



City of Sunnyvale

Agenda Item-No Attachments (PDF)

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REPORT TO COUNCIL

SUBJECT

Power Purchase Agreements for Alternative Energy Allocation (Study Issue) - Pursue Solar Energy Solutions and Approve Budget Modification No. 4

REPORT IN BRIEF

Study Issue ESD 13-01 Power Purchase Agreements for Alternative Energy Allocation (Attachment 1) evaluates the City's participation in a Power Purchase Agreement (PPA) to acquire alternative energy for City-owned or controlled utility facilities and recognized the need to perform site surveys to determine the alternative energy potential of a site. This Study Issue was initiated by the Sustainability Commission.

There have been several recent regional efforts to secure alternative energy for local city and county facilities. These regional alternative energy procurements solicited proposals for various renewable power generating options including solar (photovoltaic), solar thermal, fuel cell, or wind turbine. The most common technology deployed through these and other recent PPA procurements was solar photovoltaic. Therefore, this Study Issue focused on evaluating solar energy, as the most common type of alternative energy to consider for City owned or controlled facilities. This study was conducted by Optony, Inc., a global research and consulting firm that specializes in solar projects, under the direction of Environmental Services Department staff. The two-part evaluation consisted of an initial screening of 18 City utility sites, followed by a structural feasibility and detailed financial evaluation of 14 sites. The study finds that there are currently four sites that are viable for solar energy installations to offset utility and facility electrical use that would result in near and long-term savings for the City. These locations include: the SMaRT Station, the City's Corporation Yard, the wastewater lift station at Baylands Park, and Ortega Well (potential solar structures would be located in Ortega Park). This report provides additional detail of the evaluation, possible locations for the solar installations, project financing approaches, and estimated cost savings. For the final sites, the report concludes an average potential net savings in annual electricity costs of 40 percent or more per site.

The Parks and Recreation Commission (Minutes, Attachment 7) considered this item at its meeting on June 11, 2014, and the Sustainability Commission considered this item at its meeting on June 16, 2014 (Minutes, Attachment 8).

BACKGROUND

The City's two primary motivations in supporting the acceleration of solar power electricity generation in operations are to reduce or offset the cost associated with energy consumption by City operations and to reduce greenhouse gas (GHG) emissions. Costs for solar electricity have continued to decrease over time and the solar and energy markets offer different financing mechanisms that allow customers, including public agencies, to benefit from solar power generation.

The Climate Action Plan, Sunnyvale's comprehensive approach to achieving greenhouse gas reductions over time (Attachment 6), contemplates expanding the use of solar and other renewables. Shifting from traditional energy use to renewable sources (with lower emissions) is an important complement to energy conservation in lowering GHG emissions. Deploying solar power on City facilities demonstrates the City's commitment to sustainability and renewable energy.

The City contracted Optony Inc., a global research and consulting services firm specializing in solar projects, to conduct site surveys and a feasibility analysis with regard to solar deployment at City sites. The final report (Attachment 2) provides a feasibility analysis of 14 potential sites for solar installation, with recommendations for actions that best fit the needs and opportunities for renewable energy at City facilities.

Due to funding limitations, staff chose to focus this initial study on City owned and operated utility sites. The initial cost of the site surveys and technical evaluation was funded by utility funds. Staff also sought to find adjacencies with non-utility operations to maximize potential cost savings to the City.

During the preparation of this report, staff also reviewed the original context for the previously dropped DPW 10-09 Reliable Electrical Power Options, as was requested by the Council at the February 2013 Study Issues session. Council requested that staff propose a next step regarding that context. While the recommendations of this report address power generation for City sites, they do not address community power as discussed in DPW 10-09. Staff concluded that the Council has already taken a meaningful step to address the spirit of DPW 10-09 with prioritization of a newer Study Issue, ESD 14-02 Community Choice Aggregation. Funding for that study is included in the Proposed Operating Budget for FY 14-15 and is slated for completion this year. All Study Issues can be accessed through the City's [Study Issues](http://sunnyvale.ca.gov/CityGovernment/StudyIssues.aspx) <<http://sunnyvale.ca.gov/CityGovernment/StudyIssues.aspx>> website.

