\$16,042,148	\$16,042,148	\$16,042,148	\$16,042,148
Example Term - years	-	na	20	25	15
Actual Remaining Balance as of January 1, 2024	0	\$ 25,000,000	\$16,042,148	\$ 18,993,934	10842915.45
Deviation from "typical"	\$ (16,042,148)	\$ 8,957,852	\$ -	\$ 2,951,786	\$ (5,199,233)
Payment to Districts	\$ 16,042,148	\$ (8,957,852)	\$ -	\$ (2,951,786)	\$ 5,199,233

As mentioned above, this approach will require certain determinations be made by the Commission at the approval of any future Replacements or Additions; these include: (1) the useful life of the Replacement/Addition; and (2) prevailing TANC borrowing rate for the determined useful life.

¹ Alternatively, \$8.96M of the \$25M original principal would have been paid down.

ATTACHMENT D

Contact Information for Purposes of Notices

City of Palo Alto:

Valerie Fong, Utilities Director
City of Palo Alto
USPS: P.O. Box 10250
Palo Alto, CA 94303
Courier: 250 Hamilton Avenue
Palo Alto, CA 94301
Phone: (650) 329-2277
Fax: (650) 321-0651
Email: Valerie.Fong@CityofPaloAlto.org

City of Roseville:

Tom Habashi, Electric Utility Director
Roseville Electric
City of Roseville
2090 Hilltop Circle
Roseville, CA 95747
Phone: (916) 774-5600
Fax: (916) 784-3797
Email: thabashi@roseville.ca.us

MID:

Allen Short, General Manager
Modesto Irrigation District
USPS: P.O. Box 4060
Modesto, CA 95352
Courier: 1231 Eleventh Street
Modesto, CA 95354
Phone: (209) 526-7405
Fax: (209) 526-7315
Email: allens@mid.org

TID:

Larry Weis, General Manager
Turlock Irrigation District
USPS: P.O. Box 949
Turlock, CA 95381-0949
Courier: 333 East Canal Drive
Turlock, CA 95380
Phone: (209) 883-8211
Fax: (209) 656-2143
Email: lwweis@tid.org

SMUD:

Jim Shetler
Assistant General Manager, Energy Supply
Sacramento Municipal Utility District
USPS: P.O. Box 15852
Mail Stop: B408
Sacramento, CA 95852-1830
Courier: 6201 S Street,
Sacramento, CA 95817-1899
Phone: 916 732 6757
Fax: 916 732 6562
Email: jshetle@smud.org

TANC:

Transmission Agency of Northern California
James W. Beck, General Manager
P.O. Box 15129
Sacramento, CA 95851-0129
Phone: (916) 852-1673
Fax: (916) 852-1073
Email: gm@tanc.us

Amendment No. 1

Long-Term Layoff Agreement

By and Among

The Transmission Agency of Northern California

And certain of its Members

Namely

The City of Palo Alto

The City of Roseville

The Modesto Irrigation District

The Turlock Irrigation District

and

The Sacramento Municipal Utility District

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This Amendment No. 1 of the January 28, 2009 Long Term Layoff Agreement ("LTLA"), entered into by and among the Transmission Agency of Northern California ("TANC") and certain of its members, namely the City of Palo Alto ("PALO ALTO"), the City of Roseville ("ROSEVILLE"), the Modesto Irrigation District ("MODESTO"), the Turlock Irrigation District ("TURLOCK"), and the Sacramento Municipal Utility District ("SMUD"), referred to as "Party" or "Parties," as of the Effective Date defined in Section 1 of this Amendment No. 1, with regard to the following:

RECITALS:

- A. In section 3.a. of the LTLA, ROSEVILLE laid off all of ROSEVILLE's use of its interests, rights, and obligations under TANC Project Agreement No. 3 associated with ROSEVILLE's 2.1119 Participation Percentage in TANC's entitlement to Transfer Capability on the California-Oregon Transmission Project ("COTP") for the fifteen (15) year term of the LTLA.
- B. MODESTO, TURLOCK, and SMUD accepted and assumed all of the use of ROSEVILLE's interests, rights, and obligations transferred to TANC and by TANC to MODESTO, TURLOCK, and SMUD for the term of the LTLA.
- C. ROSEVILLE has asked to reverse the layoff effected in the LTLA on the Effective Date of this Amendment No. 1 and MODESTO, TURLOCK, and SMUD are willing to transfer the interests, rights, and obligations back to ROSEVILLE on such date.

NOW THEREFORE, in consideration of the premises described in the recitals, and in consideration of the terms, covenants, and conditions that are set out below, the Parties have entered into this

AGREEMENT:

Section 1. Effective Date.

This Amendment No. 1 shall become effective and enforceable on July 1, 2014 at 0001 hours Pacific Prevailing Time following the due execution and delivery of this Amendment No. 1 to TANC or the date on which this Amendment No. 1 is duly executed and delivered to TANC if July 1, 2014 passes without such execution and delivery (hereinafter "Effective Date").

Section 2. Return of ROSEVILLE's COTP Interests, Rights and Obligations.

Except as otherwise set forth in this Amendment No. 1, on the Effective Date:

- i) MODESTO transfers the 0.2373 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP, accepted and assumed in the LTLA, to TANC;

ii) TURLOCK transfers the 0.9373 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP, accepted and assumed in the LTLA, to TANC; and
 iii) SMUD transfers the 0.9373 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP, accepted and assumed in the LTLA, to TANC. Such transfers include all of the interests, rights, and obligations associated with ROSEVILLE's Participation Percentage laid off in Section 3 of the LTLA.

TANC hereby transfers at that instant the sum of the returned Participation Percentages from MODESTO, TURLOCK, and SMUD, being 2.1119, to ROSEVILLE. ROSEVILLE hereby accepts and assumes at that instant all of the interests, rights, and obligations associated with its 2.1119 Participation Percentage under the provisions of TANC Project Agreement No. 3.

Section 3. Modification of LTLA Provisions Made Unnecessary by this Amendment No. 1.

