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December 8, 2016

Mr. John Mathias
California Energy Commission
1516 Ninth Street, MS-20
Sacramento, CA 95814
john.mathias@energy.ca.gov

**SUBJECT: CITY OF COLTON COMPLIANCE FILING REGARDING ENERGY STORAGE
SYSTEMS PROCUREMENT TARGET FOR THE 2014-2016 COMPLIANCE PERIOD**

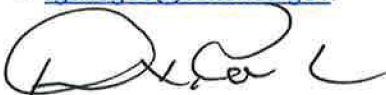
Dear Mr. Mathias:

Pursuant to the requirements of Assembly Bill 2514 (Skinner, Chapter 469, Statutes of 2010) (AB2514), City of Colton (Colton) hereby submits this report to the California Energy Commission (CEC) regarding its compliance with the energy storage (ES) system procurement targets and policies adopted by the Colton City Council.

On September 16, 2014, the Colton City Council determined, consistent with the Colton Electric Department's (CED) evaluation, that the adoption of procurement targets for ES systems for the period ending December 31, 2016 was not appropriate due to the lack of cost-effective energy storage systems options. Therefore, no AB2514 ES targets were set for 2016. A copy of the Staff Report recommending that action and a copy of Resolution R-87-14 are attached. Consistent with the Colton City Council's ES procurement targets determination, CED has not made any energy storage commitments to-date.

In anticipation of the next AB2514 compliance filing, CED is actively investigating energy storage through its membership in the Southern California Public Power Authority (SCPPA), specifically its Energy Storage and Renewable Working Groups. SCPPA's Renewable Working Group issues an annual request for proposals (RFP) for renewable energy, inclusive of a request for information (RFI) for storage projects, which receives hundreds of responses every year. While most of those responses concern renewable energy generation projects, an increasing number are storage projects and renewable-plus-storage projects. The Energy Storage Working Group goes even deeper, bringing in storage technology vendors, storage project developers, storage control and analysis software vendors, and fellow utilities for detailed discussions.

Please contact myself, or Rebecca Gallegos, Electric Utility Integrated Resource Coordinator, with any questions about this report. Either can be reached at 909-370-6132, or via email at dkolk@coltonca.gov or rgallegos@coltonca.gov.



David X Kolk, Ph.D.
Utilities Director

Enc.: CED Staff Report dated September 16, 2014
City of Colton City Council Resolution R-83-13





STAFF REPORT

DATE: SEPTEMBER 16, 2014
TO: HONORABLE MAYOR AND CITY COUNCIL
FROM: TIM McHARGUE, ACTING CITY MANAGER
PREPARED BY: DAVID X. KOLK, Ph.D., ELECTRIC UTILITY DIRECTOR
SUBJECT: TARGET FOR ENERGY STORAGE SYSTEMS

RECOMMENDED ACTION

It is recommended that the Colton City Council approve Resolution No. R-87-14 determining that a target for the Colton Electric Department to procure energy storage systems is not appropriate at this time due to lack of cost-effective alternatives.

GOAL STATEMENT

The proposed action will support the City's goal to provide safe, reliable, affordable and environmentally sustainable electric service.

BACKGROUND

California Assembly Bill 2514 (AB 2514) requires the governing board of each publicly-owned utility (POU) to determine appropriate targets, if any, for the utility to procure viable and cost-effective energy storage systems. Each governing board must make its initial determination on target energy storage levels by October 1, 2014 and no more than every three years thereafter.

Energy storage systems include large batteries, compressed air systems, thermal energy storage that produces ice during the off-peak periods to be used for air conditioning during the on-peak periods, and other technologies. Energy storage systems not considered under AB 2514 include hydroelectric pumped-storage systems.

Electric storage systems use less expensive energy for charging and storing energy to be used during periods when energy costs are higher. Typically this means charging during off-peak periods and releasing energy into the grid during high cost periods, generally the on-peak periods or morning ramp periods when energy demand is increasing rapidly.

