

MEMORANDUM

TO: UTILITIES ADVISORY COMMISSION

FROM: UTILITIES DEPARTMENT

DATE: JUNE 7, 2017

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SUBJECT: Staff Recommendation that the Utilities Advisory Commission Recommend that the City Council Approve Community Solar Preliminary Program Design Elements and Feedback on Application of Design Elements for a Solar Photovoltaic Project at the Municipal Golf Course Parking Lot

RECOMMENDATION

Staff recommends that the Utility Advisory Commission (UAC) recommend that the City Council approve a set of preliminary Community Solar (“Co-Solar”) program design elements to guide staff as it develops the City’s Co-Solar program (Attachment A).

EXECUTIVE SUMMARY

City of Palo Alto Utilities (CPAU) has promoted solar photovoltaic (PV) and other environmental stewardship programs within the Palo Alto community for over two decades. As such, CPAU is well positioned to take on a leadership role in developing a Community Solar (“Co-Solar”) Program for the benefit of community members for which rooftop solar PV is not feasible. The last attempt to start a Co-Solar program involved negotiation with a third party vendor, and staff terminated this effort due to inability to reach agreement on issues of customer risk mitigation and program transparency. Staff is now proposing that CPAU take on a central role in developing Co-Solar.

Staff is seeking approval of preliminary design elements of a Co-Solar program including site selection, cost and value proposition to participating customers, funding sources, and ways to minimize the risk to non-participating electric utility customers. These program elements would provide a framework for more fully developing a specific program for future UAC consideration and Council approval.

Staff anticipates issuing a Request for Proposal for a solar PV carport project development at golf course parking lot in the summer of 2017, seeking participating customer (“co-solar customers”) pre-commitment by spring of 2018 and returning to UAC and Council for approval in the summer of 2018, with final implementation planned by spring of 2019. Upon successful completion of the first Co-Solar project, successive sites will be developed based on demand for such projects from potential participants.

BACKGROUND

Community Aspirations for Local Solar

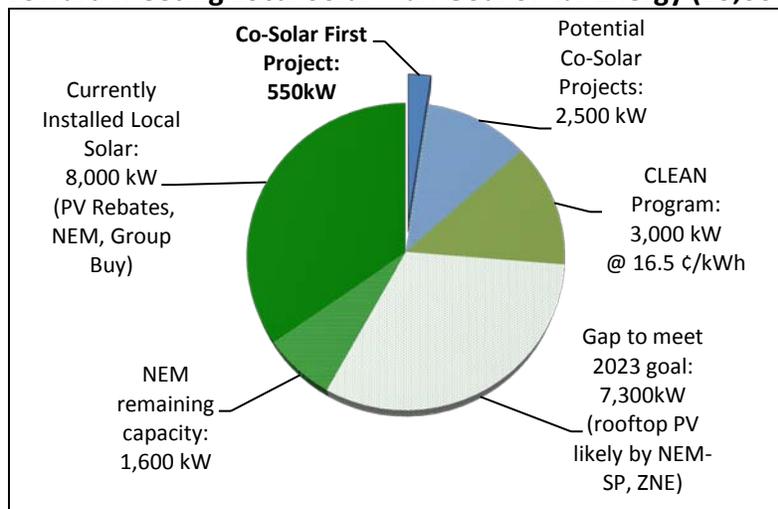
The City of Palo Alto (City) has been a leader in facilitating local solar PV electric generation systems development. Over the past two decades, approximately 1,000 rooftop solar systems

have been installed (8,000 kW capacity), providing about 1% of the Palo Alto community's electrical energy needs.

In April 2014, the Council adopted the Local Solar Plan, which set the overarching goal of meeting 4% of Palo Alto's energy needs from local solar by 2023 (Staff Report 4608, [Resolution 9402](#)). This is equivalent to developing 23,000 kW of local solar capacity by 2023. *Community Solar* is one of the new programs proposed under the Local Solar Plan.¹ It has the potential to enable significantly more residents and businesses to experience and derive the benefits from local solar deployment, even if they are unable to install solar at their own premises. Palo Alto has a number of customers who may find this attractive, including a large percentage of renters, a sizable fraction of residents living in multi-family homes, and an extensive urban tree canopy that shades numerous residential and commercial rooftops. A community solar program would give these customers an opportunity, for the first time, to get their energy from local solar.

Figure 1 below represents a forecast of total installed local solar capacity in 2023 and the programs expected to generate that installed capacity, including the Palo Alto CLEAN program (feed-in tariff), the Net Energy Metering (NEM) current and successor tariff and other new policy initiatives like Zero Net Energy (ZNE) buildings.²

Figure 1: Progress Toward Meeting Local Solar Plan Goal of 4% Energy (23,000 kW) by 2023



Lessons Learned from Prior Attempt at Developing Co-Solar based on a Third Party Turnkey Design

CPAU staff worked with a third-party vendor in 2014 and 2015 in an attempt to launch Co-Solar. The program design called for a turnkey approach, where the private sector vendor would both develop the solar project and contract with CPAU customers to receive PV project electricity generation. However, transparency and customer risk mitigation challenges made the turnkey approach infeasible in Palo Alto.³ The participant agreements between the third-party vendor and the program participant did not meet CPAU's requirements for maintaining transparency in the

¹ Community solar is defined as “a solar-electric system that, through a voluntary program, provides power and/or financial benefit to, or is owned by, multiple community members”. Refer - [A Guide to Community Solar: Utility, Private, and Non-profit Project Development, U.S. DOE and Solar America Communities Report.](#)

² See CPAU website for details on [Palo Alto Solar Programs](#)

³ Informational Report to Council: [Community Solar Program Development Update and Redirection of Efforts](#), Aug 2015

contractual arrangement. Other challenges identified at the time included finding a host site for the solar system, challenges in communicating and marketing the program, and managing the balance of risk between CPAU and the program participants.