- a. Section 3.a. of the LTLA, entitled "Layoff of ROSEVILLE's COTP Interests, Rights, and Obligations," and Section 3.b. of the LTLA, entitled "Return of ROSEVILLE's Interests, Rights, and Obligations, are hereby deleted from the LTLA.
- b. Section 3.e. of the LTLA, entitled "Project Agreement No. 3 Appendix C," is hereby modified to state that a revised APPENDIX C showing the effect of the return of ROSEVILLE's 2.1119 Participation Percentage has been approved by the TANC Commission and attached to and incorporated into this Amendment No. 1 as ATTACHMENT A.
- c. Section 3.f. of the LTLA, entitled "Billings and Payments," is hereby modified to state that ROSEVILLE shall resume the performance of its obligations under TANC Project Agreement No. 3 on the Effective Date of this Amendment No 1.
- d. Section 3.g. of the LTLA, entitled "Additions, Betterments, and Replacements," is hereby modified to: i) state that, between the effective date of the LTLA and this Amendment No. 1, TANC has not approved any Additions, Betterments, or Replacements, as defined in TANC Project Agreement No. 3; ii) delete ROSEVILLE from (iv) and (v) of section 3.g.; iii) delete ROSEVILLE from section 3.h., entitled "Default"; and iv) delete ROSEVILLE and any associated conjunction or preposition from Section 5 entitled "No Assignment Without Consent," and from Section 6 entitled "Long-Term Layoff to Third Parties Not an Assignment."

- e. Section 3.i.(i), of the LTLA is hereby deleted and replaced with the following: In the absence of a default under this Agreement, Palo Alto shall not have any rights to vote on any matter related to TANC Project Agreement No. 3; provided, however, that Palo Alto shall retain voting rights related to Additions and Betterments to be considered for approval under TANC Project Agreement No. 3, but their percentage of such vote will be zero (0) percent in order to fulfill the meaning of Opposing Member. Absent any vote to contrary, the vote of Palo Alto shall be deemed to be a "no" vote. If TANC were to consider extending the term of the outstanding Indebtedness for the COTP beyond the current maturity in 2024, then PALO ALTO shall be entitled to vote the 3.6815 Participation Percentage it held before the layoff on the question of the extension of the term of the Indebtedness, and the Participation Percentages of the DISTRICTS shall be reduced on such question by subtracting the Participation Percentages they had accepted from PALO ALTO.

Section 4. Integration.

Except as amended and modified by this Amendment No. 1, the LTLA remains in full force and effect, without change to any of its provisions other than the text expressly altered by this Amendment No. 1. On the Effective Date this Amendment No. 1 and the LTLA shall be one, integrated agreement.

The Parties have duly executed and delivered this Amendment of their authorized representatives set forth below.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

TURLOCK IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

CITY OF PALO ALTO

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

CITY OF ROSEVILLE

MODESTO IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

The Parties have duly executed and delivered this Amendment of their authorized representatives set forth below.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

By: [Signature]
Its: General Manager
Dated: 5-15-2014

TURLOCK IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

CITY OF PALO ALTO

By: _____
Its: _____
Dated: _____

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____
Its: _____
Dated: _____

CITY OF ROSEVILLE

By: _____
Its: _____
Dated: _____

MODESTO IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

The Parties have duly executed and delivered this Amendment of their authorized representatives set forth below.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

TURLOCK IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

CITY OF PALO ALTO

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: Marc Shaul
Its: _____
Dated: April 28, 2014

By: _____
Its: _____
Dated: _____

CITY OF ROSEVILLE

MODESTO IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

The Parties have duly executed and delivered this Amendment of their authorized representatives set forth below.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

TURLOCK IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

CITY OF PALO ALTO


SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

CITY OF ROSEVILLE

MODESTO IRRIGATION DISTRICT

By:  _____
Its: ASSIST CITY MGR
Dated: 4-17-14

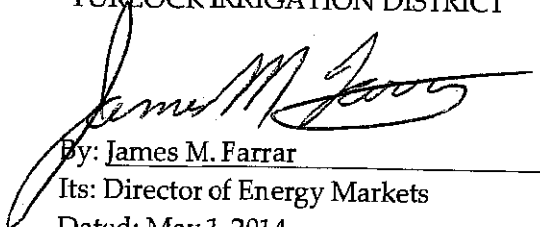
By: _____
Its: _____
Dated: _____

The Parties have duly executed and delivered this Amendment of their authorized representatives set forth below.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

By: _____
Its: _____
Dated: _____

TURLOCK IRRIGATION DISTRICT


By: James M. Farrar
Its: Director of Energy Markets
Dated: May 1, 2014

CITY OF PALO ALTO

By: _____
Its: _____
Dated: _____

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____
Its: _____
Dated: _____

CITY OF ROSEVILLE

By: _____
Its: _____
Dated: _____

MODESTO IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

The Parties have duly executed and delivered this Amendment of their authorized representatives set forth below.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

TURLOCK IRRIGATION DISTRICT

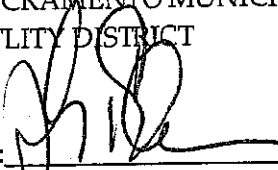
By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

CITY OF PALO ALTO

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____
Its: _____
Dated: _____

By:  _____
Its: VEN 2 LED
Dated: 4/9/2014

*pk
(copy)*

CITY OF ROSEVILLE

MODESTO IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

The Parties have duly executed and delivered this Amendment of their authorized representatives set forth below.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

TURLOCK IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

CITY OF PALO ALTO

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____
Its: _____
Dated: _____

By: _____
Its: _____
Dated: _____

CITY OF ROSEVILLE

MODESTO IRRIGATION DISTRICT

By: _____
Its: _____
Dated: _____

By: *[Signature]*
Its: General Manager
Dated: 4/10/14



MEMORANDUM

DATE: July 14, 2016

TO: TANC Commission

FROM: Bryan W. Griess
General Manager

SUBJECT: REPORT AND RESOLUTION APPROVING AMENDMENT NO. 2 TO THE 2009 LONG-TERM LAYOFF AGREEMENT (LTLA)

On January 28, 2009, the TANC Commission approved Resolution 2009-01 that authorized a 15-year Long-Term Layoff Agreement (2009 LTLA) from the City of Palo Alto and the City of Roseville to the Modesto Irrigation District (MID), the Turlock Irrigation District (TID), and the Sacramento Municipal Utility District (SMUD). On March 19, 2014, the TANC Commission approved Resolution 2014-04, which returned to the City of Roseville its California-Oregon Transmission Project (COTP) entitlement rights. This was encapsulated in Amendment No. 1 to the 2009 Long-Term Layoff Agreement.

On January 27, 2016, the TANC Commission approved Resolution 2016-02 that authorized the issuance of COTP Revenue Bonds (2016A Bonds), and on March 9, 2016 those bonds were issued and sold. The 2016A Bonds have a termination date of May 1, 2039.

The 2009 LTLA is scheduled to expire on January 28, 2024, and as part of that agreement the City of Palo Alto will receive its original COTP entitlement back. Amendment No. 2 to the 2009 LTLA will affirm that MID, TID, and SMUD will continue paying the City of Palo Alto's share of COTP debt service obligations through the term of the 2016A Bonds expiration date.

