

# Energy Storage

## San Vicente Energy Storage Facility



### Improving INFRASTRUCTURE

The Water Authority and the City of San Diego will develop this project as partners if the project moves forward.



The City of San Diego Public Utilities Department's mission is to provide reliable water utility services that protect our communities and the environment.

Energy storage facilities are important for generating clean power by harnessing the energy in water as it flows downhill between reservoirs.

In San Diego County, a 40-megawatt energy storage facility at Lake Hodges already plays a role in meeting peak power demands. Similar facilities could eventually create a major regional benefit by integrating renewable wind and solar energy into the regional transmission system while helping to control the costs of providing a safe and reliable water supply.

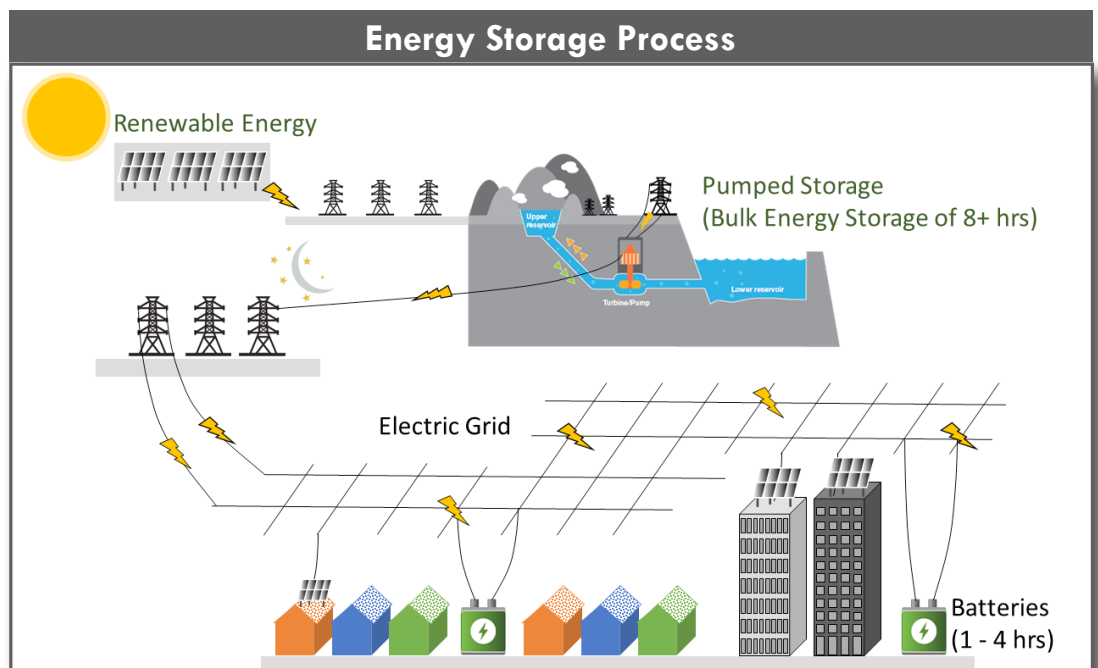
Today, pumped storage projects are configured to store excess renewable energy from sun and wind during the day, and then discharge when evening energy demands increase. Pumped storage systems store energy by pumping water in a closed loop to an upper reservoir, and then generate energy by running the system in reverse to turn energy-producing turbines.

### Project Overview

One of the most promising bulk energy storage solutions in California is the San Vicente Energy Storage Facility under consideration in San Diego County. This project could store 4,000 megawatt-hours per day of energy (500 megawatts of capacity for eight hours) – enough to serve approximately 325,000 homes annually.

This project would have a small new footprint because it would take advantage of the existing San Vicente Reservoir owned and operated by the City of San Diego. The City's partner, the San Diego County Water Authority, owns approximately two-thirds of the reservoir's water storage capacity.

The project would involve creating a small upper reservoir above the existing San Vicente Reservoir, along with a tunnel system and an underground powerhouse to connect the two waterbodies. The powerhouse would contain up to four reversible pump turbines. The upper



*Pumped storage facilities are part of an integrated and sustainable energy system that includes the production, storage and distribution of renewable power.*

## San Vicente Energy Storage Facility Study

reservoir would be in an area with no natural lake or stream.

