FINAL

UTILITIES ADVISORY COMMISSION MEETING
MINUTES OF JUNE 5, 2019 REGULAR MEETING

CALL TO ORDER

Chair Danaher called the meeting of the Utilities Advisory Commission (UAC) to order at 7:00 p.m.

Present: Chair Danaher, Commissioners Forssell, Jackson, Johnston, Scharff, Segal, and Smith
Absent:

ORAL COMMUNICATIONS

None.

APPROVAL OF THE MINUTES

Commissioner Johnston moved to approve the minutes of the May 1, 2019 meeting as presented. Commissioner Segal seconded the motion. The motion carried 4-0 with Chair Danaher, and Commissioners Forssell, Johnston, and Segal voting yes, Commissioners Jackson, Scharff and Smith abstaining.

AGENDA REVIEW AND REVISIONS

None.

REPORTS FROM COMMISSIONER MEETINGS/EVENTS

None.

GENERAL MANAGER OF UTILITIES REPORT

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

PG&E Public Safety Power Shutoff Program – Pacific Gas and Electric (PG&E) is distributing letters to utility customers throughout the Bay Area about the company's Public Safety Power Shutoff Program. Considering the growing threat of extreme weather and intensity of wildfires over the past few years, the company plans to shut off major power lines in the event of extreme fire conditions. While PG&E does not serve electricity to Palo Alto customers, we are coordinating with the company to understand the potential impacts to our local distribution system, as we intake electricity to the City from PG&E's transmission system. There is the potential that a PG&E power shutoff could result in a local outage in parts of Palo Alto. The City is convening an internal working group to ensure that we are coordinated in our actions and have a clear communication plan for our outreach to the community. We will keep the UAC apprised of PG&E and City plans as more information becomes available.

Residential workshops since last UAC meeting:

- "Is an Electric Vehicle Right for You?" City of Palo Alto Utilities (CPAU) sponsored this EV workshop in partnership with Stanford Health Improvement Program (HIP) on May 28 at Mitchell Park. Topics covered included the difference between all-electric and plug-in hybrid EVs, EV charging (home, work and public space), range anxiety misconceptions, battery longevity, buying versus leasing, and the

environmental, economic, and personal benefits of EV adoption. There were approximately 100 attendees, and a number of EVs were available for viewing before and after the presentations.

- "Irrigation Equipment Upgrades and Landscape Water Use Efficiency" was held on May 11. Attendees learned about irrigation equipment upgrades that can help improve the water efficiency of their landscape irrigation system.
- "Maintaining Native Gardens and Leak Detection" was held on June 1. Attendees learned how to create a beautiful, low water use and low maintenance landscape with native plants. The presenter discussed design concepts, best practices, and how to set goals and a budget in this informative lecture class. Attendees were also taught about how to find out if you have a leak in your system. This class was also videotaped with the intent of putting it on our website.

The next Facilities Managers Meeting will be held on Thursday June 6 at VMWare. This meeting with our largest utility customers will include presentations on the VMWare Microgrid Project, Decarbonization, Distributed Energy Resources, EV chargers installation options, and utility rate changes. Facility Managers Meeting are typically held twice a year.

As a note from last month's General Manager's report, the Mayor's Green Business Leader Awards were to be presented at the May 20 City Council Meeting but was moved to a yet to be determined date.

New Program Update – The EV Solutions and Technical Assistance program will be using Low Carbon Fuel Standard (LCFS) funds to offer full end to end consulting and project management services to various commercial customers to install EV Chargers – with emphasis on low income MF, regular Multi-Unit Dwellings and non-profits. With the assistance of our contractor ClearResult, we expect this program will accelerate the installation of EV charging infrastructure at these harder to reach customer groups. The goal is for this program to help us towards the City's sustainability goals and to streamline processes for all departments involved.

COMMISSIONER COMMENTS

None.

UNFINISHED BUSINESS

None.

NEW BUSINESS

ITEM 1: ACTION: Election of Officers.

ACTION: Commissioner Johnston moved to approve Commissioner Danaher as Chair and Commissioner Forssell as Vice Chair. Commissioner Segal seconded the motion. The motion carried 7-0 with Commissioners Danaher, Forssell, Jackson, Johnston, Scharff, Segal, and Smith voting yes

ITEM 2: DISCUSSION: Discussion of Electric Vehicle and Building Decarbonization Sustainability/Climate Action Plan Implementation Plans.

Jonathan Abendschein, Assistant Director of Resource Management, reported over the next year the UAC will discuss the Sustainability and Climate Action Plan (S/CAP) update. The presentation will focus on Citywide efforts concerning building decarbonization and electric vehicles. Later in the summer, staff will present information about customer programs.

