

MEMORANDUM

TO: UTILITIES ADVISORY COMMISSION

FROM: UTILITIES DEPARTMENT

DATE: OCTOBER 7, 2015

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SUBJECT: Update on the Implementation of the Local Solar Plan and Recommendation to End the PV Partners Program, as Planned, once the State Legislative Requirements set forth in the California Million Solar Roofs Bill Have Been Fulfilled

RECOMMENDATION

Staff recommends that the Utilities Advisory Commission (UAC) recommend that the City Council end the PV Partners program, as planned, for rebates for customer-sited solar photovoltaic (PV) systems once the state legislative requirements set forth in California Million Solar Roofs Bill (SB1) have been fulfilled.

EXECUTIVE SUMMARY

On April 22, 2014, Council adopted the Local Solar Plan, which establishes the goal of meeting 4% of the City's energy needs from local solar by 2023 and outlines a set of diverse strategies to achieve it within a set of guiding objectives. The Local Solar Plan provides a holistic framework incorporating all market segments and short- and long-term approaches. The plan further seeks to do so in a cost-effective manner. Prior programs, incentives, and policies involving solar installed in the City are integrated into the Local Solar Plan strategies, and new programmatic areas are identified for staff research and development.

This report provides an update on the state of solar installed in Palo Alto and a detailed status of all Local Solar Plan implementation efforts to date, including the status of three program initiatives (a community solar program, a solar group-buy program, and a solar donation program) and current efforts towards implementing net energy metering (NEM) incentives.

Preliminary results from a solar potential analysis confirm that the overarching Local Solar Plan goal of meeting 4% of the City's electricity needs is achievable with current programs (PV Partners, Palo Alto CLEAN program, and NEM), continued falling solar system prices, and the planned community solar and solar donation programs. The City's progress toward meeting the Local Solar Plan goal will be re-evaluated and communicated on an ongoing basis as current and future programs are brought forward for UAC, Finance Committee, and Council review.

The PV Partners program was first established in 1999 to provide rebates for customer-sited solar PV systems for both residential and commercial customers. In 2006, California adopted the Million Solar Roofs Bill (Senate Bill 1 or SB1), and funding for PV Partners was increased by \$13 million to meet the City's legislative obligations. Currently, all residential rebate funds have been completely reserved and limited funds remain available for commercial customers. Staff recommends discontinuing the program once all legislative requirements have been fulfilled and not shifting any remaining rebate funds designated for commercial customers to residential customers in the meantime, for four primary reasons: 1) the goals of SB1 to facilitate statewide deployment of 3,000 megawatts (MW) of solar and create a self-sustaining solar market have already been achieved, 2) alternate solar procurement models such as a group-buy program model have resulted in lower system prices for customers than systems installed with PV Partners rebates, 3) the administrative costs of the rebate program for both City staff and solar installers are substantial compared to alternate solar procurement models, and 4) re-opening rebates to residential customer would result in disruptive market dynamics and messaging.

BACKGROUND

The City has been a leader in local solar development starting in 1980 when it launched a solar hot water heating program. California State law (Assembly Bill 1470) established a requirement in 2007 for all natural gas utilities to offer rebates for solar water heating systems. In 2008, the City of Palo Alto Utilities (CPAU) launched the Solar Water Heating (SWH) Program which provides rebates to customers who install qualifying solar water heating systems that offset energy used by an existing water heater or boiler for domestic water heating uses. The State's goal is to install 200,000 solar water heating systems by 2017, and CPAU's proportionate share is approximately 530 systems. The City's 2007 Climate Protection Plan established a goal of achieving 1,000 systems by 2020. As of August 1, 2015, \$281,370 in rebates have been issued under the program for a total of 58 systems. The slow uptake is due in part to the poor customer economics. The program is expected to continue through 2017 with incentive levels decreasing over the program lifetime.

In 1999, the City launched its first solar PV system rebate program called PV Partners to encourage residents and businesses to install solar PV systems. In 2006, California adopted SB1, the "Million Solar Roofs" bill, which requires that all load serving entities such as CPAU provide incentives in the form of rebates to meet the goal of installing 3,000 megawatts (MW) of solar PV systems in California by 2017. The City's proportionate share of the statewide goal is 6.5 MW by 2017. To meet the SB1 requirements, the CPAU increased the PV Partners Program budget to \$13 million over ten years, with proportions of the funding allocated across four customer classes: residential, small and medium commercial, large commercial and non-profit/public sector.

Table 1 provides a summary of the solar PV installations through the PV Partners program through August 1, 2015:

Table 1: PV Partners Program Summary

PV Partners Program Capacity (MW)					
	Installed Between 1999 and 2006 (Prior to SB1)	Installed Under SB1 as of 8/1/15	Pending Projects/ Reserved Capacity	Unreserved Capacity	Total PV Partners Program
Residential	0.62	1.89	0.05	0	2.56
Commercial	0.31	3.76	0.52	0.91	5.50
TOTAL	0.93	5.65	0.57	0.91	8.06

As of August 1, 2015, 6.7 MW of solar PV has been installed¹ on 785 customer sites and an additional 0.57 MW of new solar PV installations at 14 customer sites have confirmed PV Partners rebates and are pending completion. All residential rebate funds were reserved as of August 2014. Currently, \$1.1 million in funds remain unreserved for commercial solar PV systems. In the unlikely event that any of the PV Partners funds remain unreserved at the end of 2017, marking the end of the 10-year SB1 program, the funds will return to the Electric Fund.