EXISTING POLICY

Council Policy 3.5.1 *Energy*:

The City of Sunnyvale finds that the preservation of natural resources through the use of energy efficient activities is of great importance to the citizens and businesses of Sunnyvale. It is the purpose of this Energy Policy to:

- Promote economic development
- Maintain a healthy environment
- Maximize limited natural resources
- Encourage alternative forms of transportation
- Encourage cost reduction in City operations

It is the policy of the City of Sunnyvale that the City will:

- Minimize energy consumption in City operations
- Promote the development of alternative energy resources and support the enhancement of existing technologies

ENVIRONMENTAL REVIEW

Although Public Resources Code 21080.35 exempts solar installations meeting certain criteria from review under the California Environmental Quality Act (CEQA), the proposed solar installations at the SMaRT Station, Corporation Yard, Baylands Park, and Ortega Park may require removal of some mature trees from the parking lots. In addition, approximately 6 trees may be removed from the picnic area at Ortega Park. If Council directs staff to pursue solar energy solutions through an RFP for PPAs and Direct Purchase for the four recommended sites, staff will conduct appropriate environmental review prior to returning to the City Council for final approval of the installations.

DISCUSSION

Sunnyvale purchases electricity used in City operations from PG&E. There are regulations and tariff programs authorized by the California Public Utilities Commission that enable PG&E customers to generate renewable power to offset power provided by PG&E. These include Net Energy Metering (NEM) and the Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT). These tariff programs are described in more detail in the feasibility report. At this time, Net Energy Metering is the only viable option for the City as it allows for solar generation exported to the grid to be credited at the full bundled price the City would pay for energy use at the time the power is generated (i.e., same time-of-day and time-of-year rate and inclusive of generation, distribution, and transmission charges). Energy rates are higher during the day and lower at night. This allows solar power to be generated during the day to be credited at higher rates and power used at night be charged at a lower rate. The Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT), which is available only to municipalities, would allow excess electricity generated by a City-owned PV system to be credited against electricity used at a different site. However, under the current RES-BCT tariff, the City would earn credit for only the “generation” component of the bundled time-of-use rate, which is typically only 1/3 to 1/2 the value of the full price of energy to the facility.

Site Analysis

The technical site analysis consisted of two components: an initial screening of 18 potential sites and a detailed financial and feasibility review of a subset of sites. The study also evaluated potential financing mechanisms and the potential cost-benefit of solar deployments on a site-by-site basis. The full report prepared by Optony is included in Attachment 2.

Staff identified 18 potential utility sites for solar analysis by Optony, shown in Table 1. The initial assessment consisted of a preliminary desktop review to determine the potential viability of solar and evaluated total generation potential. Based on this screening, a subset of sites (14) was identified as having sufficient power generation potential to warrant further study and moved on to a full site analysis.

Table 1. Utility Site Assessment Locations

Location	Preliminary Screening	Full Site Analysis	Recommended
Central Water Plant	X		
Mary Hetch Hetchy Turnout	X		
Schroeder Well	X		
Recycling Center	X		
Hamilton Well/Water Plant	X	X	
Mary-Carson Water Plant	X	X	

Raynor Well	X	X	
San Lucar Pump Station	X	X	
Serra Well	X	X	
Sunken Gardens	X	X	
Sunnyvale Landfill	X	X	
Water Pollution Control Plant Ponds	X	X	
Wolfe-Evelyn Water Plant	X	X	
Wright Ave Water Plant	X	X	
SMaRT Station	X	X	X
Corporation Yard	X	X	X
Baylands Lift Station	X	X	X
Ortega Well	X	X	X

The full site analysis included a renewable energy generation analysis; electrical and structural analysis; economic feasibility and financial analysis; and conclusions and recommendations. The criteria for site evaluation included electricity usage at the site, physical space available for photovoltaic (PV) installation, existing conditions at the site including age of the building and structural and electrical limitations, planned energy or structural renovations, as well as surrounding vegetation and other shading concerns. The economic evaluation looked at cost for the PV system, potential energy generation, and estimated savings either from reduced PG&E costs or reduced electricity costs resulting from a Power Purchase Agreement. These estimates are based on Optony's understanding of the solar installation and procurement market and factor in recent solar procurements including a regional procurement underway by Alameda County. Actual cost savings for the potential Sunnyvale projects will vary based on financing options and the PV system provider.

