



Project Summary

Strategic Analysis of Energy Storage Technology

Context

On September 29, 2010, Governor Arnold Schwarzenegger approved Assembly Bill 2514 (AB 2514), Skinner, Energy Storage Systems. This bill requires the California Public Utilities Commission (CPUC) to determine appropriate targets, if any, for privately owned electric utilities to procure viable and cost-effective energy storage systems. For public utilities, the bill requires the California Energy Commission (CEC) to review and approve plans to determine appropriate targets and procure viable and cost-effective energy storage systems to meet the targets. Also, the bill recognizes that despite many benefits of energy storage, there are significant barriers to obtaining the benefits of energy storage systems. These barriers include inadequate evaluation of the value of energy storage for integration of renewable energy resources, lack of recognition of technological and marketplace advancements, and inadequate statutory and regulatory support.

Energy storage is expected to play a larger role in generation resource management, integration of variable resources, and peak management applications. Currently, some energy storage technologies are feasible for such applications, making them ready for demonstrations. However, there are still significant knowledge gaps that hinder developing the business case and assessing the deployment risk.

Description

This project consists of 2 main tasks. The first will be a review of the technical status and the remaining research and development needs of current storage technologies. The second will be a strategic vision of how California might best implement its energy storage needs over the next 10 years. Research will include discussions with utilities, storage system manufacturers, and other stakeholders.

Goals and Objectives

The goal of this project is to conduct a strategic analysis of energy storage technology. The project focus is identifying and defining the necessary research on the energy storage technologies and applications for achieving the following purposes:

- Integrate intermittent generation from renewable energy resources into the grid.
- Allow intermittent generation from renewable energy resources to operate at or near full capacity.
- Reduce the need for new fossil-fuel powered peaking generation facilities by using stored electricity to meet peak demand.
- Reduce purchases of electricity generation sources with higher emissions of greenhouse gases.
- Eliminate or reduce transmission and distribution losses, including increased losses during periods of congestion on the grid.
- Reduce demand during peak periods and achieve permanent load-shifting by using thermal storage to meet air-conditioning needs.
- Avoid or delay investments in transmission and distribution system upgrades.
- Use energy storage systems to provide the ancillary services for the grid otherwise provided by fossil-fueled generating facilities.

The ultimate goal is to establish a 2020 Energy Storage Vision for California, specifically to develop scenarios for how energy storage maybe applied throughout California's electric power system and to estimate the costs and benefits of such a vision as compared to a scenario without deployment of energy storage.

Why It Matters

California is committed to dramatically increase the percentage of renewable energy use over the next 10 years. Energy storage will very likely play a key role in that. The vision document from this project will provide important input to assist the CPUC in its implementation of AB2514 and to assist the CEC in formulating policies around energy storage. Properly implemented, commercially ready energy storage technologies can reduce costs to ratepayers, reduce emissions from fossil fuel generation and successfully integrate high levels of renewable generation in California's electricity system.



ELECTRIC GRID RESEARCH PROGRAM

Project Summary

Participating Organizations

Principle Investigator:

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A123

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Applied Intellectual Capital

Beacon Power

California Public Utility Commission

CA Independent System Operator

CA Electric Storage Alliance

Distributed Utility Associations

E3 Energy

Eagle Crest Energy

Electric Power Research Institute

Electricity Storage Association

HDR/DTA Inc.

KEMA

Ice Energy

Lawrence Berkeley National Laboratory

Los Angeles Dep't of Water & Power

MegaWatt Storage Farms

National Renewable Energy Laboratory

Pacific Gas & Electric

Pacific Northwest National Laboratory

Prudent Energy

RES Americas

Sacramento Municipal Utility District

San Diego Gas & Electric
Sandia National Laboratories
Silent Power
Solar Reserve
Southern California Edison
SustainX
Xtreme Power Solutions

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Reports

[Final Report: Energy Storage Vision 2020](#) (link)

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