David Coale remarked that the cost of an electric vehicle (EV) can be less than the cost of a cell phone if a purchaser selects the right lease option. The Ride and Drive program has been key to increasing EV adoption. However, the City's minimum parking requirements prevent EV charging infrastructure from being installed. The UAC should address parking requirements and charging infrastructure with the City Manager and the Council. The REACH Code has to require all new buildings and small businesses be all electric. Installing

natural gas in residential construction will result in stranded assets. The City needs to begin paying the price to decommission the natural gas system.

Bret Andersen commented that investment in EV infrastructure supports single-occupancy vehicles (SOV) as a mode of travel. The mobility strategy is designed to reduce SOV as a mode. The City can reduce its investment in EV charging if it promotes mobility and the reduction of SOV travel. In order to reach the reduction goal for natural gas usage, every resident will have to adopt electric appliances. The City has to make adoption of electric appliances easy. Carbon Free Palo Alto has a proposal, Be Smart, which self-finances electric appliances on the bill. Billing systems appear to be the major issue, but there are work-arounds.

Tom Kabat suggested the City move quickly to require all-electric new construction in order to avoid the high cost of retrofits.

Hillary Rupert, consultant, advised that the City of Palo Alto developed the first Climate Protection Plan in 2007 and adopted the S/CAP in 2016. As of 2017, the City of Palo Alto has reduced its greenhouse gas (GHG) emissions by an estimated 43% from the 1990 baseline. The Sustainability Implementation Plan (SIP) consists of four action areas: energy, water, mobility, and electric vehicles.

Christine Tam, Senior Resource Planner, indicated the S/CAP contains many assumptions about actions needed to reach the goal of an 80% reduction in GHG emissions by 2030. EV adoption and building electrification account for more than 98% of the assumed GHG reduction needed to meet the 80 by '30 goal. To meet the goals, 90% of residents' vehicles and 50% of commuters' vehicles will need to be electric. With respect to building electrification, the primary sources of GHG emissions are water heaters, space heaters, and stoves/ovens.

Rupert continued the presentation, stating staff across the organization is making a tremendous effort to implement the EV SIP. The first action is to publicize streamlined permitting and CPAU-funded transformer upgrades. These are policy reviews and procedure streamlining. The second action is to consider EV readiness and charger installation in existing buildings. Because of the challenges with retrofitting buildings, staff is providing education and reviewing incentives. The third action is to evaluate programs to expand EV charger deployment on private property. Twenty-eight applications have been submitted for LCFS funding to install EV chargers in low-income multiunit dwellings and nonprofits. At the end of the first quarter of 2019, seven sites have received rebates.

In response to Chair Danaher's question regarding the length of time required to process an application, Rupert reported the application process can take 6-12 months to complete.

In answer to Vice Chair Forssell's request for an explanation of parking requirements and minimum parking, Rupert referred Commissioners to the City website because parking requirements are complex and involve State mandates.

In reply to Commissioner Segal's inquiry regarding a City requirement for new construction to allocate sufficient space for EV parking, Tam indicated currently Palo Alto has probably the most rigorous requirements for EV-ready parking spaces for multifamily and commercial buildings.

In answer to Commissioner Scharff's query regarding the loss of parking spaces due to installation of an EV charging space, Dean Batchelor, Utilities Director, explained the loss of a parking space occurs because a full-time parking space is converted to an EV charging space with a 3-4 hour time limit. As a charging space, the parking space is not available to non-EVs. Commissioner Scharff requested clarification of the regulations for conversion of a parking space to an EV charging space when a building is over-parked. Abendschein disclosed that a single EV charging space has to be striped as an ADA space so that regular and accessible vehicles can utilize the space. Converting a normal-sized parking space to an ADA space when a building is minimally

parked causes the loss of one parking space, which results in the building not being in compliance with parking regulations. An over-parked property can install an EV charging space because the building can lose a parking space and still be in compliance with parking requirements. Some multifamily buildings have installed chargers. The Planning and Building Departments are addressing this issue. Rupert added that the issue has been presented to the Planning and Transportation Commission, who is also reviewing the issue.

In response to Councilmember DuBois' question regarding an EV parking in an ADA space, Abendschein clarified that there are dedicated ADA spaces and EV spaces. The EV space has to be ADA accessible, which means a larger than usual space and the loss of a parking space.

In reply to Commissioner Smith's queries regarding a breakdown of the type of buildings that have applied for an EV charging space and a way to fast track applications for existing buildings, Rupert advised that she did not have a breakdown of applications by building type. Developing a fast track for applications will require interdepartmental collaboration.