From the full site analysis, it was determined that four sites are viable candidates for solar electricity installations. These sites and a brief description of the solar installation are presented in Table 2 and maps showing locations for potential solar panels and structures are included in Attachment 3. Due to the difference in electricity rates based on time-of-use, the PV system capacity is designed to offset the full PG&E bill while minimizing excess electricity generation; therefore, the designed energy offset is less than 100 percent of the annual energy usage.

Table 2. Recommended Solar Sites

Project Site	Site Description
SMaRT Station	
Type of PV System:	Rooftop / Carport
Annual Energy Usage:	419,370 kWh
Recommended System Size:	241 kW-DC
Recommended Annual System Output:	346,690 kWh
Energy Offset:	83%
Corporation Yard	
Type of PV System:	Rooftop / Carport
Annual Energy Usage:	47,780 kWh
Recommended System Size:	25 kW-DC
Recommended Annual System Output:	37,670 kWh
Energy Offset:	79% recommended
Baylands Park	
Type of PV System:	Carport
Annual Energy Usage:	58,960 kWh (Lift Station) 57,840 kWh (Park Meter)
Recommended System Size:	28 kW-DC (Lift Station) 38 kW-DC (Park Meter)
Recommended Annual System Output:	40,620 kWh (Lift Station) 55,127 kWh (Park Meter)
Energy Offset:	71% (Lift Station) 69% (Park Meter)
Ortega Well*	
Type of PV System:	Carport/Shade Structure
Annual Energy Usage:	227,067 kWh
Recommended System Size:	122 kW-DC
Recommended Annual System Output:	172,300 kWh
Energy Offset:	76% recommended

**current recommended system supports only electricity usage at Ortega Well; this site has the potential to also offset park facility usage with a larger PV system.*

Financing and Procurement Options

Three scenarios for the financing and procurement of solar electric installations on City utility sites were analyzed: Direct Purchase, Power Purchase Agreement, and Loan/Lease.

1. Direct Purchase - The City would allocate funding for the initial capital costs to purchase and install the system. For the recommended system sizes being analyzed as a part of this study, the estimated direct purchase cost is in the range of \$1,390,000 to \$1,536,000. The City would be responsible for all ownership concerns and risks, including operations and maintenance (O&M), regular system cleaning, and monitoring of system production. Direct Purchase has the potential to yield the greatest long-term returns, but requires investment upfront and ongoing operational costs. The ongoing operational costs are based on the size of the PV and estimated at \$15/kW annually. For the purposes of this study, the annual O&M costs for the recommended solar sites are estimated to be \$6,800. This would include bi-annual system cleaning, system equipment maintenance, and response to system warranty or system outage

issues. System vendors can provide services as part of the direct purchase price or as an annual charge. The costs for O&M have been included in the cost estimates for this study.

2. Power Purchase Agreement (PPA) - The City would enter into a long-term contract (typically 20-25 years) with a third-party PV system provider and purchase all energy used on the site at a set rate (usually lower than current and future PG&E rates). The third-party provider would own the PV system and be responsible for all ownership costs, including construction, financing, operations and maintenance, insurance, and system production. There would be no up-front capital investment required through a PPA. Furthermore, the PPA would allow the City to forecast energy costs for long-term budgeting purposes based on the set contracted energy rate.
3. Loan/Lease - The City would pay a third-party PV system provider on a monthly basis over 10 to 20 years, instead of paying the direct purchase costs up-front. In such arrangements, the City would be responsible for all ownership concerns, just as with a Direct Purchase. Locally-issued bonds or renewable energy bonds, such as CREBs (Clean Renewable Energy Bonds) and QECBs (Qualified Energy Conservation Bonds), have similar cash-flow models and would fall into this category. Loan/Lease avoids the need for upfront investment by the City and allows the costs to be spread over a longer term while likely yielding greater long-term returns than a PPA, after repayment is complete.