Industry Trends in Developing Community Solar & Value of Co-Solar in Palo Alto

Community solar offerings are increasing throughout the country, with smaller utilities and rural electric cooperatives being at the forefront of this transformation.⁴ These programs also tend to have the local electric utility playing a central role in project development and customer recruitment for the program. Having promoted a variety of environmental stewardship initiatives within the community, CPAU is well positioned to take a lead in developing Co-Solar. Providing local solar access to all interested customers would also provide greater community benefits such as the opportunity to showcase local solar generation, educational information for children, and greater local resiliency. The Council has recognized the value of local renewable sources as compared to energy purchases outside Palo Alto, including:

- reduction in CPAU's costs and energy losses associated with energy transmission and distribution,
- a reduction in CPAU's capacity requirements,
- keeping a portion of CPAU's electric expenditures within the community, and
- reducing the environmental impacts of the electric system and improving reliability in transmission-constrained regions like the Greater Bay Area.⁵

Co-Solar provides a cost-competitive way to deploy local renewables while providing customers a choice to "go solar". The cost of developing and installing the community solar facilities could be lower than developing and installing smaller systems on individual customer roofs.⁶ Moreover, optimal community solar program design ensures fair and reasonable cost allocation between participating and non-participating customers.

DISCUSSION

Staff is seeking UAC and Council approval of preliminary Co-Solar program design elements that address site selection, cost and value proposition to program participants, and CPAU's role in the program development, implementation, and administration. The proposed five (5) elements will provide a framework for staff to evaluate and develop local sites for Co-Solar projects and to assess customer interest in participating in the program. Staff may seek exceptions or propose modification to these design elements from the Council while fully developing and offering each Co-Solar project.

In summary, Co-Solar projects are anticipated to be developed and owned by third parties on City owned or privately owned land, with CPAU contracting for energy generated and in turn selling this energy to customers who value locally generated solar power. If the site is City owned, the land will be leased from the City to develop the project. The initially identified PV project at the golf course has the potential to serve 100 to 200 customers and serve 0.1% of Palo Alto's energy

⁴ GTM Research, [U.S. Community Solar Outlook 2017](#)

⁵ Refer : [Resolution for Palo Alto CLEAN program](#)

⁶ This trend is true for most regions in the country but could be challenging in Palo Alto due to limited land availability for developing community solar projects.

needs. If the initial Co-Solar project proves successful, subsequent projects would target to meet 0.5% of the community’s energy needs and serve up to 1,000 customers by 2023.

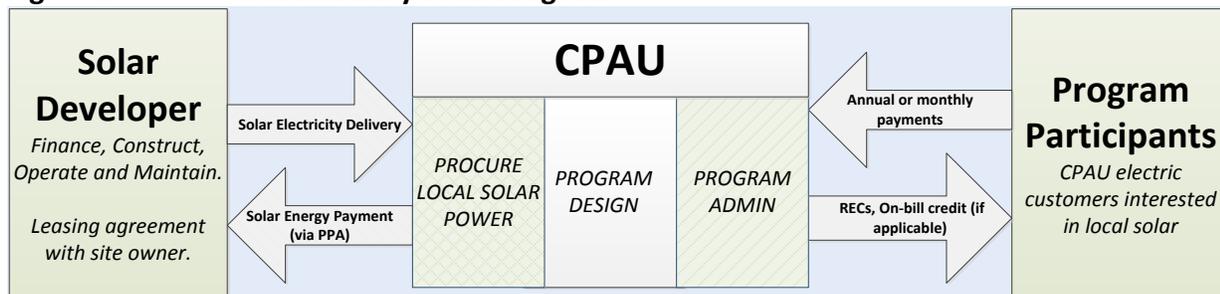
Community Solar Program Preliminary Design Elements

Element 1: CPAU’s Role in Program Development and Management

Figure 1, below, illustrates the proposed CPAU role in developing and managing Co-Solar. Staff is proposing a program design in which CPAU would procure local solar by signing a power purchase agreement with a solar developer, marketing the program to potential customers, and administering the program for the participants. Participants will receive energy from the Co-Solar project, albeit no direct flow of electrons, in return for annual or monthly payments. This approach is different from earlier turnkey based efforts.⁷ CPAU-led program management will ensure contractual transparency and mitigate other program development risks that otherwise might have been borne by participating customers.⁸ It also enables CPAU to deploy its existing and trusted customer communication channels to enroll and administer customer participation.

