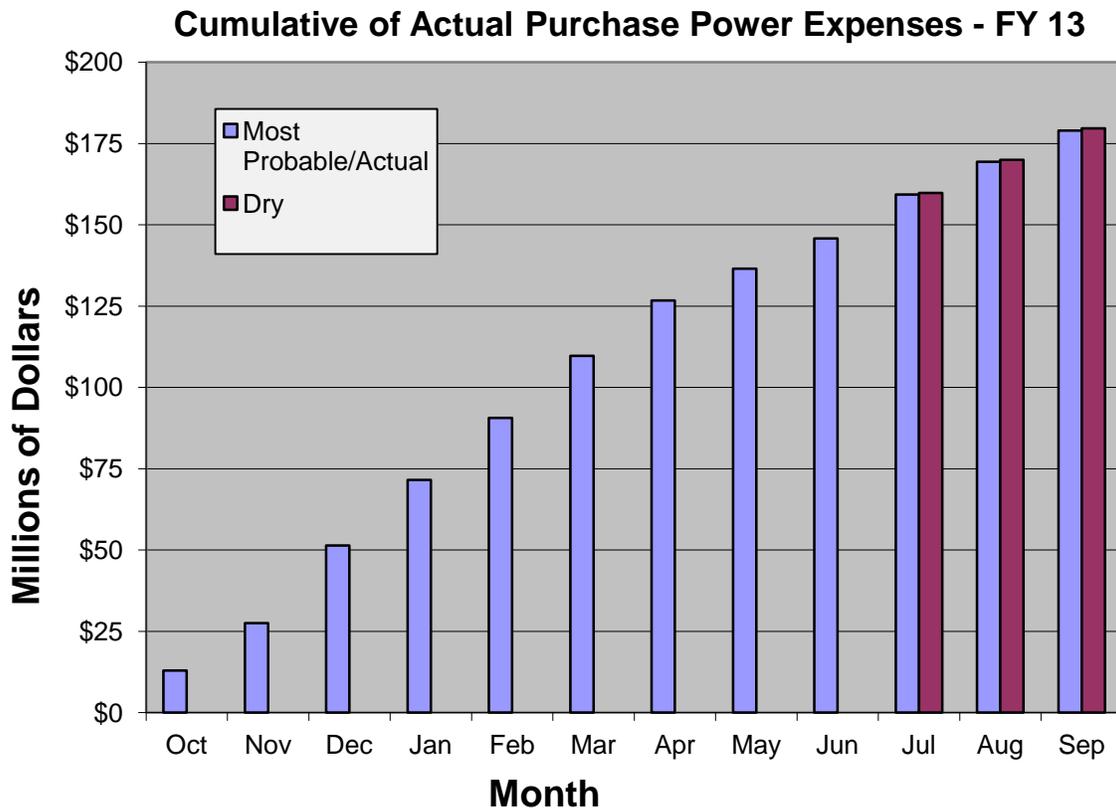


# Hydro Conditions and Purchase Power Monthly Outlook July 2013

## Western Summary

- The most probable forecast of net generation for FY 2013 is 22,718 gigawatt-hours (GWh) or 84 percent of average. October through June generation was 85 percent of average.
- The lower level forecast of generation for FY 2013 is 22,651 GWh or 83 percent of average.
- The purchased power for FY 2013 is expected to be approximately 4,126 GWh.
- The average price for purchase power across all hydro projects and off-peak and on-peak periods is expected to be \$43/MWh. This price compares to \$49/MWh last year.
- Purchase power expenses for FY 2013 are forecast to be approximately \$179 million.
- October through June purchases totaled over \$146 million – compared to \$78 million for the same period last year.



## Upper Great Plains Region

Storage: June inflows resulted in 50 percent of average and the anticipated inflow for July is forecast to be 40 percent of average. Based upon the current water supply forecast, releases out of Canyon Ferry to the Missouri River below Holter Dam will be maintained near 3,000 cfs to conserve storage. Streamflows into Bighorn Lake during June continued to remain below average at only 51% of average. Based on the July 1 water supply forecast and the planned releases out of Boysen and Buffalo Bill Reservoirs, the July runoff into Bighorn Lake is expected to equal 116,000 acre-feet (44% of average).

As of July 17, 2013, the storage level at [Canyon Ferry](#) was 1,654,682 acre feet and the active conservation pool is 87.5% full. Storage at [Yellowtail](#) is 1,014,440 acre feet and the active conservation pool is 99.4% full.

COE: Total runoff for the year is estimated to be only 85% of normal at 21.2 MAF, normal being 25.2 MAF. Forecasted energy production for the calendar year decreased from last month's forecast by 135 GWh to 7,607 GWh. The COE continues to operate in drought mode.

Snow pack: The July 1 forecasted runoff for calendar year 2013 is 22.3 MAF. This runoff would be 88% of normal runoff. As of July 1, 2013, the mountain snowpack in the reach above Fort Peck is 24% of the average snowpack for this date. Mountain snowpack in the reach between Fort Peck and Garrison is 24% of the normal April 15 peak snowpack.

