

Drought Hydropower Questions

Publicly Owned Utilities

2015

California Energy Commission

**DOCKETED**

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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.

Answer: IID's current estimate of total electric firm energy requirements for calendar year 2015 is 3852 (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 average were determined if fewer years than from 1970 were used.

Answer: IID's average annual hydroelectric energy procurement since 2006 is 417.5 (GWh), as below table shows.

Year	IID Generated Hydro (GWh)	IID Purchased Hydro (GWh)	Total
2006	265.338	156.812	422.15
2007	254.389	156.954	411.343
2008	263.403	157.502	420.905
2009	251.341	155.761	407.102
2010	266.506	155.729	422.235
2011	285.211	155.753	440.964
2012	279.364	155.738	435.102
2013	246.777	155.748	402.525
2014	239.569	155.751	395.32
Average	261.322	156.194	417.516

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.

Answer: IID's lowest hydroelectric energy procurement during 2006-2014 is 395.3 GWh in 2014, of which 239.5 GWh is from IID-owned hydro generation; 155.8 GWh is from hydro supply contracts.

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.

Answer: During 2014, IID procured 395.3 (GWh) hydroelectric energy totally. The number is the same as the answer to Question 2.

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.

Answer: IID's most recent estimate of 2015 hydroelectric energy procurement is 424 (GWh), of which 157 (GWh) is from hydro supply contracts, 268 (GWh) is from IID-owned hydro generation. Hydroelectric energy procurement is 11% of this year's firm energy requirement.

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:

Answer: IID has a number of small hydroelectric facilities located on the All-American Canal and nearby branches. The largest of these hydroelectric facilities is Pilot Knob, a two-unit facility with a combined nameplate rating of 33MW. The smallest unit is Double Weir with two units each with a rating of 0.28MW. The hydroelectric units have a combined rating of about 85MW although, due to seasonal water flows, the summer capacity rating is around 32MW of effective summer capacity where the amount of generation from the hydroelectric facilities is directly dependent upon the needs of the local area agricultural crops. Therefore, production will vary from season to season, but over the course of the year, the average hourly output from the hydroelectric facilities is about 32MW. Annual energy production from the units is approximately 270-280 (GWh) although this value changes according to water availability. That means low hydro conditions will cause much lower energy production than the actual capacity of these hydroelectric facilities.

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?

Answer: The statewide drought is not anticipated to affect the IID's Colorado River water supplies, which are defined by federal shortage criteria tied to the elevation of Lake Mead. The Colorado River benefits from an extremely large system of reservoir storage; however, it is facing its own hydrologic challenge with potential shortages projected for non-California water users as soon as 2016-2017. The incoming projected drought is expected to decrease IID's hydroelectric production and therefore face IID to rely more on power from natural gas-fired plants, solar farms and other sources, all of which are pricier than hydro, eventually the rates will go up and the customers will pay for it.

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.)

Answer: The main cost consideration that IID would incur due to drought conditions would be from two sources:

1. Internal hydro decreasing due to agriculturally based decisions requiring less water as seen in 2013-14. If more farmers decide to sell IID's water rights, fallow lands or install a solar facility on previously cropped lands, then IID's internal hydro facilities may decrease in production. The cost of decreased generation would be equivalent to:  
*((the value of the renewable generation + value of standard generation of energy)\*(average generation from small hydro –actual generation)).*
2. Low snow pack creating supply/demand issues in the energy markets, so the gas and energy prices would increase. The cost of this would be equivalent to:  
*(the projected amount of market energy + the projected amount of natural gas fired generation)\* ((price of energy without a drought + price of gas without a drought)-(price of energy with a drought+ price of gas with a drought))*

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.

Answer: IID has never needed to purchase greenhouse gas allowances in the history since the freely allocated allowances from CARB has provided more than enough to cover most fluctuations of emission allowances. Assuming under the worst drought condition, IID is not able to procure hydroelectric energy, and have to ramp up nature gas-fired generation to make up the short position. The average annual hydroelectric energy procurement is 417.5 (GWh) for ID under normal conditions. If this amount of energy is replaced by gas-fired energy , the resulting greenhouse gas emission would be  $417,500 * 0.55$  (Weighted Avg MTCO<sub>2</sub>e/MWh for IID-owned natural gas burned generation)=229,625 (MTCO<sub>2</sub>e). And it would cost IID \$2.7 Million to purchase greenhouse gas allowances for the impact of drought.( Est. Value in Cap and Trade @ \$11.48/MTCO<sub>2</sub>e)

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?

Answer: IID expects that low hydro conditions will adversely impact IID's RPS position and consequently hurt the environment. To decrease and control the drought risks to IID's RPS position, IID is constantly working on the procurement of more and more renewable energy other than hydro.

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 time frames(s)?

Answer: IID's hydro production is purely based on agricultural demand, but the governor has asked all California residents and businesses to voluntarily reduce water consumption by 20 percent. Water suppliers and municipalities aren't required to enforce these use reductions; however, IID would

anticipate stepped up monitoring and a phasing in of enforcement actions as water agencies attempt to better manage their water supplies through reduced demands. This does not necessarily effect how much production comes from IIDs hydro facilities.

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?

IID needed to cover additional renewable requirements since the hydro production was slightly less than expected. The assumption is that the decrease was a result in agricultural decisions to crop farms that require less water or decisions of farmers to sell water rights. These causes did not significantly affect IID's energy procurement or dispatch since many other renewable resource technologies were producing higher than expected energy.

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 know or potential issues with water allocations or supplies to thermal plants(for example, power plant cooling)?This is an open-ended questions and we hope 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.

Answer: IID has not experienced or is not aware of any critical reliability issues resulting from drought conditions. The only concern is if more farmers will eventually fallow more local land (for a variety of reasons; not just for drought specific reasons) and thus decrease small hydro renewable production. This would require IID to procure other short term renewable resources which may be costly and disadvantageous.