



Northern California Power Agency
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BUSINESS PROGRESS REPORT

2018

December



Table of Contents

| | |
|--|----|
| Generation Costs & Reliability | 1 |
| Environmental, Health & Safety Projects | 4 |
| Power Management/NCPA Market Results..... | 5 |
| Debt & Financial Management | 11 |
| Schedule Coordination Goals..... | 11 |
| NCPA Bills & Settlements..... | 13 |
| Political Arena State/Federal/Western Programs | 14 |
| Human Resources..... | 15 |
| Annual Budget FY to Date..... | 16 |
| Budget vs. Actual by Major Area | 17 |
| Generation Resources Analysis by Source | 18 |
| Management Services Analysis by Source | 19 |
| Third Party Revenue Analysis by Source | 21 |
| Generation Detail Analysis by Plant | 23 |

Generation Costs & Reliability

Combustion Turbine Project

Unit Operation for November 2018

| Unit | Availability | | Production | | Reason for Run |
|--|--------------|--------|-------------|-----------|---------------------------|
| CT1 Alameda | Unit 1 | Unit 2 | Unit 1 | 133.5 MWh | Testing and CAISO / CAISO |
| | 42.0% | 97.9% | Unit 2 | 165.3 MWh | |
| Curtailments, Outages, and Comments: | | | | | |
| <p>11/1/18 - Alameda CT U1 o/s for compressor blade repair OMS 6125777</p> <p>11/7/18 - Alameda CT U1 released for service at 1800 OMS 6125777</p> <p>11/9/18 - Alameda CT U1 o/s for compressor bleed valve trouble OMS 6643892</p> <p>11/20/18 - Alameda CT Unit 1 bleed valve repair completed, RTS at 1700 OMS 6643892 /</p> <p>11/1/18 - Alameda CT U2 failed to start, 17:45 on 11/02 OMS 6615426</p> <p>11/2/18 - Alameda CT U2 returned to service at 0737 OMS 6615426</p> | | | | | |
| Unit | Availability | | Production | | Reason for Run |
| CT1 Lodi | 100.0% | | 290.9 MWh | | CAISO |
| Curtailments, Outages, and Comments: No | | | | | |
| Comment. | | | | | |
| Unit | Availability | | Production | | Reason for Run |
| CT2 STIG | 100.0% | | 229.4 MWh | | CAISO |
| Curtailments, Outages, and Comments: | | | | | |
| No Comment. | | | | | |
| Unit | Availability | | Production | | Reason for Run |
| LEC | 96.8% | | 158,597 MWh | | CAISO |
| Curtailments, Outages, and Comments: | | | | | |
| <p>11/11/18 - 1:40 hours forced out, LEC tripped on start-up due to aux boiler 1351 - 1534 OMS 6647876</p> <p>11/21/18 - 2 hours forced out, LEC tripped due to technician error working on UPS 0900 - 1100 OMS 6681210</p> <p>11/24/18 - 19 hours forced out, LEC inlet filters overloaded 0000-1910 OMS 6678489</p> | | | | | |

Maintenance Summary – Specific per asset above.

Geothermal Facilities

Availability/Production for November 2018

| Unit | Availability | Net Electricity Generated/Water Delivered | Out-of-Service/Descriptors |
|--|--------------|---|---|
| Unit 1 | 100 % | 22,600 MWh | U1 had no outages for the month |
| Unit 2 | 100 % | *19,393 MWh | U2 had no outages for the month |
| Unit 3 | N/A % | N/A | Unit 3 remains out of service. |
| Unit 4 | 82.50 % | 24,387 MWh | U4 was out of service from 11/1/18 to 1815 on 11/6/18 due to EHC system failure |
| Southeast Geysers Effluent Pipeline | 48.04% | 211.1 Mgallons | Average flow rate: 4,790 gpm |
| Southeast Solar Plant | N/A | 51,749 KWh | Year-to-date KWh: 1,720,140 |
| Bear Canyon Pump Station Zero Solar | N/A | 40,284 KWh | Year-to-date KWh: 2,968,104 |

* Accounts for an additional 2,099 MWh of house load for the 21KV power supply to the effluent pipeline supplied from Unit #2.

Hydroelectric Project

Availability/Production for November 2018

| Units | Availability | Net Electricity Generated | Out-of-Service |
|----------------------------|--------------|---------------------------|--|
| Collierville Unit 1 | 100.00 % | 13839 MWh | CV #1 unit no reportable outages. |
| Collierville Unit 2 | 0.00 % | 0 MWh | CV #2 unit was out of service on, 11/01/18 at 0000 through 11/30/18 at 2359 due to generator rewind. |
| Spicer Unit 1 | 99.92 % | 720 MWh | NSM #1 unit was out of service on, 11/13/18 at 1450 through 1527 due to 21KV PT fuses. |
| Spicer Unit 2 | 99.94 % | 0 MWh | NSM #2 unit was out of service on, 11/13/18 at 1456 through 1520 due to 21KV PT fuses. |
| Spicer Unit 3 | 99.93 % | 135 MWh | NSM #3 unit was out of service on, 11/13/18 at 1456 through 1523 due to 21KV PT fuses |

Operations & Maintenance Activities:

- CMMS work orders
- CV2 Generator rewind
- Planning Tunnel ROV inspection
- Lake Alpine, Utica and Union Dam repair
- Utica Dam low level outlet valve repair
- North Fork Diversion low level outlet valve repair

Environmental, Health & Safety (EH&S) Projects Incident Reports

- No lost time accidents, recordable incidents, or vehicle accidents occurred in November.
- Find below a Safety Report that highlights the following areas: recordable incidents and lost time accidents (LTAs) reported this period and this calendar year; the number of days since last recordable or LTA; the number of work hours since last recordable or LTA; and vehicle accidents reported this month and this calendar year. In September of 2012, Generation Services completed an internal audit of its records with the results reflected in this report and as updated through the payroll period ended November 24, 2018.
- The “CT Group” column reflects the combined safety numbers of all CT employees. Beginning with the November 2009 report, the CT Group Column also includes Lodi Energy Center staff.

November 2018 Generation Services Safety Report

| | Hydro | GEO | CT Group * | NCPA HQ ** |
|-------------------------------------|---------|---------|------------|------------|
| Cal OSHA Recordable (this month) | 0 | 0 | 0 | 0 |
| Cal OSHA Recordable (calendar year) | 1 | 2 | 0 | 0 |
| Days since Recordable | 119 | 123 | 1,328 | 6,396 |
| Work Hours Since Last Recordable | 11,400 | 25,399 | 195,751 | 2,312,995 |
| LTA's (this month) | 0 | 0 | 0 | 0 |
| LTA's (calendar year) | 0 | 0 | 0 | 0 |
| Days without LTA | 4,054 | 1,191 | 9,232 | 5,325 |
| Work Hours without LTA | 371,850 | 242,374 | 637,115 | 1,935,013 |
| Vehicle Incident (month) | 0 | 0 | 0 | 0 |
| Vehicle Incident (calendar year) | 1 | 0 | 2 | 0 |

* CT Group: Combines CT-1, CT-2 and LEC Operations

** NCPA HQ: Roseville employees at the Main Office

Data originates from OSHA logs, HR records and payroll information.
Days and Hours are calculated through pay period ended November 24, 2018.

Power Management/NCPA Market Results

Dispatch and Schedule Coordination

- NCPA Dispatch and Schedule Coordination Center safely, reliably, and economically schedules, monitors, and manages NCPA and NCPA member power resources and loads 24 hours per day, 7 days per week on a continuous basis. This process includes balancing MSSA loads and resources on a 5-minute basis, optimizing NCPA resources and minimizing ISO costs.
- NCPA MSSA Load Data:

Current Year 2018 Data

| | November 2018 | | Calendar Year 2018 | |
|-----------|----------------------|---------|---------------------------|-----------|
| | Peak MW | MWh | Peak MW | MWh |
| NCPA Pool | 326.48 11/29 @ 1800 | 186,349 | 419.2 7/25 @1700 | 2,112,576 |
| SVP | 496.92 11/1 @ 1600 | 302,199 | 529.29 8/9 @1700 | 3,389,288 |
| MSSA | 811.24 11/1 @ 1700 | 488,548 | 945.44 8/9 @ 1700 | 5,501,864 |

Last Year 2017 Data*

| | November 2017 | | Calendar Year 2017 | |
|-----------|----------------------|---------|---------------------------|-----------|
| | Peak MW | MWh | Peak MW | MWh |
| NCPA Pool | 320.58 11/8 @1800 | 184,496 | 485.85 9/1 @1700 | 2,184,834 |
| SVP | 470.9 11/21 @1500 | 304,421 | 586.59 9/1 @1600 | 3,419,171 |
| MSSA | 789.32 11/8 @ 1800 | 488,917 | 1070.79 9/1 @ 1700 | 5,604,005 |

* Last year's data added for comparison purposes only

System Peak Data

| | All Time Peak Demand | 2018 Peak Demand |
|-----------|-----------------------------|-------------------------|
| NCPA Pool | 517.83 MW on 7/24/06 @ 1500 | 419.2 7/25 @ 1700 |
| SVP | 586.59 MW on 9/1/17 @ 1600 | 529.29 8/9 @ 1700 |
| MSSA | 1070.79 MW on 9/1/17 @ 1700 | 945.44 8/9 @ 1700 |

- NCPA MSSA has a Deviation Band with the CAISO, which is used as a performance measure by the CAISO. The ability to stay within this Deviation Band is a measure of NCPA Dispatch's ability to balance the MSSA Loads and Resources on a 5-minute basis. The following NCPA Deviation Band Performance table includes all deviations, including deviations from unit forced outages, metering and load outages, COTP, Western, and WECC curtailments.

| NCPA Deviation Band Performance | | |
|--|----------------------|---------------------------|
| | November 2018 | Calendar Year 2018 |
| MSSA % Within the Band | 96.88% | 97.24% |

- Spicer Meadows:
 - November 13 @ 1456 – 1523, all units separated from the grid for replacement of 21kV PT fuses.
- Geothermal Units:
 - November 6 @ 1814, Unit 4 return to service from outage due to EHC system trouble; o/s since October 21.
- Lodi Energy Center:
 - November 11, plant one half hour delayed transition to ADS control due to aux boiler trip on start up.
 - November 21 @ 0851 – 1024, plant trip off line due to UPS system trouble
 - November 24 @ 0000 – 1910, plant forced o/s for replacement of inlet air filters, plugged by airborne particulate from Camp Fire.
- Alameda CTs:
 - November 7 @ 1800, Unit 1 returned to service from outage due to compressor blade failure, o/s since June
 - November 1 @ 1800 – November 2 @ 0737, Unit 2 o/s due to emergency lube oil pump failure and IGV trouble
 - November 9 – 20, Unit 1 o/s due to compressor bleed valve trouble.
- Lodi CT:
 - No curtailments
- Collierville Units:
 - November 1 – 30, Unit 2 remains o/s for stator rewind and annual maintenance.
- STIG:
 - No curtailments