In 2012, the City launched the Palo Alto Clean Local Energy Access Now (CLEAN) program ([Staff Report 2548](#), [Resolution 9235](#)), a feed-in tariff program. Through Palo Alto CLEAN, building owners may lease their roof tops to solar developers, or develop solar themselves, and sell the energy and renewable attributes to the City under a standard Power Purchase Agreement (PPA) at a fixed rate over a specified term. The current Palo Alto CLEAN PPA price for solar PV systems is \$0.165 per kilowatt-hour (kWh) for a 20- or 25-year contract term for up to a maximum of 3 MW total of capacity. On May 27, 2015 ([Staff Report 5756](#)), Council opened the program to eligible non-solar generation technologies under a separate 3 MW cap at a rate of \$0.093/kWh or \$0.094/kWh price for a 20-year, or 25-year PPA, respectively. There have been no applications for the Palo Alto CLEAN program to date.

On April 22, 2014, the City Council adopted the Local Solar Plan (Attachment A, [Staff Report 4608](#), [Resolution 9402](#)), which set the overarching goal of meeting 4% of the City's total energy needs from local solar by 2023 and unified the City's approach toward local solar and described a set of diverse strategies for meeting the set goal. The Local Solar Plan provides a holistic framework and incorporates all market segments and short- and long-term approaches. The plan further seeks to do so in a cost-effective manner that does not create a burden on non-solar customers. Prior programs, incentives, and policies involving solar installed in the City—including specifically PV Partners, NEM, and CLEAN—are integrated into the Local Solar Plan strategies, and new programmatic areas are identified for staff research and development. The strategies range from supporting research and development partnerships supporting solar innovation to establishing programs for underserved market segments, such as residents in multifamily homes and renters.

¹ This total includes the 0.93 MW installed under PV Partners prior to SB1, the 5.65 MW installed after SB1 and the systems that have been installed after PV Partners rebates for residential customers were no longer available.

DISCUSSION

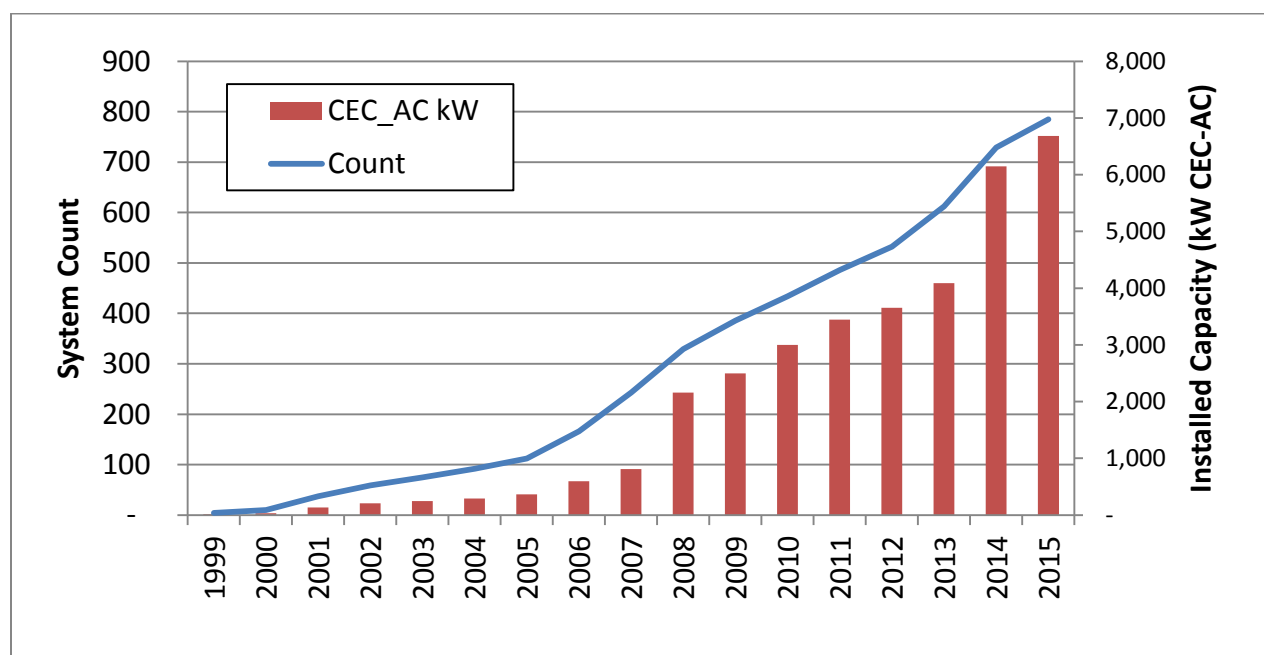
Status of Local Solar Plan Implementation Efforts

A strategy-by-strategy update of all implementation efforts that have been completed to date and that are planned for the near term is provided as Attachment B. Detail about program development, the status of net energy metering, and the future of PV Partners is included below.

Updated Local Solar Penetration, Forecast, and Goal

Figure 1 shows cumulative solar PV installations in Palo Alto from 1999 through August 13, 2015. An estimated 785 systems and 6.7 MW of capacity are currently installed representing over 1% of the City's annual energy needs.