The financial analysis of electric storage systems is very dependent upon the expected use of the system. Storage often makes financial sense for a retail customer who can charge their storage system with off-peak energy that can be used during the on-peak period, reducing high on-peak energy charges and cutting demand costs. Storage system may also make financial sense for intermittent generators, such as wind and solar producers, who want to deliver a firm, known quality of energy to its wholesale customers. Storage systems do not make financial sense for a utility that has excess generation capacity available to meet unexpected energy demand, such as the Colton Electric Department (CED).

ISSUES/ANALYSIS

The large amount of intermittent renewable generation coming online during the next few years to meet California's renewable energy standards (RPS) requirements is stressing energy systems in the western states. The demand for traditional thermal resources is actually declining during the early afternoon hours but increasing in the late afternoon and early evening hours when solar PV production declines and customer demand remains high.

Requiring thermal resources to be available to back-up intermittent resources is expensive. A gas-fired generator (such as the Agua Mansa Power Plant) may cost \$3,000 to \$5,000 to start to generate for just a few hours. Many gas-fired generators that cannot be started in a few hours are backed down to minimum operating levels and generate surplus energy during low load periods. To address the problems with intermittent resources, California is requiring investor-owned utilities to acquire 1,325 MW of energy storage by 2020. POU's are required to periodically investigate the cost-effectiveness of energy storage and, once found cost-effective, to establish a procurement target.

Energy storage systems allow intermittent generators to smooth out their delivery of energy. Rather than generate above average amounts during a few hours and below average amounts during other hours, the generator would deliver energy into a battery or other storage system during the night, or other low-demand periods, and then withdraw energy at a constant rate during the day. Storage systems could also be used to meet demand on local systems that have a high, short peak or in areas where additional transmission capacity is required.

It is difficult to analyze storage systems because their value is very dependent upon the specific use of the storage system being considered. The major problem with storage systems is they are very expensive. Large batteries cost \$1 million to \$2 million per MW with the average cost of energy between \$200 and \$400/MWh. For comparison, the cost of energy from AMPP is around \$180/MWh when capacity, energy and O&M costs are included.

Utilities, such as CED, can currently rely on the CAISO to meet moment to moment fluctuations in demand for a cost of around \$50/MWh (although during some short periods the cost could be much higher). There is no need to invest in new storage systems when a utility is over-resourced and can generate less expensively than purchasing a new storage system.

A key point however, is that there are situations where storage systems make sense from the customer's viewpoint. For example, if a customer is away from home during the day and uses a solar PV system to charge their storage system, they could essentially meet their entire energy needs for the cost of the solar PV system and storage system. Currently the equipment would cost around \$25,000 to \$50,000 but might be more affordable in the next few years.

CED performed an analysis of the cost of meeting one additional MW of load on its system and compared the cost of purchasing additional Resource Adequacy (RA) capacity for three months of the year and meeting the additional load with its own resources the remainder of the year with the cost for a lithium ion battery storage system. The lithium ion technology is currently the least expensive storage system (other than pumped-storage) available. CED can purchase three months of RA capacity for approximately \$15,000 plus energy charges of \$18,400 (for a four-hour daily block) or about \$33,400. A comparable cost of Lithium – Ion batteries would be around \$220,000. However, this analysis ignores that the lithium – Ion battery would be available all 365 hours of the year. If the battery were priced for just three months, the cost would be around \$54,000, just about \$19,000 (or almost 60% more) more than the cost of just purchasing capacity and energy.

The difficulty with making an analysis is that the battery cannot be shaped to meet CED's annual requirements. Any purchase results in excess capacity that just exacerbates CED's surplus energy position for the next few years for the non-summer months. This analysis also assumes that a 1 MW battery costs proportionately the same as a 4 MW battery (or a 1 MW battery costs one-fourth as much as a 4 MW battery which currently is not true).

A more viable alternative at this time is thermal energy storage (TES). TES uses off-peak energy to create ice that is used for air conditioning needs during the day. TES systems are close to being cost-effective for certain customer uses (such as a new fitness center) especially if the customer faces real-time pricing. TES systems may make financial sense from the customer's viewpoint but not from the CED's viewpoint at this time. CED may want to encourage TES systems by offering rebates or special off-peak charging rates to assist customers to install TES systems.