A draft of Amendment No. 2 to the 2009 LTLA is enclosed for review. No revision to the existing debt service cost responsibility is envisioned under Project Agreement No. 3 (PA-3) and Project Agreement No. 5 (PA-5) related cost sharing obligations. Approval of the attached resolution will effectuate Amendment No. 2 to the 2009 LTLA.

Enclosures

RESOLUTION 2016-XX

A RESOLUTION OF THE
TRANSMISSION AGENCY OF NORTHERN CALIFORNIA
APPROVING AMENDMENT NO. 2
TO THE 2009 LONG-TERM LAYOFF AGREEMENT

WHEREAS, the Transmission Agency of Northern California (TANC) is a joint exercise of powers agency organized under the laws of the State of California; and

WHEREAS, the *TANC Procedures for Long-Term Layoffs of Transmission Capacity* govern TANC Member layoffs of their California-Oregon Transmission Project (COTP) entitlements; and

WHEREAS, pursuant to Resolution 2009-01, the Cities of Palo Alto and Roseville entered into a *Long-Term Layoff Agreement By and Among the Transmission Agency of Northern California and certain of its Members* (2009 LTLA) to lay off their COTP Entitlements; and

WHEREAS, pursuant to Resolution 2014-04, the City of Roseville's COTP Entitlement rights were restored and the affected cost sharing percentages associated with TANC Project Agreements No. 3 (PA-3) and No. 5 (PA-5) were modified by *Amendment No. 1 to the Long-Term Layoff Agreement By and Among the Transmission Agency of Northern California and certain of its Members*; and

WHEREAS, the City of Palo Alto's COTP Entitlement associated with PA-3 remains laid off to certain TANC Members; and

WHEREAS, parties to the 2009 LTLA as amended seek certainty regarding the remaining cost sharing obligations associated with COTP; and

WHEREAS, TANC's General Counsel has drafted *Amendment No. 2 to the Long-Term Layoff Agreement By and Among TANC and certain of its Members* (Amendment No. 2) to affirm the duration of the existing cost sharing obligations; and

WHEREAS, draft Amendment No. 2 will not result in any changes to the cost sharing percentages associated with PA-3 or PA-5; and

WHEREAS, the draft *Amendment No. 2 to the Long-Term Layoff Agreement By and Among TANC and certain of its Members* (Amendment No. 2), has been reviewed and approved by the Parties of the 2009 LTLA.

NOW, THEREFORE, BE IT HEREBY RESOLVED by the Commission of the Transmission Agency of Northern California that the proposed *Amendment No. 2 Long-Term Layoff Agreement By and Among TANC and certain TANC Members* is approved in the form presented today, with such additional changes in form as the General Manager and General Counsel agree and subsequently present to this Commission.

PASSED AND ADOPTED this 20^h day of July, 2016 on a motion by _____
seconded by _____.

AYES NOES ABSTAIN ABSENT

City of Alameda

City of Biggs

City of Gridley

City of Healdsburg

City of Lodi

City of Lompoc

Modesto Irrigation District

City of Palo Alto

Plumas-Sierra Rural Electric Cooperative

City of Redding

City of Roseville

Sacramento Municipal Utility District

City of Santa Clara

Turlock Irrigation District

City of Ukiah

Amendment No. 2

Long-Term Layoff Agreement

By and Among

the

Transmission Agency of Northern California

and certain

of its Members

namely

The City of Palo Alto

The City of Roseville

The Modesto Irrigation District

The Turlock Irrigation District

and

The Sacramento Municipal Utility District

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This Amendment No. 2 of the January 28, 2009 Long Term Layoff Agreement (“LTLA”), is entered into by and among the Transmission Agency of Northern California (“TANC”) and certain of its members, namely the City of Palo Alto (“PALO ALTO”), the City of Roseville (“ROSEVILLE”), the Modesto Irrigation District (“MODESTO”), the Turlock Irrigation District (“TURLOCK”), and the Sacramento Municipal Utility District (“SMUD”), referred to as “Party” or “Parties,” as of the Effective Date defined in Section 1 of this Amendment No. 2, with regard to the following:

RECITALS:

- A. In the LTLA, PALO ALTO laid off its interests, rights, and obligations to TANC’s Transfer Capability on the California-Oregon Transmission Project (“COTP”), associated with PALO ALTO’s Participation Percentage, for the fifteen year term of the LTLA, which terminates on January 28, 2024.
- B. In the LTLA, MODESTO, TURLOCK, and SMUD accepted and assumed all of the use of PALO ALTO’s interests, rights, and obligations transferred to TANC, and by TANC to MODESTO, TURLOCK, and SMUD, for the term of the LTLA.
- C. Amendment No. 1 to the LTLA returned Roseville’s COTP interests, rights, and obligations from MODESTO, TURLOCK, and SMUD back to Roseville, and clarified PALO ALTO’s voting rights under Project Agreement No. 3.

- D. At TANC's January 27, 2016 meeting, TANC approved a resolution authorizing the issuance of California-Oregon Transmission Project Revenue Refunding Bonds, 2016 Series, ("the 2016 COTP Bonds"). On March 9, 2016 TANC issued and sold its \$173,920,000 California-Oregon Transmission Project Revenue Refunding Bonds, 2016 Series A (the "2016A Bonds").
- E. The Parties have agreed to execute this Amendment No. 2 to the LTLA, to provide that in the absence of a default by MODESTO, TURLOCK, or SMUD, the Debt Service for the 2016A Bonds associated with PALO ALTO's 3.6815 Participation Percentage in TANC's entitlement to Transfer Capability on the COTP will be paid by MODESTO, TURLOCK, and SMUD, as provided in this Amendment No. 2.

NOW THEREFORE, in consideration of the premises described in the Recitals, and in consideration of the terms, covenants, and conditions that are set out below, the Parties have entered into this Amendment No. 2 to the LTLA.

AGREEMENT:

Section 1. Effective Date.

This Amendment No. 2 shall become effective and enforceable on May 26, 2016 at 0001 hours Pacific Prevailing Time following the due execution and delivery of this Amendment No. 2 to TANC, or the date on which this Amendment No. 2 is duly executed and delivered to TANC, if May 26, 2016 passes without such execution and delivery (hereinafter "Effective Date").

Section 2. Addition of Section 3.j, "Treatment of Project Agreement No.3 Debt".