Pooling, Portfolio Planning & Forecasting

- NCPA Pool load in November 2018 was 186,329 MWh, which was 99.5% of the pre-month forecast of 187,335 MWh. From December 1 through December 18, 2018, NCPA Pool load was 110,725 MWh. Pool load may reach the December forecast of 203,011 MWh despite normally light load over the Christmas holiday, particularly if weather remains chilly.
- The Lodi Energy Center (LEC) generated 28,517 MWh for the Pool in November 2018, due to numerous full-day runs and a brief outage on the weekend after Thanksgiving. The Pool's share of generation through December 18, 2018 was 19,637 MWh, compared to the full-month forecast of 39,782 MWh.
- For the month of November 2018, 7.85" of rain was recorded at the Big Trees gage. November Big Trees average precipitation is 6.43".
- The Value of Storage (VOS) of New Spicer Meadow Reservoir (NSMR) is being maintained at \$150/MWh.
- NSMR storage as of November 30, 2018 was at 82,502 acre feet. The historical average NSMR storage at the end of November is 85,100 acre feet. As of December 13, 2018 NSMR storage is 79,899 acre feet. The current NCPA Pool share of NSMR storage is 40,885 acre feet.
- Combined Calaveras Project generation for the Pool in November 2018 totaled 6.3 GWh, down from 7.6 GWh in October 2018. The Pool's 6.3 GWh in November 2018 was above the pre-month forecast of 5.1 GWh. Through December 13, 2018 Calaveras generation for the Pool is 2.9 GWh.
- Western Base Resource (BR) deliveries for the Pool in November 2018 were 13,824 MWh, far exceeding Western's zero-MWh forecast. Through December 18, 2018, BR allocations for the Pool were 960 MWh (the Displacement program is hibernating). The most recent Western forecast for both December and January continues to show zero MWh.
- The PG&E Citygate gas index averaged \$4.27/MMBtu for December 19, 2018 delivery and has traded well above \$4 since November 7, 2018. This compares to an average of \$5.01/MMBtu (and a high \$6.975/MMBtu) in November 2018. The December 2018 PG&E Bidweek price is \$6.42, up steeply from November's Bidweek \$4.05 price. In early December, PG&E gas hit \$6.975 before retreating.
- Day-ahead NP15 electricity prices averaged \$54.74/MWh (HLH) and \$47.79 (LLH) during November 2018, with the hourly TH_NP15 maximum at \$112.81/MWh on November 19. In December, hourly on-peak prices have averaged \$70.95, with highs reaching \$170/MWh on multiple hours on December 3.

| NCPA Pool Loads & Resources Value Summary | | | | | | | | |
|---|----------------------|-----------------|---------|---------|----------------------------|------------------------|------------------------|--------------|
| Peak and Energy Summary Nov-18 | | | | | Estimated Production Costs | | Cost of Serving Demand | |
| | Coincident Peak (MW) | Forecast Values | | | NCPA Pool | | Totals | Avg (\$/MWh) |
| | Nov-29-18 Hour 18 | Total MWh | Values | Avg. MW | Cost/Revenue (Estimate) | Variable Cost (\$/MWh) | | |
| Demand | 326.2 | 186,329 | 187,335 | 258.4 | N/A | N/A | | |
| WAPA | 80.0 | 13,824 | 593 | 19.2 | \$ 1,170,723 | \$ 84.69 | \$ 10,248,635 | \$ 55.00 |
| Geothermal | - | 26,958 | 26,994 | 37.4 | 512,194 | 19.00 | | |
| Hydro | - | 6,300 | 4,609 | 8.7 | 37,800 | 6.00 | | |
| Stig & CTs | - | 477 | 776 | 0.7 | 32,259 | 67.59 | | |
| LEC | - | 28,517 | 32,738 | 39.6 | 1,077,654 | 37.79 | | |
| Contracts | 93.0 | 93,456 | 64,866 | 129.6 | 5,016,194 | 53.67 | \$ 8,624,288 | \$ 46.29 |
| Market - Net (Net Sales = Negative) | 153.2 | 16,797 | 56,759 | 23.3 | 582,734 | 34.69 | | |
| Net Total | 326.2 | 186,329 | 187,335 | 258.4 | \$ 8,429,559 | \$ 46.29 | | |

| Monthly Market Summary | | | | | | |
|------------------------|-------------------|----------------------|---|---|---------------------|----------|
| | Pool Energy (MWh) | HLH Avg MCP (\$/MWh) | Avg Variable Cost of Pool Generation (\$/MWh) | Forward Prices (EOX NP15 HLH Ask Prices) (\$/MWh) | | |
| | | | | NP15 11/1/2018 (\$/MWh) | 12/18/2018 (\$/MWh) | |
| Jan-18 | 195,093 | \$ 34.68 | \$ 43.74 | Dec-18 | \$ 58.38 | \$ 60.48 |
| Feb-18 | 173,464 | \$ 32.12 | \$ 43.94 | Jan-19 | 54.53 | 58.22 |
| Mar-18 | 190,023 | \$ 31.58 | \$ 39.43 | Feb-19 | 49.85 | 55.32 |
| Apr-18 | 175,890 | \$ 26.51 | \$ 39.05 | Q2 2019 | \$ 33.83 | \$ 35.25 |
| May-18 | 185,890 | \$ 22.58 | \$ 40.72 | Q3 2019 | 58.59 | 67.85 |
| Jun-18 | 193,859 | \$ 30.75 | \$ 38.31 | Q4 2019 | 42.36 | 47.44 |
| Jul-18 | 217,009 | \$ 63.64 | \$ 52.34 | CY2019 | \$ 45.22 | \$ 50.70 |
| Aug-18 | 211,074 | \$ 55.31 | \$ 44.06 | CY2020 | 41.29 | 42.37 |
| Sep-18 | 191,121 | \$ 35.51 | \$ 51.48 | CY2021 | 42.46 | 43.41 |
| Oct-18 | 190,756 | \$ 45.30 | \$ 46.39 | CY2022 | 43.54 | 44.23 |
| Nov-18 | 186,329 | \$ 55.00 | \$ 46.29 | CY2023 | 44.69 | 45.16 |
| Dec-18 | | | | CY2024 | 45.88 | 46.14 |

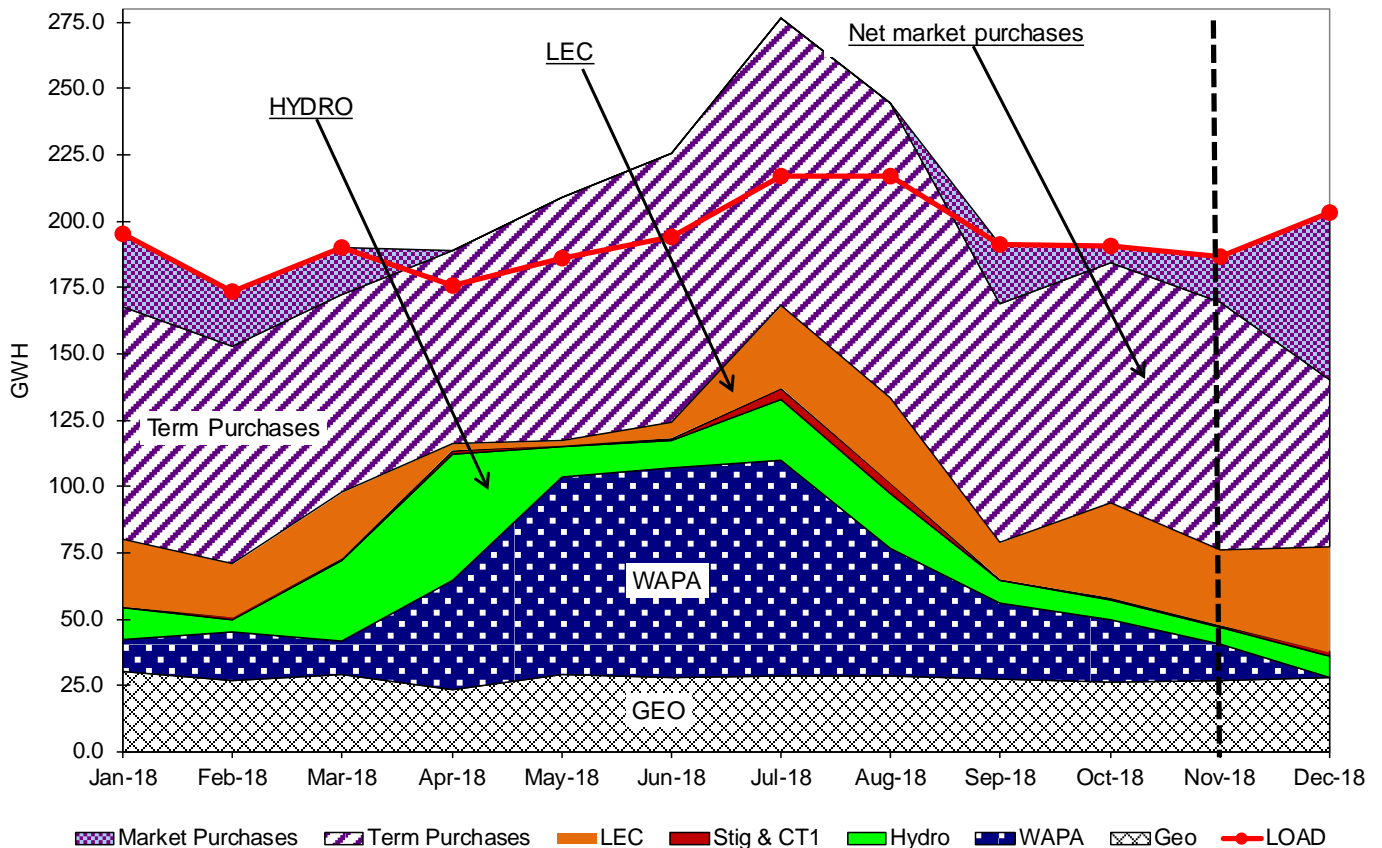
NOTES TO SUMMARY TABLE:

Peak and Energy Summary:
 * Monthly generation summary of Coincidental Peak (hour in which pool demand peaked), total MWh for the month, and pre-month forecasted values for report period.
 * Generation totals are for POOL SHARE of the projects.
 * Hydro totals include Collierville and Spicer generation.

Estimated Production Costs:
 * Fixed project costs not included except for WAPA, where total month's project costs are used to calculate the average unit cost.
 * STIG and CT costs include forward natural gas and basis hedge transactions.
 * STIG & CT costs reflect \$2.60 and \$1.62/MWh variable O&M costs per 6-12-06 GSCA.

Cost of Serving Demand:
 Compares price of meeting total monthly demand with (1) Hourly pool market clearing price; (2) Variable cost of pool gen. Pool Gen is sum of estimated costs divided by sum of generation.

NCPA POOL RESOURCES 2018 CALENDAR YEAR: January - November Actual/ balance forecasted



Industry Restructuring, Contracts and Interconnection Affairs

Resource Adequacy Compliance Filings

- NCPA made the following Resource Adequacy compliance filings with the CAISO for the compliance period February 2019:
 - Monthly System Resource Adequacy Demonstration (filed December 18, 2018)
 - Monthly Supply Plan (filed December 18, 2018)

Industry Restructuring

NCPA is actively participating in a number of CAISO stakeholder initiatives on behalf of the members. The following is a brief description of the current active initiatives:

Resource Adequacy Enhancements

- Due to the rapid transformation of the resource mix in California, the CAISO is currently re-examining the CAISO Resource Adequacy requirements and rules. This initiative will explore changes to the CAISO's Resource Adequacy requirements and rules to ensure the resources providing reserve services are effectively supporting reliable operations of the grid.