Figure 1: Cumulative Solar PV in kW CEC-AC² Installed in Palo Alto through August 13, 2015



Solar Potential Assessment

As a part of the Local Solar Plan, staff is completing a detailed GIS-based (geographic information system) solar potential assessment for Palo Alto. The analysis takes into account an assortment of factors affecting solar deployment, including:

- Latitude/longitude of Palo Alto
- Typical meteorological conditions
- Land-use constraints
- Orientation and slope of rooftops
- Shading from surrounding trees and buildings
- Industry average solar system performance

² The California Energy Commission Alternating Current, or CEC-AC, rating is the product of the number of PV panels, the Practical Test Conditions (PTC) rating per panel, and the inverter efficiency.

- Forecast of solar system costs
- Federal, state, local financial incentives
- Assumption for expected financial return
- Federal, state, local policies and regulations
- Assumption for local adoption rate
- Renters versus owner-occupied households

Table 2 shows updated values for all installed, planned and forecasted solar PV. The overarching Local Solar Plan goal is that solar PV provide 4% of the City's 2013 load, which translates to about 23 MW of installed local solar PV capacity. After accounting for 8 MW from the PV Partners program, 3 MW through the Palo Alto CLEAN program and 2 MW for new community solar and solar donation programs that are under development, almost 10 MW of additional solar capacity is required to meet the Local Solar Plan's 2023 goal. Staff believes that this is feasible given existing incentives and realistic forecasts for falling solar system prices. The solar potential analysis supports the conclusion that the City can meet the 23 MW goal without expanding rebates or net energy metering incentives.

Table 2: Updated Installed, Planned, and Forecast Solar PV and Local Solar Plan Goal

Program Status as of August 2015	Capacity (MW)	Energy (MWh/yr)	% of City's Energy Use
PV Partners Program (Installed and Remaining Capacity)	8.0	13,600	1.4%
CLEAN Program, Planned Capacity for Solar PV	3.0	5,100	0.5%
Non-Rebated Solar Installed to Date	0.3	510	0.05%
Anticipated Capacity for Community Solar and Solar Donation Programs	2.0	3,400	0.4%
Additional Solar PV to Meet Local Solar Plan Goal	9.7	16,500	1.7%
Solar Penetration Goal in 2023	23.0	39,100	4.0%

It is important to emphasize that the City is much less certain to achieve the Local Solar Plan goal without successfully deploying 3 MW through the CLEAN program and 2 MW through the future community solar and solar donation programs.

Program Development Update

Three programs were identified in the Local Solar Plan as having potential to spur solar adoption and broaden participation: 1) community solar program; 2) a solar group-buy program; and 3) a solar donation program.

1. Community Solar Program: Community solar programs (aka shared solar) typically enable an electric utility's customers to buy or lease solar panels in a centralized solar PV array and receive regular credits for electric output via their utility bills. Community solar programs are growing rapidly across the U.S. because they enable residents and businesses to experience and derive the benefits from cost-effective local solar deployment, even if they

are unable to install solar at their own premises, for example because of shading, ownership, structural or financial reasons.

Staff attempted to seek a partner to implement a turnkey community solar program and issued a request for proposal (RFP) in July 2014 from a program administrator/solar developer. The turnkey proposal did not materialize and staff terminated the RFP. More information was provided to the UAC in July and to Council in August 2015 ([Staff Report 5971](#)).

Staff is currently evaluating other methods to provide community solar for Palo Alto, which include utilizing municipal facilities to host community solar. In July 2015, an inter-departmental committee formed to develop a work plan for installing solar on City facilities and, in the near term, identify a municipal site to host the solar system for the community solar program. The committee is currently completing a comprehensive database that combines site information for all municipal facilities with other solar-relevant data, such as rooftop technical potential, on-site electricity consumption, and building lease and use constraints. Upon completing the database, staff will retain the services of a solar procurement specialist and adopt a work plan for installing solar on all viable facilities. Staff expects to finalize the community solar site selection and begin the solar PV system procurement process by Fall 2015.

2. Solar Group-Buy Program: Solar Group-Buy programs (aka group-discount or bulk buy) have historically been successful in driving down system costs by aggregating purchasing power and simplifying the process of solar adoption across a community. The City was fortunately able to participate in Peninsula SunShares, a large, regional group-buy effort led by the City of Foster City. An informational report about the program was provided to the UAC in October 2014 and to City Council in November 2014 ([Staff Report 5144](#)). Peninsula SunShares launched on April 31, 2015, and was open to all residents in the nine Bay Area counties who registered by August 10. The entire program is expected to result in over 800 kW in new solar installations across the Bay Area. Palo Alto led the region in number of enrollments with an estimated 28% of total participation. 54 Palo Alto residents signed contracts to install 236 kilowatts (kW) of solar systems. Given the success of the program, staff plans to seek opportunities to join future regional group-buy efforts.
3. Solar Donation Program: In a solar donation program, participants would contribute funds towards building solar PV systems on schools and other non-profit facilities. The projects could be funded in a variety of ways, including via donations from participants through monthly contributions (e.g., \$5 to \$10 per month) through their utility bills. This program is estimated to take the least amount of staff time to develop. Research and development of the program is planned for Winter 2015/2016 leading to a program launch in Spring 2017.

Table 3 is a tentative timeline for the review, approval and launch for the three programs.