Rupert further reported the fourth action is building public and private infrastructure. By 2020, Palo Alto residents are anticipated to own 4,000-6,000 EVs. Building public infrastructure is important to support the goals for EV adoption. Staff has some infrastructure projects in the pipeline, such as additional Level 2 chargers and installation of 26 ports or an additional 13 chargers in City garages. Staff is also talking with Tesla about super chargers and with Electrify America regarding DC fast chargers. With respect to a conflict between the EV policy and the mobility policy, the goal is to reduce the number of cars. If driving is the only option for people, staff prefers they drive an EV. The fifth action is to expand EV deployment in the City fleet. Staff has reviewed a five-year replacement strategy and identified 17 vehicles that could be replaced with EVs. The sixth action is to support regional EV group-buy programs, which have been moderately successful. This action does not have a high priority. The seventh action is engaging community members and building public awareness of EV options. The City partners with Acterra to sponsor ride-and-drive events. The FAQ pages on the CPAU website have been updated to provide EV information. The eighth action is to seek ways to collaborate with other electrification efforts. The goal of the EV infographic is to tell the EV story in an easy and fun way so that folks can engage with it. There was an estimated 4,000 EVs in Palo Alto at the end of 2018, and 29% of new car sales in Palo Alto are EVs.

In answer to Chair Danaher's query regarding the 4,000 EVs including hybrid vehicles, Rupert believed the 4,000 EVs do not include hybrids.

Rupert further stated Palo Alto has 2.5 times more EVs in 2018 than in 2014. Challenges for staff are determining the right metrics for GHG reductions, technology outpacing City policies and regulations, and competing priorities.

Tam continued the presentation, stating within the Energy SIP framework, staff looks at energy efficiency and building electrification as the key areas. The City has adopted ten-year energy efficiency targets, and staff will continue to pursue cost-effective energy efficiency programs and mandates. A variety of tools is available to facilitate the electrification process in residences. Staff is reviewing whether to exceed State requirements in the next Building Code cycle in order to obtain additional energy efficiency savings and building electrification beyond 2020. . Staff is developing voluntary programs and technical assistance programs that can result in additional energy savings and electrification beyond 2020. Construction of a replacement facility for the sludge incinerator is complete. As a transitional measure, the City has purchased carbon offsets to match natural gas emissions from the City's consumption of natural gas. The City has a variety of tools, from education and outreach to customers to pilot programs, to facilitate the adoption of electrification. The current Building Code encourages all-electric new construction. Staff will explore mandating clean technologies and the needs of the low-income community and hard-to-reach customers. Staff is aware of the barriers customers face. Staff needs to work with neighbors in the Bay Area to drive market and supply chain transformation. Staff launched a heat pump water heater rebate pilot program three years ago but has not seen a lot of uptake. Consequently, staff is attempting to collaborate with

communities in the Bay Area to discount the cost of heat pump water heaters. Staff is working closely with Development Services to push for mandates and incentives in the Code to encourage efficiency and electrification. On Earth Day, staff launched an induction cooktop loaner program. The multifamily gas furnace to heat pump retrofit pilot program is funded by grants from the Bay Area Air Quality Management District. Staff is currently searching for multifamily buildings, primarily low-income housing, to convert gas furnaces to heat pumps. A survey of residents found about 25% are familiar with a heat pump water heater. Customers view natural gas as a cheap and clean energy source. Currently, there is little State and Federal funding to support building electrification. Heat pump technology for small commercial buildings and residential homes is very good. For commercial buildings over 100,000 square feet, the technology is not mature.

In reply to Commissioner Johnston's questions regarding encouraging more office buildings to install EV chargers in their parking lots and barriers to additional EV adoption, Rupert explained that the City has not promoted destination charging in the private sector or workplaces. Outreach to the private sector is an action item, but it has low priority because of the focus on multiunit dwellings and nonprofits. Tam reported responses to the residential survey indicate renters do not purchase EVs because they do not have a convenient charger. Abendschein added that large commercial customers are installing chargers based on employee demand. Staff has a meeting with facility managers regarding EV chargers.

Commissioner Scharff questioned the effect of PG&E's public safety power outages on fleet EVs. Rural communities are concerned about electrification because of the potential for electrical outages. Commissioner Scharff indicated he had heard someone from the State speak at a conference about hydrogen fuel cells being equal to EVs.

Chair Danaher remarked that 20,000 EVs will represent a huge part of the electricity load in the City. The EVs should be networked so that the charging rates can be controlled. Staff needs to ensure that EV chargers are future-proofed.

Councilmember DuBois suggested branding Palo Alto as the EV capital, challenging other cities to beat Palo Alto's adoption rate, thinking about eliminating gas stations because of the high rate of EV adoption in Palo Alto.

ACTION: None

ITEM 3: ACTION: Discussion of Electric Supply Carbon Accounting Methodology and RPS Compliance Strategy. Bret Andersen believed staff needs to get the numbers right and needs to be honest about offsets and carbon neutrality. The assumed natural gas leakage rate is 5%, which means the carbon footprint for buildings is two to three times greater than it is believed to be. The City needs to start accounting for the cost of carbon and using that cost in promotional and incentive programs for electrification.

Tom Kabat related that staff could incorporate the fugitive emissions CO_2 equivalent into promotions for heat pumps. Using a 20-year timeline rather than a 100-year timeline is vital.