Day-Ahead Market Enhancements

- In this initiative, CAISO will consider enhancements to combine the Integrated Forward Market with the Residual Unit Commitment process, change the day-ahead scheduling granularity from hourly to 15-minute, and add an imbalance reserve product. Additional design elements needed to extend the day-ahead market to EIM entities will also be considered. Recently, the CAISO indicated that they are considering breaking the DAME initiative into two (2) separate stakeholder initiatives (the details of such have not be made available).

Flexible Resource Adequacy Criteria and Must Offer Obligation (FRAC MOO Phase 2)

- This initiative will explore further enhancements to flexible capacity requirements to help address generation oversupply and ramps less than three hours. This effort also seeks new rules to allow intertie resources and storage resources' not operating under non-generator resource provisions to provide flexible capacity. Through this effort, CAISO will also assess the impact of merchant variable energy resources on flexible capacity requirements.

Review Transmission Access Charge Structure

- This initiative will consider possible changes to the CAISO's current volumetric Transmission Access Charge (TAC) structure for recovering participating transmission owners' costs of owning, operating and maintaining transmission facilities under CAISO operational control. The CAISO will consider stakeholder input on the initiative scope, which will include possible changes to reflect the benefits of distributed resources in reducing future transmission needs.

Western

Western Base Resource Tracking (NCPA Pool)

| Western Base Resource Tracking - NCPA Pool | | | | | | | |
|---|-----------------------------------|-----------------------|---------------------|--------------------------|---|---|--|
| | Actual | | | Costs & Rates | | | |
| | BR Forecast ¹ (MWh) | BR Delivered (MWh) | Difference (MWh) | Restoration Fund (\$) | Monthly Cost of BR ² (\$/MWh) | CAISO LMP Differential ³ (\$/MWh) | 12-Mo Rolling Avg. Cost of BR ⁴ (\$/MWh) |
| Jul-18 | 82,704 | 81,285 | (1,419) | \$1,516,215 | \$ 18.65 | \$ 0.52 | \$ 29.90 |
| Aug-18 | 69,979 | 47,727 | (22,252) | \$1,516,215 | \$ 31.77 | \$ (0.76) | \$ 30.07 |
| Sep-18 | 59,937 | 28,828 | (31,109) | \$2,124,730 | \$ 73.70 | \$ 0.03 | \$ 32.14 |
| Oct-18 | 57,294 | 23,113 | (34,181) | \$1,170,723 | \$ 50.65 | \$ 0.16 | \$ 33.95 |
| Nov-18 | 29,042 | 13,824 | (15,218) | \$1,170,723 | \$ 84.69 | \$ 0.18 | \$ 35.33 |
| Dec-18 | 16,349 | - | 0 | \$1,170,723 | \$ 71.61 | \$ - | \$ 36.38 |
| Jan-19 | 20,572 | - | 0 | \$1,170,723 | \$ 56.91 | \$ - | \$ 36.51 |
| Feb-19 | 37,432 | - | 0 | \$1,170,723 | \$ 31.28 | \$ - | \$ 35.87 |
| Mar-19 | 56,569 | - | 0 | \$1,170,723 | \$ 20.70 | \$ - | \$ 33.62 |
| Apr-19 | 61,300 | - | 0 | \$2,278,398 | \$ 37.17 | \$ - | \$ 33.08 |
| May-19 | 86,402 | - | 0 | \$2,278,398 | \$ 26.37 | \$ - | \$ 33.87 |
| Jun-19 | 83,927 | - | 0 | \$2,278,398 | \$ 27.15 | \$ - | \$ 34.79 |
| 1/ As forecasted in NCPA 18/19 Budget | | | | | | | |
| 2/ = (Western Cost + Restoration Fund)/BR Delivered, for Pool Participants only. | | | | | | | |
| 3/ = (MEEA LMP - PG&E LAP LMP) using public market information (i.e. not settlement quality). | | | | | | | |
| 4/ Based on BR Delivered (Actual) when available and BR Forecast in all other cases. Includes CAISO LMP impact. | | | | | | | |

- The Displacement Program has shut down for the winter, effective trade date November 1, 2018. The program is scheduled to resume March 1, 2019.
- Pool members' total savings under MEEA pricing (Market Efficiency Enhancement Agreement) was about \$2,500 for the Pool in November 2018.

Debt and Financial Management

- Federal Reserve (Fed) Chairman Jerome Powell's November speech at the Economic Club of New York took a dovish tone. With an unemployment rate of 3.7% and inflation near the Fed's 2% target, Powell opined that the U.S. economy is close to the Fed's dual objectives of "promoting maximum employment and price stability." Most notably though, he commented that "Interest rates...remain just below the broad range of estimates of the level that would be neutral for the economy." This was a significant change from his comments in October that the Fed was "a long way from neutral," and hinted that the pace of future Fed rate hikes may slow in the coming quarters.
- In early December, the bond market sounded the alarm of a recession with an inversion in U.S. Treasury yields marking the first time since 2007. The yield on the 5-year Treasury note fell below the yield on the 3-year note, meaning that investors were being paid more to hold bonds maturing in three years than comparable bonds maturing in five years.
- The flattening of the U.S. Treasury yield curve is driven by the continued rise in short-term yields (driven by the expectation for near-term Fed tightening), while longer yields declined (will the economy slow to the point of recession?). For example, the yield on three-to-12-month Treasury bills increased less than 5 bps over the month. Meanwhile, yields on Treasury maturities beyond two years declined between 10 and 15 bps.
- NCPA staff in coordination with the Agency's financial advisor, PFM, held a kickoff call to refund the 2010 Hydroelectric bonds, Series A. The first draft of documents are scheduled to be released in early January by the Agency's bond counsel, Norton Rose Fulbright. Over the next two months, NCPA staff will be working closely with all project participants preparing the official statement and associated documents.

Schedule Coordination Goals

Software Development

- NCPA IS staff is assisting Santa Clara to transition its MSS portfolio from scheduling via Web Service into the use of the new client-based NCPA Scheduling Suite. Testing continues and more enhancements are developed to further enhance the Energy and AS Bidding in the Prescheduler app. January 2019 is the new target for rollout.
- Work continues to develop on the replacement for the NCPA Automated Dispatch System. Completion is anticipated middle of next year.
- Work is in progress to automate and integrate members' monthly Resource Adequacy demonstrations and supply plans into NCPA's bid-to-bill system.

- Work continues in configuring the Accounting Software for Hometown Connections Inc. Configuration inputs have been loaded into the test environment. Testing is ongoing in preparation for rollout in January 2019.
- Work is underway to switch Pioneer's NPCE SCID into the new PCCE SCID. The scheduling software is being configured to prepare for the transition anticipated in February 2019.

Network

- The IS Operations and Support group continues to migrate the remaining 10% of data over to the new Nimble storage array as part of a SAN upgrade project. The project will be completed by end of the calendar year.
- The IS department is currently working to perform a migration from SharePoint 2013 to SharePoint 2016, which is part of the larger plan to implement records retention for documents within libraries. The migration will be completed by end of 2018.
- Progress continues to be made upgrading staff to Windows 10 with about 50% of the Agency on the new Operating System. The goal is to have all workstations moved over before the end of 2020.
- The IS Operations and Support group is preparing to replace the current backup solution this fiscal year. Requirements are being drafted and a Request for Information will soon be developed and sent to vendors to begin discussions and demonstrations of their products.
- IS, along with Power Management and Settlements, is actively updating contingency plans for applications and services that support the bid-to-bill process. This is an effort to identify any gaps and provide recommendations to help reduce risks associated with unplanned downtime. This project is expected to be completed by the end of the year.

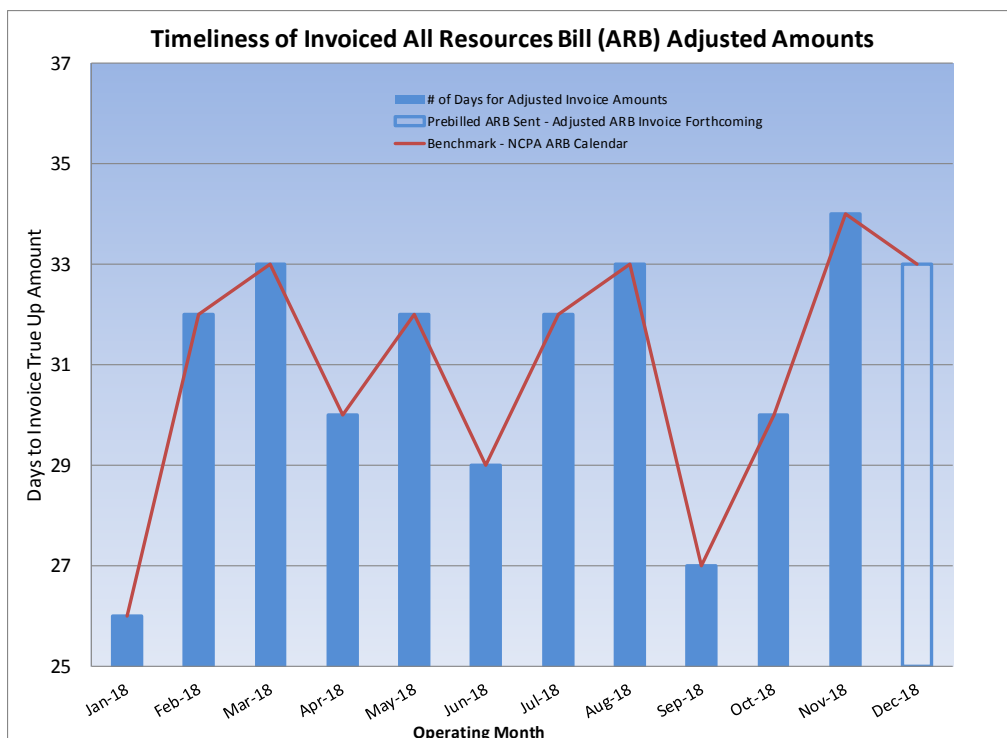
NCPA Bills & Settlements

Progress Against the Strategic Plan

Adjusted Power bills, which include CAISO transactions, invoiced to members the following month subsequent to the monthly pre-billed ARB month. Timely ARB settlements adjustments help improve members' cash flow and reconciliation of their budget performance.