Table 3: Tentative Review and Approval Timeline for Major Programs

	Program Development	UAC Review	Fin. Comm. Review	Council Review	Program Launch
1. Group-Buy Program (Complete)	Summer 2014	Oct 2014	N/A	Nov 2014	April 2015
2. Community Solar Program	May 2014 – Present	Spring 2016	Spring 2016	Summer 2016	Winter 2016/2017
3. Solar Donation Program	Winter 2015/2016	Summer 2016	Summer 2016	Fall 2016	Spring 2017

Net Energy Metering

In 1996, California state law required all electric load serving utilities to offer net energy metering (NEM) to eligible customers on a first-come, first-served basis up to a maximum cap based on the utility's aggregate customer peak demand. NEM is a special billing arrangement that provides a bill credit to customers with eligible solar PV or other net metered systems for based on the full retail rate for the electricity that their system generates. Palo Alto's NEM cap is set at 5% of the City's 2006 peak electric demand or 9.5 MW. Current installations total 6.7 MW, representing 3.5% of the utility's aggregate customer peak demand. Staff estimates that the City will meet the 9.5 MW NEM cap by the end of 2016. To date, all local solar installations utilize NEM and all net energy metered systems are solar PV³.

Staff plans to seek Council approval of the NEM cap to memorialize the calculation methodology and clarify any ambiguity related to Palo Alto's NEM cap. Additionally, as the City approaches its NEM cap, staff will begin reporting progress towards meeting the cap in order to further support market certainty and inform customer decision-making.

After the cap has been reached, customer-sited systems will be subject to a different set of terms and conditions, referred to as the NEM successor program. Staff is preparing proposed design guidelines for the NEM successor program in Palo Alto to supplement the electric cost of service analysis (COSA) guidelines approved by Council on September 15, 2015 ([Staff Report 6061](#)). Staff plans to further clarify terms and conditions for existing NEM participants (aka "grandfathering" provisions) and a NEM successor program for UAC, Finance Committee and Council consideration by early 2016.

Future of PV Partners

As of August 2014, all residential rebate funds for solar PV systems through the PV Partners program were reserved. Limited funds remain available for commercial customers. On March 17, 2015, the Finance Committee requested that staff return to the Committee for a discussion about the options for continuing PV Partners rebate funds for residential use—either by adding

³ In principal, customers may install a variety of distributed energy technologies on-site that would be eligible for NEM, including, for example, geothermal electric, fuel cell, wind, biomass, and anaerobic digestion technologies. In practice, staff expects the vast majority—if not all—of on-site generation and NEM participation to be solar PV.

new funds for rebates or by shifting the remaining rebate funds not yet reserved by commercial customers to residential customers. Members of the Committee questioned whether additional rebates for residents might yield more solar deployment than funds directed to solar developers through the Palo Alto CLEAN program.

Staff recommends discontinuing the PV Partners after the City's legislative requirements set by SB1 have been achieved, and not shifting funds from the commercial customer class to the residential customer class for four primary reasons.

1. SB1 Goals Will Have Been Met

The explicit goal of SB1 is to aid the deployment of 3,000 MW of solar PV across the state by the end of 2018. In Palo Alto, staff expects all PV Partners rebate funds to be fully reserved by the end of the 10-year program, so that the City will meet its contribution toward the statewide goal. Additionally, the implicit goal of SB1 is to create a self-sustaining solar market, a goal that was reinforced through a program design that ratcheted down incentive levels with increased deployment so as to encourage solar installers to continually seek cost-reductions. Even though the SB1 rebates through Pacific Gas & Electric (PG&E) and other investor owned utilities (IOUs) have been nearly completely reserved⁴, solar deployment has continued such that California as a whole has already exceeded the statewide SB1 deployment target of 3,000 MW⁵. In Palo Alto's service territory, residential installations have not slowed down absent rebates. All data support that the implicit goal to create a self-sustaining solar market has already been achieved.

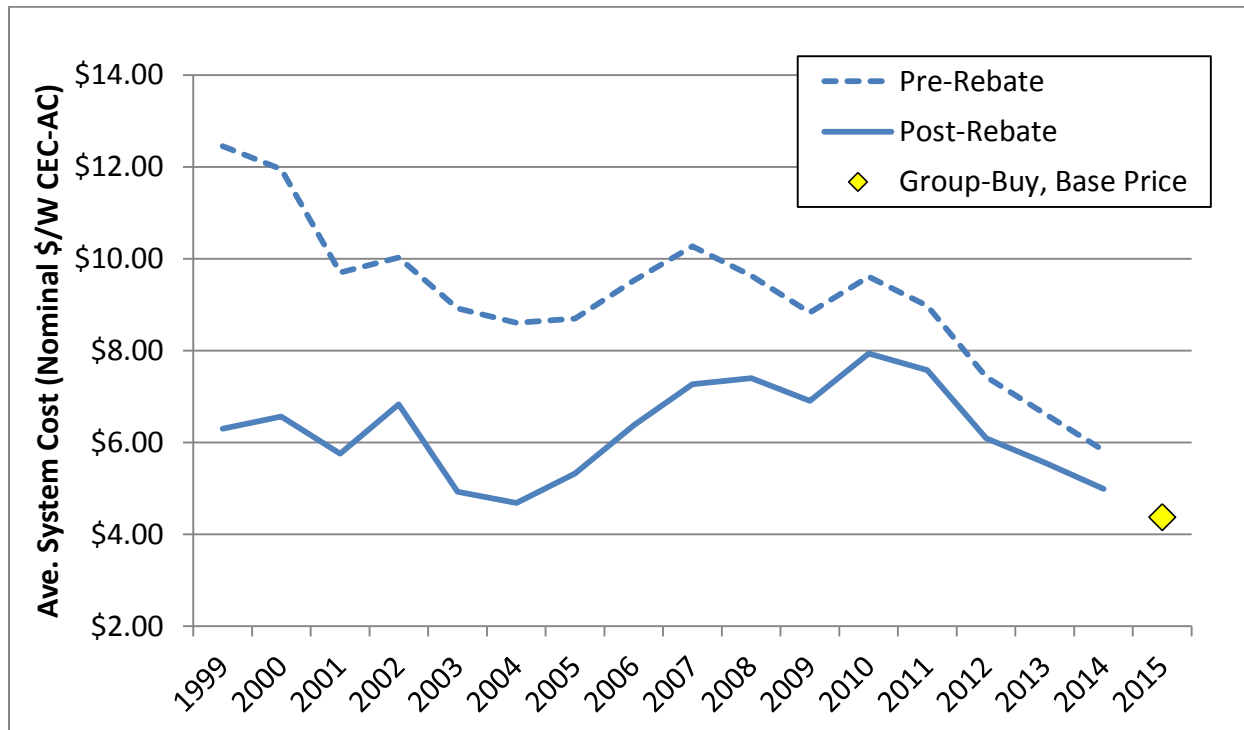
2. The Objective of Lowering the Cost of Solar Can be Achieved in Other Ways

