



DATE: September 11, 2017

TO: Council Sustainability Committee

FROM: Director of Utilities & Environmental Services

SUBJECT Design and Construction Approach for the Solar Photovoltaic System Project at the Water Pollution Control Facility - Phase II

RECOMMENDATION

That the Committee reviews and comments on this report, and provides direction regarding the appropriate design and construction approach for an additional one-megawatt or larger solar photovoltaic system at the Water Pollution Control Facility (WPCF).

BACKGROUND

In 2009, the City began studying the feasibility of constructing a large solar photovoltaic (PV) system at the WPCF. Initially, a 500 kilowatt, privately designed, constructed, owned, and operated facility was envisioned. In this scenario, the City would purchase the energy from the private company through a Power Purchase Agreement (PPA). At the time, only private entities could take advantage of the tax-write off component of the incentives associated with this type of project. A request for proposals (RFP) seeking PPA development was issued in May 2009, and staff interviewed the top three respondents.

At the same time, a low-cost loan from the California Energy Commission (CEC) became available, which allowed staff to study if owning a system may be a better economic choice than purchasing the generated energy from a private party who would also own the system. Based on initial findings, staff began negotiating a turn-key project (where the City would own the system) with the top three respondents, and pursuing the CEC loan, which also provided further incentives via rebates. In parallel, staff pursued Net Energy Metering (NEM) for the project, which allowed the City to sell excess unused energy to PG&E. At the same time, staff recommended increasing the system size and output to one megawatt, in part to take full advantage of NEM, and in recognition of the needs at WPCF.

The modified project approach to allow a design-build contract was approved by the City Council on [November 9, 2009](#). REC Solar, of San Luis Obispo, was selected to construct the facility. The project was successfully completed in 2011. Despite its location next to the bay with salty air and generally corrosive environment, the system has operated very well. On many sunny, mild days it still produces very close to its rated output of one megawatt of power.

A few years after the solar photovoltaic project was put in service, the City upgraded its combined heat and power cogeneration facility at WPCF which uses bio-gas, a renewable by-product of the wastewater treatment process, to produce more renewable energy. Because some of the energy produced by the cogeneration system is at times excess to the needs of WPCF, the City decided to explore options to further benefit from the excess energy it produced. NEM limits onsite generation to one megawatt, so the existing solar PV system caused the WPCF to reach the limit for NEM. The City found a new tariff, called Renewable Energy Self-Generation Bill Credit Transfer or RES-BCT, which would allow the City to export its excess energy generated by both the solar PV and the upgraded cogeneration system. Under RES-BCT, the City is authorized to produce up to five megawatts of power and export its excess energy to a limited number of other City facilities. This not only allowed more efficient use of the cogeneration energy, but it also opened the door for the expansion of the City's solar PV installation at the WPCF.

DISCUSSION

Over the past couple of years, staff has prepared a site adjacent to the existing solar PV system, including soil preparation and grading, to accommodate a second phase of solar PV at the WPCF. The approximately 8-acre site, comparable to the space occupied by the existing solar PV system, is expected to be ready in the next two months. Given the efficiency improvements achieved in solar PV panel technology in the past few years, the site can be used to generate more power than one megawatt; possibly as high as 1.5 megawatt. However, because of regulations related to the number of sites that can be included in the export portfolio of a RES-BCT tariff, staff has determined that the tariff can only allow an addition of 500 kilowatts of power. Staff is proposing a larger expansion, likely beyond one megawatt, in anticipation of new regulations from the recently formed [East Bay Community Energy \(EBCE\)](#) which would not only allow but encourage local clean energy producers to generate and transfer to EBCE as much clean energy as they can produce.

Various Approaches to Design and Construction

There are various ways that the design, procurement, and construction of the new solar system can be processed. The two main options are conventional design-bid-build, and as an alternative, design-build approach. Advantages and disadvantages of each are discussed below.

Design-Bid-Build

This approach is similar to the overwhelming majority of the public works and utilities projects managed by the City. Under this process, the City selects a professional services company through a request for proposals process to design the facility and prepare Plans, Specifications, and a probable Estimated cost of construction, or PS&E documents. The Council reviews and approves PS&E documents and calls for competitive bids. Typically, the contractor that submits the lowest bid is awarded the project.

