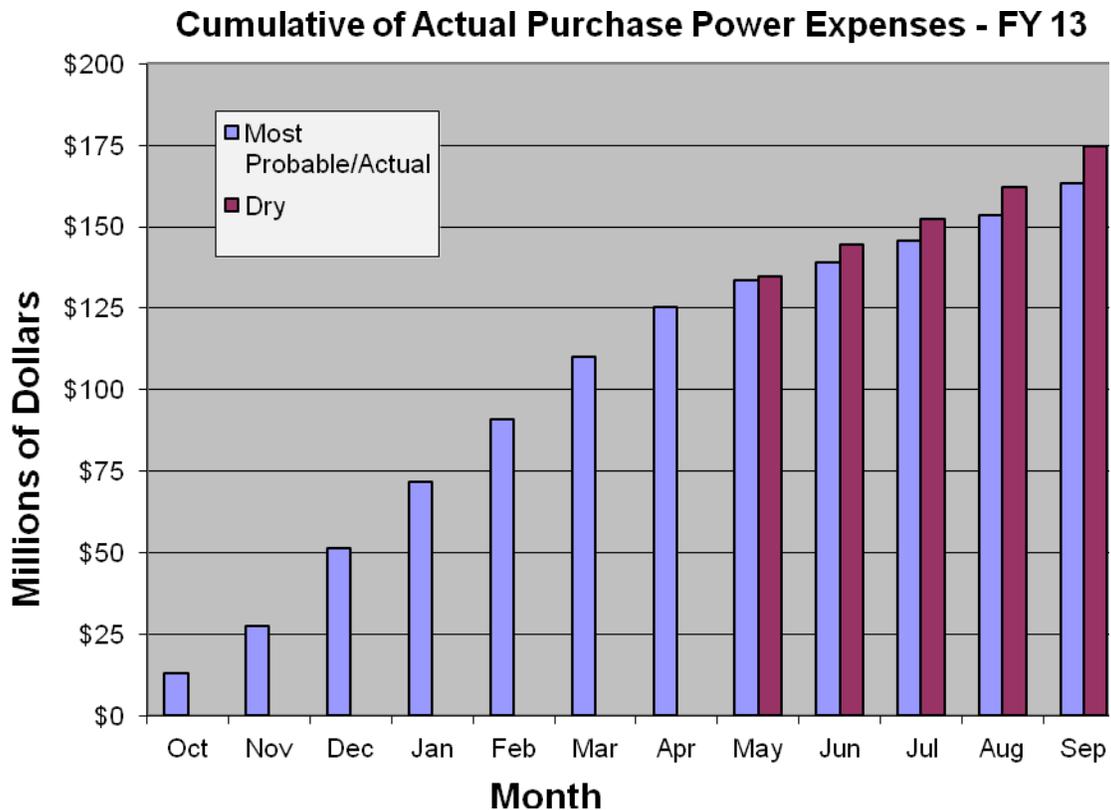


# Hydro Conditions and Purchase Power Monthly Outlook May 2013

## Western Summary

- The most probable forecast of net generation for FY 2013 is 22,820 gigawatt-hours (GWh) or 84 percent of average. October through April generation was 85 percent of average.
- The lower level forecast of generation for FY 2013 is 22,476 GWh or 83 percent of average.
- The purchased power for FY 2013 is expected to range between 3,809 and 4,058 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 \$51/MWh last year.
- Purchase power expenses for FY 2013 are forecast to range between \$163 and \$175 million.
- October through April purchases totaled over \$125 million – compared to \$66 million for the same period last year.



## Upper Great Plains Region

Storage: April brought increased precipitation in the mountains, while streamflows into Canyon Ferry were 73 percent of average due to cooler temperatures. Storage in Canyon Ferry is at 98 percent of average and the anticipated inflows during the May through July period is forecast to be 79 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 4,000 cfs to assure the reservoir of filling to the top of the joint-use pool by the end of June. Streamflows into Bighorn Lake during April continued to remain below average at only 67% of average. Based on the May 1 water supply forecast and the planned releases out of Boysen and Buffalo Bill Reservoirs, the May through July runoff into Bighorn Lake is expected to equal 579,000 acre-feet (61% of average).