Jim Stack, Senior Resource Planner, reported many financial implications are associated with changing the City's RPS compliance strategy. Month by month, CPAU has excess supply in the spring and summer from hydroelectric and solar power and deficit supply in the winter months. On an hourly basis, CPAU has large surpluses in July, especially in the evening hours when hydroelectric power is dispatched, and deficits in all hours in the winter. Over the past six to seven years, the grid has changed dramatically. Oftentimes, the carbon intensity of the grid is very low during the middle of the day due to solar generation and very dirty in the evening hours due to natural gas generation. The current approach to carbon accounting is a simple annual accounting method. Staff determines the load over the course of a year and the total carbon neutral supply. If they match, staff considers the utility carbon neutral. The more accurate approach is an hour-by-hour basis, which looks at the net surplus or deficit of resources compared to load and weights those amounts

by the carbon intensity of the grid at that point in time. Another dimension is whether unbundled Renewable Energy Certificates (RECs) are considered carbon neutral. Beginning in 2020, CPAU has to report in its Power Content Label (PCL) the average emissions associated with the supply portfolio. The state will not consider unbundled RECs to be carbon neutral. Currently, CPAU tends to have surplus resources during the spring and summer evening hours when the grid electricity is the dirtiest. By dispatching those resources to maximize their value, CPAU displaces a lot of carbon from the grid. For 2018, the total carbon emissions for the portfolio was about 16,000 metric tonnes (mT).

In answer to Commissioner Segal's question about negative carbon emissions, Stack explained when CPAU has a surplus of supplies compared to load, CPAU is putting more resources onto the grid than taking out of the grid. Staff weights those resources by the carbon intensity of the grid at that period in time. If CPAU has 100 megawatt hours (MWh) of extra supply resources and the carbon intensity of the grid is 10 pounds per MWh, CPAU is displacing 1,000 pounds of carbon. Lena Perkins, Acting Senior Resource Planner, added that CPAU's resources are showing up in the dirtiest times of the grid and CPAU's load is distributed in relatively clean times of the grid. This methodology was recently re-validated by a Stanford University study using the same methodology and declaring the same result. Jonathan Abendschein, Assistant Director of Resources Management, clarified that the physics of electricity require the amount consumed to equal the amount generated. If CPAU generates extra solar power, electricity from a gas-fired plant has to be reduced. If CPAU generates 10% more renewables over the course of a year than load, there's a chance CPAU will end up negative. Perkins indicated it only works in the context of a broader grid.

Stack continued his presentation, stating without unbundled RECs, CPAU's portfolio would be responsible for about 1,600 mT of CO_2 using the annual approach. With an hourly approach, it's about 17,000 mT.

In reply to Commissioner Scharff's inquiry regarding marginal emissions and average emissions, Stack suggested Commissioners think of marginal emissions as the last unit of generation that is brought online to meet an additional unit of demand. The last unit tends to be the dirtiest unit on the grid. On an average basis, all the renewables, which tend not to be the last unit, are lumped in. On an average basis, the average emission factors are lower while the marginal emission factors are higher. CPAU's portfolio looks better under the marginal emissions factors because a lot of its hydroelectric generation is dispatched in the periods when marginal emissions factors are extremely high. In response to Commissioner Scharff's query regarding marginal emissions factors not being the right methodology, Stack advised that CPAU is a small part of the overall grid. If every utility in the state applied the marginal emissions factors to their entire loads, the end result would not equal the total emissions statewide. It has to be an average basis. Abendschein added that staff would continue to talk about marginal emissions in the context of coaching individuals to use electricity. The average emissions methodology gradually pushes staff to do the right thing with CPAU's portfolio. With marginal emissions, the portfolio can change quickly from good to bad such that staff does not have enough lead time to make good portfolio decisions.

Stack further reported CPAU is currently using unbundled RECs from out-of-state generation to abate emissions. Other methods to abate emissions are carbon offsets, carbon allowances, and bundled RECs from instate renewable energy. Given the disparity of prices, it is reasonable to ask are unbundled RECs legitimate if they cost so little. There is an ongoing philosophical and academic discussion on that topic. Staff thinks unbundled RECs are legitimate instruments and have some concrete carbon-reduction value. The question, though, is whether additionality is associated with the purchases. In other words, do they incentivize new levels of generation to be built in out-of-state regions? On the margins, they do create some incentive. Also, they make it cheaper for states to increase their RPS policies.

Chair Danaher noted the additionality argument also applies to bundled RECs, but that argument is faulty. Stack indicated the state has imposed limits on the number of unbundled RECs that can be used for compliance purposes. Abendschein added that staff is struggling with public perception. Some people do not believe the arguments. Staff wants to get a sense of the environmental community's thoughts about a position like this. The instinct is to look at the renewable portfolio and want to point to specific sources of

supply coming to Palo Alto, but the arguments say look only at carbon and get the best carbon impact possible no matter where the energy comes from. It is a logical approach but difficult to explain. If environmental stakeholders say CPAU is greenwashing, the purchase of unbundled RECs could be problematic for public perception. Staff needs to look into that before making any firm decision on RPS compliance.