The December 2018 NCPA All Resources Bill (ARB) monthly invoice sent to members on November 21, 2018 contains:

- December 2018 monthly pre-billed budget/forecast amounts;
- October 2018 (1st Adjustment) NCPA Project and CAISO Initial settlement true-ups;
- September 2018 (2nd Adjustment) NCPA Project settlement true-up and T+12 business day recalculated CAISO settlement true-up allocations;
- July 2018 (3rd Adjustment) T+55 business day recalculated CAISO settlement true-up allocations and NCPA Projects true-up;
- January 2018 (4th Adjustment) T+9 month recalculated CAISO settlement true-up allocations;
- March 2017 (5th Adjustment) T+18 month recalculated CAISO settlement true-up allocations;
- December 2015 (6th Adjustment) T+33 month recalculated CAISO settlement true-up;
- September 2015 (7th Adjustment) T+35 month CAISO settlement true-up;



Legislative & Regulatory

Political Arena State/Federal/Western Programs

- This week, and last, important water decisions that affect the Central Valley Project were made: (1) the California Waterfix consistency filing returned to the State Department of Water Resources; (2) the State Water Board adopted Lower San Joaquin River unimpaired flows despite voluntary settlement agreements; (3) State and Federal agencies amended the 1986 Coordinated Operations Agreement for the Central Valley Project and State Water Project; and (4) Federal agencies crept forward on key Central Valley Project Power issues. NCPA remains committed to participate, evaluate, and communicate, as well as protect and advocate, for CVP resource viability as the confluence of CVP issues continue to emerge.
- Staff of NCPA's Legislative and Regulatory Affairs were in Washington DC, meeting with congressional committee staff, delegation offices and senior officials at the Department of Interior to advance NCPA's legislative priorities and gain insights on next year's congressional agenda. NCPA outlined concerns with the Federal Communication Commission's recent order on pole attachments, received delegation support for pushing the Bureau of Reclamation to provide timely action on outstanding "croffset," and the pending cost allocation study for the Central Valley Project. Our visit with the Department of Interior Assistant Secretary for Water and Science informed us that final action on these issues would occur during the first half of 2019.
- The California Air Resources Board adopted updates to its Cap-and-Trade Program and mandatory reporting regulations. Key to NCPA in this effort is the agency's position on the use of allowance proceeds, which now includes an acknowledgement that such funds can be used for wildfire mitigation.
- The State Legislature returned for an organizational session early this month. Several legislators hit the ground running with early bill introductions, including legislation on the establishment of a statewide, centralized electricity procurement entity (AB 56 by Assemblymember Garcia), fire preparedness and safety (AB 38 by Assemblymember Wood), and zero-emission vehicles (AB 40 by Assemblymember Ting). The Legislature will officially reconvene on January 7th, commencing several weeks during which new legislation will continue to surface before the bill introduction deadline on February 22nd.
- After holding a member session earlier this month on our Crisis Communication Plan, NCPA staff continue to work with members to provide materials that support the development of utility-specific plans.
- NCPA will host a January 9th member workshop on POU Wildfire Mitigation Plans at our Roseville office. Members interested in attending should register [here](#) by January 4th.

Human Resources

Hires:

Emily Lemei joined NCPA on December 12, 2018 as the Customer Programs Manager at our Roseville Headquarters office. Emily comes to NCPA from the California Energy Commission where she oversaw POU compliance with the state's Renewables Portfolio Standard. Emily has established strong working relationships within the public power and energy stakeholder communities, and brings in-depth knowledge of regulatory processes and utility programs to this position. Emily is originally from Sacramento, and is a graduate of George Washington University.

Trevor Simpson joined NCPA on December 14, 2018 as a Hydro Tech at our Hydroelectric Operations in Murphys, CA. Trevor brings over four years of experience in the hydro electric industry, having most recently held the position of Utility Mechanic with the United States Army Corps of Engineers in Kahlotus, WA.

Intern Hires:

None.

Promotions/Position Changes:

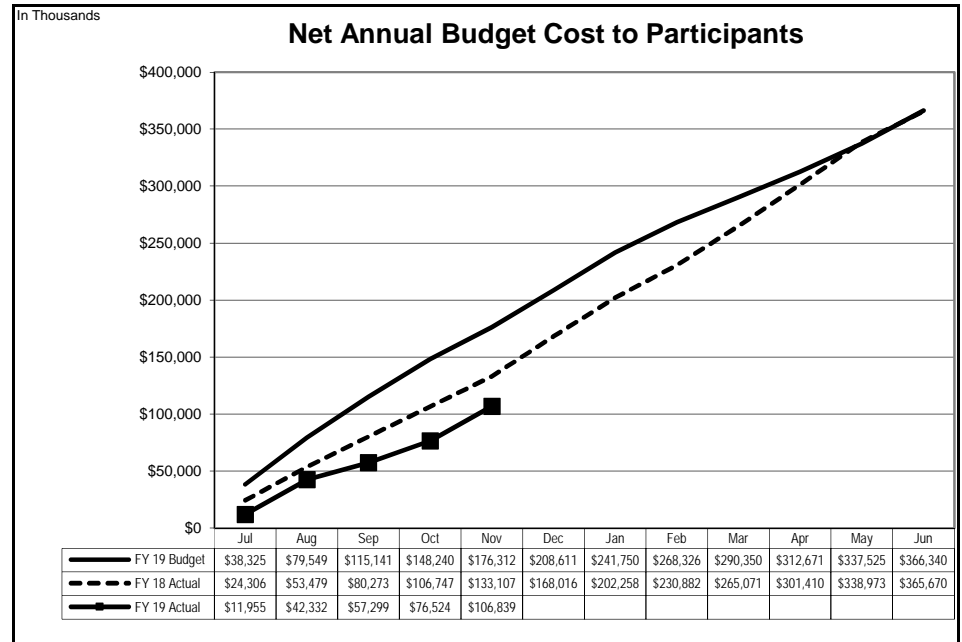
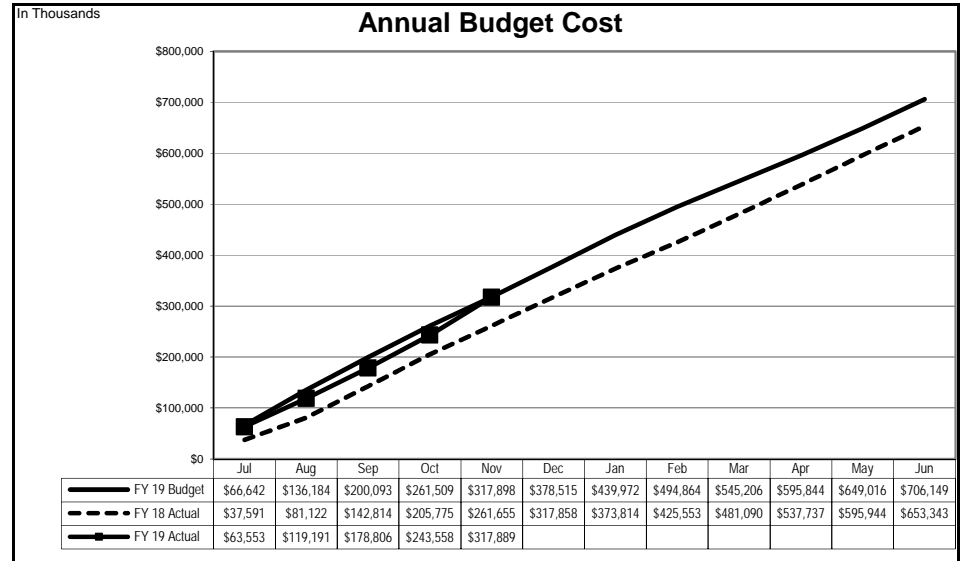
Michael (Mike) Whitney was promoted to Power Contracts and Industry Restructuring Manager within the Power Management department effective November 26, 2018. Mike has worked in various positions at NCPA during the past 12 years, and has been an invaluable member of the NCPA team. In his new role within the Power Management department, Mike will be managing efforts in the following areas: Industry Restructuring activities, contract administration and development, resource integration, new business development and a variety of other duties.

Separations:

None.

**Annual Budget
2018-2019 Fiscal Year To Date
As of November 30, 2018**

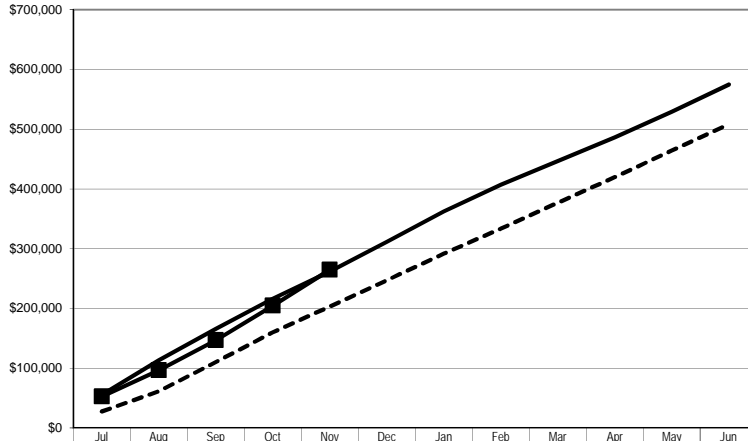
| In Thousands | Program | | | |
|---|---------------|---------|-------------------|-----------------|
| | Annual Budget | Actual | Under(Ovr) Budget | YTD % Remaining |
| GENERATION RESOURCES | | | | |
| NCPA Plants | | | | |
| Hydroelectric | 51,857 | 20,896 | \$ 30,960 | 60% |
| Geothermal Plant | 34,425 | 14,374 | 20,051 | 58% |
| Combustion Turbine No. 1 | 6,606 | 3,000 | 3,606 | 55% |
| Combustion Turbine No. 2 (STIG) | 8,743 | 4,009 | 4,734 | 54% |
| Lodi Energy Center | 83,717 | 43,403 | 40,314 | 48% |
| | 185,347 | 85,681 | 99,666 | 54% |
| Member Resources - Energy | 64,449 | 27,023 | 37,426 | 58% |
| Member Resources - Natural Gas | 3,098 | 2,034 | 1,065 | 34% |
| Western Resource | 31,350 | 7,791 | 23,559 | 75% |
| Market Power Purchases | 15,539 | 10,244 | 5,295 | 34% |
| Load Aggregation Costs - ISO | 273,858 | 130,662 | 143,196 | 52% |
| Net GHG Obligations | 1,123 | 1,150 | (28) | -2% |
| | 574,764 | 264,585 | 310,179 | 54% |
| TRANSMISSION | | | | |
| Independent System Operator | 112,822 | 46,400 | 66,422 | 59% |
| MANAGEMENT SERVICES | | | | |
| Legislative & Regulatory | | | | |
| Legislative Representation | 2,023 | 827 | 1,196 | 59% |
| Regulatory Representation | 887 | 235 | 651 | 73% |
| Western Representation | 848 | 251 | 597 | 70% |
| Member Services | 438 | 126 | 313 | 71% |
| | 4,196 | 1,438 | 2,758 | 66% |
| Judicial Action | 625 | 258 | 367 | 59% |
| Power Management | | | | |
| System Control & Load Dispatch | 6,107 | 2,377 | 3,731 | 61% |
| Forecasting & Prescheduling | 2,775 | 998 | 1,777 | 64% |
| Industry Restructuring | 439 | 108 | 331 | 75% |
| Contract Admin, Interconnection Svcs & Ext. Affairs | 1,135 | 334 | 801 | 71% |
| Green Power Project | 3 | 0 | 3 | 96% |
| Gas Purchase Program | 78 | 26 | 52 | 67% |
| Market Purchase Project | 112 | 35 | 77 | 69% |
| | 10,649 | 3,877 | 6,772 | 64% |
| Energy Risk Management | 260 | 57 | 203 | 78% |
| Settlements | 941 | 222 | 720 | 76% |
| Integrated System Support | 273 | 47 | 226 | 83% |
| Participant Pass Through Costs | 1,619 | 485 | 1,135 | 70% |
| Support Services | - | 520 | (520) | |
| | 18,563 | 6,904 | 11,659 | 63% |
| TOTAL ANNUAL BUDGET COST | 706,149 | 317,889 | 388,260 | 55% |
| LESS: THIRD PARTY REVENUE | | | | |
| Plant ISO Energy Sales | 100,456 | 73,164 | 27,293 | 27% |
| Member Resource ISO Energy Sales | 28,187 | 19,426 | 8,761 | 31% |
| NCPA Contracts ISO Energy Sales | 14,720 | 12,161 | 2,560 | 17% |
| Western Resource ISO Energy Sales | 23,183 | 12,465 | 10,718 | 46% |
| Load Aggregation Energy Sales | 131,329 | 82,805 | 48,524 | 37% |
| Ancillary Services Sales | 4,409 | 2,700 | 1,709 | 39% |
| Transmission Sales | 110 | 46 | 64 | 58% |
| Western Credits, Interest & Other Income | 37,414 | 8,284 | 29,130 | 78% |
| | 339,808 | 211,049 | 128,759 | 38% |
| NET ANNUAL BUDGET COST TO PARTICIPANTS | 366,340 | 106,839 | \$ 259,501 | 71% |