Program Design Element #1	
<p><i>CPAU’s Role in Program Development and Management</i></p>	<p>CPAU will take a lead role in the program design, procurement, and management. Specifically:</p> <ul style="list-style-type: none"> a. CPAU will identify a site and solicit potential developer counterparties for execution of power purchase and land lease agreements. b. CPAU will market and sell the generated electricity to participating customers. c. CPAU will manage changes among participants, balancing convenience and flexibility for Co-Solar customers with overall program costs and administrative sustainability. d. CPAU will purchase the excess energy, the difference between energy produced and purchased by Co-Solar participants.

Figure 1: CPAU-led Community Solar Program



Element 2: Selection of Community Solar Site(s)

Staff recommends that solar PV project sites for Co-Solar be readily accessible to members of the public, and preferably on publicly owned municipal facilities. A solar system that is installed on a

⁷ Informational Report to Council: [Community Solar Program Development Update and Redirection of Efforts](#), Aug 2015

⁸ Program development risks identified in the turnkey third party solution included challenges in finding a host site for the solar system, challenges in communicating and marketing the program and balance of risk between the City and the program participants.

municipal facility would offer greater opportunities for community visibility, education and outreach. Moreover in the expensive and dynamic property market in Palo Alto, it can be a challenge to gain site control at a non-municipal facility at reasonable leasing terms. Attachment B is a list of City owned sites which have potential for local solar development in coming years.

To achieve project economies of scale, staff proposes that Co-Solar project site have a minimum capacity to host 50 kW of solar project to meet average electricity demand of 10 - 25 residential customers, though staff expects to target larger sites (250-750 kW) as much as possible.

CPAU will make best efforts that the solar project design enhances the site use and meets Palo Alto design guidelines. Consistency with City master plans and architectural review processes is important. However, given the expected costs for local solar projects, this will have to be done cost-effectively to make sure the program remains attractive to co-solar customers. Spending too much on design is likely to hurt program viability.

Program Design Element #2	
<i>Selection Criteria for Community Solar Site</i>	<ul style="list-style-type: none"> a. Co-Solar sites should be accessible to the public to promote participation and community visibility, education, and outreach. b. Municipal sites will take priority in the site selection process due to the fact they are controlled by the City and provide the greatest opportunities for visibility, education, and outreach for the duration of a PPA, as well as sustained intrinsic value to participants. c. To achieve economies of scale, pursue sites that can accommodate significant solar capacity, ideally 250-750 kW. Sites smaller than 50 kW should not be pursued. d. Choose sites where there is a reasonable expectation that the project will be able to enhance the site use and meet Palo Alto design objectives cost-effectively. Design objectives should not hurt CPAU’s ability to price the program to attract participants.

Design Element 3: Cost and Value Proposition to Participating Customers

Providing “Solar of All”, or more specifically for customers with no or limited access to good solar resources (e.g. renters and houses with tree canopy), is a primary driver of the program. To achieve these goals, the benefits of joining the Co-Solar program should be clear and compelling. Program participants will need to understand the cost and value proposition, the environmental and sustainability benefits, the commitment terms and flexibility, and the risks associated with participation (if any).

Local solar, within Palo Alto City limits, gives Co-Solar customers the opportunity to actually see their energy source, providing a tangible connection to the City’s renewable energy and carbon reduction efforts. Local solar provides environmental benefits, since it is located on already-developed sites, unlike utility-scale solar, and does not require transmission lines, which can have aesthetic and physical impacts on the environment. When paired with storage, local solar can also provide emergency preparedness benefits. Staff will need good market research to identify which messages are compelling enough to attract participants. Palo Alto customers have been willing to pay a premium for environmental and community benefits in the past, as shown by the high subscription rate for the PaloAltoGreen program.

Co-solar program will likely be a premium product.⁹ Staff is currently exploring possible pricing options for this program. These options are discussed in Attachment C. These pricing options under consideration give participants flexibility to make a short-term participation commitment, likely one year or less.¹⁰ Staff recommends that the premium paid by program participants be reasonable and low enough to generate interest. Staff will aim that the Co-Solar subscription rate does not exceed 15% of their annual or monthly electric bill, which amounts to approximately \$7.50 per month or \$90 per year for an average residential customer.¹¹

Other program terms such as Co-Solar signage identifying the potential participants and sharing real-time panel production information via web portal or smartphone app will be considered. Providing such terms to customers will need to be balanced against the administrative burden associated with moving customers in and out of the program.

Since customer interest and buy-in is a critical for the success of the community solar program, staff plans to seek feedback from potential customers before finalizing this important aspect of the program design.

Program Design Element #3	
<i>Cost and Value Proposition to Participating Customers</i>	<ul style="list-style-type: none"> a. Before launching, the program must be able to demonstrate a clear and compelling value proposition that will attract participants. b. The commitment term and ability to enter and leave the program should be flexible enough that customers are comfortable signing up for the program. c. Program subscription fees to be reasonable and low enough to generate interest.

Design Element 4: Power Purchase Agreement Terms and Project Capital

As discussed in Design Element 1, CPAU plans to have a third party developer build, own, and operate the solar facility, while CPAU operates the program and sells the energy to participants. This structure provides the developer with a single counterparty, CPAU, to buy the energy. It will increase certainty for project developer and reduce project development costs and risks. A private sector market place exists for solar project development in which tax-equity financing is used, where the power from the project can be sold to a buyer like CPAU through a Power Purchase Agreement (PPA). Design Element 4 discusses the terms and options CPAU would seek in such a PPA.