Section 3.j, "Treatment of Project Agreement No.3 Debt", is hereby added: MODESTO, TURLOCK, and SMUD accept and assume the obligation to pay PALO ALTO's 3.6815 Participation Percentage of the Debt Service on the 2016A Bonds in accordance with their respective Participation Percentages of the layoff shares transferred in section 3.c of the LTLA from and after the end of the Term of the LTLA until the last maturity date of the 2016A Bonds, currently May 1, 2039, and any extension thereof. Nothing in this Amendment No. 2 shall affect or limit the underlying obligations of PALO ALTO under TANC Project Agreement No. 3, such as, by way of example and not as a limitation, the obligation of PALO ALTO, in the event of a default by MODESTO, TURLOCK, or SMUD, to pay to TANC an amount equal to its Participation Percentage of all Debt Service on the TANC Project Indebtedness and to pay to TANC an amount equal to PALO ALTO's Participation Percentage of TANC Project Costs, TANC Project O&M

Costs, and TANC Capital Improvement Costs, as provided in section 4.1.3.2 of TANC Project Agreement No. 3. Nothing in this Amendment No. 2 shall affect or limit the other obligations of PALO ALTO under TANC Project Agreement No. 3, such as, by way of example and not as a limitation, the obligations of PALO ALTO to pay to TANC an amount equal to PALO ALTO's Participation Percentage of TANC Project Indebtedness issued and sold for certain future Additions under section 3.1.2.2.2, and Replacements under section 3.1.2.2.3 of TANC Project Agreement No. 3.

Section 3. Integration.

Except as amended and modified by Amendment No. 1 and this Amendment No. 2, the LTLA remains in full force and effect, without change to any of its provisions other than the text expressly altered by this Amendment No. 2. On the Effective Date this Amendment No. 2 and the LTLA shall be one, integrated agreement.

The Parties have duly executed and delivered this Amendment via their authorized representatives set forth below.

TRANSMISSION AGENCY OF
NORTHERN CALIFORNIA

TURLOCK IRRIGATION DISTRICT

By: _____

By: _____

Its:

Its:

Dated: _____

Dated: _____

CITY OF PALO ALTO

SACRAMENTO MUNICIPAL
UTILITY DISTRICT

By: _____

By: _____

Its:

Its:

Dated: _____

Dated: _____

MODESTO IRRIGATION DISTRICT

CITY OF ROSEVILLE

By: _____

By: _____

Its:

Its:

Dated: _____

Dated: _____



Utilities Advisory Commission Staff Report

From: Dean Batchelor, Director Utilities
Lead Department: Utilities

Meeting Date: December 6, 2023
Staff Report: 2311-2263

TITLE

S/CAP Strategic Plan on the Reliability and Resiliency for the Electric Distribution Utility

RECOMMENDATION

Staff Recommends the Utilities Advisory Commission (UAC) Recommend the City Council Approve the Reliability and Resiliency Strategic Plan¹ for the Electric Distribution Utility

EXECUTIVE SUMMARY

At the September 6, 2023 UAC meeting staff and the UAC discussed a work plan for development of a Reliability and Resiliency Strategic Plan (RRSP). The RRSP is a work item in the 2023-2025 Sustainability and Climate Action Plan (S/CAP) Work Plan. This work item was intended to address the need for a reliable, well maintained electric system with enhanced reliability to support an electrified community and a desire among some community members for ways to maintain some level of electric supply during outages, particularly with an electrified home. Staff has developed a Draft RRSP¹ and has begun implementation of some items. This report provides an overview of the RRSP and a progress update from December 2023². Staff is requesting the UAC recommend the Council approve the RRSP.

The six strategies of the RRSP are described in depth in the report, but are as follows:

- Strategy 1: Replace and modernize electric distribution infrastructure
- Strategy 2: Implement operational practices to improve reliability and manage outages effectively

¹ Draft Strategic Plan for Reliability and Resiliency <https://www.cityofpaloalto.org/files/assets/public/v/2/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2023/12-dec-2023/new-folder/12-06-23-id-2307-1780-attachment-a-rrsp-draft-for-discussion-and-approval.pdf>

² RRSP Progress Update from December 2023 <https://www.cityofpaloalto.org/files/assets/public/v/1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2023/12-dec-2023/new-folder/12-06-23-id-2307-1780-attachment-b-rrsp-progress-update.pdf>

- Strategy 3: Integrate and ease adoption of flexible and efficient technologies and strategies
- Strategy 4: Evaluate the benefits of flexible and efficient technologies and strategies to the utility and community
- Strategy 5: Evaluate utility-driven programs to promote adoption of flexible and efficient technologies and strategies
- Strategy 6: Implement any utility-driven programs identified in Strategy 5 that are chosen by the community

BACKGROUND

A core part of City of Palo Alto Utilities Department (CPAU) mission is to provide safe and reliable electric supply and distribution services. On-going activities to support this mission include proactive maintenance of the electric distribution system, replacement of aging distribution system components, procuring and delivering sufficient electric supplies to meet Palo Alto electric demands, and advocating for the upgrade and maintenance of a reliable bulk transmission grid in California. The focus of the RRSP is the electric distribution system reliability and resiliency. An overview of the distribution system description and topology³ is provided for context for the RRSP.

CPAU along with Emergency Services has engaged with the community regularly to seek feedback on the role of the City to enhance the levels of resiliency service. Two public meetings were held in [August 2018⁴](#), and [November 2019⁵](#) to seek community input on a utility resiliency framework. The engagement resulted in the development of a vision, set of goals to enhance utility resiliency – these aspects were discussed with the UAC in [March 2020⁶](#), and has since been incorporated into the CPAU’s on-going work plans.

Based on this public engagement, CPAU’s resiliency objective to advance the Utility to become a “Smart” Utility, able to assist the City prepare, respond, support, and rebound from manmade and natural disasters. Smart in this context was defined by the community to mean advanced

³ Description of Electric Distribution System Topology

<https://www.cityofpaloalto.org/files/assets/public/v/1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2023/12-dec-2023/new-folder/12-06-23-id-2307-1780-attachment-c-description-of-electric-distribution-system-topology.pdf>

⁴ UAC August 2018 Agenda <https://www.cityofpaloalto.org/files/assets/public/v/1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2018/final-uac-agenda-8-22-18-special-resiliency-workshop-agenda.pdf>

⁵ Resiliency workshop#2: <https://www.cityofpaloalto.org/files/assets/public/v/1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2019/11-06-19-meeting/final-uac-agenda-november-13-2019.pdf>

⁶ Discussion of Resiliency Workshops: Follow-up and Next Steps <https://www.cityofpaloalto.org/files/assets/public/v/1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2020/03-05-2020-special/item-no.-1-mini-packet-id-11074.pdf>

grid technologies such as advanced meters, but also includes non-tech solutions (coordinate with neighborhood group and via other communication channels) and backup generation.

On June 6, 2023 Council adopted the Sustainability and Climate Action Plan (S/CAP) and the 2023-2025 S/CAP Work Plan, which included a work item to complete a Reliability and Resiliency Strategic Plan (RRSP) and policy guidelines to guide its development. This work item was intended to address the need for a reliable, modernized electric system with enhanced reliability to support an electrified community and a desire among some community members for ways to maintain some level of electric supply during outages, particularly with an electrified home. On September 6, 2023 staff presented the Utilities Advisory Commission staff's approach for developing the RRSP⁷.