Annual Budget Budget vs. Actual By Major Area As of November 30, 2018

In Thousands

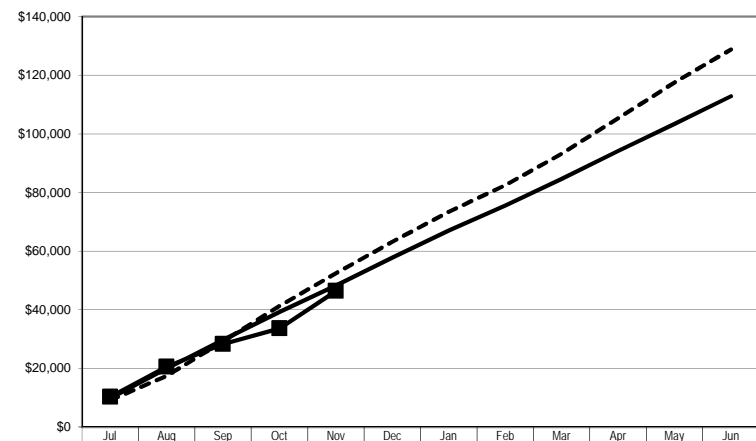
Generation Resources



| | | | | | | | | | | | | |
|--------------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| FY 19 Budget | \$55,270 | \$113,084 | \$165,773 | \$216,177 | \$261,937 | \$311,494 | \$362,100 | \$406,988 | \$446,665 | \$486,191 | \$528,677 | \$574,764 |
| FY 18 Actual | \$27,457 | \$61,486 | \$110,071 | \$159,932 | \$203,497 | \$247,442 | \$291,750 | \$333,238 | \$376,666 | \$419,645 | \$464,289 | \$508,257 |
| FY 19 Actual | \$52,459 | \$96,197 | \$146,500 | \$204,511 | \$264,585 | | | | | | | |

In Thousands

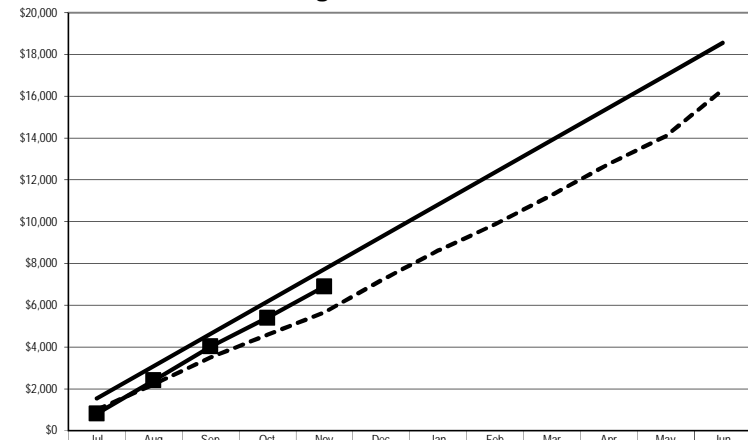
Transmission-ISO



| | | | | | | | | | | | | |
|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|
| FY 19 Budget | \$9,825 | \$20,006 | \$29,679 | \$39,145 | \$48,226 | \$57,739 | \$67,044 | \$75,501 | \$84,619 | \$94,184 | \$103,323 | \$112,822 |
| FY 18 Actual | \$9,126 | \$17,413 | \$29,207 | \$41,243 | \$52,490 | \$63,218 | \$73,436 | \$82,442 | \$93,137 | \$105,326 | \$117,555 | \$128,774 |
| FY 19 Actual | \$10,278 | \$20,580 | \$28,273 | \$33,646 | \$46,400 | | | | | | | |

In Thousands

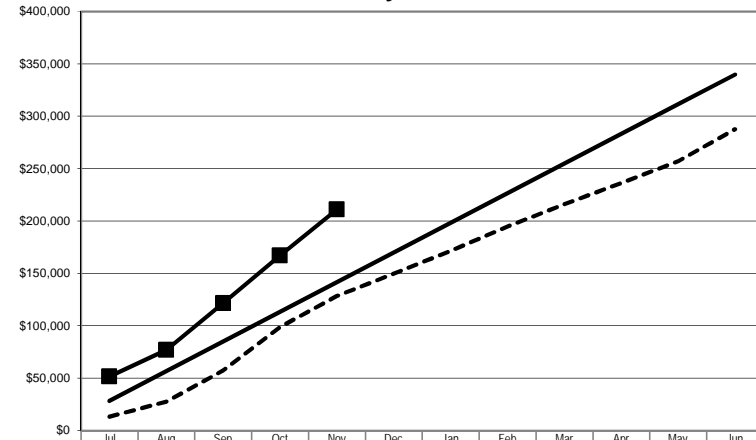
Management Services



| | | | | | | | | | | | | |
|--------------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|
| FY 19 Budget | \$1,547 | \$3,094 | \$4,641 | \$6,188 | \$7,735 | \$9,282 | \$10,828 | \$12,375 | \$13,922 | \$15,469 | \$17,016 | \$18,563 |
| FY 18 Actual | \$1,008 | \$2,223 | \$3,516 | \$4,600 | \$5,667 | \$7,198 | \$8,628 | \$9,873 | \$11,287 | \$12,766 | \$14,100 | \$16,311 |
| FY 19 Actual | \$816 | \$2,414 | \$4,033 | \$5,400 | \$6,904 | | | | | | | |

In Thousands

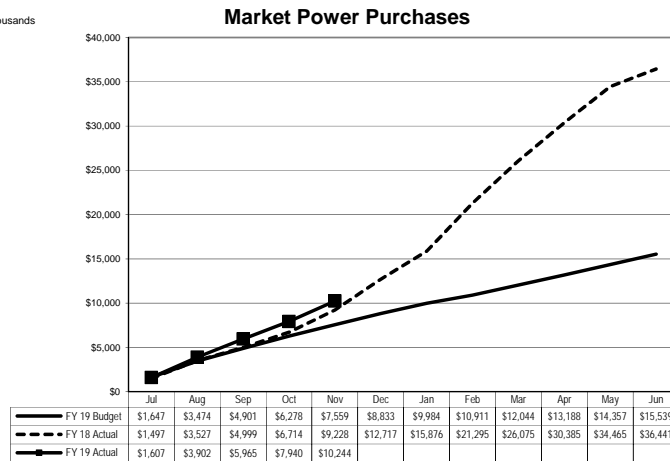
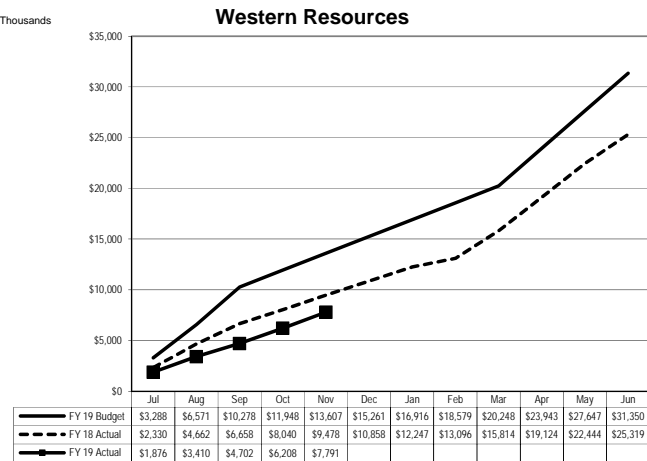
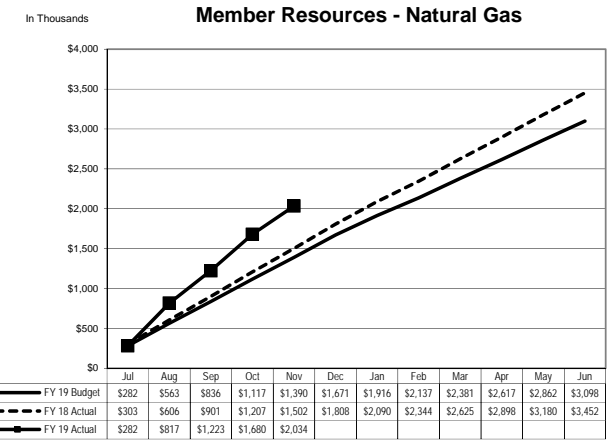
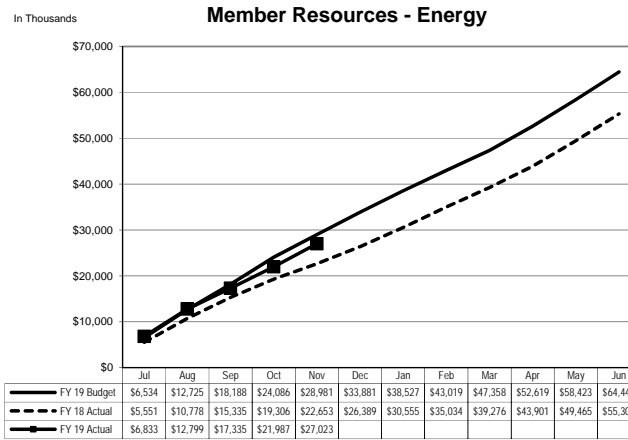
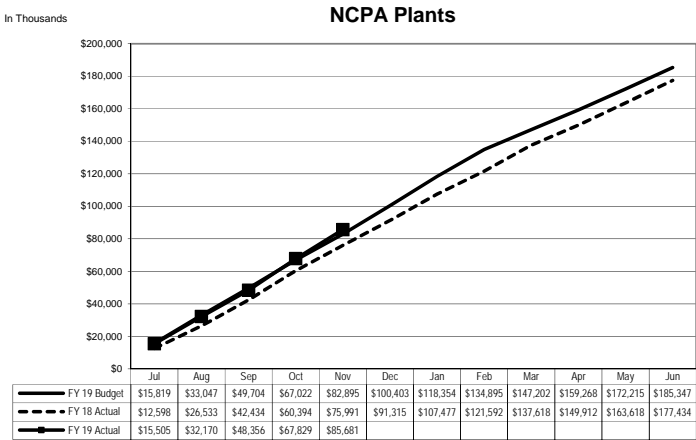
Third Party Revenue



| | | | | | | | | | | | | |
|--------------|----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| FY 19 Budget | \$28,317 | \$56,635 | \$84,952 | \$113,269 | \$141,587 | \$169,904 | \$198,221 | \$226,539 | \$254,856 | \$283,173 | \$311,491 | \$339,808 |
| FY 18 Actual | \$13,285 | \$27,643 | \$57,380 | \$99,028 | \$128,548 | \$149,842 | \$171,856 | \$194,671 | \$216,019 | \$236,327 | \$256,971 | \$287,673 |
| FY 19 Actual | \$51,598 | \$76,859 | \$121,507 | \$167,033 | \$211,049 | | | | | | | |