⁹ Program participation price or fee will be based on CPAU’s ‘avoided cost of purchasing solar from a large remote solar system’ or commodity portion of the retail rates. Local solar projects located within Palo Alto city limits is likely to be more expensive than procuring energy from large utility-scale solar projects (even including transmission and other costs associated with non-local projects).

¹⁰ SEPA’s [What the Community Solar Customers Want](#) report lists residential customers desire for a shorter term commitment

¹¹ PaloAltoGreen Program had premium subscription fees of about 1.5 cents/kWh in its early days and achieved significant participation (~20% of residential customers, or 5000 customers). This amount is about a 10% - 15% premium over average electric rates for residential customers.

CPAU will seek to execute a Purchase Power Agreement (PPA) for a term of up to 25 years with a third-party solar developer. The term will correspond with to the duration of the lease for the underlying site. Such a long-term output purchase commitment is expected to be necessary to attract private equity for the construction of solar project.

Staff also recommends exploring leveraging the City’s low cost of capital by using the Electric Special Projects (ESP) reserve. ESP funds could be used to partially pre-pay for the project at the start of the project or to buy-back the project mid-way through the life of the project. When a privately funded solar project is developed, a portion of the financing typically comes from tax equity investors¹² and a portion is debt-financed at private sector interest rates. In concept, by pre-paying CPAU could enable the developer to eliminate some or all of the debt financing, allowing the developer to save on interest payments. Under such a structure, CPAU would require the developer to reduce the power purchase price charged to CPAU, enabling CPAU to lower the price to Co-Solar customers. Although this transaction may enable a lower power purchase price, it would require careful legal review to ensure all risks are properly addressed, since it is not a simple transaction.

Staff is also exploring the option to buy back the project after approximately 7 years. This takes advantage of the fact that tax-equity investors typically receive all tax benefits within the first seven years of project operation. One way this might work is to include an option for CPAU to buy the project from the developer at the seven year mark at a price to be negotiated. If the price offered by the solar developer were attractive, it might provide additional savings to Co-solar program subscribers, as CPAU would own the energy generated. It may also provide a benefit if the solar project lifetime ends up being more than the PPA term (say, 30-35 years vs. a PPA term of 25 years), allowing CPAU to take advantage of the extended project lifetime at little or no cost without PPA energy purchase costs. Any capital provided by the ESP reserve would be repaid with interest over the life of the project by the program participants. Just like the pre-pay alternative, a buyback is not a simple transaction and would require careful legal review to ensure all risks are properly addressed.

Program Design Element #4	
<i>Power Purchase Agreement Terms and Project Capital</i>	<ul style="list-style-type: none"> a. CPAU will execute a Power Purchase Agreement with a third-party solar developer to design, construct, own and operate community solar projects for a term not to exceed 25 years. b. If it provides a savings to participants, CPAU may utilize Electric Special Projects (ESP) reserve to partially pre-pay to lower the financing cost of the capital investment in local solar projects. c. If it provides a savings to participants, CPAU may use the ESP reserve to buy the project from the developer in later years. d. Capital provided by the ESP reserve shall be repaid with imputed interest over the project life, not to exceed 25 years.

¹² Tax equity investors are generally large firms with substantial tax liabilities. They provide capital to the project developer, and in return receive rights to the tax credits resulting from the Investment Tax Credit provided by the Federal government to solar developers (who generally do not have substantial tax liabilities).

Design Element 5: Minimizing Risk to Non-participating Customers

There are several risks associated with the Co-Solar program that could impact non-participating customers. These risks cannot be completely eliminated, but can be mitigated. Table 1, below, shows the risks staff has already identified and the proposed mitigations. Additional risks may be identified as the program is developed and staff will seek to mitigate these risks as they are identified.

Table 1: Identified Risks to Non-Participants and Proposed Mitigations

Risks	Mitigations
Risk that few customers will participate.	<ul style="list-style-type: none"> • Seek customer pre-commitment for 50% of project output before constructing the project, and in no event should construction begin with less than 30%. • Begin with a single project rather than multiple projects to assess community interest and fine tune program elements. • If the project is not fully subscribed, the remaining project capacity will be used for the CPAU Carbon Neutral Electric Portfolio. • Use Public Benefit Research and Development Funds rather than ratepayer funds for start-up costs and to partially fund on-going operating costs.
If engaging in pre-payment or buyback, identify potential risks of project failure before negotiating buyback/pre-pay terms.	<ul style="list-style-type: none"> • Solar projects, with no moving parts, generally have low risk of physical failure. Any potential risks would be mitigated using property insurance or other performance warranties type of mechanisms to minimize risk to capital invested in the pre-payment or buyback.
Ensure funds are available for project retirement or repowering.	<ul style="list-style-type: none"> • CPAU will ensure the developer provides funding for project retirement to ensure the City has no responsibility for project demolition or repowering once the project ceases operation.
Risk that the project could be deemed to involve the offer or sale of a security under federal and state securities law, potentially requiring Securities and Exchange Commission registration and ongoing financial reporting and disclosures.	<ul style="list-style-type: none"> • Absent regulatory clarity, this risk can be mitigated, but not eliminated, by thoughtful program design, such as the design elements (#1 to #4) proposed here.