The advantage of this approach is that the City has full control over the design and the project specifications, and that the City benefits from the contractors' competition in receiving the bids for the same design. While this is a tried and true approach for the typical construction, such as paving roads, building buildings, or pipelines, the disadvantage is that it is not necessarily the best approach for constructing unique projects or projects with many unknowns. It is best to allow a firm that is familiar with the work and considered an expert in the field to design, value engineer, and construct the facility for the City.

Design-Build

This approach would allow a company that has been selected based on a bid process to design and build a facility for its client, in this case, the City. Because there are qualitative variables other than the low cost involved, such as the merits of the design, or in case of buildings, architectural features and quality of design, the selection may not be solely based on the lowest cost. The advantage of this approach is that a very competent, experienced builder is going to design a facility that they have designed and constructed multiple times before and perfected it, and therefore there is less room for including features in design or requirements in the specification to render the project hard to build, less functional, or less than state of the practice.

The City has used this approach in the past, and a couple of recent examples in Utilities and Environmental Services would be the construction of existing solar PV system at the WPCF (or any other Solar PV system built in the City) and the recent construction of the Co-Generation system at the WPCF. For the latter, the City used engineering consultant services to produce a preliminary (i.e., 10%) facilities plan. As importantly, this approach eliminates finger-pointing between separate designers and builders related to different elements of design, specifications, and constructability, since a single firm would be responsible for the project.

The disadvantages include that the City could lose some control over the design, features, and ease of operability and maintenance. Furthermore, there could also be a perception that the project could have been done less expensively.

Requested Committee's Direction

Staff would appreciate policy direction on the following two questions.

1. Would it be appropriate for this specialized project, to be processed as a design-build project, or should it go through the conventional design-bid-build process?
2. If the Committee is in support of a design-build approach, should the staff first attempt to negotiate an agreement for this new phase with REC Solar, the successful previous design-builder of the existing facility at WPCF, or should staff request proposals from various builders and then negotiate with the lowest cost proposer? In either case, the approval authority for any negotiated cost will be with the Council.

ECONOMIC IMPACT

Unlike the existing solar PV facility, the energy produced by the new facility would almost exclusively be used for export to either other City buildings or facilities to help the City meet its Zero Net Energy goal, or sold to EBCE. While the financial variables are numerous and hard to precisely predict this early in the project, staff believes the project's impact on City residents and businesses to be neutral.

STRATEGIC PRIORITIES

This agenda item supports the Complete Communities Strategic Initiative. The purpose of the Complete Communities strategy is to create and support structure, services, and amenities to provide inclusive and equitable access with the goal of becoming a thriving and promising place to live, work and play for all.

Goal 1: Improve quality of life for residents, business owners, and community members in all Hayward neighborhoods.

Objective 1: Increase neighborhood safety and cohesion.

By producing more emissions free energy from renewable sources, this project in a small measure contributes to the health and wellbeing of our residents throughout the City.

FISCAL IMPACT

The cost for this project is estimated at between \$4M to \$6M depending on the size of the system that is finally selected. The money will be funded by a combination of a small state grant and the Wastewater Improvement Capital Fund. Benefitting accounts will reimburse the Wastewater Improvement Capital Fund as they consume the electric energy over the years. Given the use of the RES-BCT tariff, a ten to fifteen-year project payback period it is estimated.

The payments from the benefitting accounts would be in line with what they would have paid to other electric service providers. Therefore, there will be no adverse impact on the General Fund's participating accounts.

SUSTAINABILITY FEATURES

The installation of additional solar PV in municipal facilities would allow the City to work towards producing local, GHG-free electric energy, from renewable sources. This project will get the City a step closer to meeting the Council's stated goal of Zero Net Energy (ZNE) for City municipal services by 2025. The City is currently producing more than 50 percent of its electric energy from renewable sources and purchase just over 8,000,000 kWh from PG&E. Depending on the selected project size, this project can potentially produce an additional 2,300,000 to 4,000,000 kWh and get the City substantially closer to meeting its municipal ZNE goal.

PUBLIC CONTACT

The project is at the Hayward Shoreline and located on the City's WPCF property. Impact on neighboring businesses would be minimal. No public contacts have been made at this point.

NEXT STEPS

Based on the Committee's recommended alternative, staff will prepare responsive documents and present it to Council for review and action.

Prepared and Recommended by: Alex Ameri, Director of Utilities & Environmental Services

Approved by:

A handwritten signature in black ink, appearing to read 'K. McAdoo', is positioned above a horizontal line.

Kelly McAdoo, City Manager