Due to the additional administrative actions required to secure a loan/lease for financing and repayment, the Loan/Lease option is not preferable. However, the Direct Purchase and the PPA may be worth exploring given the potential cost savings to the City and the overall environmental benefit. Government Code section 4217 *et. seq.* gives public agencies flexibility in procuring and structuring energy efficiency contracts. Rather than utilizing a standard competitive bid process for public works construction, agencies may issue Requests for Proposals (RFPs) and award contracts based on experience of the contractor, the type of technology employed, cost to the agency, and other relevant factors. Additionally, Sunnyvale Municipal Code section 2.09.070 lists exemptions to the City's Charter requirement for competitive bidding and award to lowest bidder including situations where it would be impractical or unavailing.

Based on the feasibility analysis, four sites were recommended to proceed with solar procurement utilizing the NEM program - the SMaRT Station, the Corporation Yard, Baylands Park, and Ortega Well. The sites currently consume approximately 800,000 kilowatt-hours per year. To offset electricity use at these sites, the City would install 454 kW of solar PV. Over 25 years, the City could realize an estimated net savings of \$1.8 to \$3.5 million dollars, depending on the financing approach selected. Estimated costs and Net Present Value (NPV) savings for each location are presented in Table 3, and an excerpted project economics table including each of the recommended sites is included in Attachment 4. Baylands Park is operated by the City and owned by the County of Santa Clara. Staff would need to initiate discussions with the County and possibly amend the operations agreement for the solar installation at Baylands Park. Trees may need to be removed and replaced to accommodate solar installations. Approximately 20 trees would need to be replaced for full build-out at Ortega Park.

Table 3. Estimated Cost and 25-yr NPV Savings for Recommended Projects

Site Name	Direct Purchase Cost Range	Estimated Payback*- Direct Purchase (years)	Total Net Energy Cost Savings - Direct Purchase*	Total Net Energy Cost Savings - Loan/Lease	Total Net Energy Cost Savings - PPA
SMaRT Station	\$655,000 - \$724,000	7	\$1,601,000 - \$2,235,000	\$1,548,000 - \$2,182,000	\$1,153,000 - \$1,788,000
Corporation Yard	\$91,000 - \$101,000	9	\$121,000 - \$182,000	\$113,000 - \$174,000	\$93,000 - \$154,000
Baylands Park	\$179,000 - \$198,000	8	\$290,000 - \$423,000	\$276,000 - \$409,000	\$165,000 - \$299,000
Ortega Park	\$465,000 - \$513,000	10	\$442,000 - \$701,000	\$404,000 - \$663,000	\$368,000 - \$627,000
Total for all sites	\$1,390,000 - \$1,536,000		\$2,454,000 - \$3,541,000	\$2,341,000 - \$3,428,000	\$1,779,000 - \$2,868,000

*Payback period is calculated based on total savings estimated over 25 years. Total net savings deducts initial investment required for the direct purchase.

In addition to the cost savings, the environmental benefit of the solar installations would be equivalent to preventing the release of 170 metric tons of carbon dioxide annually, based on current power sources. This amount is equivalent to planting 140 acres of trees or eliminating 390,000 vehicles miles traveled annually.

Should Council approve proceeding with PV procurement at the recommended sites, staff would retain additional technical support which will include developing detailed specifications and pre-engineering system designs for the RFP for a PPA and/or Direct Purchase; procurement support; and technical and financial evaluations of vendor proposals, qualifications, and experience. The estimated cost for this technical support is \$40,000 and would be funded by the solid waste, wastewater, and water utility funds. Staff would then bring back the results of the competitive RFP to Council for review and award.

FISCAL IMPACT

This Study Issue concluded that there are opportunities for the City to realize cost savings by generating its own renewable energy. It is estimated that proceeding with the installation of solar could result in significant energy cost savings for the City, an average of 40 percent or more at each site. The amount of the savings would be dependent on the financing approach selected and the actual future power used at each site. Although both a PPA and Direct Purchase would result in cost savings to the City, a Direct Purchase would generally yield greater long-term cost savings. The City would need to identify how to fund the upfront capital costs and would have ongoing O&M responsibilities for the solar panels and structures. Proceeding with a competitive RFP process would allow the City to determine which financing approach produces the best overall value.