Program Design Element # 5	
<i>Minimizing Risk to Non-participating Customers</i>	<ol style="list-style-type: none"> a. Seek demonstrated interest or pre-commitment from program participants at a 50% level, but in no event shall it be less than 30% of the local solar project capacity before commencing project construction. b. Ensure a successful first project before developing subsequent projects. c. If the project is not fully subscribed, any unsubscribed project output will be added to the CPAU Carbon Neutral Electric Portfolio d. Public Benefit funds will be used to cover the initial program development cost and to partially fund on-going operating costs as a back-stop measure, recognizing the value such Co-Solar program projects bring to the entire community. e. Any operational risks must be mitigated using insurance or other mechanisms, particularly if electric utility capital is at risk. f. Provision must be made for retirement or repowering at end of project life. g. Ensure as much as possible that any other potential risks are identified and mitigated before launching any Co-Solar project.

Application of Program Design Elements to the Co-Solar Project at the Golf Course Parking Lot

After surveying several potential sites, staff found the municipal golf course parking lot as the most promising initial site to host the first community solar project.¹³ If the concept of a centrally owned community solar project proves to be successful, and this project is over-subscribed, staff will further evaluate other sites identified to meet the community demand. Outlined below is a discussion of the application of the proposed Co-Solar program guidelines to the initial community solar project.

a) Role of CPAU in Co-Solar program Development

CPAU staff with help of legal and tax advisors, consulting resources, and short-term staffing assistance will be performing the following tasks for the project:

- Soliciting and negotiating a PPA with developer/operators
- Seeking potential participants input on the program elements and pricing structure
- Facilitating and coordinating project approval and construction
- Developing customer communication and subscription systems
- Modifying the utility customer billing system as needed; and
- Developing systems for on-going administration upon program launch, for the first and subsequent Co-Solar projects

b) Selection of the Project Site

The golf course parking lot is readily accessible to all community members and could accommodate a 550 kW solar system that would be capable of serving the electricity demand of 100-200 residential customers.¹⁴ Attachment D provides an outline of the preliminary carport

¹³ Attachment B provides a list of City facilities with potential to install local solar.

¹⁴ Assuming 350 to 700 kWh average monthly electricity consumption per residential customer

solar PV system design. Though the location is within an area dedicated as parkland, staff believes the program will have minimal impacts due to its location on an existing parking lot, and will provide benefits (such as shading) to golf course visitors. Staff will ensure applicable guidelines, such as the Baylands Master Plan, are addressed as the project is designed.

Staff briefed the Parks and Recreation Commission (PRC) on potential use of this site for a community solar project in April 2017.¹⁵ The PRC comments were mostly accepting or supportive of the project and advised staff on following aspects:

- Making sure that the project does not interfere with the golf course business and considering that carport PV design be in harmony with the surroundings
- Consideration of what if parking lot configuration needs to be changed in intermediate term (10 -15 years)
- Consideration about vegetation around the parking lot and if it will interfere with the project
- Potential of glare impact at the airport

Staff will incorporate the PRC feedback as the further details of project implementation are developed in coming months. Apart from contributing towards the local solar goals, the community will receive additional benefits from the proposed project:

- The location will provide an opportunity to showcase local solar generation for the community, including educational information designed for children. With proximity to the Baylands Natural Preserve, this educational opportunity will be complementary to other programs in the Baylands such as Water Quality Control Plant tours, EcoCenter and Baylands Nature Interpretative Centre.
- There is a potential to develop the site to be a microgrid to provide emergency power, if additional funding became available to pair carport solar PV project with energy storage.

c) Cost and Value Proposition of the Project

The value proposition of the community solar program is one of the critical elements to make the program successful. As discussed above, Attachment C outlines pricing options staff is currently considering, which will likely involve a premium to bills in early years and may provide a discount in the long term. Staff plans to seek feedback from potential customers and develop a clear value proposition and marketing plan before finalizing this aspect of program design.

d) Capital funding for the Project

As discussed above, CPAU will seek a Purchase Power Agreement (PPA) with a third-party solar developer through a competitive solicitation process (RFP) in the Summer/Fall of 2017. CPAU will explore PPA terms such as pre-payment of a portion of the initial capital cost and an option to buy back the project after approximately 7-years.

e) Risk to non-program participants

- *Demonstrated Customer Interest and Pre-Commitment:* Staff plans to seek demonstrated

¹⁵ See the April 25, 2017 staff report to the Parks and Recreation Commission (<http://www.cityofpaloalto.org/civicax/filebank/documents/57241>) and the meeting minutes (<http://www.cityofpaloalto.org/civicax/filebank/documents/57851>)

customer interest and pre-commitment for a minimum of 30% of project capacity before committing to actual construction of the project, but will aim for at least 50% pre-commitment.