This report presents the RRSP for the UAC's consideration and recommendation for approval by the City Council. The RRSP lays out six strategies to address the issues noted above, several of which are being implemented on an on-going basis while others require further analysis and resources for implementation of projects.

DISCUSSION

The RRSP encompasses actions related to maintaining and upgrading many of the electric distribution system elements as described in the RRSP Electric Distribution System Topology⁸, to meet higher electrical energy demands, enable customer deployment of new technologies to lower cost and increase resiliency, and to efficiently utilize electrical service and the distribution grid.

The six strategies for the RRSP are:

- Strategy 1: Replace and modernize electric distribution infrastructure
- Strategy 2: Implement operational practices to improve reliability and manage outages effectively
- Strategy 3: Integrate and ease adoption of flexible and efficient technologies and strategies
- Strategy 4: Evaluate the benefits of flexible and efficient technologies and strategies to the utility and community
- Strategy 5: Evaluate utility-driven programs to promote adoption of flexible and efficient technologies and strategies
- Strategy 6: Implement any utility-driven programs identified in Strategy 5 that are chosen by the community

⁷ Staff Report: <https://www.cityofpaloalto.org/files/assets/public/v/1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/linking-documents/09062023-id-208-1934-uac.pdf>

⁸ RRSP Electric Distribution System Topology <https://www.cityofpaloalto.org/files/assets/public/v/1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2023/12-dec-2023/new-folder/12-06-23-id-2307-1780-attachment-c-description-of-electric-distribution-system-topology.pdf>

These strategies are outlined below and describe the steps CPAU is currently taking and plans to take to maintain and enhance the electric distribution system reliability and resiliency.

Strategy 1: Replace and modernize electric distribution infrastructure

To avoid outages the utility must replace aging infrastructure, upgrade the electric system's capacity to ensure it can accommodate new technologies and electrification measures into the distribution system, and increase the interconnectedness of the system, both internally and with the PG&E transmission system. Infrastructure investment to reduce wildfire risk will also reduce outages. Actions in this area would be coordinated with the Fiber to the Premises project and wildfire mitigation plan.

The RRSP actions for this strategy are as follows:

- 1.1 Replace aging infrastructure
- 1.2 Upgrade capacity to accommodate new loads
- 1.3 Improve switching to improve system flexibility, efficiency, and reliability
- 1.4 Identify and construct second transmission connection
- 1.5 Underground distribution system in Foothills area

The electric utility's grid modernization effort, expected to be completed by 2030, will accomplish actions 1.1, 1.2, and 1.3. The utility will replace much of this infrastructure over a seven-year grid modernization effort while simultaneously addressing the need to increase capacity to meet new and increasing customer loads. A coordinated, planned investment to address new capacity is needed to avoid operational issues caused by new load installed without permits, and to ensure the utility can keep up with utility service upgrade applications for new load additions. The grid modernization project will also include additional distribution feeder circuit ties and switches so that in the event of a fault or an overload of substation transformer, a neighborhood could be served by switching to a second feeder. This will also allow flexibility in configuring the distribution system for efficiency, reducing system losses, and enable improved integration of new solar and storage on the system. An additional benefit is that planned upgrades to 12 kV distribution voltages (from 4 kV, currently) in several neighborhoods will reduce energy losses on the distribution system.

CPAU continues to work with the CAISO and PG&E to connect to the transmission grid via a second transmission line to eliminate potential service disruptions made more likely by the fact that the City is currently served via a single transmission corridor. In addition, wildfire risk in the foothills creates the potential for outages during windy high fire risk days if the utility needs to shut off service to avoid the risk of electric lines being blown into trees and starting wildfires. The utility is undergrounding lines in the Foothills to minimize this risk.

Strategy 1 Progress To-Date and Next Steps

The City's grid modernization project is underway, based on an electric engineering study which identified upgrades throughout the distribution system, including line transformer capacity, feeder capacity, increasing the number of switches and connections on the system between

feeders and substations, and upgrading substation equipment. The program has the following timeline:

- Upgrade transformer and feeder capacity in the overhead sections of the system (which represent over 90% of single-family neighborhoods) by the end of 2027.
- Upgrade underground sections by 2030.
- Add switches, connections, and upgrade substations by 2030.

Construction on the first modernization project is starting in Q1 2024 in a 1200-home neighborhood bounded by Louis, Amarillo, 101, and Embarcadero, followed by additional neighborhoods. The modernization projects will be coordinated with fiber to the premise construction.

Staff, with assistance from a consultant, continues to work with the CAISO and PG&E to build a second transmission line to the Adobe Creek Substation, from Moffett field, but no definitive progress has been made to date.

A key wildfire mitigation activity is undergrounding eleven miles of electric lines in the Foothills area. This project involves installing substructure work, including boxes for electric and fiber lines; removing electric lines and fiber lines from poles; and installing pad-mount equipment where possible. This iterative project consists of multiple phases and is expected to be complete in 2025. CPAU already installed two of four required substructures and is designing the next two. The first two phases were completed in September of 2023.

Strategy 2: Implement operational practices to improve reliability and manage outages effectively

This strategy involves minimizing the number of outages by reducing operational risks that lead to outages. If key staff positions are not filled it becomes difficult to keep up with investment and maintenance, to operate the system, or to recover from outages. Without active and effective tree trimming, the risk of outages related to wildfires increases. Communication during outages is also critical to help residents understand what is happening and take what steps are needed for their health, safety, and comfort.

The RRSP actions for this strategy are as follows:

- 2.1 Strengthen the workforce
- 2.2 Employ best maintenance practices for wildfire protection
- 2.3 Communicate effectively during outages

Strategy 2 Progress To-Date and Next Steps

Concerted efforts are currently underway to recruit, train, and retain line-workers, system operators, engineers, inspectors to maintain system and respond to outages effectively. Staff have also contracted with third-party contractors to supplement staff to undertake emergency response, maintenance, and capital improvement projects. Staff regularly updates its Wildfire Mitigation Protection Plan to protect power lines in the Foothills, and staff is exploring innovative

software to make vegetation management more efficient. In September 2023 CPAU implemented and operationalize a new Outage Management System (OMS). The new OMS will also allow CPAU to more quickly detect and respond to power outages and provide customers with timely notifications and updates.

