THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

INFORMATION

- Board of Directors
  Engineering and Operations Committee

8/19/2014 Board Meeting

9-1

Subject

Update on solar power generation opportunities for the F. E. Weymouth and Joseph Jensen Water Treatment Plants

Executive Summary

Solar power generating facilities can enhance Metropolitan's long-term power use efficiency and hedge against projected increases and volatility in the price of electricity. Moving forward with facilities at the F. E. Weymouth and Joseph Jensen Water Treatment Plants would take advantage of three incentive programs that will be phased out in the near future. Participation in these programs would be beneficial as they would provide long-term cost savings for energy use at both plants.

Description

Background

In 2010, Metropolitan's Board adopted Energy Management Policies which are intended to contain energy costs and reduce exposure to price volatility through the implementation of cost-effective alternative energy projects. The policies which are directly related to solar power development include:

- Develop strategies to hedge against cost increases and price volatility;
- Track and assess impacts of greenhouse gas (GHG) regulations; and
- Pursue cost-effective energy projects in the areas of energy efficiency or conservation improvements, small hydroelectric energy, and solar energy.

Metropolitan staff recently conducted an assessment of the potential for solar power projects at its water treatment plants. The assessment considered a number of emerging factors which impact the cost effectiveness of solar power. First, the cost to procure solar panels has decreased significantly over the past five years. Today's price for panels is approximately 60 percent of the price in 2009. Solar panel manufacturers have also increased the overall efficiency of solar energy conversion and reduced panel degradation. As a result, solar facilities now require a smaller footprint. As the California Solar Initiative (CSI) program is being phased out, new incentive programs are being offered by electric utilities. These programs are discussed in detail below. Finally, higher electricity rates and greater volatility are expected in the future from electrical utilities.

Based on staff's assessment of potential opportunities for solar power generation at Metropolitan's treatment plants, two options for installation of solar facilities at the Weymouth and Jensen plants were developed by staff and discussed with the Engineering and Operations Committee in June 2014. These options are described below.

Incentive Programs Available for the Weymouth Plant

The state of California launched the CSI program in 2007 to provide incentives for installation of solar facilities to customers in the investor-owned utility territories of Southern California Edison (SCE), Pacific Gas and Electric, and San Diego Gas & Electric. The CSI program was provided with a budget of $2.167 billion over a 10-year period, and is now entering its final phase. The CSI program is currently at Step 10 of 10, with an available rebate of $0.088 per kilowatt hour (kWh). Since the Weymouth plant is located within the SCE service

area, a solar facility at that location would be eligible to receive a rebate for the initial 1 megawatt (MW) in generation capacity.

In April 2013, SCE introduced the Renewable Energy Self-Generation Bill Credit Transfer program (RES-BCT), which would also be applicable for a solar facility at the Weymouth plant. This incentive program, which is available to public agencies, supports development of solar facilities up to 5 MW per site. The RES-BCT program allows any solar energy not consumed onsite to be credited and transferred to other SCE accounts of the sponsoring entity. Since Metropolitan has more than 400 accounts with SCE, this credit transfer incentive would be beneficial in reducing Metropolitan's overall energy costs. The RES-BCT program has a program-level cap of 124 MW in generation capacity. At the present time, there is sufficient capacity available in the program to include a solar facility at the Weymouth plant.

Incentive Programs Available for the Jensen Plant

The Jensen plant is located within the Los Angeles Department of Water and Power's (LADWP's) service area. LADWP administers a Solar Incentives Program (SIP) which provides incentives for solar facilities up to 1 MW in generation capacity. The LADWP program is currently at Step 8 of 10, with an available incentive of approximately $1.45 per installed watt. A solar facility at the Jensen plant would be eligible to receive a rebate for construction of a 1 MW installation.

Potential Solar Generation Projects at the Weymouth and Jensen Plants

Based on space available at the Weymouth site and the plant's projected power demands following completion of the ozonation facilities, staff considered two options for constructing a solar facility: a 3 MW facility and a 2 MW facility. A 3 MW solar facility could generate up to 7.7 million kWh of clean renewable energy annually. The majority of power generated would be consumed onsite, directly offsetting full retail electricity rates and reducing operating costs at the Weymouth plant. Through the RES-BCT program, excess energy produced by a 3 MW solar facility would be used to offset energy costs at other Metropolitan facilities served by SCE. If a 2 MW solar facility were constructed, all of the power generated (5.1 million kWh annually) would be consumed onsite. Either system would be ground-mounted and would include a single-axis tracking system to allow the solar panel arrays to track the sun's path from east to west on a daily basis. Approximately 15 acres would be required for a 3 MW installation.