Vice Chair Forssell wanted to understand the bill impact for customers.

Commissioner Scharff commented that he always thought CPAU should move away from RECs, but now he is hearing that unbundled RECs may be superior. Stack reiterated that there is a lot of debate, but staff thinks unbundled RECs are viable. Commissioner Scharff stated buying brown power and unbundled RECs to offset the brown power would make CPAU carbon neutral. Yet, staff seemed to be saying it is not okay to use natural gas and carbon offsets. Those seem to conflict. Chair Danaher agreed the two do conflict. Staff is responding to the S/CAP. In fact, the UAC should be looking at the lowest cost method to reach carbon neutral. Maybe the S/CAP targets need to be reformulated.

In answer to Commissioner Scharff's inquiry regarding the effect of selling renewables and moving toward carbon offsets or RECs on the S/CAP, Abendschein explained that CPAU has added a lot of renewable energy to the grid. Now, CPAU is trading between resources. For building energy use, if staff buys offsets and considers it complete, long-term hard work will be needed to reduce natural gas use. Staff has not done that work yet. Saving money on the electric side and using those savings to fund other sustainability efforts is moving CPAU forward. Relying solely on carbon offsets does not affect the actions needed to reach the 80 by '30 goal. Perkins added that the RECs are only on the western interconnect. There is an imbalance market looking to be rolled into a day-ahead energy market. The greenness of unbundled RECs versus bundled RECs is not the right question. If they're close, Staff has to consider whether bundled RECs have 15 times the carbon impact.

Stack continued the presentation, stating using an hourly accounting, the portfolio in 2018 had about 17,000 mT of emissions to abate. Using unbundled RECs, it would cost about $62,000. Using offsets, it would cost about $250,000.

In reply to Commissioner Johnston's inquiry about translating that to a percentage of rates or dollars per month, Abendschein indicated an ongoing $1.5-$1.7 million cost equals a 1% increase in rates.

Stack further reported CPAU first adopted an RPS target in 2002. SB 100 gives utilities with large amounts of old, large hydroelectric in their portfolios an exemption to come in below the RPS requirement level. CPAU has to achieve an RPS level that is the lesser of the regular limit and the amount of load not supplied by old, large hydroelectric.

Commissioner Scharff noted the City lobbied strongly for that provision and achieved its inclusion in SB 100 because Palo Alto was viewed as doing the right thing for the environment.

Stack continued, stating in 2019 CPAU's RPS requirement is 31%, but the portfolio is roughly double that, resulting in a large surplus. The current approach to comply with the RPS requirement is to exceed the RPS requirement with all instate resources. Staff could choose lower-cost options. Staff could sell some resources that exceed load. Because CPAU's load has been declining, CPAU has more resources overall in an average hydroelectric year than load. Staff could sell everything that exceeds the RPS requirement.

In response to Chair Danaher's question about staff already selling excess, Stack advised that Staff could sell the portion that exceeds load. Right now, roughly 110% of CPAU's load is in total hydroelectric plus renewables, so staff could sell 10% or everything above the RPS requirement, which would be 30%. Under RPS law, CPAU is allowed to satisfy 10% of the RPS requirement using unbundled out-of-state RECs. Staff could sell some of CPAU's instate bundled resources and swap them for cheaper out-of-state unbundled RECs. CPAU has been exceeding its RPS requirement for almost ten years. Every year that CPAU has exceeded

the RPS requirement, staff has been saving the excess for a total of about 1.2 million RECs. Staff could sell all of CPAU's RPS resources for the next four years and rely on the saved RECs. On the increasing cost side, staff could sell some resources like solar that produces a lot in the summer and replace it with geothermal that produces in a baseload pattern. Staff could try to be carbon neutral every hour of the year, but that would involve selling a lot of solar, buying a lot of baseload renewables, and dispatching hydroelectric resources to match load rather than to obtain the most value. Staff does not recommend that approach. Going to a carbon neutral every hour approach would cost $6-$10 million per year. Bucket swapping would be a $500,000 per year opportunity. Using saved RECs between now and 2030 would result in an approximate $2 million savings. Selling all supply exceeding the RPS requirement is a minimal compliance strategy. A minimal compliance strategy would result in a $5-$7 million per year savings.

In answer to Commissioner Johnston's query about using the banked RECs instead of buying new RECs, Stack disclosed that staff would sell Bucket 1 resources and buy market power.

In response to Commissioner Scharff's inquiry about the price of banked RECs, Stack reported the banked RECs are worth essentially the same as a Bucket 1 REC. CPAU does not lose any value by banking RECs.