Staff is recommending that funding for the technical support to proceed be shared among the benefitting utility funds, proportional to the total energy used by the main project sites. Budget Modification No. 4 has been prepared to appropriate funding from the utility funds to a new project to fund the procurement.

Budget Modification No. 4

FY 2014/15

	Current	Increase/ (Decrease)	Revised
<u>Expenditures</u>			
Wastewater Management Fund			
New Project - Solar Installation Procurement	\$0	\$40,000	\$40,000
<u>Reserves</u>			
Solid Waste Management Fund Rate Stabilization Reserve	\$1,218,758	(\$24,000)	\$1,194,758
Wastewater Management Fund Rate Stabilization Reserve	\$4,214,361	(\$3,200)	\$4,211,161
Water Supply and Distribution Fund Rate Stabilization Reserve	\$3,589,429	(\$12,800)	\$3,576,629

PUBLIC CONTACT

Public contact was made through posting of the Council agenda on the City's official-notice bulletin board outside City Hall, at the Sunnyvale Senior Center, Community Center and Department of Public Safety; and by making the agenda available at the Sunnyvale Public Library, the Office of the City Clerk and on the City's website.

Additionally, staff conducted separate community outreach meetings for Ortega Park and Baylands Park to provide information to potentially impacted neighbors and park users and to receive feedback. Postcards were sent to residents within a 1,000 foot radius around Ortega Park. In addition, notices for both meetings were provided to neighborhood association contacts, Friends of Parks and Recreation, and posted at the park sites.

Twenty-three community members attended the community outreach meeting held at Ortega Park on March 10, 2014. Based on a poll of the attendees at the end of the meeting, ten were supportive of solar panels at the park, and no one voted in opposition to the potential solar project in the park. Concerns raised by community members can be categorized into the following areas: tree removal or relocation for parking or shade structures, negative aesthetic impacts on the park, impacts to parking and sidewalk access, reduced visibility in the parking lots, loss of natural shade in some areas of the park, potential for increased crime (burglaries and drug dealing) as a result of the solar structures, and potential vandalism or damage to the panels from children or teenagers. Supportive comments included that it seems like a good cost saving measure and a wonderful idea. Two attendees remarked on their positive experience with solar on their homes. Community members asked that if the City were to move forward, that considerations be made to encourage larger trees if replacements are necessary, relocate trees within the park, reconsider the shade structures over the picnic areas, add EV charging stations, and consider more aesthetically pleasing solar panels and structures.

Two community members attended the Baylands Park community outreach meeting held at the SMaRT Station on March 12. Staff answered questions from the attendees. No concerns were raised

by the public.

A summary of the feedback received at the public meetings and via email is included in Attachment 5.

The Parks and Recreation Commission considered this item at its meeting on June 11, 2014, and the Sustainability Commission considered this item at its meeting on June 16, 2014. The minutes for the Parks and Recreation and Sustainability Commissions are included in Attachment 7 and Attachment 8.

ALTERNATIVES

1. Direct staff to complete appropriate environmental review of the proposed installations at the selected sites and return for final approval.
2. Direct staff to pursue solar energy solutions through an RFP for PPAs and Direct Purchase for the four recommended sites.
3. Direct staff to pursue solar energy solutions through an RFP for only PPAs for the four recommended sites.
4. Approve Budget Modification No. 4 to appropriate \$40,000 for additional technical services to support the project.
5. Other action as determined by Council.
6. Do not pursue solar energy at this time.

STAFF RECOMMENDATION

Recommend that Council Adopt Alternatives 1, 2 and 4: Direct staff to complete appropriate environmental review of the proposed installations at the selected sites and return for final approval; direct staff to pursue solar energy solutions through an RFP for PPAs and Direct Purchase for the four recommended sites; and approve Budget Modification No. 4 to appropriate \$40,000 for additional technical services to support the project.

