

### **2014 Adopted Energy Storage Targets & Policies**

*Please indicate what, if any, energy storage targets your utility adopted in 2014 to be achieved by December 31, 2016.*

After reviewing the costs and benefits of storage compared to its current portfolio of resources, the City of Roseville (Roseville) determined that storage costs were significantly higher than its current portfolio and storage benefits were unproven. Therefore, Roseville did not adopt energy storage targets, although it continues to assess energy storage.

*If energy storage targets were adopted, provide an update on the progress of your utility towards meeting the energy storage targets:*

- N/A

*If energy storage targets were NOT adopted, please discuss any efforts your utility has undertaken to evaluate or otherwise consider energy storage technologies either RD&D or pilot projects. If your utility has since procured energy storage, even in the absence of a formal target, please describe these projects as well.*

Roseville is currently undergoing two studies evaluating energy storage including a NCPA/SCPPA joint contract with DNV GL and an Integrated Resource Planning (IRP) process working with Black and Veatch. These studies support Roseville's assessment of energy storage systems and are expanded on below.

### **Overview of Energy Storage Portfolio**

*Please describe current or planned energy storage projects, including pilots and RD&D projects, if any, in your utility's resource portfolio:*

- *Project description*
- *Technology type*
- *Interconnection point*
  - *If customer-sited, indicate installed capacity by sector*
- *Ownership (i.e., utility, third-party, customer)*
- *Year installed (or planned to be installed)*

As described in the previous section, Roseville is evaluating energy storage procurement in detailed studies and will set the targets to be achieved by December 31, 2020, if appropriate, before Oct 1, 2017.

### **Key Factors Impacting Energy Storage Procurement**

*Please describe your utility's reasoning for procuring, or not procuring, energy storage to date. In particular, discuss barriers to your utility procuring energy storage.*

In its October 1, 2014 target setting, Roseville analyzed the feasibility of a cost effective energy storage solution considering several applications. Roseville concluded storage technologies had a much higher cost than energy from Roseville's portfolio of resources. In addition, the extent of application benefits were unproven. Therefore, energy storage procurement targets were not appropriate. Staff recognizes that both application benefits, storage system costs, and the electric system's challenges will continue to evolve and will continue to evaluate storage system procurement.

*Please discuss planned or potential energy storage projects, including RD&D and pilot programs, your utility may pursue going forward.*

Roseville has applied for a DOE grant which would allow Roseville to fund a pilot project integrating PV and storage at a distribution level. Roseville is also setting aside space in its community solar project for future storage.

*Pursuant to Section 2836(b) of the Public Utilities Code, POU's are required, by or before October 1, 2017, to reevaluate adoption of energy storage procurement targets, if any, to be achieved by December 31, 2020. Please provide an update on your utility's re-evaluation process of energy storage technologies (i.e., the NCPA/SCPPA joint contract with DNV GL to provide an updated evaluation of energy storage technologies).*

Roseville is currently reevaluating adoption of energy storage procurement targets in two studies. First, the NCPA/SCPPA joint contract with DNV GL includes 20 year cost effectiveness study of various technologies including:

- Lithium Batteries
  - Lithium Nickel Manganese Cobalt Oxide (NCM)
  - Lithium Iron Phosphate (LiFePO<sub>4</sub>)
  - Lithium Titanate (Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub>)
- Vanadium Redox (VRB)
- Thermal Energy Storage (TES)
- Flywheel
- Compressed Air Energy Storage (CAES)

Additionally, benefit applications under evaluation include:

- Electric energy time shift
- Electric supply capacity
- Regulation
- Spinning and non-spinning reserves
- Voltage support
- Load following/ramping support for renewables
- Frequency response
- T&D congestion relief

Second, Roseville is working with Black and Veatch in its IRP report. Energy storage applications including grid scale, distribution scale, and customer sited programs are all being evaluated. Of particular focus in this study is the integration of intermittent distributed resources on Roseville's system and how energy storage may supplement existing resources to provide application benefits such as those outlined above. Additionally, the study will have scenarios to include aggressive market adoption of storage for GHG reduction targets.

Before October 1, 2017, Roseville will utilize the results of these two studies in its update energy storage goal setting for targets to be achieved by December 31, 2020.