Stack continued his presentation, stating in 2020 under a minimal compliance strategy, CPAU could save about $7 million in supply costs with an RPS level of about 21%. In terms of carbon, the current portfolio under an hourly accounting method would result in negative 45,000 mT of CO_2 emissions. If CPAU changed to a minimal compliance approach, it would have a portfolio responsible for positive 114,000 mT of CO_2 emissions. Mitigating the 114,000 mT of emissions would require purchasing Bucket 3 RECs or another strategy. If staff purchased Bucket 3 RECs, there would be a cost of about $400,000 to mitigate those emissions, compared to a $7.4 million savings from selling Bucket 1 RECs.

In answer to Commissioner Scharff's question of whether the strategy would be to sell Bucket 1 RECs and purchase Bucket 3 RECs, Stack responded correct. That is the minimal compliance or the least cost approach.

Stack further reported if staff sold all resources greater than the RPS requirement, customers would see some unspecified market power purchases on the PCL. If staff used the minimal compliance approach, almost a quarter of supply would be from market purchases.

In reply to Vice Chair Forssell's question about bucket swapping introducing a market power slide to the PCL, Stack answered yes.

Stack continued the presentation, stating a $7 million net savings would result in a 4-5% rate reduction. Staff could retain the $7 million and defer rate increases for a number of years. Staff could use the funds for sustainability initiatives. Another factor to consider is customer perception of these options.

In reply to Commissioner Smith's inquiry of whether the graph included banked RECs in each year and whether the graph should show zero banked RECs in 2030, Stack advised that the graph includes RECs banked each year. The final banked RECs would be sold in 2030; therefore, 2031 would show zero banked records.

Stack further reported as existing contracts expire, CPAU has less surplus to sell. As the RPS level increases, there is less headroom.

In response to Commissioner Smith's query about reducing electric demand to the point that banked RECs would not be needed, Stack related that reducing demand would provide additional RECs that could be sold. Chair Danaher noted past analyses indicated the increase in EV adoption would offset the decreases in other consumption. The UAC did not expect a reduction in the overall load. In answer to Commissioner Smith's question about spending the $7 million savings to increase EV infrastructure, Stack indicated that is one possibility. Staff is forecasting a decrease in overall load because of efficiency and behind-the-meter solar exceeding the gains from EV load.

Commissioner Scharff commented that the decreasing load will increase rates for consumers. Perkins added that industrial customers are leaving the service area as well. Commissioner Scharff stated industrial customers are moving because Santa Clara's electric rates are substantially less than CPAU's electric rates.

Stack further reported staff will return with another discussion and a recommendation. Staff will seek Council approval of a change in the carbon accounting methodology because it is part of the Carbon Neutral Plan. The RPS compliance strategy is a significant shift, so staff wanted the Council's feedback on it as well. Staff could begin selling some resources in 2019, but 2020 is more likely. In the next nine months, staff will also provide the UAC with reports regarding the new 30-year Western Base Resource contract.

In reply to Commissioner Segal's inquiry regarding the impact of renewing the contract on the exemption for the RPS level requirement, Stack indicated a new hydroelectric contact would not be exempt. Renewing an existing contract would be exempt. In response to Commissioner Segal's question of whether the $7 million savings could purchase sufficient storage to offset the need to purchase some RECs, Stack advised that the savings would fund a significant storage installation that staff could use to shift generation around to reduce carbon. Perkins added that in terms of City impacts, the savings would have the greatest impact on transportation, whether mobility or EVs. In answer to Commissioner Segal's query about wind power in the first slide, Stack disclosed that CPAU has one contract expiring at the end of 2021 and another in 2028. If the Western contract is reduced or eliminated, staff might replace it with wind power.

In response to Chair Danaher's question regarding distinguishing the environmental value of Bucket 1 RECs from Bucket 3 RECs, Perkins explained that the maximum Bucket 3 RECs staff could procure for RPS compliance is 10%. Staff is already dealing with an artificially constrained market. Bucket 1 RECs are increasing in price. The price for Bucket 3 RECs is flat or decreasing. Study papers indicate by optimizing over a larger area, there is no net leakage of carbon on the WECC (Western Electricity Coordinating Council) and the prices are lower for everyone. Abendschein added that one of the countervailing arguments concerns additionality. The fact that there is not much of a liquid market for Bucket 1 RECs means generally the requirement forces utilities to enter into a long-term Power Purchase Agreement, which most people agree is instrumental in adding renewable energy to the grid. The countervailing argument applies when utilities buy Bucket 3 RECs that may come from established projects. There's an argument to be made that Palo Alto has done its work on additionality. If environmental groups look carefully at those arguments and are concerned about CPAU's portfolio, staff would be in a position to make that argument.

