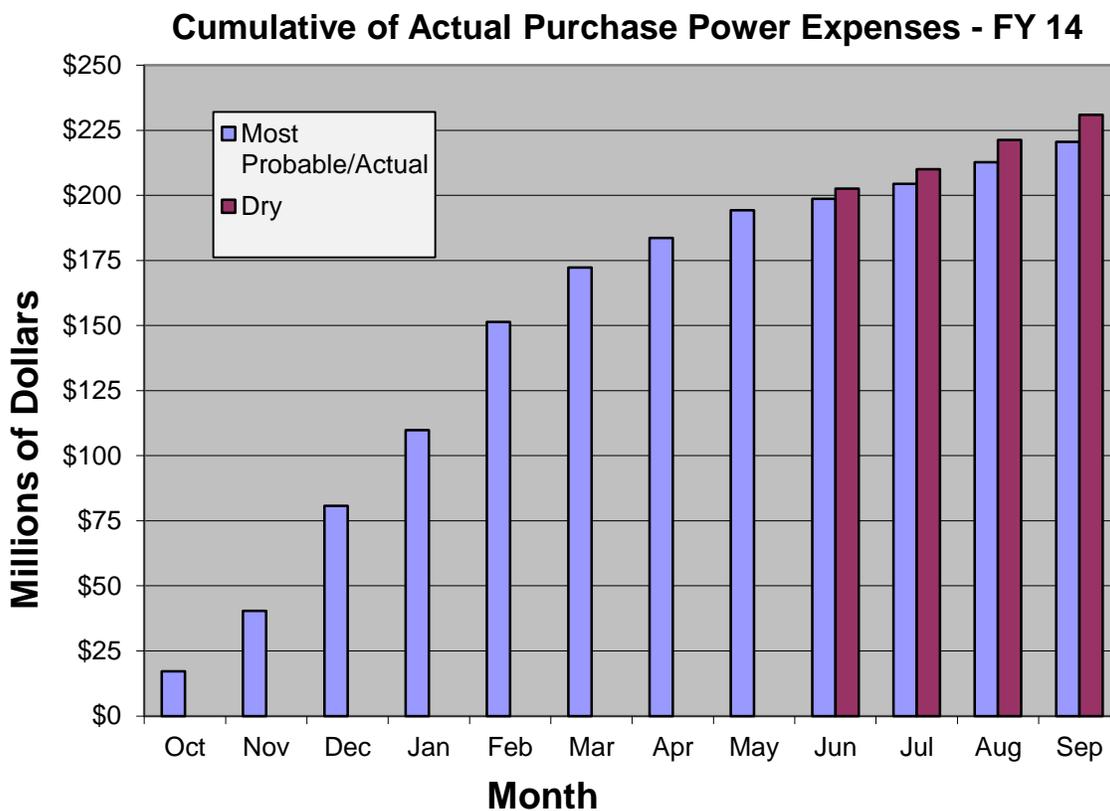


## Hydro Conditions and Purchase Power Monthly Outlook June 2014

### Western Summary

- The most probable forecast of net generation for fiscal year (FY) 2014 is 23,421 gigawatt-hours (GWh) or 86 percent of average. October through May generation was 82 percent of average.
- The lower level forecast of generation for FY 2014 is 22,640 GWh or 83 percent of average.
- The purchased power for FY 2014 is expected to range between 4,386 and 4,634 GWh.
- The average price for purchase power across all hydro projects and off-peak and on-peak periods is expected to be \$50/megawatt-hour (MWh). This price compares to \$45/MWh last year.
- Purchase power expenses for FY 2014 are forecast to range between \$221 and \$231 million.
- October through May purchases totaled over \$194 million – compared to \$141 million for the same period last year.



## Upper Great Plains Region

Storage: The anticipated inflow for the June through July period is forecast to be 922.0 thousand acre-feet (kAF), or 97 percent of the 30-year average. Streamflows into Bighorn Lake during May were 203 percent of average. On June 1, the NRCS measured the snow water content of the mountain snowpack in the Bighorn Basin at 111 percent of average. Based on the June 1 water supply forecast and the planned releases out of Boysen and Buffalo Bill Reservoirs, the June-July runoff into Bighorn Lake is expected to equal 782,900 acre-feet (119 percent of average).

As of June 24, 2014, the storage level at [Canyon Ferry](#) was 1,841,144 acre-feet and the active conservation pool is 97.3 percent full. Storage at [Yellowtail](#) is 925,249 acre-feet and the active conservation pool is 90.7 percent full.

COE: Bird peaking continues at Garrison and Ft. Randall. The Piping Plover and Least Tern return annually to nest on the sand banks of the river. Periodically the plants will be releasing a pulse of water to ensure the birds nest near the tops of the sandbanks, thus preventing the nests from washing away if the river fluctuates. Runoff is estimated to be 125 percent of normal. Forecast energy was raised to 9,691 GWh, up somewhat from last month. Average is 10,027 GWh.