Based on the results of the study, the City can realize significant savings by pursuing solar energy generation at the recommended sites and demonstrate the City's commitment to renewable energy and local greenhouse gas emission reductions. Community concerns about the aesthetic impacts on Ortega Park can be mitigated by specifying more aesthetically pleasing designs for the structures to be located in park settings. Additional outreach will be conducted as the project proceeds. Staff recommends that the City pursue an energy solution for the four recommended sites either through PPAs or direct purchase. While this study looked only at utility sites, staff will consider solar feasibility as a part of future facility planning efforts such as the Community Center master plan.

BOARD / COMMISSION RECOMMENDATION

The Parks and Recreation Commission considered this item at its June 11, 2014 meeting and voted 3-0 (2 Commissioners were absent) to recommend that Council approve Alternatives 1, 2 and 4: Find that the proposed solar installations are exempt from CEQA under Public Resources Code Section 21080.35 (Rooftop Solar CEQA Exemption) and CEQA guideline 15303 (New Construction or Conversion of Small Structures)*; direct staff to pursue solar energy solutions through an RFP for PPAs and Direct Purchase for the four recommended sites; and approve Budget Modification No. 39 to appropriate \$40,000 for additional technical services to support the project.

The motion that passed included a friendly amendment directing staff to ensure concerns identified by the community specific to Ortega Park including tree removal, replacement and pruning, and

safety are addressed as the project moves forward.

Parks and Recreation Commissioners would like to move the project forward and indicated there would be time to consider and alleviate concerns of the community regarding safety and removal of trees in the next phase of the project. Commissioner Kenton supports the concept of green energy. All the Commissioners expressed interest in preserving trees. Chair Alexander would like to know more about the environmental impact of removing trees.

*As a result of the questions raised at the Parks and Recreation Commission meeting regarding the removal and replacement of trees from Ortega Park, staff has determined that additional environmental review should be conducted before a decision is made to rely on the CEQA exemptions for solar installations and small structures.

The Sustainability Commission considered this item at its meeting on June 16, 2014 and voted 4-0-1 (1 Commissioner abstained and 1 Commissioner was absent) to recommend that Council Adopt Alternatives 1 and 4: Find that the proposed solar installations are exempt from CEQA under Public Resources Code Section 21080.35 (Rooftop Solar CEQA Exemption) and CEQA guideline 15303 (New Construction or Conversion of Small Structures) (* from above); approve Budget Modification No. 39 to appropriate \$40,000 for additional technical services to support the project; and to recommend Council adopt a modified Alternative 2: direct staff to pursue solar energy solutions through an RFP for PPAs and Direct Purchase for the four recommended sites with the design prepared so the systems can be expanded to the full site potential.

Commissioner Glaser commented that he would like to see a financial analysis completed for the four sites comparing the economics included as part of the current study to potential financial scenarios that may be in place under a Community Choice Aggregation Program. Specifically, this could analyze the financial implications of participating in a CCA Net Energy Metering program, as well as installing solar systems to the sites' full solar capacity and selling all of the energy produced to a CCA, using Marin Clean Energy and their acquisition costs as a guide.

Prepared by: Melody Tovar, Regulatory Programs Division Manager
Reviewed by: John Stufflebean, Director, Environmental Services
Reviewed by: Kent Steffens, Director, Public Works
Reviewed by: Robert A. Walker, Assistant City Manager
Approved by: Deanna J. Santana, City Manager

ATTACHMENTS

1. Study Issue ESD 13-01 *Power Purchase Agreements for Alternative Energy Allocation*
2. Solar Feasibility Study for the City of Sunnyvale
3. Solar Project Locations
4. Project Economics Table for Recommended Sites
5. Public Feedback Summary
6. [Climate Action Plan \(hyperlink\)](http://www.pmcworld.com/client/sunnyvale/documents/cap/Sunnyvale-CAP.pdf)
<<http://www.pmcworld.com/client/sunnyvale/documents/cap/Sunnyvale-CAP.pdf>>
7. Draft Minutes, Parks and Recreation Commission, 6/11/14
8. Draft Minutes, Sustainability Commission, 6/16/14