Strategy 3: Integrate and ease adoption of flexible and efficient technologies and strategies

Many technologies being added to the electric system are capable of charging and discharging, generating electricity, or flexing their electric use by time of day. Technologies include rooftop solar, home batteries, vehicle to home and vehicle to grid systems, grid-responsive home equipment and smart EV charging, and smart electrical panels and circuit sharing devices at home, etc. These technologies can also create challenges for the distribution system at high penetrations, resulting in voltage issue, reverse current flows resulting in failures in system protection, or other issues because the system is not designed for them. But they can also create benefits when used well, reducing the cost of electricity, reducing emissions, reducing strain on the local distribution system, reduce the need for electrical panel upgrades by customers, and creating home resiliency. Effective integration will make the system operate more efficiently, especially when paired with best practices for installing and operating them. And these technologies can be even more effective when paired with efficient electrification practices like circuit sharing, installing lower-voltage EV chargers and heat pumps, and improving building efficiency to enable heat pumps to be sized smaller.

The RRSP actions for this strategy are as follows:

- 3.1 Configure the distribution system to accommodate high penetrations of solar, batteries, and other technologies
- 3.2 Review, communicate, and streamline permitting and other regulatory rules for efficient electrification strategies⁹
- 3.3 Communicate how to electrify efficiently
- 3.4 Communicate how to use technologies in a grid-friendly way

These actions remove barriers to installation of these types of technologies and electrification strategies. The study and design of the grid modification project includes accommodation of high penetration of solar, storage, vehicle to grid, and other technologies and enabling of these systems to be installed more easily, with fewer utility engineering studies needed. Ensuring they are accommodated easily and routinely by the City's permitting system is also important. In parallel with these barrier reduction efforts staff will develop communications and outreach to promote these technologies and explain how to use them in a grid-friendly way (e.g. setting EV chargers, batteries, and other flexible loads to charge or operate outside evening hours, especially mid-day, and to discharge in the evenings). As advanced metering infrastructure (AMI) is installed and time of use rates become viable, these rates will enhance this communication.

⁹ RRSP Efficient Electrification Strategies <https://www.cityofpaloalto.org/files/assets/public/v/1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2023/12-dec-2023/new-folder/12-06-23-id-2307-1780-attachment-d-efficient-electrification-strategies.pdf>

Strategy 3 Progress To-Date and Next Steps

Staff has completed two studies on high penetration of solar and storage. These studies identified the risk of feeder and transformer capacity issues, voltage problems, and system protection issues that could result from high penetrations of solar and storage, particularly under “reverse flow” conditions (when power is flowing in the opposite direction than the system is designed for). Solutions involve upgrading the distribution system to operate under reverse flow conditions, including:

- upgrading up to 15 feeders and 10 substation transformers,
- installing equipment capable of maintaining voltage and under reverse flow,
- installing system protection (breakers, relays) capable of operating under reverse flow,
- changing system operating practices where needed
- transferring loads among feeders to balance loads on the substation transformers
- Exploring “smart” (microprocessor-based) controls for voltage regulation, protection, and automatic switching

Staff believes that these upgrades will also enable higher penetrations of vehicle to grid technologies and other flexible loads, but is currently studying this to confirm.

As noted above, staff is continuing its studies on integrating flexible technologies with the distribution system. Staff has begun cross-department discussions with City permitting departments to ensure there is clarity on how these technologies are treated under the City’s permit processes. There has already been a fair amount of attention on solar and storage permitting to-date, but staff is expanding the discussion to include technologies like smart vehicle charging, smart panels, and efficient electrification strategies involving circuit pausers and lower-voltage equipment. When this step is completed staff will develop resources and outreach to help and encourage residents to employ these strategies and install this equipment, including instructions on how to best use the equipment to reduce emissions, costs, and minimize distribution system impacts. Staff is aiming to complete these steps by March 2024, but competing priorities and staff constraints may slow progress. Development of time of use rates is in progress through the City’s electric cost of service study, which staff is aiming to complete for Council adoption in June 2024. The transition to time of use rates is dependent in part on the rollout of the City’s AMI system.

Strategy 4: Evaluate the benefits of flexible and efficient technologies and strategies to the utility and community

These resiliency-enhancing and utility demand responsive new technologies are in different stages of adoption and commercialization. Operationalizing these distributed technologies for the benefit of the grid also takes considerable resources for a small utility like CPAU, and having a framework for valuing the benefits to the utility and community is important. This strategy will examine various benefits of adopting these technologies to the utility, the individual customer, and the community. Based on this analysis, Strategy 5 will develop different program options for community/Council consideration.

The RRSP actions for this strategy are as follows:

- 4.1 Determine the utility value of new technologies and impact to electric supply costs
- 4.2 Explore the utility value of new technologies on electric distribution costs and capacity
- 4.3 Explore estimating the value of resiliency for the community
- 4.4 Estimate the cost of individual customer community resiliency approaches

Staff already has some experience valuing the benefits of solar, storage, and other flexible technologies to the electric utility's supply costs and plans to hire a consultant to complete this evaluation. These technologies could also potentially yield benefits to the distribution system. The utility may be able to reduce the amount of new capacity needed to accommodate electrified buildings and vehicles or use existing capacity more efficiently to allow for more electrification in areas of the distribution system even before they are upgraded via the grid modernization project. Valuing these benefits is far more complex than valuing the benefits to the utility's supply costs. Lastly, staff will explore how to quantify the value of having backup power to various segments of the community. This analysis is also complex since different individuals, businesses, nonprofits, and government agencies will value resiliency differently. One way to approach this analysis is to assess the average cost of the most common technologies available to these customers right now to provide resiliency.

Strategy 4 Progress To-Date and Next Steps

Staff has done several analyses of the value of energy storage to the community over the last decade, with the most recent being in 2020. These analyses have primarily focused on the value to the electric utility's supply costs, though some analyses have included customer benefits as well, including resiliency benefits. Staff is developing a Request for Proposals (RFP) to hire a consultant to update these analyses. This consultant will likely focus on valuing the electric supply costs, the resiliency benefits, and the cost to customers of achieving resiliency during outages through commonly available strategies and technologies such as:

1. Emergency preparation
2. Generators (diesel, propane, natural gas)
3. Solar with backup power inverter
4. Battery storage system without solar
5. Solar + storage
6. Vehicle to load
7. Vehicle to home (with / without solar)

Valuing the benefits to the distribution system is more complex and will likely require a different approach since it requires much more in-depth modeling of the electric distribution system. This will be an intensive exercise, not something that can be achieved in-house with existing staffing without impacting the grid modernization project. Staff is in discussion with its electric engineering consultants on how to approach the analysis and is also exploring academic partnerships on the topic.

Cost for implementing these resiliency solutions at various locations will also be explored. Locations include single-family homes, multiple family homes, homes of vulnerable residents, partnerships with major commercial facilities (e.g. VMware), community centers (e.g. libraries, fire stations), neighborhood and substation level, etc.