Alternative solar adoption models can result in lower overall systems costs and at a substantially reduced cost to electric utility ratepayers compared to continuing the PV Partners rebate program. Specifically, group-buy programs that aggregate the purchasing power of many households across an organization or region have achieved substantial reductions in system costs by lowering the customer acquisition costs for solar developers and facilitating economies of scale. The system price offered through the Peninsula SunShares group-buy program for the most basic installation was \$3.50/Watt-Direct Current (DC) (approx. \$4.40/Watt CEC-AC) for a 3 to 9 kilowatt system for a cash purchase (i.e. not including any financing option). Prices for similar-sized customer-owned systems that applied for a PV Partners rebate in the last two years were \$4.70/Watt-DC (approx. \$5.90/Watt CEC-AC) prior to receiving the rebate, and \$4.02/Watt-DC (approx. \$5.00/Watt CEC-AC) after receiving the rebate. Therefore, a solar system purchased through the Peninsula SunShares program was over 10% cheaper than the *post*-rebate solar system cost through the PV Partners program and 25% cheaper than the *pre*-rebate solar system cost. Figure 2 shows the historical average annual system cost of solar PV installed through the PV Partners program. The base price for the Peninsula SunShares program is included for comparison.

⁴ As of August 19, 2015, less than 1 MW worth of rebate funds remain for all IOUs combined. (<http://csi-trigger.com/>) PG&E ceased accepting applications for residential rebates in Fall 2013.

⁵ As of August 19, 2015, solar deployment in California is 3,216 MW (<http://www.gosolarcalifornia.org/>).

Figure 2: Average System Cost Installed through PV Partners



3. PV Partners Administrative Costs are High

Finally, the rebate and administrative costs of the PV Partners program are high, including the administrative costs borne both by the City and by solar installers that are completing the paperwork on behalf of utility customers. The California Energy Commission (CEC) set onerous requirements for the implementation of SB1. Staff estimates that each residential rebate application requires about 3 hours total of administrative work by City staff and solar installers, in addition to a \$50 per application cost for rebate processing software. The administrative costs combined with the rebate value is over \$2 per Watt-DC averaged over the program's history, which are costs paid for by all electric utility ratepayers. By comparison, staff estimated the administrative costs of a solar group-buy program for residential systems to be less than \$0.07 per Watt-DC.

Of course, a new residential solar PV rebate program could avoid the onerous requirements set by the CEC for SB1 eligibility, but it's still instructive to realize the administrative cost advantage that a group-buy program offers. However, shifting the remaining rebate funds not yet reserved by commercial customers to residential customers under PV Partners would not avoid the CEC requirements.

4. Making Rebate Funds Available Again to Residential Customers Will Result in Disruptive Market Dynamics

Residential rebate funds have been fully reserved for over 13 months. Making rebate funds available again to residential customers will result in disruptive market dynamics and confusing messaging to customers. Furthermore, it may have the unintended consequence of alienating the dozens of households who have already installed systems without receiving rebates.

Alternatives for PV Partners

Alternatives to the staff recommendation to discontinue PV Partners after solar legislative mandates have been met include: 1) transferring the remaining PV Partners rebate funds not yet reserved by commercial customers to residential customers; 2) adding new rebate funds for residential customers from Electric Fund ratepayers; and 3) adding new rebate funds for residential customers from the City's General Fund.

Staff does not recommend any of the alternatives. The rate of residential installations has not slowed since rebates for residential customers were fully reserved, indicating that rebates are not required for customer adoption. A program providing rebates would therefore very likely result in a high proportion of "free-ridership", a hallmark of an ineffective incentive program design.

NEXT STEPS

Table 4 is a tentative timeline of all activities planned in the near future for the continued implementation of the Local Solar Plan.