FY Generation: The six main stem power plants generated 608 million kilowatt hours of electricity in June. Total energy production for 2013 was earlier forecasted to reach 8.0 billion kWh, but has been reduced to around 7.8 billion kWh. The long-term average is approximately 10 billion kWh.

Purchased Power: With the advent of warmer weather, on peak prices are starting to get to \$50 and off peak power holds in the mid to upper twenties.

## Rocky Mountain Region

The Loveland Area Projects (LAP) reside in both the Upper Missouri and Upper Colorado basins. Hydrologic conditions can vary from one river basin and watershed to another. The three LAP watersheds are the Bighorn River Basin in Wyoming, the North Platte River Basin in Colorado and Wyoming, and the headwaters of the Colorado River Basin in Colorado.

Drought conditions still range from moderate to extreme in the LAP area. The reservoir inflow has been below normal in all three LAP basins so far this year. The snow pack has now melted at all but the highest elevations. The reservoir storage at the end of June was near average in the Bighorn Basin and well below average in the North Platte Basin and for the Colorado-Big Thompson Project (CBT). The latest National Weather Service forecast for the August through October period indicates temperatures are more likely to be above average in Wyoming and Colorado while precipitation is just as likely to be above average as below average. Due to a lack of precipitation in May and June, the spring runoff will end up below average for the CBT and well below average for the North Platte and Bighorn basins.

LAP Water Conditions At-A-Glance									
	Reservoir Storage 1,000 acre-feet			Actual Reservoir Inflow To-Date 1,000 acre-feet			Most Probable Reservoir Inflow 1,000 acre-feet (April - July)		
	end of June	average	% of average	October - June	average	% of average	July forecast	average	% of average
<b>CBT</b>	708.6	797.5	89%	531.1	569.1	93%	540.8	590.0	92%
<b>North Platte</b>	1,335.2	1,886.9	71%	475.7	948.3	50%	328.4	750.0	44%
<b>Bighorn</b>	2,178.3	2,139.1	102%	939.5	1,310.7	72%	729.4	1,435.3	51%
<b>TOTAL</b>	4,222.1	4,823.5	88%	1,946.3	2,828.1	69%	1,598.6	2,775.3	58%
Net At Plant Generation Projections (GWh)									
	Most Probable Case median inflow			Reasonable Minimum Case lower decile inflow			Reasonable Maximum Case upper decile inflow		
	July projection	average	% of average	July projection	average	% of average	July projection	average	% of average
<b>Winter 12-13</b>	512.8	724.0	71%	512.8	724.0	71%	512.8	724.0	71%
<b>Summer 13</b>	939.2	1,214.7	77%	911.0	1,214.7	75%	999.8	1,214.7	82%
<b>TOTAL 2013</b>	1,452.0	1,938.7	75%	1,423.8	1,938.7	73%	1,512.6	1,938.7	78%

LAP generation has been well below average since October. With the July reservoir inflow forecasts lower than June forecasts, LAP generation is now expected to be below average for the remainder of the year. The projected generation includes the planned cessation of CBT Adams Tunnel imports and associated generation for a six week period from July 23<sup>rd</sup> through August 3<sup>rd</sup> to improve water clarity in Grand Lake by minimizing the introduction of organic and non-organic particulates from Shadow Mountain Reservoir. The Park Service has determined that recent fires near Grand Lake will not impact the water clarity.

### Colorado River Storage Project Management Center

The total storage volume for the CRSP main stem reservoirs is 16,144,000 acre feet, which is about 52 percent of the total main stem reservoir storage capacity. Main stem reservoir inflows for the most recent historical month (June, 2013) were about 34 percent of average. Lake Powell elevation currently is about 3,599 feet, 101 feet from maximum reservoir level, and about 109 feet from the minimum generation level. The July, 2013 inflow forecast for April through July, 2013 at Lake Powell is 37 percent of average at 2.67 million acre feet.

Consistent with Section 6.C.1 of the Interim Guidelines, if the August 24-Month study projects the January 1, 2014, Lake Powell elevation to be less than 3,575.0 feet and at or above 3,525.0 feet and the Lake Mead elevation to be at or above 1,025.0 feet, the operational tier for Lake Powell in water year 2014 will be the Mid-Elevation Release Tier and the water year release volume from Lake Powell will be 7.48 maf. This July 2013 24-Month study projects that, with an 8.23 maf annual release pattern in water year 2014, the January 1, 2014, Lake Powell elevation would be 3,574.97 feet and the Lake Mead elevation would be 1,105.73 feet. Therefore, the 2014 Lake Powell operational tier is currently projected to be the Mid-Elevation Release Tier with an annual release volume of 7.48 maf. Based on analysis of a range of inflow scenarios, the current probability of

realizing an inflow volume that would result in the Mid-Elevation Release Tier in 2014 is slightly greater than 50 percent.

SLCA/IP net generation for Fiscal Year 2013 is 4,294 GWh as compared to 5,607 GWh based on the long-term historical average generation.