- *Underwriting project development cost for the unsubscribed portion:* The annual payment under the project PPA is estimated to be \$100,000 - \$125,000. The incremental cost of producing solar electricity locally compared to remotely is estimated at \$15,000 to \$35,000 per year over the 20- 25 year term of the PPA. This means that Council needs to make a determination that \$15,000 to \$35,000 per year is additional cost to all electric customers in beneficial to the community. . As a comparison, CPAU’s total electric supply portfolio costs are \$60-\$80 million/year.¹⁶
- *Start-up costs and ongoing administration costs considerations:* These costs are estimated at \$300,000 plus 1.0 FTE of staff effort over the next 24 months. This cost will be funded from the Electric Utility’s Public Benefit (PB) Funds collected under Public Utilities Code Section 385. The cost of starting the program will be recovered over the long term not just from the first Co-Solar project, but from future projects as well if the first Co-Solar project is successful.¹⁷ Subsequent costs incurred by CPAU and the on-going program administrative cost will be borne by program participants. The on-going cost of administering the program is estimated at less than \$50,000 per year.

DRAFT TIMELINE

Project Milestone	Timeline
1. Parks and Recreation Commission discussion	April 2017 (completed)
2. Utility Advisory Commission (UAC) review of Co-Solar program Design Guidelines	June 2017
3. Proposal to Council for adoption – Co-Solar program Design Guidelines	August 2017
4. Issue RFP to Select a Solar Developer	August 2017
5. Select a Solar Developer through RFP Process (preliminary determination)	Dec 2017/ Jan 2018
6. Customer Outreach and Pre-commitment	March 2018
7. UAC approval of detailed Co-Solar program elements	April/May 2018
8. Final Council Approvals <ul style="list-style-type: none"> ○ Park Improvement Ordinance ○ PPA agreement, including pre-payment and buy-back provisions, if any (final) ○ Land lease agreement with solar developer 	June 2018

¹⁶ Refer: CPAU [Fiscal Year 2018 Electric Financial Plan](#)

¹⁷ Though the initial solar site at the golf course parking lot will generate only 0.1% community’s electricity needs, staff anticipates subsequent Co-Solar program projects (~2,500 kW) would add up to 0.4% of community’s electricity needs by 2023. In comparison, the Council approved CLEAN solar programs are expected to provide 0.5% of the community’s electricity needs at an incremental cost of \$385,000 per year over a 20 year life of projects.

o Detailed Co-Solar program rules related to customer commitment terms & program administration	
9. Required Permits and Approval for Project Construction	July - Dec 2018
10. Construction of carport PV project (slow season for golfing)	Dec – Feb 2019
11. Electricity flows from PV system, Co-Solar program launched	April 2019

NEXT STEPS

Staff plans to bring a proposal for adoption to Council for community solar design guidelines in August 2017. Staff will then launch the RFP process for solar developer selection and initiate customer outreach efforts for the project. Staff will keep the UAC informed on important project milestones and expects to return with the final program approval in April or May of 2018.

RESOURCE IMPACTS

The costs to undertake preliminary site assessment, feasibility studies, and initial program development is estimated at \$300,000 plus 1.0 FTE of staff effort over the next 24 months, and is expected to be funded from the public benefit funds from the Electric Utility’s Distribution Fund, specifically Public Benefit Funds collected as required by Public Utilities Code Section 385. These are funds specifically collected for to fund energy efficiency and renewable energy projects.

The initial capital outlay is estimated at approximately \$1.8 to \$2 million¹⁸ and is likely to be funded by tax equity financing from the private sector and may include pre-payment from the utility ESP reserves. Project development and operational costs would be repaid by the community solar program participants over the life of the program. No additional funds are requested at this time.

POLICY IMPLICATIONS

Community solar program conforms to the City of Palo Alto Utilities Strategic Plan objective to provide environmentally sustainable customer solutions. The proposed pilot 550 kW carport PV project will contribute towards the Local Solar Plan and the community goal of meeting 4% of electricity needs with local renewable resources.

Organizationally, it should also be noted that Co-Solar would provide an additional resource for CPAU staff that consult with consumers, and will involve customer support representatives as well as program, marketing, and management staff. This represents a positive step in CPAU providing unique value to Palo Alto customers.

ENVIRONMENTAL REVIEW

The Commission’s discussion of the community solar design guidelines to facilitate deployment of the Co-Solar project is exempt from California Environmental Quality Act (CEQA) review as such discussion does not meet the definition of a project under Public Resources Code 21065.

¹⁸ Assuming all-in installed cost of about \$3 - \$4 per watt for 550 kW solar carport project

Attachment A

Palo Alto Community Solar Program (“Co-Solar”) Design Elements

The Community Solar Program is a central part of the 2014 Council approved Local Solar Plan with the goal of producing 4% of community wide energy within the community by 2023. In setting this goal Council found that local solar photovoltaic (PV) systems within Palo Alto to be more valuable compared to PV systems sited outside the Palo Alto. Co-Solar program is being developed to meet part of this goal, and to provide an opportunity to community members without access to solar electric energy on their own roofs be part of a centrally located community solar project.