Commissioner Scharff viewed this as a huge change in Palo Alto's direction. Saving $7 million a year over ten years is a large number, but it does not feel right to tell people CPAU is carbon free. If big hydroelectric was considered renewable, CPAU would tell everyone it was 100% renewable. Chair Danaher related that under the hourly accounting methodology, CPAU is not carbon neutral during large periods of time. Commissioner Scharff remarked that staff could buy more renewables to cover that. Vice Chair Forssell understood under carbon-neutral hourly, CPAU would be an island and not part of the grid, which is different than using hourly average accounting, which is still in the context of the grid. Commissioner Scharff asked if CPAU would be carbon free under the hourly accounting method and as part of the grid.

In response to Vice Chair Forssell's request for the meaning of minimally RPS compliant, Stack explained that under the current Council-approved definition, CPAU could be considered carbon neutral by buying Bucket 3 RECs. To the extent CPAU has market purchases that show up in the PCL, CPAU could buy additional Bucket 3 RECs and still be considered carbon neutral under the minimally compliant approach. Vice Chair Forssell inquired whether anyone is suggesting a change in Palo Alto's established definition of carbon neutral, to which Stack replied no. Commissioner Scharff asked if the definition would be revised to be more granular. Chair Danaher viewed it as two problems: the amount of emissions determined by the accounting methodology and requiring the purchase of offsets or credits, and the source of the offsets or credits. Commissioner Scharff viewed it as CPAU striving to have 50% renewables and 50% hydroelectric. Because of

the vagaries of the market, sometimes CPAU has to offset emissions with RECs. Commissioner Johnston interpreted the discussion as whether to move away from the traditional strategy.

In reply to Commissioner Scharff's statement that he did not have sufficient information, Abendschein advised that staff needs to have an internal discussion to frame recommendations for the UAC. Staff also needs to follow up on some studies that have some promising positive support for the concepts discussed and that staff might use to frame the arguments. In addition, Abendschein wanted to talk with environmental stakeholders about these concepts and get their initial reactions. It might make sense to provide customers with a carbon-neutral hourly portfolio if it is important and intuitive to the customers and if customers are willing to pay extra.

Commissioner Smith suggested staff provide the UAC with past Council direction to frame the discussion in the perspective of a goal. Stack reported in 2013 the objective was to rely on RECs until CPAU built some hard resources and then in 2016 or so rely on half of supply from instate hard resources through long-term contracts for renewables and half from hydroelectric. In reply to Commissioner Smith's inquiry regarding additional hydroelectric supplies coming online, Stack indicated there are no new hydroelectric resources coming online. Staff recently learned about some hydroelectric resources that are coming off contracts with other utilities and that CPAU might pick up. In response to Commissioner Smith's concern about maintaining 50% hydroelectric if demand increases, Stack disclosed that current renewables contracts are just as low as the hydroelectric contract.

Commissioner Jackson suggested creating a rate plan for homeowners who convert to all electric if CPAU realized the $7 million savings. Perkins reported lowering rates by 5% is incentivizing electrification and EVs.

In response to Vice Chair Forssell's query regarding the City's internal RPS target, Stack clarified that the City's target is currently the same as the State's target. CPAU initially had a target higher than the State's target, but the State has caught up. Vice Chair Forssell asked if a minimal RPS requirement would be 29% renewable, as much hydroelectric as possible, and buying either offsets or allowances or using banked RECs, to which Stack replied that is correct for 2018 when the RPS requirement was 29%. Perkins clarified that the RPS level is the percentage of the portfolio comprised of eligible renewables in one year. That is different from the RPS minimum set by the State. Stack noted the RPS requirement is different from the amount achieved each year. Vice Chair Forssell remarked that minimally compliant would be selling the excess instead of generating 60% renewable power from projects.

Chair Danaher indicated combining that with the RPS compliance complicates the issue quite a bit. Disassociating the two issues would be helpful. Bucket 3 RECs may be a cheaper way to abate the additional 17,000 mT calculated under the more exacting standard in order to maintain carbon neutrality. He requested staff provide for the next meeting information regarding what CPAU does with RECs now and how CPAU accounts for the shortfall when purchasing RECs.

In answer to Commissioner Segal's inquiry regarding limitations on the contents of the PCL, Stack reported staff cannot change anything on the PCL. Staff inserts the values, and the PCL shows the portfolio equals so many pounds per MWh of carbon emissions over the course of the year.

Dean Batchelor, Utilities Director, advised that staff will return in August with a continued discussion but no action for the topic.

ACTION: None

ITEM 4: DISCUSSION: Discussion of Natural Gas Leakage from the City of Palo Alto's Gas Distribution System. David Coale commented that leakage can double the impact of GHG effects from natural gas, which would make it about the same as burning coal. The global warming potential of methane should be 86 times CO_2

because it should be taken in the 20-year timeframe rather than the 100-year timeframe. The City accounts for transmission losses across the entire electricity grid but only within the City for natural gas transmission.