Table 4: Tentative Timeline for Near-term Implementation of the Local Solar Plan

Time Period	Description
Fall 2015	▪ Develop a strategy for solar on municipal facilities ▪ Complete implementation of AB 2188 (Development Center) ▪ Clarification of NEM cap calculation methodology to Council ▪ Design guidelines for the NEM successor program to the UAC, Finance Committee, Council ▪ Incorporate solar perspective throughout the electric COSA process
Winter 2015/2016	▪ Begin reporting progress toward the NEM cap in Utilities Quarterly Update and on CPAU solar website: http://www.cityofpaloalto.org/solar ▪ Complete study of distribution system impacts of high penetrations of solar PV and EV ▪ Incorporate solar perspective throughout the electric COSA process (cont.) ▪ NEM successor program and grandfathering provisions to the UAC, Finance Committee, Council ▪ Continuation of community solar program research and development ▪ Begin solar donation program research and development
Spring 2016	▪ Community solar program design to the UAC, Finance Committee, Council

RESOURCE IMPACT

There is no change to budgets, planned expenditures or staff resources as a result of staff's recommendation to discontinue the PV Partners program once solar legislative mandates have been met. Administering the PV Partners program requires dedicated staff resources through at least 2020 to disperse all remaining rebate funds⁶. Once all program funding has been reserved by customers and no more new applications are being processed, the ongoing staff resource impact is anticipated to be 0.02 FTE to process performance-based incentive (PBI) payments that are paid out over a five year time frame. After all program funding has been reserved, available staff resources will be reallocated to other solar program initiatives. If, however, Council desires to add new rebates for residential solar PV, there would be a budget and rate impact for the Electric Fund.

POLICY IMPACT

The recommendation to discontinue the PV Partners program once solar legislative mandates have been met does not conflict with any City policy. The Local Solar Plan supports the City's environmental sustainability goals, including those set out in the Council-approved 2011 Utilities Strategic Plan and the City's Sustainability and Climate Protection Plan. Fulfilling our SB1 legislative mandates through PV Partners will help promote solar development and is consistent with the Carbon Neutral Plan, the Local Solar Plan, and State and local efforts to promote distributed solar projects.

ENVIRONMENTAL IMPACT

Discontinuing the PV Partners program once solar legislative mandates have been met does not meet the California Environmental Quality Act's (CEQA) definition of "project" under California Public Resources Code Sec. 21065, thus no environmental review is required.

ATTACHMENTS

- A. Adopted Local Solar Plan
- B. Summary of Local Solar Plan Implementation Efforts

PREPARED BY:

 **AIMEE BAILEY**, Resource Planner

REVIEWED BY:

 **JANE RATCHYE**, Assistant Director, Resource Management

APPROVED BY:



VALERIE O. FONG
Director of Utilities

⁶ For PV Partners reservations that are already approved, the last estimated performance-based incentive (PBI) payment date is 2020. However, if staff receives an application for all or a portion of the remaining rebate funds as a part of a new construction project, then the project may require PBI payments through 2022.

Exhibit A to Resolution No 9402
Adopted by City Council on April 21, 2014

City of Palo Alto Utilities – Local Solar Plan

Goal

To increase the installation of local solar photovoltaic facilities to provide 4 percent of the City's total energy needs by 2023.

Objectives

1. Facilitate the development of local, safe and cost-effective solar in Palo Alto to meet the diverse needs of the community
2. Reduce the cost of installing solar in Palo Alto and become a leader in promoting renewable distributed generation through solar installations
3. Understand the community's solar potential and diverse needs and develop solar programs accordingly
4. Remove internal obstacles to minimize cost and achieve greater solar potential
5. Promote solar installations in a cost effective and safe manner
6. Leverage industry resources to the extent possible
7. Deploy industry best practices

Strategies

- 1. Remove internal system and institutional barriers which increase “soft” costs and may impede adoption of solar in Palo Alto**
 - a. Work with the Development Center, Planning and Utilities to identify further improvements to streamline the solar permitting process.
 - b. Promote advancements in the City's permitting process to community and solar developers.
- 2. Develop proper policies, incentives, price signals and rates to encourage solar installation**
 - a. Solar Policy and Rate Design – explore rate structures that balance cost of service with the City's policy to promote the development of new solar systems in Palo Alto.
 - i. When evaluating new solar policies, evaluate the impact, if any, on non-solar ratepayers.
 - b. City of Palo Alto Utilities (CPAU) Billing System – explore modifications to the billing system and/or evaluate:
 - i. Incorporating net metering information on the monthly bills
 - ii. Virtual net metering to allow the sharing of net metering bill credits across accounts
 - c. CPAU Incentives – assess providing rebates or other incentives after the SB1 mandated expenditures are exhausted, the Federal Investment Tax Credit has been reduced from 30% to 10% and the net-metering cap has been met, to continue to encourage local solar installations.