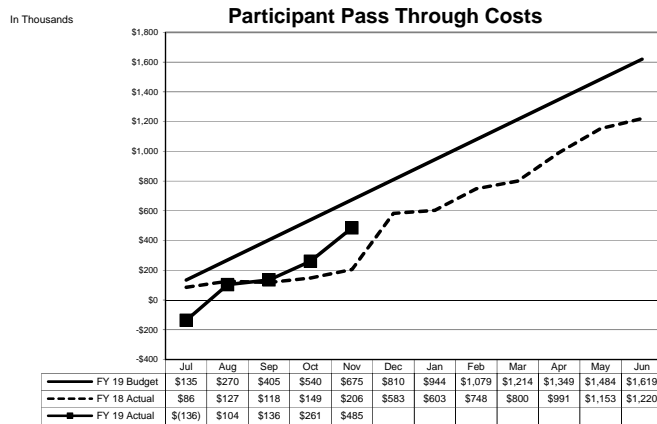
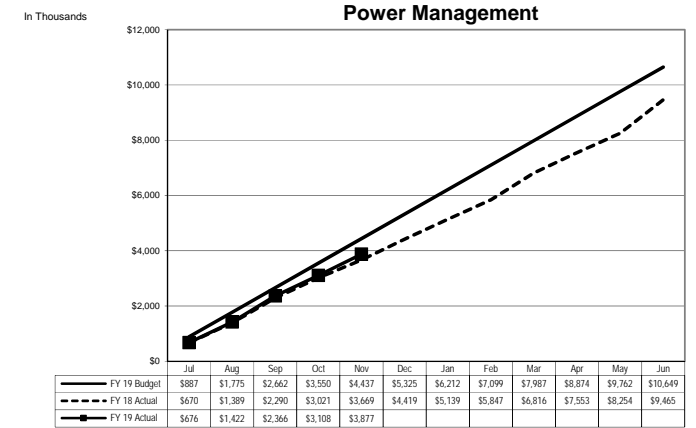
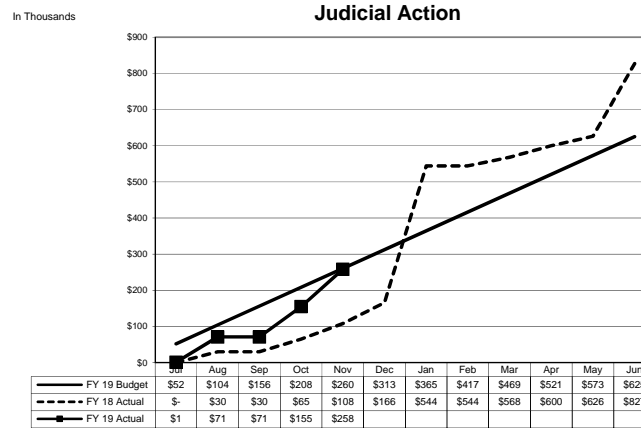
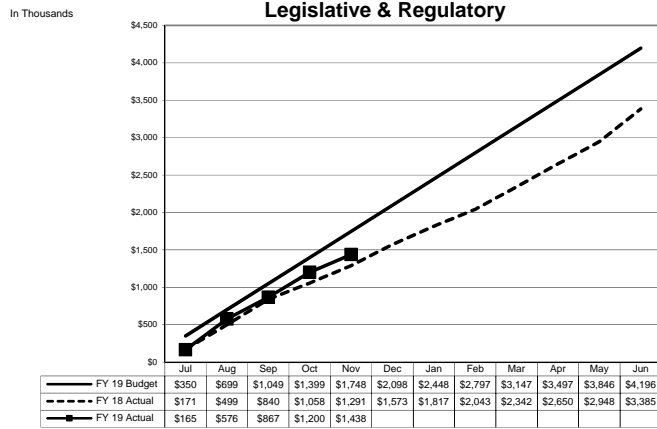
Footnote: Transmission is solely reflective of Independent System Operator (ISO) costs

Annual Budget Cost Generation Resources Analysis By Source As of November 30, 2018



Footnote: Other Resources (Graeagle, BART PV, Gridley PV) are included in Market Power Purchases

Annual Budget Cost Management Services Analysis By Source As of November 30, 2018

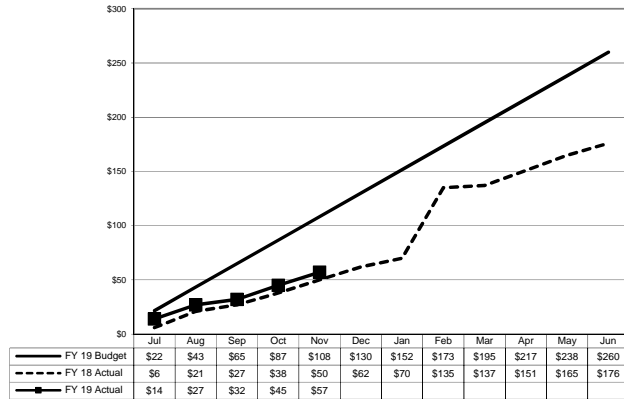


**Annual Budget Cost
Management Services Analysis By Source
As of November 30, 2018**

In Thousands

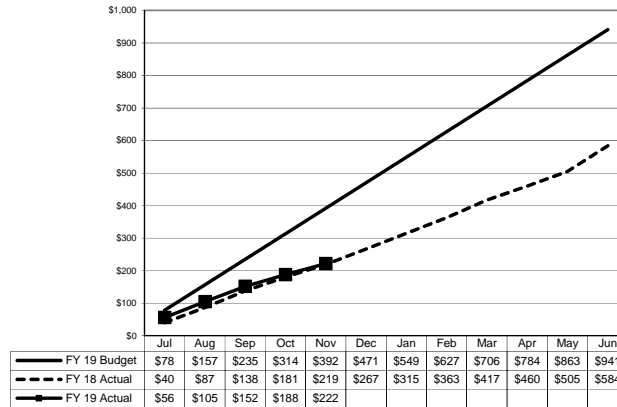
Energy Risk Management

In Thousands

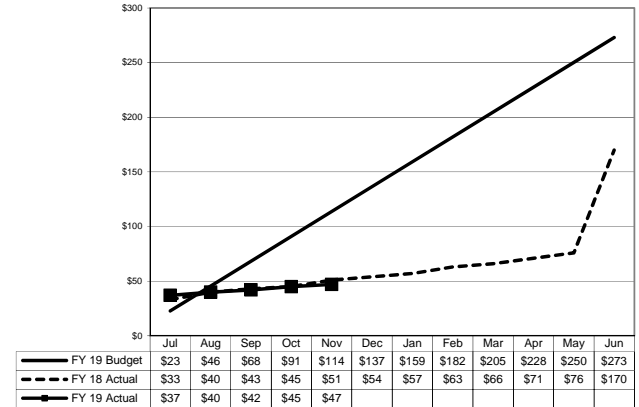


Settlements

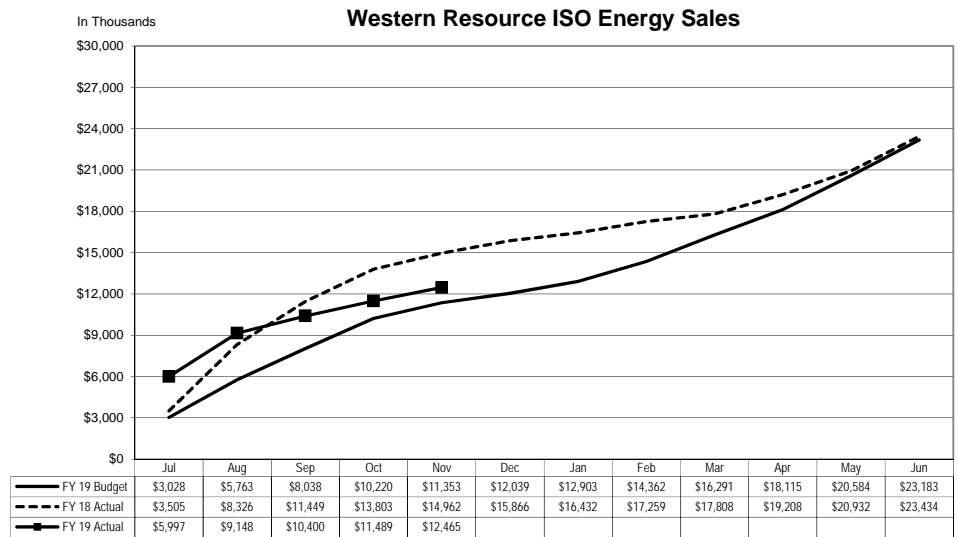
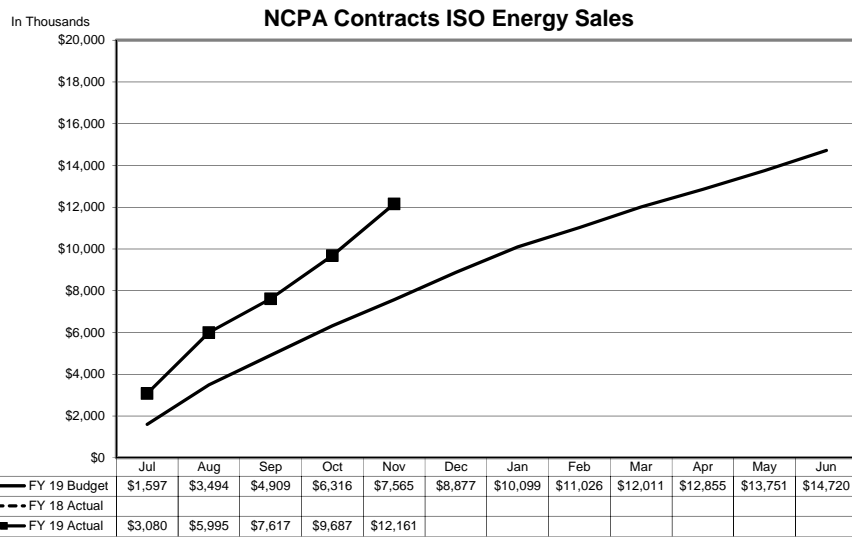
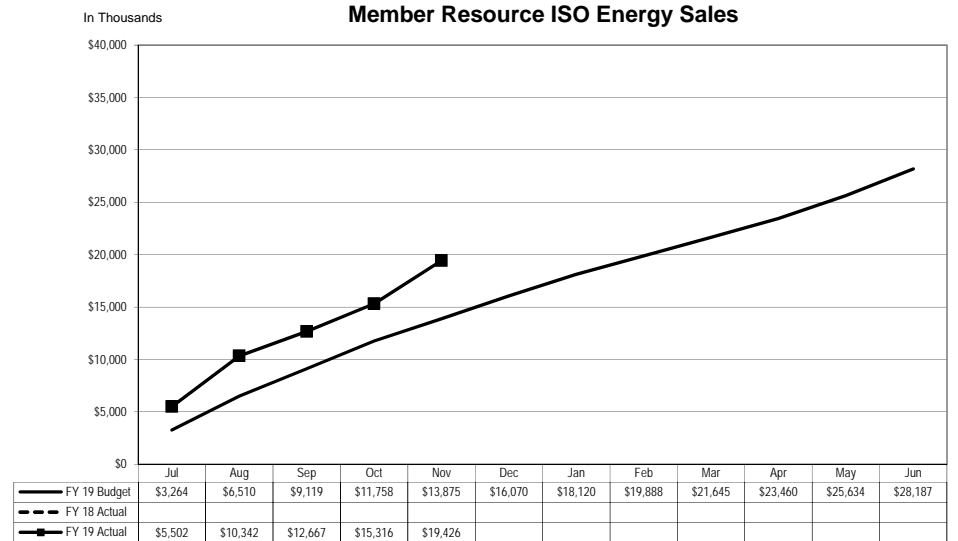
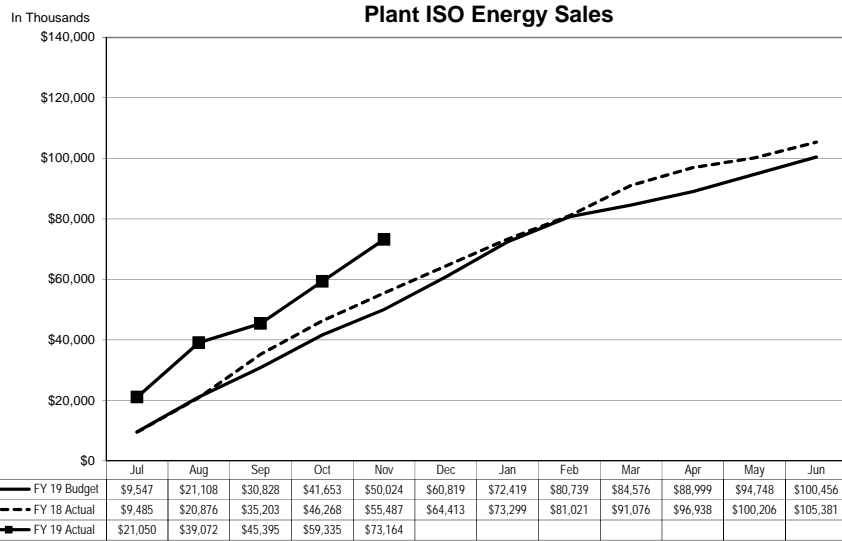
In Thousands