The goals of developing Co-Solar in Palo Alto are as follows:

- ✓ Providing local solar PV electricity access to all residents and businesses who seek such energy, but are unable to do so (for example, do not have suitable roof space to site solar PV panels)
- ✓ Siting renewable projects on a local, already-developed site rather than a remote undeveloped site
- ✓ Avoiding siting renewable energy in a remote, prompting the construction of new transmission lines
- ✓ Keeping a portion of the economic benefits of renewable energy purchases in-town, where possible
- ✓ Building projects that, if paired with storage, could act as a community emergency power supply
- ✓ Providing Community benefits such as the opportunity to showcase local solar generation and educational information for children

Community Solar Program Design Elements

<p>1. <i>CPAU’s Role in Program Development and Management</i></p>	<p>CPAU will take a lead role in the program design, procurement, and management. Specifically:</p> <ul style="list-style-type: none">a. CPAU will identify a site and solicit potential developer counterparties for execution of power purchase and land lease agreements.b. CPAU will market and sell the generated electricity to participating customers.c. CPAU will manage changes among participants, balancing convenience and flexibility for Co-Solar customers with overall program costs and administrative sustainability.d. CPAU will purchase the excess energy, the difference between energy produced and purchased by Co-Solar participants.
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<p>2. Selection Criteria for Community Solar Site</p>	<ul style="list-style-type: none"> a. Co-Solar sites should be accessible to the public to promote participation and community visibility, education, and outreach. b. Municipal sites will take priority in the site selection process due to the fact they are controlled by the City and provide the greatest opportunities for visibility, education, and outreach for the duration of a PPA, as well as sustained intrinsic value to participants. c. To achieve economies of scale, pursue sites that can accommodate significant solar capacity, ideally 250-750 kW. Sites smaller than 50 kW should not be pursued. d. Choose sites where there is a reasonable expectation that the project will be able to enhance the site use and meet Palo Alto design objectives cost-effectively. Design objectives should not hurt CPAU's ability to price the program to attract participants.
<p>3. Cost and Value Proposition to Participating Customers</p>	<ul style="list-style-type: none"> a. Before launching, the program must be able to demonstrate a clear and compelling value proposition that will attract participants. b. The commitment term and ability to enter and leave the program should be flexible enough that customers are comfortable signing up for the program. c. Program subscription fees to be reasonable and low enough to generate interest.
<p>4. Power Purchase Agreement Terms and Project Capital</p>	<ul style="list-style-type: none"> a. CPAU will execute a Power Purchase Agreement with a third-party solar developer to design, construct, own and operate community solar projects for a term not to exceed 25 years. b. If it provides a savings to participants, CPAU may utilize Electric Special Projects (ESP) reserve to partially pre-pay to lower the financing cost of the capital investment in local solar projects. c. If it provides a savings to participants, CPAU may use the ESP reserve to buy the project from the developer in later years.

	<p>d. Capital provided by the ESP reserve shall be repaid with imputed interest over the project life, not to exceed 25 years.</p>
<p>5. <i>Minimizing Risk to Non-Program Participants</i></p>	<p>a. Seek demonstrated interest or pre-commitment from program participants at a 50% level, but in no event shall it be less than 30% of the local solar project capacity before commencing project construction.</p> <p>b. Ensure a successful first project before developing subsequent projects.</p> <p>c. If the project is not fully subscribed, any unsubscribed project output will be added to the CPAU Carbon Neutral Electric Portfolio</p> <p>d. Public Benefit funds will be used to cover the initial program development cost and to partially fund on-going operating costs as a back-stop measure, recognizing the value such Co-Solar program projects bring to the entire community.</p> <p>e. Any operational risks must be mitigated using insurance or other mechanisms, particularly if electric utility capital is at risk.</p> <p>f. Provision must be made for retirement or repowering at end of project life.</p> <p>g. Ensure as much as possible that any other potential risks are identified and mitigated before launching any Co-Solar project.</p>

ATTACHMENT B

Preliminary Assessment of Solar Development on City-Owned Sites**

Ready for Solar Deployment Now
1. Golf Course parking lot
2. Downtown Library
3. Utilities Control Center
4. WQCP warehouse
5. Fire Station #1 (Univ. Park)
Ready for Solar Deployment between now and 2020 (in pipeline)
1. Airport
2. Fire Stations #3 and #4 (rebuild)
3. Fire Station #2 (reroof)
4. Public Safety Building
5. Golf Course
6. Jr. Museum & Zoo
7. New downtown parking structure
8. New California Avenue area parking structure
Ready for Solar Deployment After 2020
1. Cubberley Community Center
2. Municipal Service Center
3. WQCP Admin/Ops Buildings (prospective rebuild)
4. Civic Center, Police-occupied area (prospective seismic retrofit after Public Safety building established)
5. Ventura Center (consider during reroof)

* Data Source: 2015-2016 City Staff Assessment of the Local Solar Potential on City Owned Sites

** Note: One or more sites may need to be removed from the list upon further evaluation

ATTACHMENT C

Pricing Options for Community Solar Program Participants

Staff's initial assessment and recommended approach to pricing community solar to participating customers is outlined here. Staff plans to reach out to potential program participants and seek their feedback on two alternate pricing options (monthly rate subscription vs. block purchase with monthly credit) before finalizing this aspect of the program design. Capacity of the utility billing system to handle such pricing options and cost of administering such pricing options will also be considered before selecting a pricing option for the program. Upfront purchase of or lease of panels will not be considered.

