

Energy Storage: Bolstering California's Economy with AB 2514

Assemblymember Nancy Skinner (D-14), Chair, Assembly Rules Committee, in partnership with California Attorney General Edmund G. Brown Jr., has introduced AB 2514 in the California State Legislature. This transformative legislation will: create thousands of new green-collar jobs; create a smarter, cleaner electric grid; increase the use of renewable energy; provide significant savings by reducing the need for new power plants and transmission lines; and, reduce air pollution from greenhouse gases and smog-forming nitrogen oxides (NOx).

AB 2514 will achieve these benefits by requiring all investor-owned and publicly owned utilities to procure new grid-connected energy storage systems or the services of such systems with a minimum capacity of 2.25% of peak load (averaged over 5 years) by 2014 and 5% of peak load by 2020. Energy storage systems store energy for use at a later time, when electric power is most needed and most expensive, such as on hot summer afternoons. All forms of commercially ready energy storage technologies, including chemical, mechanical and thermal means of storing energy are eligible.

Further, all applications of energy storage (such as peak shaving or grid support services) provided by these technologies are eligible toward meeting the mandated requirement. The legislation also includes a requirement for each utility to create a 5-year program and implementation plan for maximum shifting of air conditioning and refrigeration load from peak demand to "off-peak"; a requirement that plans recognize the air emission benefits of load shifting; and, authority for the California Public Utilities Commission to allow an increased rate of return ranging from ½% to 1% for utility investments in energy storage.

Benefits of Energy Storage

AB 2514 will help close the gap between the United States and other nations in investments and deployments of energy storage, a fast-growing clean technology industry that represents a significant economic development opportunity for California.

Specifically, this legislation will:

1. Create jobs. If fully implemented, AB 2514 can create approximately 5,000-10,000 new green-collar manufacturing and direct installation jobs in California.
2. Accelerate the deployment of renewable energy. Storage can help integrate renewable energy into our electric grid and increase its value by making it dispatchable.

"This bill will help to ensure continued growth and strength within the California solar industry through concrete substantial deployments of energy storage that will effectively integrate solar systems into a more stable and reliable electric grid." Andrew Beebe, VP Global Product Strategy, Suntech America

3. Lower electricity costs. Greater use of energy storage will provide the State with cost effective alternatives to the high costs of building new power plants and transmission lines, especially since grid infrastructure is used only part-time to meet relentlessly growing demand for daytime “peak” power.
4. Reduce air pollution from greenhouse gases and smog-forming nitrogen oxides (NOx). Deployment of energy storage will reduce the need for fossil fuel-burning “peaker” plants, as well as coal-fired power imported from other states.
5. Turn California’s ambition for a smart grid into reality. Our current electric grid is highly inefficient and is largely designed for one-way flow of electricity from the power generation facility to where it is used. The smart grid of the future will enable two-way flow of electricity, more renewables and is predicated on widespread use of energy storage as a dispatchable grid resource. By better utilizing the State’s existing electric transmission and distribution infrastructure, curbing demand for daytime “peak” power, and reducing the need for fossil fuel-based power generation to integrate renewable energy into the grid, energy storage will make our grid smarter, cleaner and more energy-efficient.

A Mandate For Energy Storage Provides the Necessary Leadership and Focus to Realize the Benefits of Energy Storage Quickly

1. A mandate for energy storage will optimize our current infrastructure. California’s current regulatory framework allows our electric system to operate inefficiently. For example, our transmission assets are only used 40-50% of the time, yet are constrained at certain times of the year.
2. A mandate for energy storage will facilitate current energy policy. Current California policy has not kept pace with advances in energy storage, yet energy storage can cost-effectively help address California’s many near term, complex and inter-related energy policy challenges, such as green house gas emissions reduction, renewables integration, transmission and distribution constraints, increasing peak demand and accommodating electric vehicles.
3. A mandate for energy storage will ensure that California capitalizes on the tremendous global economic development opportunity provided by grid connected energy storage ... a trend that is already underway in other states and countries around the world.

Progress requires coordinated, multi-agency focus - CA can seize this opportunity or watch it go by.

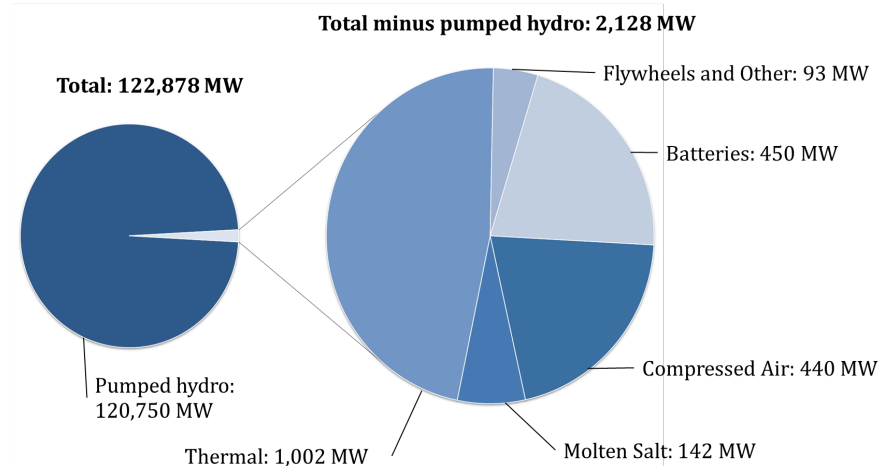
Smart, Clean, Cost-Effective Energy Storage: Ready for Deployment