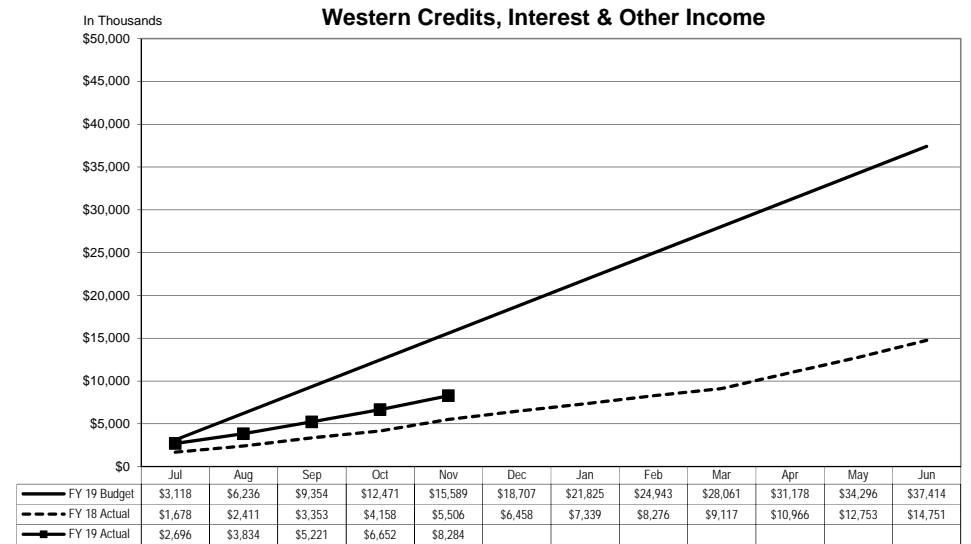
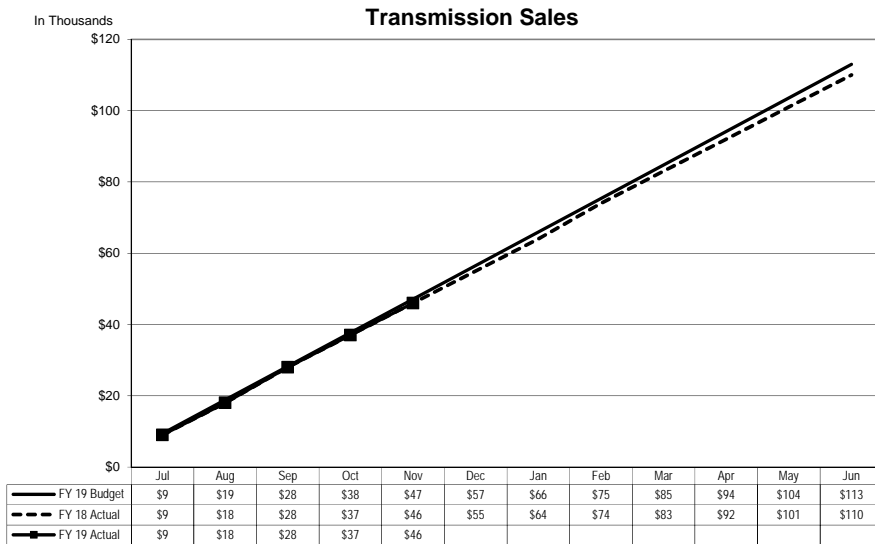
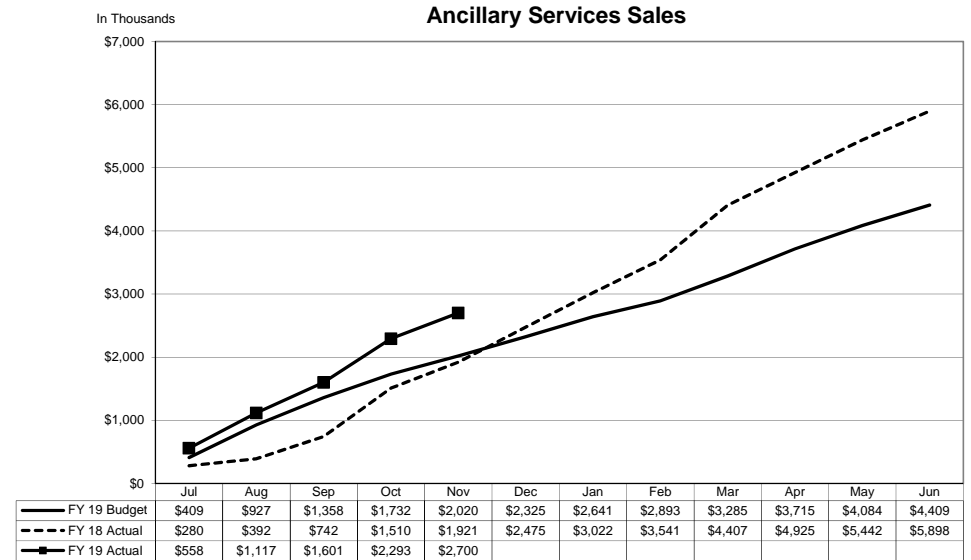
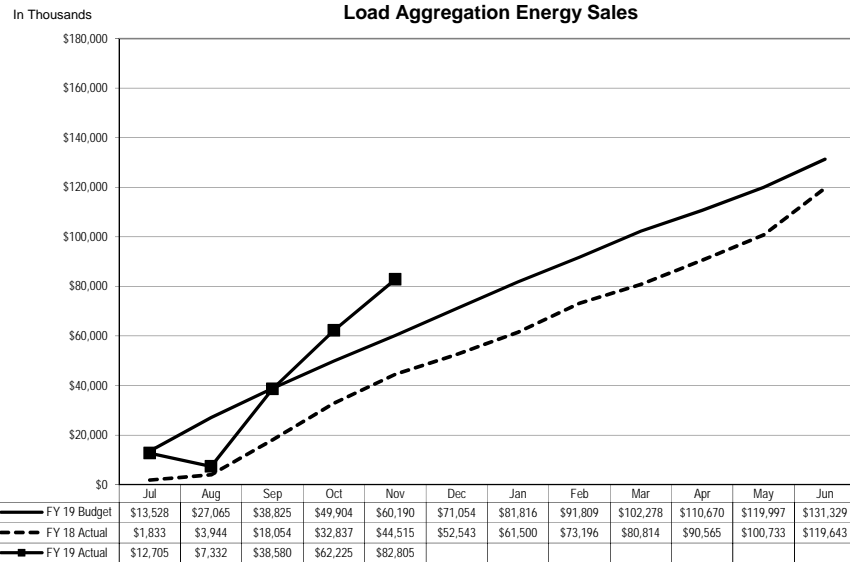
Integrated Systems Support



**Annual Budget Cost
Third Party Revenue Analysis By Source
As of November 30, 2018**



**Annual Budget Cost
Third Party Revenue Analysis By Source
As of November 30, 2018**



**Annual Budget
NCPA Generation Detail Analysis By Plant
As of November 30, 2018**

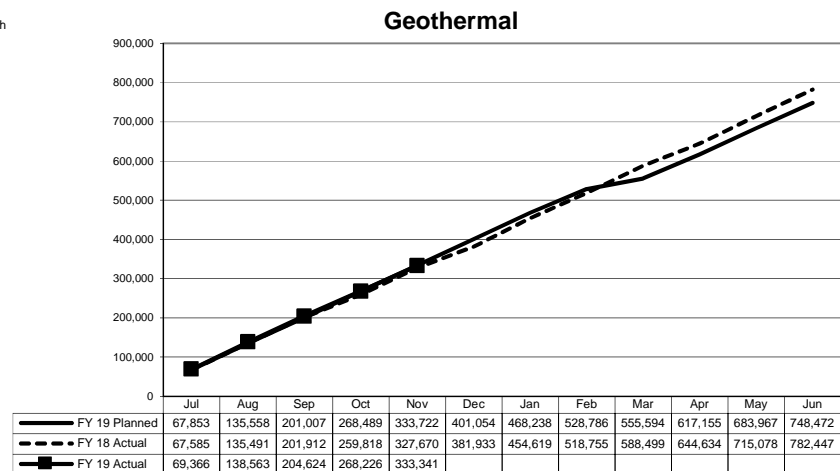
Generation Cost Analysis

\$ in thousands

| | Geothermal | | | | |
|--|------------|------------|-----------|-------------|-----------|
| | Budget | Actual | \$/MWh | Under(Over) | YTD % |
| | | | Actual | Budget | Remaining |
| Routine O & M | \$ 17,793 | \$ 7,246 | \$ 21.74 | \$ 10,547 | 59% |
| Capital Assets/Spare Parts Inventories | 3,267 | 1,646 | 4.94 | 1,621 | 50% |
| Other Costs | 8,137 | 3,006 | 9.02 | 5,131 | 63% |
| CA ISO Charges | 291 | 419 | 1.26 | (127) | -44% |
| Debt Service | 4,937 | 2,057 | 6.17 | 2,880 | 58% |
| Annual Budget | 34,425 | 14,374 | 43.12 | 20,051 | 58% |
| Less: Third Party Revenue | | | | | |
| Interest Income | 382 | 158 | 0.47 | 225 | 59% |
| ISO Energy Sales | 26,285 | 16,340 | 49.02 | 9,944 | 38% |
| Ancillary Services Sales | - | - | - | - | - |
| Effluent Revenues | 700 | 670 | 2.01 | 30 | 4% |
| Misc | 110 | 47 | 0.14 | 63 | 57% |
| | 27,477 | 17,215 | 51.64 | 10,262 | 37% |
| Net Annual Budget Cost to Participants | \$ 6,948 | \$ (2,841) | \$ (8.52) | \$ 9,789 | 141% |
| Net Generation--MWh @ Meter | 748,472 | 333,341 | | | |
| \$/MWh (A) | \$ 2.69 | \$ (14.69) | | | |

