

**Power and Water Resources Pooling Authority responses to
Drought Hydropower Questions
Publicly Owned Utilities
2015**

California Energy Commission

DOCKETED

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TN # 75874

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Question 1: Please provide your publicly owned utility's (POUs) current estimate of total electric firm energy requirements in gigawatt hours (GWh) for calendar year 2015.

572 GWH

Question 2: Please provide your POU's average annual hydroelectric energy procurement in GWh since 1970, including 2014. Please differentiate between generated and purchased hydro energy supplies, and specify the timeframe over which these averages were determined if fewer years than from 1970 were used.

**193 GWH average annual CVP (Central Valley Project) hydro from 2005 – 2014
1,930 GWH total CVP hydro associated with water operations – not procured in open market**

**12 GWH average annual small hydro from 2010 – 2014
62 GWH total annual small hydro from 2010 - 2014**

Question 3: Please provide your POU's lowest hydroelectric energy procurement in GWh during the same time period used in Question 2, and identify the year in which this occurred. Please provide figures for both POU-owned/controlled hydroelectric generation and hydroelectric energy supply contracts.

**129 GWH from CVP hydro in 2014
9.4 GWH from small hydro in 2014**

Question 4: Please provide your POU's hydroelectric energy procurement in GWh during 2014, if different from that shown in Question 2. If the same, please state so explicitly.

Same

Question 5: Please provide your POU's most recent estimate of 2015 hydroelectric energy procurement (generation and purchases), both in GWh and as a percentage of this year's firm energy requirement.

111 GWH estimated for 2015 – about 20% of estimated demand

Question 6: Does your POU expect that low hydro conditions (or the drought more generally) will raise any system or local reliability concerns? Please explain:

Our demand is relatively stable throughout each day. Our hydroelectricity or lack thereof will neither affect system nor local reliability; instead, variability of intermittent products is a more pressing problem.

Question 7: Under what circumstances would the adverse effects of the drought create severe or critical operational concerns for your system's electric generation or for electricity deliveries in your service area?

The reduction of surface supply causes more reliance on groundwater which has a higher unit energy requirement (KWH/AF). Arbitrary modification of cold water planning may divert/thwart expected generation causing generation scheduling issues.

Question 8: At what value of annual hydro generation this year (in GWh) would the effects of drought result in significant or substantial financial concerns? Please estimate additional costs your POU may incur because of low hydro conditions. Please provide the assumptions used. (Please highlight in yellow any information about specific costs, projected or potential, that are considered confidential or commercially sensitive. This could include potential impacts on rates that have not yet been considered for adoption by your local governing board. Such information, if provided and marked as confidential, will be protected from public disclosure through December 31, 2016.)

Annual generation costs are fixed; whereas, below average levels causes unit costs to accelerate above thermal alternatives. As generation is cut the costs remain, and in addition, we need to buy replacement supplies.

We estimate hydropower supply loss of 150 GWH with a replacement cost of 48/MWH or over \$7 million – about an 18 percent increase in the energy cost of our utility.

Question 9: Please estimate any additional procurement of greenhouse gas allowances, in metric tons, that your POU has already incurred or that your POU expects will be necessary because of low hydro conditions in 2015. Please provide the assumptions used.

Our Thermal resources are fixed and will not increase production except as driven by market pricing, which in turn might be affected by the drought but cannot be determined at this time. Our Market supplies have the embedded cost of allowances, accordingly, we see no need to purchase additional allowances, but our market-based suppliers will.

Question 10: Does your POU expect that low hydro conditions (or the drought more generally) will have any other local impacts beyond local reliability? If so, are efforts underway to address these impacts?

No. Our systems are not tied to local hydropower sources. The drought may affect other resources used for local reliability which will drive alternative costs up as hydropower resources are replaced with low efficiency thermal units.

Question 11: Will water curtailments this year, such as by the State Water Resources Control Board, affect your POU's hydroelectric energy procurement or dispatch (either utility-controlled hydro generation or purchases)? If so, to what extent will these supply resources be affected in terms of GWh, and over what timeframe(s)?

SWRCB curtailments of water diversion will not affect our hydropower procurement, but it will affect demand as any reduction in water supply is met with a two-to-four fold increase in energy to switch to groundwater. The curtailments beyond those of pre-1913 rights are somewhat arbitrary and cannot be predicted to answer the question.

Question 12: Did water curtailments in 2014 affect your POU's hydroelectric energy procurement or dispatch? If so, to what extent were supply resources affected and over what timeframe(s)? Did curtailments derate the capability to generate in megawatts (MW), and if so during what timeframes?

The water rights curtailments did not affect our hydropower dispatch.

Question 13: Energy Commission staff would like to know about any potential drought related issues that will or could affect electric systems and/or local reliability. For example, are there known or potential issues with water allocations or supplies to thermal plants (for example, power plant cooling)? This is an open-ended question and we hope that your POU can, to the extent possible, provide us with information regarding your POU's overall assessment regarding how drought conditions may affect reliability in your local communities.

Curtailment of generation due to coldwater bypass is our largest uncertainty. We are unaware of any effects on our purchased thermal resources. Drought conditions (25th percentile of hydropower) hit PWRPA in two ways: 1) our demand in very dry years increase by about 25 percent; whereas, 2) our hydropower decreases about 10 percent.

We view system reliability risk as being equally affected by intermittent resources as by drought impacts on hydropower.