Tom Kabat explained that a REC is a rigorously tracked attribute from a project that is hard metered and tracked by an accounting system into accounts. An offset is a counter-factual calculation of what someone would have done if had had not been paid not to do what he would have done. CPAU should use the 20-year timeframe because it gives the larger effect of fugitive emissions. About 25% of current global emissions needs to be removed from the atmosphere at a cost of more than $100 per ton. Avoiding emissions now is worth a cost of $100 per ton.

Bret Andersen expressed concern about where the huge emission number will be reported. The City's carbon footprint does not show fugitive emissions. Staff should call out the emission number in planning and in the City's footprint for natural gas use.

Jonathan Abendschein, Assistant Director of Resource Management, reported the item was prompted by a question from Vice Chair Forssell about the amount of leakage from Palo Alto's gas distribution system. Staff does not know for sure. A 2012 study to determine whether CPAU needed to report estimated gas leakage to the Environmental Protection Agency (EPA) calculated about 4,700 mT of carbon was being emitted due to leakage and oxidization on CPAU's system. The calculation used many nationwide assumptions; therefore, it is not necessarily specific to Palo Alto. The amount is a small number relative to total emissions, which are in the range of 150,000 to 160,000 mT. A second method for calculating gas leakage is the difference between meter readings from the four stations where CPAU takes gas from PG&E's system and the total sales CPAU meters over the same period of time. The difference between the two is 1.5% to 3%. Metering is an imprecise science. A 2% measuring error is the standard for a meter in the field. Not all of the 1.5% to 3% is released into the atmosphere, but the amount released into the atmosphere is an open question and would require further study. The City does more than the Department of Transportation (DOT) requires to repair and search for leaks. Therefore, Abendschein assumed the actual emissions to the atmosphere are lower than many other utilities.

Commissioner Segal supported estimating methane emissions at the 20-year level rather than the 100-year level. Understanding the impact of upgrading the most vulnerable pipes on reducing emissions and on the cost to reduce emissions would be interesting. Dean Batchelor, Utilities Director, advised that the oldest gas pipes are replaced after leak surveys are conducted. Approximately 45 miles of PVC pipe remain in the City, and they will be replaced over the next five to seven years with high-density gas pipe.

In response to Chair Danaher's question about PG&E tracking or estimating leakage from its system, Abendschein indicated he could obtain the information as PG&E is mandated to report it to the California Air Resources Board (CARB).

Vice Chair Forssell concurred with using a 20-year time horizon. She had raised the issue with the thought to expand the Green Gas program to offset fugitive emissions as well. However, the electric portfolio should be prioritized over gas emissions.

Batchelor indicated he will place gas emissions on the list of items for a future agenda and return before the end of the year for a discussion.

In reply to Commissioner Smith's query about staff anticipating another 1% decrease over the five to seven years it will take to replace PVC pipes, Batchelor answered yes. When the ground moves, the joints of the PVC pipes leak gas. CPAU does not have the normal leakage rate because the pressure on the PVC pipe is lower than other utilities use.

ACTION: None

ITEM 5: DISCUSSION: Discussion and Update on Fiber and AMI Planning.
Dean Batchelor, Utilities Director, reported staff will present a fiber update to the Council on June 24. The update will include reissuing a Request for Proposals (RFP) and perhaps a new scope of work. In November, the Council approved Automated Metering Infrastructure (AMI). Staff wants to build fiber to the collectors for AMI so that the response to outages is faster. Hopefully, staff will return to the Council in October with a contract award and start work at the first of 2020.

In reply to Commissioner Smith's query about a dig once policy, Batchelor explained that all projects for electrical upgrades include installation of fiber conduit.

In response to Commissioner Jackson's inquiry about the UAC reviewing the RFP before it is released, Batchelor indicated he will forward it to the UAC.

ACTION: None

ITEM 6: DISCUSSION: Discussion and Status of Water Leak Bill Credits.
Dean Batchelor, Utilities Director, reported staff added $25,000 to the budget for a total of $75,000. Currently, credits total approximately $59,000 for 131 customers. The average rebate is about $373 for water credits and irrigation repairs. The maximum credit allowed is $2,500, but requests for credits have not been that high.

ACTION: None

ITEM 7: ACTION: Selection of Potential Topic(s) for Discussion at Future UAC Meeting.
Chair Danaher noted an additional discussion of RPS strategy will be scheduled for the August meeting.

In response to Commissioner Johnston's question regarding the ordinance for neighborhoods that want to underground all utility equipment, Dean Batchelor, Utilities Director, advised that the item will be presented to Council in June or August. He will provide an update to the UAC after the Council meeting.

ACTION: None

NEXT SCHEDULED MEETING: August 7, 2019

Meeting adjourned at 10:08 p.m.

Respectfully Submitted
Tabatha Boatwright
City of Palo Alto Utilities