Total purchase power expenses for firming during the fiscal year 2013 are about \$47.6 million as compared to about \$14.8 million based on long-term median historical releases. Purchase power availability in the region is abundant and prices are typical for this time of year. Firming purchases for the last couple of months have been in the upper \$30's to low \$40's on-peak and upper \$20's to low \$30's off-peak. Spot Market prices spiked to over \$100/MWh on-peak during a particularly hot period at the end of June.

### **Desert Southwest Region**

Current Aggregate Storage (Mead, Mohave & Havasu): 14.576 MAF (14.823 MAF May-2013), 21.099 MAF (73-Year Historical Avg).

The Lake Mead end of June 2013 elevation was 1,105.98 ft. (2.38 ft. lower than end of May 2013 elevation ), or about 113.66 ft. below full storage elevation of 1,219.64 ft. and 55.98 ft. above the minimum generation elevation for Hoover of 1,050 ft.

Lake Mead's elevation peaked at 1122.32 ft in January of WY 2013 (11.86 ft. below the WY 2012 peak elevation of 1134.18 ft.), and is projected to drop to a minimum elevation of 1103.84 ft. in September of WY 2013, a maximum fluctuation in lake elevation of 18.48 ft.

The Lake Powell operational tier for WY 2013 is currently the Upper Elevation Balancing Tier. Total releases from Lake Powell are projected to be average at 8.23 MAF for WY 2013 (actual of 9.47 MAF for WY 2012). The projected 2013 April – July unregulated inflow into Lake Powell is 2.67 MAF or 37% of average (actual of 2.06 MAF or 29% of average for 2012).

Basin Snow Pack and Precipitation: DSW hydrology is mostly dependent on the Colorado River Basin snow pack and precipitation above Lake Powell. The WY 2013 precipitation is currently 77% of average and the snowpack is gone.

Lower Basin Runoff: The lower basin tributary inflow into Lake Mead for May 2013 was 2 KAF. The projected side inflow into Lake Mead for WY2013 is 669 KAF which represents a 8.4% decrease over last year's actual of 730 KAF, and represents 51% of the normal annual side inflow of 1.3 MAF.

Forecasted WY 2013 Generation: 5201 GWh compared to 5644 GWh (Historical Average). The projected Hoover and Parker-Davis generation for WY 2013 is 92% of the average historical generation.

Wholesale Power Market Conditions: The June market prices in the Desert Southwest averaged about \$38/MWh firm on-peak, \$26/MWh firm off-peak compared to \$38/MWh firm on-peak, \$26/MWh firm off-peak for the previous month.

## Sierra Nevada Region

The total storage of the four major CVP reservoirs is 5.382 million-acre-feet, compared to 7.887 MAF last year. Accumulated inflow for the water year-to-date is 61 percent of the 15-year average for Trinity, 71 percent for Shasta, 68 percent for Folsom and 53 percent for New Melones. Folsom Reservoir releases are being cut to conserve storage.

The Northern Sierra Eight Station index averages slightly more than 50 inches of precipitation per water year. This water year started out with October recorded precipitation totaling 2.70 inches, which is below average for this month. November recorded precipitation totaled 13.00 inches, which is more than 200 percent of average. December came in at 17.10 inches, or 193 percent of average. January came in at 1.50 inches or 17 percent of its average. It ranks as one of the sixth driest. February ended at 0.90 inches or 11 percent of its average. March ended at only at 4.38 inches or 65 percent of its average. April ended at 1.52 inches or 41 percent of its average. May ended at 1.30 inches or 59 percent of its average. June ended at 1.80 inches or 186 percent of its average. The cumulative total at this time is 44.20 inches or 88 percent of the total average of 50.30 inches. There has been no measurable precipitation for July at this time.

The snowpack is assumed to reach its peak April 1st. Therefore, snow water equivalents are reported as a percentage of this average. As of May 23rd, the North is at 2 percent, the Central is at 2 percent and the South is at 1 percent of this average. The Sacramento River Index forecast of water supply based upon May 1st conditions is “dry” (close to critical) for the 90 percent exceedence case and “dry” for the 50 percent case, reflecting the poor January, February and March, which has set records, but not in a good way. The State’s final yeartype declaration is based upon May 1st conditions at the 50 percent exceedence level. This year is officially “dry.”

The average projection of net generation is again taken from the latest modeling using the update to our customers’ “Green Book.” This average, at 3.34 GWh, is less than the 3.63 GWh from the CVPIA PEIS planning studies. Under the Post 2004 Marketing Plan, net generation, after Project Use load, First Preference Customer load and sub-control area reserve requirement, becomes the Base Resource which is allocated among the Base Resource, Variable Resource and Full Load Service Customers. This past fiscal year ended at 109 percent of that average. Reclamation forecasts are based upon April 1st conditions, which were based upon water supply forecast of “dry” for the 90 percent exceedence and “dry” for the 50 percent exceedence. These forecasts would be 93 percent and 94 percent of this “Green Book” average net generation. Forecasts sometimes “flip” because during drier conditions, more reservoir releases must be made to meet demands while under the “less dry” case, some flow requirements could conceivably be met via side flow. Project use pumping is now at maximum to meet South of Delta water demands.