

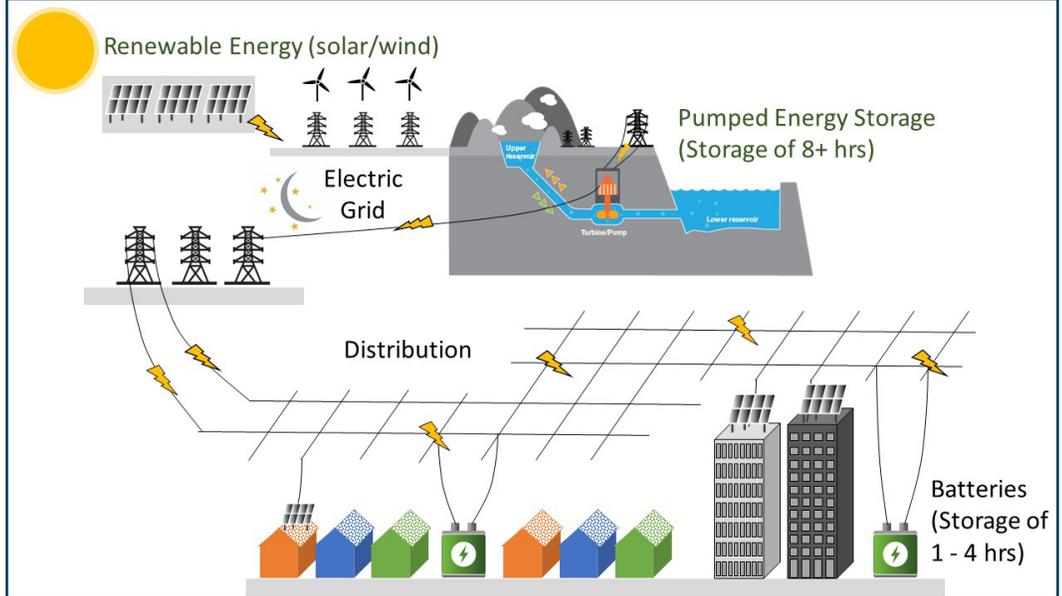
Energy storage facilities are important for generating clean energy by harnessing the energy in water as it flows downhill between reservoirs.

In San Diego County, a 40-megawatt energy storage facility at Lake Hodges already provides clean energy during times of high energy use. Similar facilities could eventually create a major regional benefit by storing renewable wind and solar energy, helping to balance the electric grid, and controlling the costs of providing safe and reliable water supplies.

Today, pumped energy storage projects are configured to store excess renewable energy from solar and wind during the day, and then discharge that energy when use increases in the evening.

Pumped energy storage systems store energy by pumping water in a closed-loop to an upper reservoir, and then generate energy by releasing water to turn energy-producing turbines.

## ENERGY STORAGE PROCESS



## PROJECT OVERVIEW

One of the most promising pumped 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). When operating, the project will provide enough energy for about 135,000 households.

This potential project would have a small footprint by taking advantage of the existing San Vicente Reservoir owned and operated by the City of San Diego. The Water Authority, which owns approximately two-thirds of the reservoir's water storage capacity, is partnering with the City on this potential project. The State of California is investing \$18 million to support initial project design, environmental reviews, and the federal licensing process. Those complex components are expected to take at least

## MORE INFO

[sdcwa.org/san-vicente-energy-storage-facility](https://sdcwa.org/san-vicente-energy-storage-facility)

four years, with construction completion forecast for 2030.

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 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 use, the system would create clean energy as water from the upper reservoir flows downhill through the turbines. The exchange between the two reservoirs would not consume water.

## WATER AUTHORITY AND CITY OF SAN DIEGO PARTNERSHIP

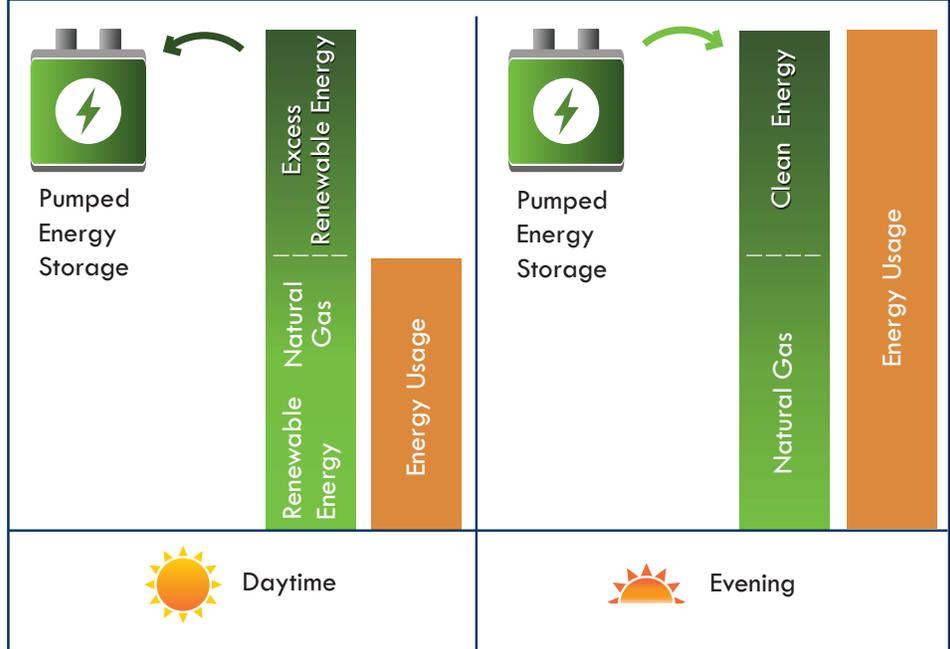
San Vicente Dam and Reservoir are owned and operated by the City of San Diego. The Water Authority completed raising the San Vicente Dam in 2014, and now owns 157,000 acre-feet of storage capacity in the expanded reservoir. That project created the largest single increase water storage capacity in county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

These public agencies jointly proposed the San Vicente Energy Storage Facility Study to help meet clean energy goals. San Vicente Reservoir is near major electricity transmission interconnection facilities, 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.

## 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 – and they will use revenues from the project to help offset the cost of water services for the region. If the project moves ahead, private investors would provide the capital, along with expertise to integrate the project with existing infrastructure for the benefit of the entire region.

## 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.

## ENERGY STORAGE BENEFITS

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