Snow pack: April 1 forecasted runoff for calendar year 2014 is 32.0 million acre-feet (MAF). This runoff would be 127 percent of normal runoff. Mountain snowpack above Ft. Peck is currently 138 percent of normal. The mountain snowpack in the reach between Ft. Peck and Garrison is currently 142 percent of normal.

FY Generation: The six main stem power plants generated 880 million kilowatt-hours (kWh) of electricity in May. Total energy production for 2014 is forecasted to be 9,691 GWh, up from 8,964 GWh forecasted in March. The long-term average is approximately 10 billion kWh.

Purchased Power: We are starting the summer months of the generating season, and with loads increasing prices have stayed in the upper twenties for off-peak power and on-peak power ranges up to upper thirties.

## 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.

The LAP area continues to be drought free. The year to date reservoir inflow has been well above average. The overall LAP reservoir storage at the end of May was average with gains in the North Platte Basin and Colorado-Big Thompson Project (CBT) and losses in the Bighorn Basin since the end of last May. The snowpack was well above average starting the month and has mostly melted as of this writing which is normal. The latest National Weather Service forecast indicates July through September temperatures will more likely be below average while the precipitation is more likely to be above average. The spring snow melt runoff is still forecast to be above average in all three basins and well above average overall due to the snowpack and favorable soil moisture and bank storage carrying over from the heavy fall storms.

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)		
	beginning of June	average	% of average	beginning of June	average	% of average	June forecast	average	% of average
	<b>CBT</b>	733.5	673.3	109%	109.5	56.4	194%	937.0	588.0
<b>North Platte</b>	1,646.7	1,725.8	95%	200.2	122.9	163%	1,000.0	770.0	130%
<b>Bighorn</b>	1,815.7	1,798.2	101%	149.9	108.1	139%	1,550.0	1,315.0	118%
<b>TOTAL</b>	4,195.9	4,197.3	100%	459.6	287.4	160%	3,487.0	2,673.0	130%
Net At Plant Generation Projections (GWh)									
	Most Probable Case median inflow			Reasonable Minimum Case lower decile inflow			Reasonable Maximum Case upper decile inflow		
	June projection	average	% of average	June projection	average	% of average	June projection	average	% of average
	<b>Winter 13-14</b>	555.3	718.0	77%	555.3	718.0	77%	555.3	718.0
<b>Summer 14</b>	1,409.5	1,217.8	116%	1,315.6	1,217.8	108%	1,528.4	1,217.8	126%
<b>TOTAL 2014</b>	1,964.8	1,935.8	101%	1,870.9	1,935.8	97%	2,083.7	1,935.8	108%

The summer season generation is expected to fall between 108 percent and 126 percent of average. Reclamation operating plans project likely plant bypasses in the Bighorn and North Platte basins and about a 50 percent chance of an early summer Lake Granby spill due to heavy reservoir inflows. Heavy runoff and likely reduced water demand will result in nearly full East Slope CBT storage. Another curtailment of Adams Tunnel imports and associated CBT generation has been planned for August as a means to improve water clarity in Grand Lake. There are now no plans to pump water from Lake Granby to Shadow Mountain Reservoir during the water clarity operation this year.

### Colorado River Storage Project Management Center

The total storage volume for the CRSP main stem reservoirs is 17,090,000 acre feet, which is about 55 percent of the total main stem reservoir storage capacity. Main stem reservoir inflows for the most recent historical month (May 2014) were about 96 percent of average. Lake Powell elevation currently is about 3,600 feet, 100 feet from maximum reservoir level, and about 110 feet from the minimum generation level. Lake Powell elevation increased about 20 feet in May as spring runoff entered the reservoir. Based on the current forecast, the June 24-Month study projects Lake Powell elevation will peak near approximately 3,614 feet near the end of June and end the water year near 3,610 feet with approximately 12.715 MAF in storage (52 percent capacity).

Note that projections of elevation and storage have uncertainty, primarily due to uncertainty regarding the spring runoff and resulting inflow to Lake Powell. Under the minimum probable inflow scenario, last updated in April, the projected summer peak is 3,599 feet and end of water year storage is 11.0 MAF (45 percent capacity). Under the maximum probable inflow scenario, updated in April, the projected summer peak is 3,632 feet and end of water year storage is 14.9 MAF (61 percent capacity). There is a 10 percent chance that inflows will be higher, resulting in higher elevation and storage, and 10 percent chance that inflows will be lower, resulting in lower

elevation and storage. The annual release volume from Lake Powell during water year (WY) 2014 is projected to be 7.48 MAF under all inflow scenarios.