Modern energy storage technologies, some of which have been in existence for decades, cover a wide range of sizes, power (measured in megawatts, or MW), and discharge durations. An energy storage system can be either centralized or distributed and can be utility-owned, customer-owned or third-party owned. Today, there is 123,000 MW of energy storage installed worldwide, including more than 2,000 MW of non-pumped hydro technologies. According to GTM Research, the market for these technologies is growing rapidly and is anticipated to grow by 40% per year.

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PowerGetics ● Prudent Energy ● PVT Solar ● Suntech ● SustainX ● XtremePower

Current worldwide installed energy storage capacity



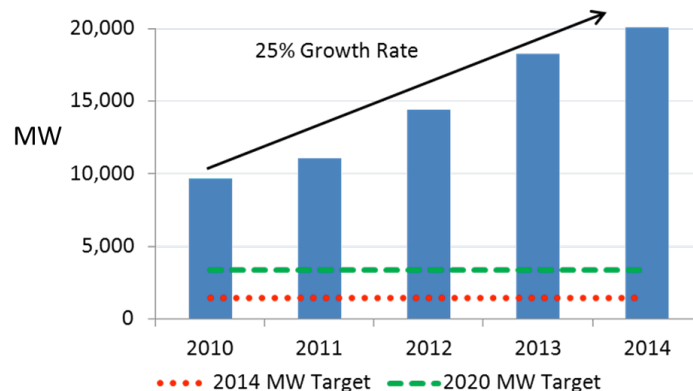
The Energy Storage Industry is Ready and Able to Meet the Requirements of AB 2514

In March 2010, CESA conducted an industry survey to determine energy storage manufacturers' ability to ramp their production to meet the requirements of AB 2514. Responses from 21 energy storage firms indicate that the goals set forth in AB 2514 are achievable and would encourage significant job creation in California.

- 85% of companies surveyed will consider establishing manufacturing capacity in California if AB 2514 becomes law
- Sufficient manufacturing capacity exists today to meet over 6.7 times AB 2514's year 2014 goal
- Planned 2014 manufacturing capacity could supply over 7.0 times AB 2514's year 2020 goal

"Ice Energy would not only significantly expand in-state operations but expects to open a new state-of-the-art storage manufacturing plant in California to meet the new demand that would be created by AB 2514 enactment" ... Frank Ramirez, CEO, Ice Energy

Energy Storage Annual Manufacturing Capacity



Source: StrateGen Consulting, LLC Industry Survey, Rev. 1, 3/23/2010. (21 firms responding)

Survey respondents: A123 Systems, Altairnano, Beacon Power, CALMAC, Electron Vault, EnerVault, Evapco, FAFCO, Fluidic Energy, Ice Energy, NGK Locke, Panasonic, Powergetics, Prudent Energy, PVT Solar, Samsung, Sanyo, Seeo, SustainX, Velkess, Xtreme Power

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Examples of Projects Eligible Under AB 2514

Batteries

- Electrical energy is stored for later use in chemical form. Existing battery technologies are being improved, and new battery technologies are becoming available.
- Example: 34 MW Sodium Sulfur Battery — 51 MW wind farm, Japan (NGK)



Thermal Storage

- Air conditioners create ice at night, when power rates are low. This stored ice then runs a cooling system during the afternoon, when power costs are highest and the power grid is most stressed.
- Example: 12 kW Thermal Storage — Napa Community College (Ice Energy)



Flywheels

- Flywheels convert electrical energy to kinetic energy, then back again very rapidly. Flywheels are ideal for power conditioning and short-term storage.
- Example: 3 MW Mechanical Storage for Ancillary Services — NE ISO (Beacon Power)



Compressed Air

- Electricity is used to compress air into storage tanks or a large underground cavern. The compressed air is used to spin turbines when electricity is needed.
- Example: 115 MW Compressed Air Energy Storage — McIntosh, Alabama



Pumped Hydro

- Excess electricity is used to pump water uphill into a reservoir. When power is needed, the water can run down through turbines, much like a traditional hydroelectric dam.
- Example: 1,532 MW Pumped Hydro — TVA's Raccoon Mountain