During off-peak periods – when power is inexpensive and renewable supplies from wind and solar facilities exceed demand – turbines would pump water to the upper reservoir where it would act as a battery of stored potential energy. During peak energy demand, the system would create carbon-free power as water from the upper reservoir flows downhill through the turbines. The exchange between the two reservoirs would not consume water and it is a closed-loop system.

### Water Authority and City of San Diego Partnership

San Vicente Dam and Reservoir are owned and operated by the City of San Diego. The Water Authority completed raising the San Vicente Dam in 2014, and now owns 157,000 acre-feet of storage capacity in the expanded reservoir. That project created the largest single increase water storage capacity in county history. It also was a cornerstone of the Water Authority's Emergency & Carryover Storage Project, designed to provide water for the region in case an earthquake, drought or other emergency cuts imported water supply deliveries to the region.

These public agencies jointly proposed the San Vicente energy storage project to help meet clean energy goals. The existing reservoir is near the terminus of the Sunrise Powerlink, which would allow the project to

play a central role in integrating solar and wind energy from across the Southwest for use in San Diego County. In 2017, the City and Water Authority began engaging with potential developers.

### Making the San Vicente Project a Reality

The San Vicente project is designed to draw on the strengths of the public and private sectors working together. The public agencies will ensure that San Vicente Reservoir serves its primary mission – supplying clean and reliable water for 3.3 million people – and they will use revenues from the project to help offset the cost of water services for the region. Private investors will provide the capital, along with expertise to integrate the project with existing infrastructure for the good of the entire region.

Planning and investing for large-scale energy projects like the San Vicente Energy Storage Facility takes a long time. Unlike other non-carbon energy resources in California, pumped storage requires a license from the Federal Energy Regulatory Commission and has a longer construction cycle, so it's important to take steps now to make sure the project can help California realize a clean energy future.

For more information, go to [sdcwa.org/san-vicente-energy-storage-facility-study](http://sdcwa.org/san-vicente-energy-storage-facility-study). ■

### Energy storage benefits

- Helping balance the energy grid and enhance system reliability by storing energy during low-demand periods
- Producing energy on demand, especially during high-demand periods
- Storing surplus zero-carbon renewable wind and solar energy that would otherwise be lost during times of low demand
- Generating additional revenue to offset water agency costs and help stabilize water rates



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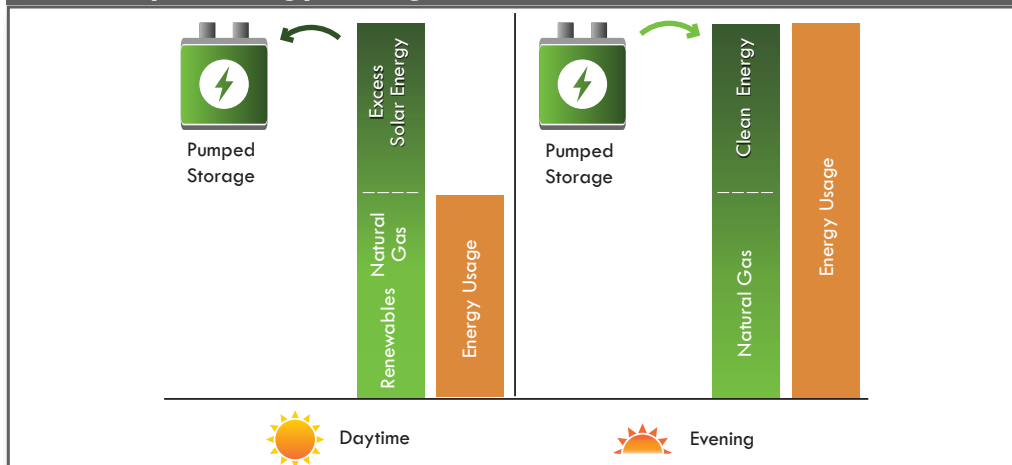


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### Pumped Energy Storage Facilities Serve as Giant Batteries



*Pumped energy storage projects work like giant batteries by storing excess renewable energy during the day, when renewable power production peaks. Energy is released from the "battery" in the evening, when energy usage increases and renewable energy is not available.*