Because of this financial analysis, CED recommends that the City Council not establish storage targets for the CED at this time, but revisit the economic feasibility in three years as required by the law. Staff's analysis and recommendation was presented to the Colton Utilities Commission (Commission) at their Regular Meeting on September 8, 2014. The Commission made a recommendation that City Council adopt a Resolution determining it is inappropriate for CED to establish a target for the procurement of energy storage at this time due to the lack of cost-effective alternatives.

FISCAL IMPACT

Adopting this Resolution will not have a financial impact since the recommendation is not to set storage goals and not invest in storage systems at this time.

ALTERNATIVES

The City Council may:

1. Adopt Staff's recommendation to adopt Resolution R-87-14 to not set a target for ESS procurement..
2. Direct Staff to investigate other storage alternatives and return to Council with a proposed target capacity for storage systems.

ATTACHMENTS

1. Proposed Resolution No. R-87-14.

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RESOLUTION NO. R-87-14

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF COLTON
DETERMINING THAT A TARGET FOR THE COLTON ELECTRIC
DEPARTMENT TO PROCURE ENERGY STORAGE SYSTEMS IS NOT
APPROPRIATE DUE TO LACK OF COST-EFFECTIVE ALTERNATIVES**

WHEREAS, California Assembly Bill 2514 requires the governing board of each local publicly-owned electric utility to determine appropriate targets, if any, for the utility to acquire cost-effective energy storage systems; and

WHEREAS, All energy storage systems must be cost-effective in comparison to other capacity and energy procurement alternatives; and

WHEREAS, Colton Electric Department staff undertook an analysis of the cost-effectiveness of energy storage systems in comparison with other alternatives for meeting its load; and

WHEREAS, Colton Electric Department staff concluded that energy storage systems at this time are not economically viable due to their high cost and the contracts and ownership of generation resources that the Colton Electric Department currently has available to it; and

WHEREAS, The Colton Utility Commission reviewed Colton Electric Department staff recommendation and agreed that at this time energy storage systems are currently non-economic for the Colton Electric Department; and

WHEREAS, the Colton City Council agrees that establishing a target for energy storage systems would increase ratepayer costs.

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF COLTON
DOES HEREBY RESOLVE AS FOLLOWS:**


To satisfy the City of Colton's obligations pursuant to Assembly Bill 2514, the Colton City Council determines that setting a capacity target for energy storage system options for the Colton Electric Department is not appropriate at this time;

1 The Colton City Council will reevaluate its decision within three years as required by
2 Assembly Bill 2514.

3 **PASSED, APPROVED AND ADOPTED** this 16th day of September, 2014.

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5 
6 SARAH S. ZAMORA, Mayor

7 ATTEST:

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10 CAROLINA R. PADILLA
11 City Clerk
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1 STATE OF CALIFORNIA)
2 COUNTY OF SAN BERNARDINO) ss
3 CITY OF COLTON)

4 CERTIFICATION

5 I, **CAROLINA R. PADILLA**, City Clerk of the City of Colton, California, do
6 hereby certify that the foregoing is a full, true and correct copy of **RESOLUTION NO.**
7 **R-87-14**, duly adopted by the City Council of said City, and approved by the Mayor of
8 said City, at its Regular Meeting of said City Council held on the **16th day of September,**
9 **2014**, and that it was adopted by the following vote, to wit:

10	AYES:	COUNCILMEMBER	Toro, Gonzales, Navarro, Oliva,
11			Bennett, Suchil and Mayor Zamora
12	NOES:	COUNCILMEMBER	None
13	ABSTAIN:	COUNCILMEMBER	None
14	ABSENT:	COUNCILMEMBER	None
15			

16 IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official
17 seal of the City of Colton, California, this _____ day of _____, 20____.

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21 _____
22 CAROLINA R. PADILLA
23 City Clerk
24 City of Colton

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26
27 (SEAL)
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