Based on the most probable inflow forecast, estimated SLCA/IP net generation for FY 2014 is 4,124 GWh as compared to 5,584 GWh based on the long-term historical average generation.

Estimated purchase power expenses for firming during the FY 2014 are about \$60.2 million as compared to about \$21.7 million based on long-term average historical releases. Purchase power availability in the region is good and prices are somewhat higher than usual for this time of year. Firming purchases for the last month have been averaging in the mid \$40s on-peak and mid \$30s off-peak.

### **Desert Southwest Region**

Current Aggregate Storage (Mead, Mohave & Havasu): 12.954 MAF (13.538 MAF April 2014), 20.744 MAF (64-Year Historical Avg).

The Lake Mead end of May 2014 elevation was 1,087.46 feet (7.09 feet lower than end of Apr 2014 elevation), or about 132.18 feet below full storage elevation of 1,219.64 feet and 37.46 feet above the minimum generation elevation for Hoover of 1,050 feet.

Lake Mead's elevation peaked at 1,108.75 feet in January of WY 2014 (13.57 feet below the WY 2013 peak elevation of 1,122.32 feet), and is projected to drop to a minimum elevation of 1,080.62 feet in September of WY 2014, a maximum fluctuation in lake elevation of 28.13 feet.

The Lake Powell operational tier for WY 2014 is currently the Mid-Elevation Release Tier. Total releases from Lake Powell to Lake Mead are projected to average about 7.48 MAF for WY 2014 (actual of 8.232 MAF for WY 2013). The projected 2014 April-July unregulated inflow into Lake Powell (as of June 16, 2014) is 7.26 MAF or 101 percent of average (actual of 2.56 MAF or 36 percent of average for 2013).

Basin Snow Pack and Precipitation: DSW hydrology, or the Lower Colorado River Basin, is mostly dependent on the Colorado River Basin snow pack and precipitation above Lake Powell. The WY 2014 precipitation is currently 97 percent of average and the snowpack is gone.

Lower Basin Runoff: The lower basin tributary inflow into Lake Mead for May 2014 was 14 kAF. The projected side inflow into Lake Mead for WY 2014 is 662 kAF which represents a 20 percent decrease over last year's actual of 824 kAF, and represents 51 percent of the normal annual side inflow of 1.3 MAF.

Forecasted WY 2014 Generation: 5,318 GWh compared to 5,640 GWh (Historical Average). The projected Hoover and Parker-Davis generation for WY 2014 is 94 percent of the average historical generation.

Wholesale Power Market Conditions: The May market prices in the Desert Southwest averaged about \$41/MWh firm on-peak, \$30/MWh firm off-peak compared to \$41/MWh firm on-peak, \$32/MWh firm off-peak for the previous month.

## Sierra Nevada Region

The total storage of the four major CVP reservoirs is 4.233 MAF, compared to 6.815 MAF last year. Accumulated inflow for the water year-to-date is 30 percent of the 15-year average for Trinity, 49 percent for Shasta, 38 percent for Folsom, and 35 percent for New Melones. None of the reservoirs is in flood control operations at this time. Trinity storage is at 44 percent capacity, Shasta at 42 percent, Folsom nearly 50 percent, and New Melones is at 30 percent of its capacity. End of September carryover could be at an all-time low.

The Northern Sierra Eight Station index averages slightly more than 50 inches of precipitation per water year. October recorded precipitation totaled 0.72 inches, or 23 percent of the monthly average. November recorded precipitation totaled 1.66 inches, or 26 percent of average. December came in at 0.92 inches, or 10 percent of average. January came in at 1.20 inches or 13 percent of its average. February ended at 14.20 inches or 130 percent of its average. March came in at 10.21 inches, or 153 percent of average. April ended at 3.95 inches or 67 percent of average. May which averages 2.20 inches ended at 0.75 inches, only 34 percent of average. The cumulative total at this time is 28.80 inches or 57 percent of the annual average and there has been no measurable precipitation for June.

Water year type forecasting begins in December, but snow surveying doesn't begin until January. The snowpack is assumed to reach its peak April 1. Snow water equivalents are reported as a percentage of this average. As of May 23, the North is at 2 percent, the Central is at 3 percent and the South is at 1 percent of this average. The Sacramento River Index forecast of water supply, based upon May 1 conditions forecast, remains "critical" for the 90 percent exceedence as well as the 50 percent case. The 40-30-30 year type declaration based upon May 1 conditions at the 50 percent exceedence level is "critical."

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 approximately 91 percent of that average. Reclamation forecasts are based upon January 1 conditions, which were based upon water supply forecast of "critical" for the 90 percent exceedence and "critical" for the 50 percent exceedence. These forecasts are 66 percent and 63 percent of this "Green Book" average net generation.