Strategy 5: Evaluate utility-driven programs to promote adoption of flexible and efficient technologies and strategies

Based on the cost and value of various demand reduction and resiliency solutions investigated in Strategy 4, staff and its consultants will develop outlines of potential CPAU programs for the community and associated resources needs for such programs. The goal of this strategy is to characterize and estimate resource needs for the potential program approaches described below and to provide policy options for Council's consideration and for the allocation of appropriate resources.

The RRSP actions for this strategy are as follows:

- 5.1 Evaluate utility-driven programs to enhance resiliency and lower the demand on the grid
- 5.2 Evaluate equity-based and need-based versions of the programs
- 5.3 Evaluate community-based versions of the programs
- 5.4 Evaluate other resiliency approaches

These four actions involve doing a high-level review of potential strategies for utility-driven programs that could enhance resiliency and reduce grid impacts in a variety of contexts. Implementing any of these programs would be an expansion of the utility's role in providing resiliency. To-date, utility customers with the need for a higher level of reliability and resiliency than the utility provides have made their own arrangement for generators or other backup systems. Pursuing any of the programs listed below would involve expanding the utility's role, which would require resources. The resource need would depend on how time-intensive and costly the program is. Outreach, education, and providing resources would be the least time-intensive and costly, while utility programs to facilitate installation of flexible technologies, direct utility control of these technologies, or neighborhood microgrids would require the most effort and cost.

Under these four actions staff would evaluate possible utility programs to help community members install grid-responsive equipment, solar, storage, and vehicle to home or vehicle to grid solutions. This could involve strategies like incentives, technical assistance, expansion of the current Clean Energy Accessible Now (CLEAN) program tariff, direct installation through a utility program, or a public-private partnership with a flexible load aggregator. Types of locations to investigate would include single-family homes, multi-family buildings, and partnerships with major facility owners. These programs would then be reviewed to determine what features might be needed to enable them to serve lower-income customers or customers with medical needs. Versions of the programs specifically focused on providing community benefits, such as through installations at community centers or partnerships with major facilities that could provide both

private and community benefits. And lastly, other strategies like mobile battery storage and neighborhood microgrids would be evaluated.

To be clear, these evaluations would not result in actionable programs that could be adopted. They would only do a high-level preliminary review of the pros and cons of specific strategies and identify the resources needed to do a more complete evaluation. This would support Council policy discussions on which of the strategies to devote resources to investigating further. New staff and budget resources would almost certainly be required.

Strategy 5 Progress To-Date and Next Steps

As noted under strategy 4, staff is currently preparing a request for proposals (RFP) for a consultant to help with implementation of RRSP strategies 4 and 5. The consultant would perform the valuation analyses outlined in Strategy 4 and review a City-provided list of potential utility-driven approaches to expand the use of flexible technologies in Palo Alto to decrease supply costs, carbon emissions, and distribution system costs while enhancing community resiliency. A draft list of program features, technologies, and locations is in RRSP Strategy 5, Action 1:

Evaluate possible utility programs to help community members install grid-responsive equipment, solar, storage, and/or vehicle to home or vehicle to grid solutions. Program approaches could include, but are not limited to, incentives, technical assistance, power purchase agreements or feed-in tariffs, direct installation and possibly ownership of equipment, or public-private partnerships with an aggregator. Types of locations to investigate include single-family homes, multi-family buildings, at small and medium businesses, or in larger commercial facilities in Palo Alto.

In addition, Strategy 5, Actions 2 and 3 are to evaluate how the program ideas developed under Action 1 need to be adjusted to address the needs of low-income residents, residents with medical needs, or how they could be tailored to provide community-wide benefits via installation at community facilities or via public-private partnerships. Lastly, staff intends to address mobile battery storage and neighborhood or substation level microgrids as noted in Action 4.

Staff is seeking UAC feedback on whether the technologies, program approaches, and locations that are listed in Actions 1-4 address the range of potential utility programs the community expects to see in this analysis. This list will form part of the basis for the RFP and consultant contract scope.

Automated demand response programs to reduce electric utility supply costs may be easier to implement than other utility programs, since they are more commercialized. For example, staff is currently evaluating an electric vehicle telematics-based smart charging demand response program that may be able to lower the impact of EV charging on statewide peak demands and reduce utility supply costs. Staff has determined the cost and resources required to implement such a program in Palo Alto outweighs the value of such a customer program at this time. Staff is monitoring the implementation of such programs at other utilities and may revisit merits of this program in the 2025-26 timeline, after the implementation of advanced electric meters.

Strategy 6: Implement any utility-driven programs identified in Strategy 5 that are chosen by the community

Specific actions under this strategy would depend on the outcomes of the policy discussions following the studies completed for Strategies 4 and 5. Implementation of any programs would likely require additional staffing and budget resources.

FISCAL/RESOURCE IMPACT

Strategy 1: Replace and modernize electric distribution infrastructure: Implementation of this strategy has already been budgeted as CIP for Grid Modernization. Cost is estimated at \$200 to \$300 million and would require 5 to 8 FTE staff over the seven-year period. This estimate includes replacement of aging infrastructure and to increase capacity of the system to accommodate additional loads projected as a result of electrification. The cost of the second transmission line has not been estimated.

Strategy 2: Implement operational practices to improve reliability and manage outages effectively: The new utility outage management system became operational in September 2023 and the system costed \$630,000, including five years of annual maintenance. Ongoing 0.25 FTE of staffing effort would be required to maintain the system. Other activities under this strategy are operationalized and would not require any additional resources.

Strategy 3: Integrate and ease adoption of flexible and efficient technologies and strategies: This effort is estimated to cost \$30,000 to \$50,000 for consulting assistance and 0.25 FTE of staff effort. This amount would solely cover analysis and not any subsequent implementation.

Strategy 4 & 5: Evaluate the benefits of flexible and efficient technologies and strategies to the utility and community and Evaluate utility-driven programs to promote adoption of flexible and efficient technologies and strategies: The plan to retain a consultant to assist with this analysis effort and is estimated to cost \$70,000 to \$120,000, and will require 0.25 FTE of existing staff effort to complete the analysis and bring forth potential customer programs for community consideration. In addition, more consulting work or academic partnerships may be needed at additional cost and staff time to value the distribution benefits of flexible and efficient technologies and strategies (Task 4.2).

Strategy 6: Implement any utility-driven programs identified in Strategy 5 that are chosen by the community for implementation: The effort and cost associated with this strategy is unknown at this time.

STAKEHOLDER ENGAGEMENT

Extensive public engagement on this topic was undertaken to-date as outlined below:

- Two public meetings in August 2018 and November 2019 to seek community input on utility resiliency framework. The engagement resulted in the development of a vision, set of goals

and nine projects to enhance utility resiliency – these aspects were discussed with the UAC in March 2020, and has since been incorporated into the CPAU’s on-going work plans.

