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STAFF REPORT

ENGINEERING DEPARTMENT

RANCHO CUCAMONGA

Date: September 17, 2014

To: Mayor and Members of the City Council
John R. Gillison, City Manager

From: Mark A. Steuer, Director of Engineering Services/City Engineer

By: Trina Valdez, Management Analyst I

Subject: APPROVAL OF A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RANCHO CUCAMONGA TO DECLINE ESTABLISHING A PROCUREMENT TARGET FOR ENERGY STORAGE SYSTEMS FOR THE RANCHO CUCAMONGA MUNICIPAL UTILITY

RECOMMENDATION

Approval of a Resolution of the City Council of the City of Rancho Cucamonga approving to decline establishing a procurement target for Energy Storage Systems for the Rancho Cucamonga Municipal Utility.

BACKGROUND/ANALYSIS

On February 15, 2012, the City Council directed staff to determine if establishing procurement targets for Energy Storage Systems was appropriate for the Rancho Cucamonga Municipal Utility (RCMU) as a requirement of Assembly Bill (AB) 2514 (Skinner). AB 2514 was signed into law in 2010 requiring that on or before March 1, 2012, the governing board of a local publicly owned utility initiate a process to determine appropriate targets, if any, for the utility to procure viable and cost-effective energy storage systems to be achieved by December 31, 2016 and December 31, 2021. AB 2514 also requires that the governing board adopt any procurement targets for energy storage systems, if it is determined to be appropriate and cost effective, by October 1, 2014, and report this information to the California Energy Commission.

Energy storage systems are devices that store energy for a period of time. An efficient energy storage system is determined by the amount of energy the system can store and the ability to be deployed at a specific time that will reduce peak load. The location of the storage system must be within range of a location that will benefit from a reduction in load and provide consistent reduction to deliver long term savings to the utility. In our analysis, staff reviewed common energy storage systems currently available, which includes thermal, battery, and hydroelectric storage.

Thermal Energy Storage

Thermal energy storage allows excess thermal energy to be collected for later use depending on the specific technology. Common thermal energy storage options are solar energy storage and ice-based technology. Ice thermal energy storage freezes water into ice at night during off-peak hours then uses the ice to cool a structure during the day to reduce the electricity needed for air conditioning demand during on-peak hours.

In February 2012, staff reviewed the RCMU area to find potential sites to install ice thermal energy storage units as a pilot project. Staff found that the space needed to accommodate the size of the thermal energy storage unit was not feasible for most existing RCMU customers. The majority of customers are located within multi-unit buildings resulting in limited ground space or restricted roof space. Two energy storage units were installed in December 2012 and overall, the

units have provided some load reduction during peak energy hours. Based on this experience and a review of other utility programs, staff has determined that thermal energy storage systems may be cost-effective from the individual customer's perspective. However, the benefit of these thermal energy units to RCMU as a whole (primarily through peak load reduction) is not sufficient to justify providing utility incentives for these projects at this time. RCMU will continue to encourage customers to implement load-shifting technologies, such as thermal energy storage, and will reevaluate whether an incentive may be justified in the future.

Battery Energy Storage

Battery storage systems are generally used with a renewable energy source such as a wind or solar photovoltaic system and are charged during periods of low demand to be used to level the load during peak times. Traditional batteries are expensive, have high maintenance costs and limited lifespan due to crystals that form inside the cells during the charge and discharge cycles. The crystals can grow large enough inside the battery to cause the battery to bulge and short out requiring replacement. Newer technology has been developed using liquid metals inside the battery to reduce the chemical crystals and to increase the efficiency, but at a higher cost than traditional batteries. Research found that utilizing a battery to store and retrieve energy to reduce load is usually not that cost effective due to the high capital and maintenance costs. RCMU is continuing to evaluate battery storage options and looking into grant funding to do more research.

Hydroelectric Energy Storage

Hydroelectric energy storage uses the gravitational force of falling or flowing water to produce electrical power for storage. The cost of hydroelectricity and hydroelectric energy storage is relatively low but requires close proximity to a water source which does not make it a viable option for RCMU.

Staff has concluded that the available options of energy storage systems are currently not cost effective or does not meet the needs of the utility. RCMU is recommending at this time that the City Council decline to establish a procurement target for energy storage. The City's decision to decline establishing a procurement target must be reevaluated at least once every three years and be reported to the California Energy Commission. RCMU will continue to review new energy storage technology to see if establishing a procurement target in the future would be appropriate and will return to City Council by October 1, 2017.

Respectfully submitted,

Mark A. Steuer
Director of Engineering Services/City Engineer

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