The two proposed locations for the solar facility are within the Weymouth plant's operational boundary, near the southwest and northeast corners of the site. These locations would not impact current plant operations or potential future treatment projects.

At the Jensen plant, space is available for a 1 MW solar facility. This facility could generate up to 2.4 million kWh of clean renewable energy annually. All of the power generated would be consumed onsite directly, offsetting full-retail electricity rates and reducing operating costs at the plant. The system would be ground-mounted and would include a single-axis tracking system to allow the solar panel arrays to track the sun's path from east to west on a daily basis. Approximately five acres would be required for the installation.

The proposed location of the solar facility is within the Jensen plant's operational boundary, at the southwest corner of the site. This location would not impact current plant operations or potential future treatment projects.

Business Analysis

Two options for moving forward with solar facilities at the Weymouth and Jensen plants are shown in the table below. The first option includes a 1 MW system at the Jensen plant and a 2 MW system at the Weymouth plant. The second option includes the same 1 MW system at the Jensen plant and a 3 MW system at the Weymouth plant. In comparison, the table contrasts these options with the "do-nothing" approach of continuing to purchase power from the local utilities without constructing solar facilities. For both of the options, there is a positive Net Present Value, a benefit/cost ratio greater than 1.0, and a payback period of 11 years or less.

OPTION		NO SOLAR	SOLAR FACILITIES [2]			
		Cost of Energy [1] (NPV) [3]	Total Expense [4] (NPV)	Savings (NPV)	Benefit/Cost Ratio	Payback Period (yrs)
1	Jensen 1 MW & Weymouth 2 MW	$24M to $43M	$13M	$11M to $30M	1.8 to 3.3	8.5 to 10
2	Jensen 1 MW & Weymouth 3 MW	$30M to $55M	$18M	$12M to $37M	1.6 to 3	9 to 11

(1) Cost of Energy: Assumes annual electricity rate increases of 4% to 8% over the next 30 years. All power continues to be purchased from the local utility.
(2) Assumptions include: 30-year life for photovoltaic panels; zero salvage value; 4% discount rate; 30-year analysis period.
(3) NPV: Net Present Value represents the present value of a multiyear cash flow.
(4) Total Expense includes initial capital cost and operation and maintenance costs over the 30-year analysis period.

Moving forward with solar generation facilities will allow Metropolitan to continue efforts to reduce operating costs and increase efficiency. These projects would produce renewable energy that would reduce Metropolitan's overall carbon footprint. Under both options, Metropolitan would receive up to $1 million in rebates from SCE's CSI program over the first five years of operation of the Weymouth system, and a lump sum reimbursement of up to $1.4 million from LADWP's SIP program when the Jensen system commences operation.

The design and construction of the two solar facilities would be funded and executed as capital projects under Metropolitan's Capital Investment Plan. As approved by the Board in April 2014, capital expenditures during fiscal years 2014/15 and 2015/16 will be funded by current operating revenue (budgeted PAYGO). The total estimated construction cost is anticipated to range from $16 million to $18 million.

Conclusion

While the price of electricity continues to rise and remains volatile, technological innovations have improved the efficiency of solar panels, reduced the space required, and reduced construction costs. Recent market trends show that the price of solar panels may have reached bottom, and that installation costs may have leveled off. Considering the upcoming closeout of a significant solar incentive program and future regulation uncertainty, staff believes there is a window of opportunity to proceed with beneficial solar power projects at the Weymouth and Jensen plants. While both of the identified options would provide significant cost savings to Metropolitan, generate positive benefit/cost ratios, and provide a reasonable payback period, Option No. 2 (1 MW facility at Jensen and 3 MW at Weymouth) appears to be more favorable since it would maximize use of SCE's bill credit transfer program and would maximize generation potential at the Weymouth and Jensen plants.

Policy

This information letter is provided at the request of the Board

Fiscal Impact

None

8/4/2014
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8/5/2014
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