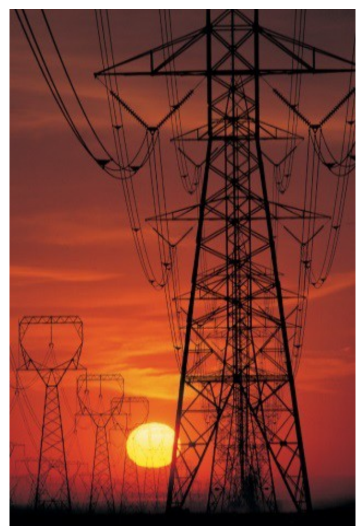
Central Valley Project Hydropower Production

Introduction

Reclamation's Mid-Pacific Region has eleven 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. The power generated from these plants provides power to convey water within the CVP service area, helps California meet its energy needs and assists 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?

- When you use electricity to cook a pot of food for 1 hour, you use 1,000 watt-hours of electricity.
- 1,000 watt-hours equal 1 kilowatt-hour, or 1 kWh.
- A megawatt (MW) is 1,000 kilowatts

What Reclamation is doing

Hydrology in the CVP can vary significantly from year to year which affects the hydropower production. Typically, in an average water year, about 4,500,000 MW-hours (MWh) of energy is produced. Fiscal Year 2011 was an above average year as a substantial snowpack accumulated in the CVP watersheds throughout the year and as a result, 5,567,688 MWh of energy was produced.

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.

Reclamation partners

From a power perspective, Reclamation's customers are both water and 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 power customers began advance financing of the power 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 preference customers. Those customers have 20-year contracts (that expire in 2024) for their share of the CVP energy that is in excess of Reclamation's water pumping needs.

How CVP hydropower contributes to the economy

CVP energy is sold for around 3 cents per kWh ($30 per MWh) to CVP preference customers and is based on actual capital costs of the construction of the CVP power facilities, plus annual O&M costs allocated to power. On top of the price paid for CVP energy, the preference customers also pay approximately 1.5 cents per kWh ($15 per MWh) for their contribution to the CVP Restoration Fund.

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.