As of June 2, 2013, the storage level at [Canyon Ferry](#) was 1,516,893 acre feet and the active conservation pool is 80.2% full. Storage at [Yellowtail](#) is 933,412 acre feet and the active conservation pool is 91.5% full.

COE: Total runoff for the year is estimated to be only 80% of normal at 19.9 MAF, normal being 24.8 MAF. This may result in lower generation in future months, especially if drought conditions remain. The COE continues to operate in drought mode.

Snow pack: The June 1 forecasted runoff for calendar year 2013 is 20.5 MAF. This runoff would be 81% of normal runoff. As of June 1, 2013, the mountain snowpack in the reach above Fort Peck is 93% of the average snowpack for this date. Mountain snowpack in the reach between Fort Peck and Garrison is 92% of the average snowpack for this date.

FY Generation: The six main stem power plants generated 608 million kilowatt hours of electricity in April. 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: Generally prices are staying within the mid twenties for off peak power and mid-to upper-thirties for on peak power.

## 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 have improved somewhat in the LAP area with recent spring storms but still range from moderate to extreme. The reservoir inflow has been well below normal in all three LAP basins so far this year. In a dramatic reversal since last month, the accumulated snowpack at the beginning of this month was near average in the Bighorn Basin and the Colorado River headwaters. It was still below average in the North Platte Basin but well above last year's level. The reservoir storage at the end of April was still above average in the Bighorn Basin but well below average in the North Platte Basin and for the Colorado-Big Thompson Project (CBT). The snow melt runoff is just beginning. The latest National Weather Service forecast for the May through July period indicates temperatures are more likely to be above average and precipitation more likely to be

below average in Wyoming and Colorado. Reclamation is still forecasting well below average spring reservoir inflows but those forecasts are significantly higher than they were last month.

LAP Water Conditions At-A-Glance									
	Reservoir Storage 1,000 acre-feet			Snowpack inches snow water equivalent			Most Probable Reservoir Inflow 1,000 acre-feet (April - July)		
	end of April	average	% of average	end of April	average	% of average	May forecast	average	% of average
<b>CBT</b>	467.2	599.6	78%	364.1	369.5	99%	525.5	590.0	89%
<b>North Platte</b>	1,287.3	1,592.9	81%	359.6	393.5	91%	450.0	750.0	60%
<b>Bighorn</b>	1,824.2	1,668.4	109%	352.8	334.9	105%	998.0	1,435.3	70%
<b>TOTAL</b>	3,578.7	3,860.9	93%	1,076.5	1,097.9	98%	1,973.5	2,775.3	71%
Net At Plant Generation Projections (GWh)									
	Most Probable Case median inflow			Reasonable Minimum Case lower decile inflow			Reasonable Maximum Case upper decile inflow		
	May projection	average	% of average	May projection	average	% of average	May 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>	1,088.9	1,214.7	90%	904.7	1,214.7	74%	1,299.0	1,214.7	107%
<b>TOTAL 2013</b>	1,601.7	1,938.7	83%	1,417.5	1,938.7	73%	1,811.8	1,938.7	93%

LAP generation was well below average over the winter and in April. LAP generation is still expected to be below average for the upcoming summer season as a whole but much closer to average than was forecast last month. Generation is projected to be above average in June and near average in July and August. The August projection even includes the likely cessation of CBT Adams Tunnel imports to improve water clarity in Grand Lake by minimizing the introduction of organic and non-organic particulates from Shadow Mountain Reservoir.

### Colorado River Storage Project Management Center

The total storage volume for the CRSP main stem reservoirs is 15,790,000 acre feet, which is about 51 percent of the total main stem reservoir storage capacity. Main stem reservoir inflows for the most recent historical month (April, 2013) were about 38 percent of average. Lake Powell elevation currently is about 3,596 feet, 104 feet from maximum reservoir level, and about 106 feet from the minimum generation level. The elevation is projected to increase about 5 feet to 3600 by June, then resume declining. The April, 2013 inflow forecast for April through July, 2013 at Lake Powell is 42 percent of average at 3.0 million acre feet.

