# Hetch Hetchy and Hydropower in California

Updated April 2018

The restoration of Hetch Hetchy Valley in Yosemite National Park will reduce slightly the hydropower production from San Francisco's three hydropower facilities in the Tuolumne River watershed. The combined output of the Kirkwood, Moccasin, and Holm power plants is expected to decline by about 350 gigawatt- hours (gWh) per year[1], a 20% reduction from the current production of 1700 gWh per year.[2]

While all sources of electricity are important, several river restoration projects in California have resulted in similarly modest decreases in electricity production. These changes represent only a tiny fraction of the ongoing investments in renewable power in California. Figure 1, below, compares the hydropower reduction expected to accompany restoration of Hetch Hetchy Valley with other recent, ongoing and expected changes to electricity production throughout the State:

Figure 1: Annual Average Changes to Electricity Generation in California
Actual, Ongoing and Proposed
(gigawatt-hours per year)
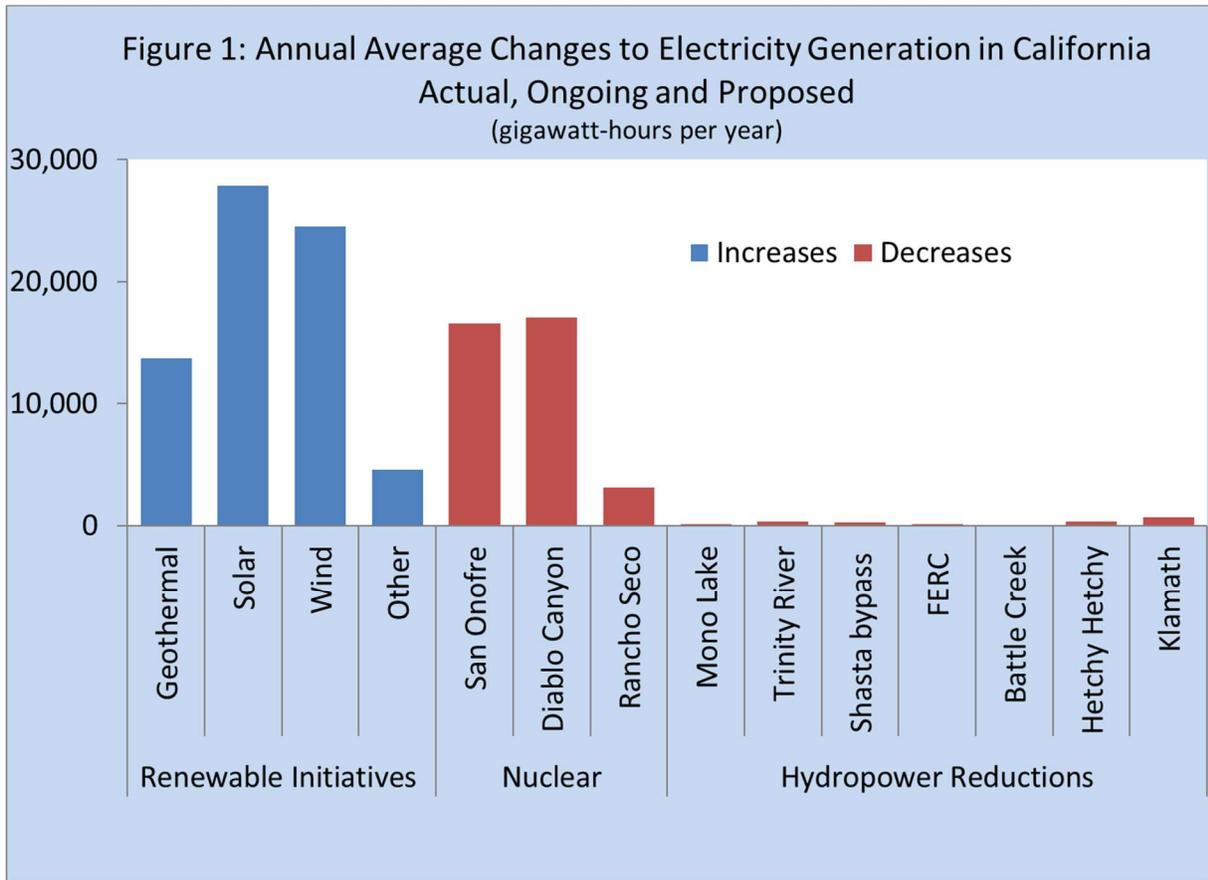
Summary of changes in California electricity production

- California's Renewable Portfolio Standard: California law mandates that at least 33% of its electric power be produced with renewable resources by 2020 (large hydropower facilities are not considered renewable). These facilities are expected to produce more than 68,000 gWh annually with geothermal (13696 gWh), solar (25336 gWh), wind (24537 gWh), biomass and other facilities (4616 gWh)[3].
- San Onofre shutdown: Permanently retired in 2013 due to safety concerns.[4]
- Diablo Canyon: Set to close in 2025.[5]
- Rancho Seco: Closed in 1989, due to operations and safety concerns by vote of Sacramento citizens.[6]
- Mono Lake Restoration: In 1994, the California State Water Resources Control Board ruled that the diversions from the streams feeding Mono Lake caused undue harm to resident and migratory birds. As a result, Los Angeles has needed to replace not only part of their waters supply but hydropower as well - about 134 gWh per year.[7]
- Trinity River restoration plan: The Trinity restoration plan was adopted in 2000 to restore salmon populations that have sustained local Indian tribes for millennia. The reduction in diversions from the river to the Central Valley has decreased annual hydropower production by about 318 gWh.[8]
- Shasta power plant bypass: From 1987 until 1997, some releases from Shasta Dam to the Sacramento River were required to bypass the power plant to maintain water temperatures sufficiently cool to protect endangered winter run and spring run Chinook salmon. The average annual decrease in hydropower was 242 gWh.[9]
- FERC dam relicensings: During its proceedings to relicense dams, the Federal Energy Regulatory Commission has ruled that the operations of some dams must change to improve downstream fisheries and recreational. Changes on the Mokelumne, Feather, Kern and other rivers have resulted in reduced generation of 148 gWh per year.[10]
- Battle Creek Dam Removal: The removal of five small hydropower dams on Battle Creek, to provide cold water habitat for endangered salmon, expected to reduce hydropower production by 69 gWh per year.[11]
- Klamath River dam removal: Dam removal on the Klamath to improve conditions for salmon is expected to decrease hydropower production by about 690 gWh annually.[12]

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[1] One gigawatt-hour equals 1,000,000 kilowatt-hours, enough electricity to power 200 homes for a year.

[2] Paradise Regained, Environmental Defense Fund, 2004

3 CPUC spreadsheet:" RPS_Project_Status_Table_2012_FebFinal"

[4] San Onofre average energy production 1995-2006 17034 gWh (EIA)

[5] Diablo canyon average energy production 1995-2006 17034 gWh (EIS)

6 2010 Annual Report, Sacramento Municipal Utility

[7] Mono Basin EIR, 1993

8 Trinity River Mainstem Fishery Restoration, Final EIS/EIR, December 2000

9 Bureau of Reclamation, Shasta Powerplant Bypass Data

10 California Hydropower System: Energy and Environment Environmental Performance Report, 2003

[11] Battle Creek EIR, 2009

12 Bureau of Reclamation, Hydropower Benefits Technical Report, August 2011 (EIA 1995-2006)