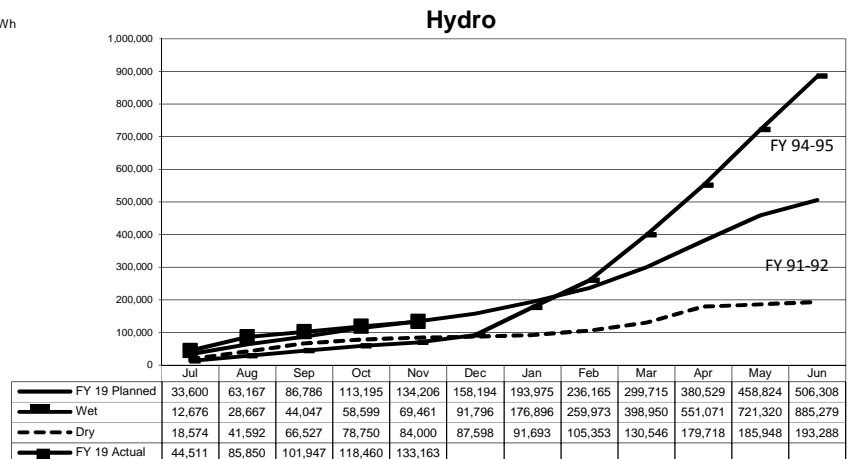
MWhs Generated

In MWh



| | Hydroelectric | | | | |
|--|---------------|------------|----------|-------------|-----------|
| | Budget | Actual | \$/MWh | Under(Over) | YTD % |
| | | | Actual | Budget | Remaining |
| Routine O & M | \$ 8,685 | \$ 2,829 | \$ 21.24 | \$ 5,856 | 67% |
| Capital Assets/Spare Parts Inventories | 1,975 | 815 | 6.12 | 1,160 | 59% |
| Other Costs | 3,238 | 1,108 | 8.32 | 2,130 | 66% |
| CA ISO Charges | 2,801 | 1,496 | 11.23 | 1,305 | 47% |
| Debt Service | 35,157 | 14,649 | 110.01 | 20,508 | 58% |
| Annual Budget | 51,857 | 20,896 | 156.92 | 30,960 | 60% |
| Less: Third Party Revenue | | | | | |
| Interest Income | 670 | 191 | 1.43 | 479 | 71% |
| ISO Energy Sales | 20,783 | 11,853 | 89.01 | 8,930 | 43% |
| Ancillary Services Sales | 3,048 | 1,439 | 10.80 | 1,609 | 53% |
| Misc | - | 0 | 0.00 | (0) | - |
| | 24,501 | 13,483 | 101.25 | 11,018 | 45% |
| Net Annual Budget Cost to Participants | \$ 27,356 | \$ 7,414 | \$ 55.67 | \$ 19,942 | |
| Net Generation--MWh @ Meter | 506,308 | 133,163 | | | |
| \$/MWh (A) | \$ (15.41) | \$ (54.33) | | | |

In MWh



Footnotes:

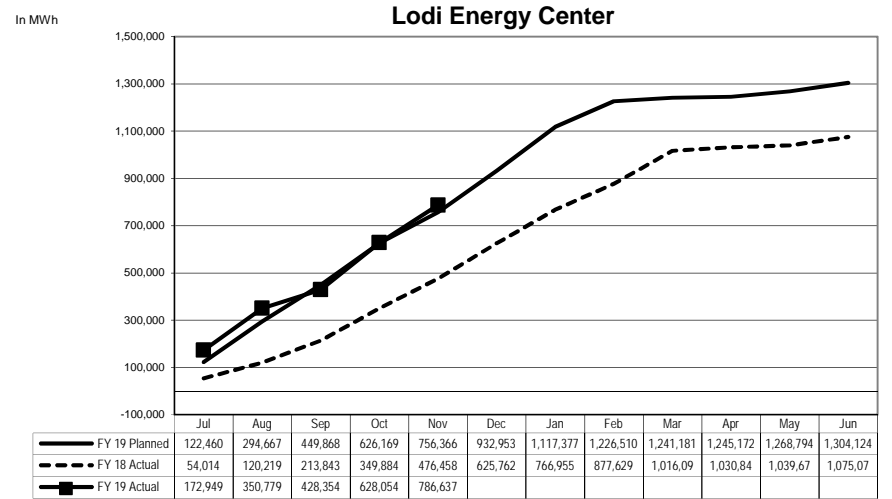
(A) Aggregate fiscal year generation in \$/MWh (excluding debt service)

**Annual Budget
NCPA Generation Detail Analysis By Plant
As of November 30, 2018**

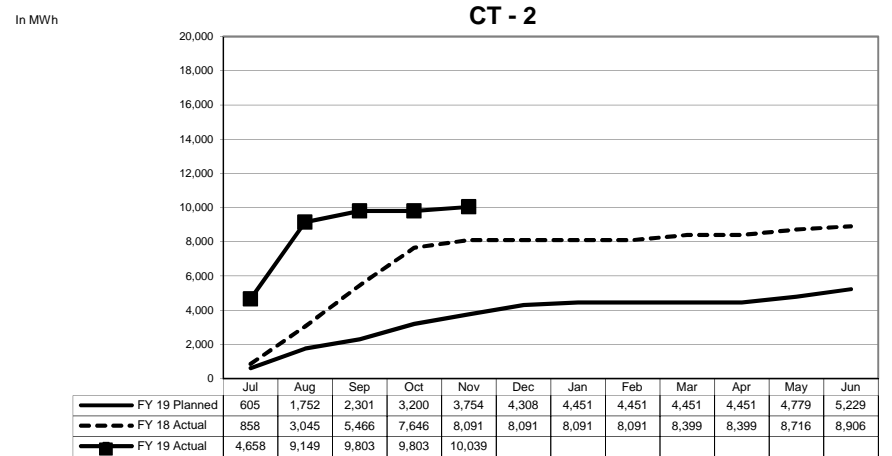
Generation Cost Analysis

| | Lodi Energy Center | | | | |
|---|--------------------|-------------------|----------------|--------------------|-----------------|
| | Budget | Actual | \$/MWh Actual | Under(Over) Budget | YTD % Remaining |
| Routine O & M | \$ 13,965 | \$ 5,125 | \$ 6.52 | \$ 8,840 | 63% |
| Fuel | 33,092 | 22,620 | 28.75 | 10,472 | 32% |
| AB 32 GHG Offset | - | - | - | - | 0% |
| CA ISO Charges and Energy Purchases | 5,665 | 3,161 | 4.02 | 2,503 | 44% |
| Capital Assets/Spare Parts Inventories | 1,613 | 650 | 0.83 | 963 | 60% |
| Other Costs | 3,302 | 980 | 1.25 | 2,322 | 70% |
| Debt Service | 26,080 | 10,867 | 13.81 | 15,213 | 58% |
| Annual Budget | 83,717 | 43,403 | 55.17 | 40,314 | 48% |
| Less: Third Party Revenue | | | | | |
| Interest Income | 386 | 269 | 0.34 | 116 | 30% |
| ISO Energy Sales | 52,415 | 42,215 | 53.67 | 10,199 | 19% |
| Ancillary Services Sales | 1,029 | 826 | 1.05 | 203 | 20% |
| Transfer Gas Credit | - | - | - | - | 0% |
| Misc | - | 0 | 0.00 | (0) | 0% |
| | 53,829 | 43,311 | 55.06 | 10,519 | 20% |
| Net Annual Budget Cost to Participants | \$ 29,887 | \$ 92 | \$ 0.12 | \$ 29,795 | 100% |
| Net Generation--MWh @ Meter | 1,304,124 | 786,637 | | | |
| \$/MWh (A) | \$ 2.92 | \$ (13.70) | | | |

MWhs Generated



| | Combustion Turbine No. 2 (STIG) | | | | |
|---|---------------------------------|-------------------|------------------|--------------------|-----------------|
| | Budget | Actual | \$/MWh Actual | Under(Over) Budget | YTD % Remaining |
| Routine O & M | \$ 1,481 | \$ 629 | \$ 62.68 | \$ 851 | 58% |
| Fuel and Pipeline Transport Charges | 977 | 722 | 71.95 | 255 | 26% |
| Capital Assets/Spare Parts Inventories | 60 | 8 | 0.81 | 52 | 86% |
| Other Costs | 506 | 169 | 16.84 | 337 | 67% |
| CA ISO Charges | 2 | 98 | 9.76 | (96) | -4740% |
| Debt Service | 5,717 | 2,382 | 237.28 | 3,335 | 58% |
| Annual Budget | 8,743 | 4,009 | 399.31 | 4,734 | 54% |
| Less: Third Party Revenue | | | | | |
| Interest Income | 109 | 41 | 4.04 | 68 | 63% |
| ISO Energy Sales | 401 | 1,486 | 148.07 | (1,085) | -270% |
| Ancillary Service Sales | - | - | - | - | 0% |
| Fuel and Pipeline Transport Credits | 990 | 855 | 85.15 | 135 | 14% |
| Misc | - | - | - | - | 0% |
| | 1,500 | 2,382 | 237.26 | (882) | -59% |
| Net Annual Budget Cost to Participants | \$ 7,243 | \$ 1,627 | \$ 162.05 | \$ 5,616 | 78% |
| Net Generation--MWh @ Meter | 5,229 | 10,039 | | | |
| \$/MWh (A) | \$ 291.87 | \$ (75.22) | | | |



Footnotes:

(A) Aggregate fiscal year generation in \$/MWh (excluding debt service)

**Annual Budget
NCPA Generation Detail Analysis By Plant
As of November 30, 2018**

Generation Cost Analysis

| | Combustion Turbine No. 1 | | | | |
|---|---------------------------------|------------------|----------------------|---------------------------|------------------------|
| | Budget | Actual | \$/MWh Actual | Under(Over) Budget | YTD % Remaining |
| Routine O & M | \$ 1,560 | \$ 1,010 | \$ 164.98 | \$ 550 | 35% |
| Fuel and Pipeline Transport Charges | 497 | 522 | 85.29 | (25) | -5% |
| Capital Assets/Spare Parts Inventories | 3,965 | 907 | 148.22 | 3,058 | 77% |
| Other Costs | 580 | 206 | 33.58 | 375 | 65% |
| CA ISO Charges | 3 | 355 | 58.05 | (352) | -12089% |
| Debt Service | - | - | - | - | - |
| Annual Budget | 6,606 | 3,000 | 490.11 | 3,606 | 55% |
| Less: Third Party Revenue | | | | | |
| Interest Income | - | 1 | - | (1) | - |
| ISO Energy Sales | 572 | 1,269 | 207.26 | (696) | -122% |
| Ancillary Services Sales | - | - | - | - | 0% |
| Misc | - | 16 | 2.56 | (16) | 0% |
| | 572 | 1,285 | 209.82 | (712) | -124% |
| Net Annual Budget Cost to Participants | \$ 6,033 | \$ 1,715 | \$ 280.21 | \$ 4,318 | 72% |
| Net Generation--MWh @ Meter | 7,533 | 6,121 | | | |
| \$/MWh (A) | \$ 800.92 | \$ 280.21 | | | |

Footnotes:

(A) Aggregate fiscal year generation in \$/MWh (excluding debt service)

MWhs Generated

In MWh

CT - 1

