



CVP Hydropower

Overview

Reclamation's California-Great Basin Region has 11 hydroelectric power plants in the Central Valley Project (CVP) with a maximum operation capability of 2,100 megawatts (MW) when all reservoirs are at their fullest. A MW is 1,000 kilowatts and 1,000 watt-hours equal 1 kilowatt-hour or 1 kWh. The power generated from these plants provides power to convey water within the CVP service area, helps California meet its energy needs, and boosts the economy.

CVP powerplants and capacities

Northern California Area Office (NCAO)

- Shasta Dam, 710 MW
- Trinity Dam, 140 MW
- Judge Francis Carr, 154 MW
- Spring Creek, 180 MW
- Keswick Dam, 105 MW
- Lewiston Dam, 350 KW (kilowatts)

Central California Area Office (CCAO)

- Folsom Dam, 207 MW
- Nimbus Dam, 17 MW
- New Melones Dam, 383 MW

South-Central California Area Office (SCCAO)

- O'Neill, 14.4 MW
- San Luis, 202 MW

What's a kilowatt?

Electricity used to cook a pot of food for 1 hour equals 1,000 watt-hours of electricity.

What Reclamation is doing

Hydrology in the CVP varies significantly from year to year and affects the hydropower production. Typically,



Five Shasta Dam hydropower pumps

in an average water year, about 4.5 million MWh of energy is produced. In above average years, when substantial snowpack has accumulated in the CVP, watersheds have produced as much as 5,567,688 MWh of energy throughout the year.

What it takes to get the job done

CVP powerplants are operated 24 hours a day, 365 days a year. Facility staff implements a comprehensive preventative maintenance program to ensure constant operation, coordinates operational schedules for

optimization of water and power, and accomplishes facility and equipment improvements. In addition, as a part of operations and maintenance, each generator is taken

out of service in the fall or early winter for approximately 2-3 weeks for extended maintenance, repairs, and minor improvements. With this strategic blend of preventative maintenance and facility enhancements, hydropower production and reliability are increased, and remains economical.



Shasta Dam Powerplant

Reclamation partners

From a power perspective, Reclamation’s customers are both water and public power users; both value the products produced by the CVP. To ensure reliability and dependability of the energy generated by CVP power plants, Reclamation’s public power customers

began advance financing of the power’s operation-and-maintenance (O&M) portion of the CVP budget in 1998 and soon followed with funding major rehabilitation projects. The Western Area Power Administration (WAPA) markets and transmits energy the CVP produces. WAPA follows a formal procedure for allocating CVP energy to partner power customers. Those customers have long-term contracts for their share of the CVP energy that is more than Reclamation’s water pumping needs.

How CVP hydropower contributes to the economy

CVP Hydropower provides clean, renewable energy to both CVP facilities via Reclamation and public partner entities via WAPA. The CVP energy infrastructure is designed to deliver CVP energy first and foremost directly to CVP facilities to aid in pumping project water to Reclamation customers. Energy is delivered to these facilities at an average annual rate of around 3 cents per kWh (\$30 per MWh) and costs are based on actual annual O&M costs allocated to project power. Excess power not used to support CVP Project needs is marketed via WAPA to select



Powerlines transmitting hydropower.

public entities at approximately \$31.85 per MWh (FY 21), allowing numerous entities access to clean energy at lower costs. In addition to the price paid for CVP energy, these public power partners also contribute annually to the CVP Restoration Fund (approximately \$23M in fiscal year 2021)

CVP hydropower makes a difference during heat waves

CVP power generation is ‘shaped’ so that maximum production is predominantly available during peak demand hours from afternoon through early evening. This is accomplished by holding the releases from Reclamation’s regulating reservoirs – Natomas, Keswick, and Lewiston – constant during a 24-hour period and then operating the larger upstream generators heavily during higher peak demand time and shutting them off overnight during periods of low demand (off-peak periods). This cycle causes the regulating reservoirs to rise and fall to better support high power demands during heat waves and other times when extra power may be needed.

Additional Information:

For more information on CVP’s hydropower program visit: <https://www.usbr.gov/mp/hydro.html>

Learn more about Reclamation’s hydropower industry information and program at: <https://www.usbr.gov/power/edu/edu.html>