

# UC Berkeley

## Electric Grid

### Title

Strategic Analysis of Energy Storage Technology Fact Sheet

### Permalink

<https://escholarship.org/uc/item/29q10723>

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## **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:

University of California, Berkeley, School of Law  
(Ethan Elkind)

University of California, San Diego (Byron  
Washom)

University of California, Los Angeles (Andris  
Abele)

#### Advisory Team Representation:

A123  
Altair Nanotechnologies  
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

**Project Start Date:** February 1, 2011

**Project End Date:** Dec. 31, 2011

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**CEC Work Authorization No:** MR-088

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Funds for this project came from a \$324,998 award by the California Energy Commission (CEC) through the Public Interest Energy Research program (PIER)

### Reports

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

### For More Information, Contact

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