- Discussion of these topics with the S/CAP Working Group 2022-23
- Addition of topic to 2023-2025 S/CAP Work Plan, which was discussed with S/CAP Working Group and S/CAP Committee, then adopted by Council June 6, 2023 ([Report #:2303-1158](#))¹⁰
- Discussions with the UAC on a variety of reliability and resiliency topics over the past three years, 2021-23: OMS updates, Wildfire Mitigation Plan, Workforce, etc.
- Analysis of the [Impact of Decarbonization on the Resiliency of Single Family Homes in Palo Alto](#)¹¹ was presented to the UAC November 2021
- Analysis of [Costs and Reliability of Different Back-up Electricity Technologies](#)¹² presented to the UAC in December 2022.
- Strategic Plan discussions w/ UAC (which include resiliency topics)
- [Electric Distribution Infrastructure Modernization Update](#)¹³ provided to the UAC in June 2023
- [Discussion of Reliability and Resiliency Strategic Plan Policy Guidelines](#)¹⁴ with the UAC in September 2023

Progress in implementing the RRSP will be reported to the UAC periodically as progress is made in implementing projects contemplated under the plan.

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. Implementation of individual programs/installations chosen by the community in Strategy 6 that may need CEQA evaluation.

ATTACHMENTS

¹⁰ Staff Report 2303-1158: <https://www.cityofpaloalto.org/files/assets/public/v/1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/reference-files/060523-id-2303-1158.pdf>

¹¹ Impact of Decarbonization on the Resiliency of Single Family Homes in Palo Alto: <https://www.cityofpaloalto.org/files/assets/public/v/2/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2021/11-03-2021-regular/id-13608.pdf>

¹² Costs and Reliability of Different Back-up Electricity Technologies: <https://www.cityofpaloalto.org/files/assets/public/v/2/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2022/12-07-2022/12-07-2022-agenda-and-packet.pdf>

¹³ Electric Distribution Infrastructure Modernization Update: <https://www.cityofpaloalto.org/files/assets/public/v/2/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/reference-files/electrification-modernization-plan-6-7-2023.pdf>

¹⁴ Discussion of Reliability and Resiliency Strategic Plan Policy Guidelines: <https://www.cityofpaloalto.org/files/assets/public/v/1/agendas-minutes-reports/agendas-minutes/utilities-advisory-commission/archived-agenda-and-minutes/agendas-and-minutes-2023/09-sep-2023/09-06-2023-uac-packet.pdf>

Attachment A: Presentation

AUTHOR/TITLE:

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Staff: Jonathan Abendschein, Assistant Director of Utilities/Resource Management



**Reliability and
Resiliency Strategic
Plan Adoption**
Utilities Advisory
Commission

December 6, 2023

Background

- 2022 Discussions w/ S/CAP Committee and Working Group
 - Highlighted need for modernizing grid, enhancing capacity, reliability
- Council Adoption of 2023-2025 S/CAP Work Plan (June 6, 2023)
 - Adopted with S/CAP on June 6, 2023
 - Included Reliability and Resiliency Strategic Plan
 - Guidelines for plan development included in Appendix D
- September 6, 2023 UAC Discussion
 - General support for the approach
 - Feedback on how to improve task framing
 - Feedback on how to incorporate resiliency in the plan

Proposed Reliability & Resiliency Strategic Plan

- Strategy 1: Replace and modernize electric distribution infrastructure
- Strategy 2: Implement operational practices to improve reliability and manage outages effectively
- Strategy 3: Integrate and ease adoption of flexible and efficient technologies and strategies
- Strategy 4: Evaluate the benefits of flexible and efficient technologies and strategies to the utility and community
- Strategy 5: Evaluate the resource needs for various demand reduction and resiliency programs
- Strategy 6: Implement any utility-driven programs identified in Strategy 5 that are chosen by the community

Achievements To-Date

- Grid modernization construction starting Q1 2024 (Task 1)
 - Increase capacity, reliability, efficiency
 - Replace aging infrastructure
- Developed plan for solar and storage integration (Task 1)
- Made progress on recruitment and retention (Task 2)
- Developed/implemented Foothills wildfire strategies (Task 2)
- Installed new outage management system (Task 2)

Implementation Activities In Progress

- Ongoing efforts related to Tasks 1 and 2 – grid modernization, recruitment and retention, wildfire management, etc.
- Reviewing efficient electrification and flexible technologies against permit / interconnection processes (Task 3)
- Developing efficient electrification outreach program and exploring efficient electrification technical assistance (Task 3)
- Getting partnerships in place to analyze the impact of flexible load management on grid capacity (Task 4.2)
- Establishing consulting contract to evaluate cost/benefit and resource needs of potential resiliency programs (Tasks 4 and 5)

Recommendation

Staff Recommends the Utilities Advisory Commission
Recommend the City Council Approve the Reliability and
Resiliency Strategic Plan for the Electric Distribution Utility



CITY OF
**PALO
ALTO**

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FORECAST 12-MONTH ROLLING CALENDAR

	Utilities Advisory Commission	City Council
December 2023	- Reliability and Resiliency Strategic Plan Update - Cross Bore Phase 3 - Recommendation on California Oregon Transmission Project (COTP)	* Approval of Consultant Contract for S/CAP Funding Study (C) * Approval of the Final 2023 Electric Integrated Resource Plan (C) * Palo Alto Fiber Expansion Plan and Construction Alignment with Electric Grid Modernization (C)
January 2024	- Preliminary Financial Forecast - Utilities Quarterly Report FY24-Q1 - Discussion and Update on Five Year Capital Improvement Progress	* Procurement of 12KV Circuit Breakers for Hanover & Hansen Way Substations (C) * Recommendation on California Oregon Transmission Project (COTP) (C)
February 2024	- SFPUC Water Allocations During Droughts - Tesla Project	* Preliminary Financial Forecast (FCM) * Approval of Amendment No1 with Clearesult (C) * Reliability and Resilience Strategic Plan Update (C) * Adoption of Resolutions and Ordinances for Three Building Electrification Programs (C)
March 2024	- Financial Plans and Rates	
April 2024	-	* Financial Plans and Rates (FCM)
May 2024	-	
June 2024	-	* Financial Plans and Rates (C)
July 2024	-	
August 2024	-	
September 2024	-	
October 2024	-	
November 2024	-	
December 2024	-	

To be Scheduled

- 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 December 2023)
- DER discussion
- Second transmission line update
- 24/7 load following
- Distributed energy resources
- Update on grid modernization progress
- Reliability and resiliency strategic plan update
- Dark fiber utility rates comparison

- Commercial electricity segmentation plans
- Security meeting