Community solar pricing options broadly fall into two categories:

- Upfront PV Panel Purchase (or Lease) by Participating Customers: The option requires upfront payment and a long-term commitment (~20 years) by participants. This could be a large hurdle for many interested customers (e.g. renters), pose significant administrative burden on the City, and encumbrances to project sites that could cause problems, for example on dedicated parkland. Therefore, upfront panel purchase (or lease) option by participating customers is not included for further consideration.
- Customer Subscription with no Up-Front Commitment: This requires CPAU to be the counterparty to the solar developer and then re-sell the output of the project to participants as discussed in the Co-Solar Design Element # 1. Since individual customers prefer to have the option to not make a long-term commitment and the City has the ability to sell the output to larger pool of interested customers, CPAU is well positioned to make such an offering. In addition, the CPAU can utilize its low cost of capital available through ESP reserve and access the low cost private sector tax equity capital (through public-private sector partnership) to finance the project and pass on the savings to the program subscribers (Design Element #4).

Two subscription models will be considered, the monthly subscription option (Option A) and annual subscription option (Option B).

- i. **Option A – “Monthly Rate Subscription”**: This option would be similar to the PaloAltoGreen program where customers will purchase local solar electricity proportional to their monthly electric load. Participants are likely to pay a 10% - 15% annual premium in their utility bills for initial years (for example \$5 to \$8/month for an average customer). In the long term, due to the price certainty of a local project, participants may see a discount or credit on their electric bill. Project may become unviable if monthly premium payments turn out to be greater than 15% of monthly bills. Customers may subscribe and unsubscribe

from the program at any time; but to cover administrative cost, a small fee may be charged for customers who do not stay in the program for a year

- ii. **Option B – “Block Purchase with Monthly Credits”:** Customers can subscribe to annual blocks of electricity. For example, 1 block = 500 units or output of one 300-watt panel.¹ Customer will pay annual or monthly fixed fee for the blocks of energy subscribed. Output from the local solar project will be credited to the participants based on the seasonal variability of the solar generation (i.e. more generation credited in spring and summer months and less in winter months). Participants will need stay with the program at least for a year. Otherwise they will forfeit the remaining credits for the year.

The exact subscription prices will be determined once solar project development terms are confirmed through competitive solicitation process from private sector developers.

Environmental Attributes of the Program and Treatment of Renewable Energy Credits (RECs)

Staff recommends that CPAU retires Renewable Energy Credits (RECs) from the community solar project on behalf of the program participants. In this way, program participants can claim full environmental benefits of the program. Currently CPAU is well on the way to meet Renewable Portfolio Standards (RPS) requirements.² Incremental RECs from the community solar program may not be needed for meeting 2015 Senate Bill 350 RPS compliance requirements. Staff will consider the benefits of community solar project and RECs treatment in the avoided cost calculations and finalizing the subscription rate for program participants.

1 Customers can purchase multiple blocks of community solar (say 500 units each) up to 100% of their annual energy usage. For example, customers with annual usage of 4200 units (350 kWh/ month) can subscribe for 8 blocks of community solar

2 CPAU [Quarterly Update for Second Quarter of FY 2017](#), Figure 1: Electric Supply Resource Actual and Projection, 2016 to 2018

ATTACHMENT D

Community Solar Project at the Golf Course Parking Lot

The golf course parking lot is located at the 1875 Embarcadero Rd, Palo Alto (see Illustration 1). The proposed carport solar PV structures would cover and provide shade over the parking lot lanes (see Illustration 2).

Illustration 1: Potential location for Carport Solar PV Installation

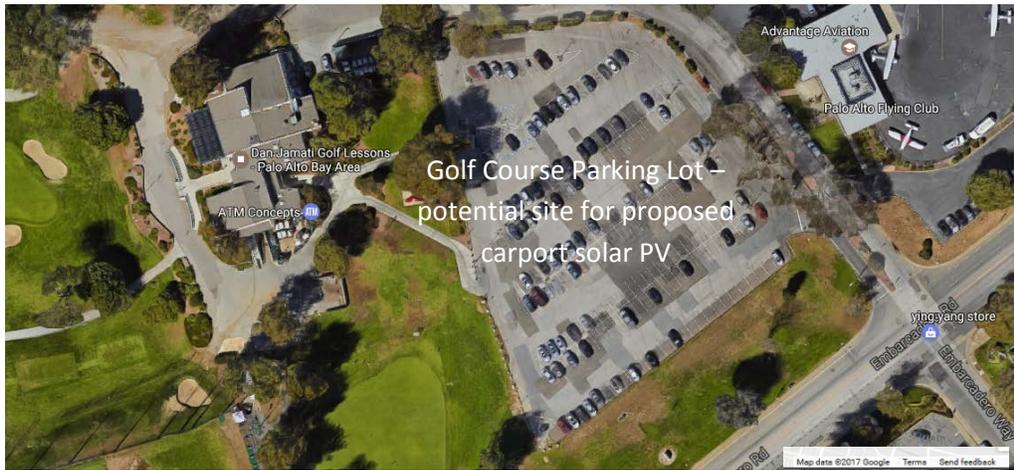


Illustration 2 - Preliminary Conceptual Design for the Carport Solar PV (550 kW)