- d. Leverage available resources for solar policy and program development
 - i. Participate in the Federal Department of Energy's American Solar Transformation Initiative to receive free services including development of a customized solar road map
 - ii. Request assistance from existing membership in Solar Electric Power Association and ESource
 - iii. Consider partnering with regional cities, counties and the State of California in developing solar programs
- e. Advocate at a local, regional and state level for effective rules, regulations and legislation to promote cost effective and fair solar development
 - i. Coordinate with other municipal utilities through the Northern California Power Agency (NCPA) and the California Municipal Utilities Association (CMUA) on state legislation related to solar

3. Assess technical and market potential of solar in Palo Alto

- a. Review commercial and residential sites to determine solar technical potential
- b. Determine cost drivers for installing solar in Palo Alto
- c. Utilize other industry studies to develop a feasible and marketable potential
- d. Develop a database of solar potential
- e. Assess the impacts of PV on CPAU's distribution system

4. Implement policies and programs to increase solar system installations on CPAU customer sites with good solar access

- a. Continue to promote the PV Partners program to achieve the 6.5 MW of installation by 2017, per CA SB1
- b. Continue to promote the Palo Alto CLEAN (feed-in-tariff) program and revamp the marketing of Palo Alto CLEAN to facilitate the coordination of potential sites with developers and property owners/managers to achieve some level of participation
 - i. Annually re-assess the avoided cost of local renewable energy and recommend adjustments to the CLEAN offer price and contract terms, as appropriate
 - ii. Investigate developers' concerns with Palo Alto CLEAN program rules
 - iii. Continue to educate commercial property owners about the CLEAN program
- c. Evaluate solar project financing options
 - i. Coordinate with the California FIRST Property Assessed Clean Energy (PACE) program which allows solar system owners to borrow funds for the PV installation and pay it back on their property tax bills over a term equal to the expected system life (20 years).
 - ii. Partner with local lenders to offer solar financing¹

¹ See an example of such a program from New Jersey's Public Service Enterprise Group her: <http://www.pseg.com/home/save/solar/index.jsp>

5. Facilitate and/or develop new programs to encourage new participants to develop local solar installations.

- a. Develop a solar donation program for community members to donate to public sector and non-profit organizations which may benefit from solar, but can't afford the investment on their own.
 - i. Work with PAUSD and other non-profits to identify sites. Potential installation sites include public sector and non-profit locations which are ineligible to receive federal tax subsidies.
 - ii. Evaluate alternative mechanisms to provide donations to sustain the program, including:
 - (1) Reformulating the suspended PaloAlto**Green** electric program as a mechanism to provide ongoing donations;
 - (2) Developing a bill donation mechanism to raise funds; or
 - (3) Developing on-line or crowd-funded sources to raise ongoing funds.
- b. Develop a community solar share program for the benefit of community members that do not have good solar access but have the desire to invest in local solar.
 - i. Evaluate program design options that allow CPAU customers to invest in a share of a new larger-scale solar PV installations located in Palo Alto
 - ii. Evaluate options for providing value back to customer investors, including:
 - (1) Evaluate CPAU's ability to provide monthly payments (in \$) on the customer's Utilities bill
 - (2) Evaluate CPAU's ability to offer "virtual net metering" so that energy produced (in kWh) from a solar system could be reflected on customers' Utilities bills. [Note that the billing system challenges may be substantial for this option.]
 - (3) Evaluate providing payments to customers via a third-party administrator separate from the Utilities bill.
 - iii. Evaluate outsourcing the administration of the community solar program to provide the following:
 - (1) Develop the community solar program
 - (2) Perform program marketing
 - (3) Identify installation sites
 - (4) Manage the solar installation contract
 - (5) Own, operate and maintain the PV installation (or contract with a third-party)
- c. Investigate group-discount solar PV program options to allow/facilitate Palo Alto residents to pool their buying power to secure significant discounts, making installing solar on their home simple and more affordable.
 - i. Leverage existing group-discount programs offered to regional residents and company employees.

6. Maximize solar installations on City-owned facilities

- a. Assist Public Works in evaluating leasing City-owned facilities with low electric consumption (elevated garages and surface parking lots) to a solar developer who

could install solar PV systems and would be compensated under the Palo Alto CLEAN program.

- b. Assist Public Works in investigating installing net-metered solar on City-owned sites to reduce the City's annual electric costs (and benefit the General fund).

7. Educate the community on the benefits of solar through information and demonstration projects

- a. Develop solar demonstration projects on City and public facilities
- b. Promote the benefits of PV systems together with fuel switching (replacing end-of-life gas appliances with electric appliances or replacing a gasoline vehicle with an electric vehicle or a plug-in hybrid vehicle) strategies to reduce greenhouse gas emissions.
- c. Investigate developing a "one-stop-shop" model (e.g., Wave-one).
- d. Develop "how to go solar" promotional materials which allows customers to evaluate several solar options.
- e. Develop direct marketing for small commercial/business customers.
- f. Develop a database of solar projects installed throughout the community as "case studies" and promote them through CPAU's web site.
- g. Promote new innovative solar technologies using the CPAU Emerging technology Program
 - i. Thermoelectric paint
 - ii. PV & batteries
 - iii. Building-integrated PV (BIPV)
 - iv. White roofs
 - v. Microgrids
 - vi. Solar shingles
 - vii. Solar thermal