Consistent with Section 6.C.1 of the Interim Guidelines, if the August 2013 24-Month study projects the January 1, 2014, Lake Powell elevation to be at or above 3,575.00 feet and below the equalization level of 3648.00 feet and the Lake Mead elevation to be at or above 1,075.00 feet, the operational tier for Lake Powell in water year 2014 will be the Upper Elevation Balancing Tier and the water year release volume from Lake Powell will be 8.23 maf. This May 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 3,577.27 feet and the Lake Mead elevation would be 1,107.47 feet.

Therefore, the 2014 Lake Powell operational tier is currently projected to be the Upper Elevation Balancing Tier with an annual release volume of 8.23 maf and no projected shift in April to the Equalization Tier.

However, if hydrology should become slightly drier than is currently projected and the August 24-Month Study projects the January 1, 2013 Lake Powell elevation to be less than 3,575.00 feet, the Mid-Elevation Release Tier will govern and the annual release volume from Lake Powell will be 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 Upper Elevation Balancing Tier and an 8.23 maf annual release is approximately 55 percent and the probability for the Mid-Elevation Release Tier and a 7.48 maf annual release is approximately 45 percent.

SLCA/IP net generation for Fiscal Year 2013 is 4,233 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 \$46 million as compared to about \$14.5 million based on long-term median historical releases. Purchase power availability in the region is abundant and prices are reasonable for this time of year. Firming purchases for the last couple of months have been in the lower \$30's on peak and upper \$20's off peak. On peak prices are projected to rise into the \$40-50 range as temperatures increase this summer.

### **Desert Southwest Region**

Current Aggregate Storage (Mead, Mohave & Havasu): 15.231 MAF (15.710 MAF Mar-2013), 20.734 MAF (73-Year Historical Avg).

The Lake Mead end of April 2013 elevation was 1,112.91 ft. (5.68 ft. lower than end of Mar 2013 elevation ), or about 106.73 ft. below full storage elevation of 1,219.64 ft. and 62.91 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 1104.23 ft. in September of WY 2013, a maximum fluctuation in lake elevation of 18.09 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 3.0 MAF or 42% 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 80% of average and the snowpack is 56% of average.

Lower Basin Runoff: The lower basin tributary inflow into Lake Mead for March 2013 was 38 KAF. The projected side inflow into Lake Mead for WY2013 is 735 KAF which represents a 0.7% increase over last year's actual of 730 KAF, and represents 56% of the normal annual side inflow of 1.3 MAF.

Forecasted WY 2013 Generation: 5189 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 April market prices in the Desert Southwest averaged about \$37/MWh firm on-peak, \$29/MWh firm off-peak compared to \$33/MWh firm on-peak, \$27/MWh firm off-peak for the previous month.

### **Sierra Nevada Region**

The total storage of the four major CVP reservoirs is 7.590 million-acre-feet, compared to 9.515 MAF last year. Accumulated inflow for the water year-to-date is 72 percent of the 15-year average for Trinity, 72 percent for Shasta, 73 percent for Folsom and 62 percent for New Melones. Reservoir releases have increased to meet Delta needs.

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. The cumulative total at this time is 42.00 inches or 83 percent of the total average of 50.30 inches.

The snowpack is assumed to reach its peak April 1<sup>st</sup>. Therefore, snow water equivalents are reported as a percentage of this average. As of May 23<sup>rd</sup>, 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 1<sup>st</sup> 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 year type declaration is based upon May 1<sup>st</sup> 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 1<sup>st</sup> 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 84 percent of this “Green Book” average net generation. The forecasts sometimes “flip” because during drier conditions, more reservoir releases must be made to meet instream flow while under the “less dry” case, some instream flow requirements could conceivably be met via side flows. Project use pumping remains low due to Delta water quality concerns and with increased releases on the Sacramento to meet Delta needs and increased Trinity River Diversions to support the Sacramento, base resource remains quite high.