Attachment B: Summary of Local Solar Plan Implementation Efforts

Strategy-By-Strategy Update of Local Solar Plan Implementation Efforts		
Strategy	Achievements to Date	Ongoing/Future Plans
Strategy 1: Remove internal system and institutional barriers which increase “soft” costs and may impede adoption of solar in Palo Alto	Pre-dating the Local Solar Plan, Development Services implemented a streamlined permitting process for residential solar PV systems. Palo Alto received the 2014 Best Solar Collaboration Award for the improved permitting process.	Staff is publicizing the streamlined solar permitting process on an ongoing basis. Staff plans to continue streamlining of permitting, inspection, and interconnection processes as necessary to comply with the recently enacted AB2188 which mandates a standardized procedure for solar permitting across the state. (Fall 2015)
Strategy 2: Develop proper policies, incentives, price signals and rates to encourage solar installation	As described in detail in this report, staff evaluated increasing the funding for PV Partners beyond compliance obligations and recommend not expanding the program after all legislative mandates have been met.	Staff is currently incorporating local solar considerations in the electric rate analysis discussions. (Ongoing) Staff will bring forward a clarification for the methodology used to calculate the City’s NEM cap for Council adoption (Fall 2015) Staff members from multiple departments are coordinating to integrate and improve the permitting, inspection, and interconnection processes to ensure the City has visibility of all systems being installed within Palo Alto and to accurately and electronically track progress towards the NEM cap. (Fall 2015) Staff seeks regular technical and non-technical assistance from the Solar Electric Power Association, E Source, and the U.S. Department of Energy funded American Solar Transformation Initiative. (Ongoing) The City coordinates with the Northern California Power Agency (NCPA) and the California Municipal Utilities Association (CMUA) on an ongoing basis on effective rules, regulations, and legislation to promote cost-effective and fair solar development. (Ongoing) Solar considerations are being incorporated in the ongoing discussions for adopting new billing and customer information

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		systems. Staff plan to research and evaluate a NEM successor program, which will be coordinated with the electric rate discussion and analysis. Guidelines for the NEM successor program design will be brought to the UAC, Finance Committee, Council in Fall 2015, and a program will be brought for review by Spring 2016. A clear path to securing a host site is critical to successfully launch a community solar program. Staff is in the process of selecting a municipal site to host the solar system, which could facilitate the process of launching the program and enhance associated education and outreach efforts.
Strategy 3: Assess technical and market potential of solar in Palo Alto	Completed a GIS-based solar technical potential assessment for rooftops and published a map of the potential online for interested community members ¹ (Summer 2014)	Staff is broadening the solar technical potential assessment to incorporate surface parking. (Fall 2015) Staff is completing the economic and market potential assessment and documentation. Preliminary results of the potential assessment are incorporated in the memo. (Fall 2015) Staff plan to coordinate with the Planning Department on the impact of current zoning rules for carport installations Staff plan to conduct a study of distribution system impacts from high penetrations of solar and EV (FY16)
Strategy 4: Implement policies and programs to increase solar system	As described in detail in the full report, Palo Alto's PV Partners program providing rebates for customer-cited solar systems has spurred over 6.5 MW of local solar PV adoption to	Staff is currently evaluating joining the HERO program, which would give residents another PACE financing option

¹ <https://cityofpaloalto.org/solarmap>

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installations on CPAU customer sites with good solar access	date. All residential rebate funds have been reserved and commercial rebate funds are nearly depleted. Staff recommends that the program not be expanded once all legislative obligations have been fulfilled. The Palo Alto Clean Local Energy Accessible Now (CLEAN) program is a feed-in tariff program for renewable generation facilities sited within Palo Alto. To date, the program has not generated a project. However, staff continues to market the program. Furthermore, after a recent solar developer survey, the feedback provided led staff to propose the recommendation to offer a 25-year power purchase agreement (PPA) option, instead of only the 20-year PPA. Council subsequently approved this change. The City is currently a member of California FIRST, which give residents a Property Assessed Clean Energy (PACE) financing option to pay for on-site renewable energy installations through their property tax bill	
Strategy 5: Facilitate and/or develop new programs to encourage new participants to	Palo Alto joined a regional solar group-buy program called Peninsula SunShares. The solar system prices resulting from the Aggregating the purchasing power of the community resulted in solar system prices	Staff plans to begin the research and development of a solar donation program (Winter 2015/2016) Staff provides ongoing support to PAUSD and the Sustainable School Committee in their efforts to evaluate the costs and

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develop local solar installations	approximately 15-25% below current market prices across all nine Bay Area counties. Registration for the program ran from April through August 2015. Palo Alto households made up approximately 40% of the total program participation.	benefits of solar PV installations on school facilities (ongoing) Staff provided an informational report to the UAC in July 2015 regarding the status of the community solar program development efforts. At present, staff is selecting a municipal site to host the community solar facility. Staff will return to the UAC with a proposed program design in Spring 2016.
Strategy 6: Maximize solar installations on City-owned facilities	Public Works released an RFP in May 2014 to lease the top levels of five downtown City multi-level parking structures for solar PV facilities applying through the Palo Alto CLEAN feed-in tariff program. Currently, staff and the selected developer are negotiating a site lease for the installations.	A committee was formed to inventory all municipal facilities and their suitability for solar PV and to develop a work plan for installing solar on viable sites. (Fall 2015)
Strategy 7: Educate the community on the benefits of solar through information and demonstration projects	Pre-dating the Local Solar Plan, in 2008 Public Works and Utilities installed solar demonstration projects at the Municipal Service Center, Baylands Interpretive Center, and Cubberley Community Center. Staff hosts workshops on a variety of topics, including customer-sited solar energy. The last solar energy workshop was April 25, 2015, and was coordinated with the program administrator for the solar group-buy program Peninsula SunShares.	Staff routinely evaluates innovative solar technologies through the Program for Emerging Technologies (PET). Through PET, a 6-month pilot project was launched in partnership with Petra Systems to evaluate and demonstrate distributed solar PV on street light poles. The pilot project concluded in May, and staff is in the process of completing an evaluation report. Staff is evaluating issuing an RFP for customer-facing tools to aid in solar decision-making (Fall 2015)