



2020

BUSINESS PROGRESS REPORT

JANUARY



Northern California Power Agency
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Generation Costs & Reliability

Combustion Turbine Project

Unit Operation for December 2019

Unit	Availability		Production		Reason for Run
CT1 Alameda	Unit 1	Unit 2	Unit 1	72.8 MWh	CAISO / CAISO
	100.0%	96.9%	Unit 2	21.5 MWh	
Curtailments, Outages, and Comments:					
Unit 1: Normal operation.					
Unit 2: 12/13/19 - Alameda Unit 2 o/s from 0800 to 1230 OMS 8079017. 12/19/19 1730 to 12/20/19 1130 - Failed Start, OMS 8104713.					
Unit	Availability		Production		Reason for Run
CT1 Lodi	97.2%		23.3 MWh		CAISO
Curtailments, Outages, and Comments:					
12/12/19 - 12/13/19 - Lodi CT bleed valve trouble ETR 12/13, OMS 8075665					
Unit	Availability		Production		Reason for Run
CT2 STIG	100.0%		0.0 MWh		CAISO
Curtailments, Outages, and Comments:					
Normal operation.					
Unit	Availability		Production		Reason for Run
LEC	100.0%		190,459 MWh		CAISO
Curtailments, Outages, and Comments:					
Normal Operations.					

Maintenance Summary – Specific per asset above.

Geothermal Facilities

Availability/Production for December 2019

Unit	Availability	Net Electricity Generated/Water Delivered	Out-of-Service/Descriptors
Unit 1	0 %	0 MWh	U1 was off line the entire month due to Kincade Fire in Geysers/PG&E line work
Unit 2	0 %	*0 MWh	U2 was off line the entire month due to Kincade Fire in Geysers/PG&E line work
Unit 3	N/A %	N/A	Unit 3 remains out of service.
Unit 4	100 %	38,508 MWh	U4 was off line 12/23 from 0630 until 0650 due to line upset
Southeast Geysers Effluent Pipeline	85.8 %	170.2 mgallons	Average flow rate: 3,729 gpm
Southeast Solar Plant	N/A	0 KWh	Year-to-date KWh: 2,598,995
Bear Canyon Pump Station Zero Solar	N/A	11,293 KWh	Year-to-date KWh: 3,756,722

* Accounts for an additional 0 MWh of house load for the 21KV power supply to the effluent pipeline supplied from Unit #2.

Hydroelectric Project

Availability/Production for December 2019

Units	Availability	Net Electricity Generated	Out-of-Service
Collierville Unit 1	95.23 %	16340 MWh	No Outages to Report.
Collierville Unit 2	94.99 %	6512 MWh	No Outages to Report.
Spicer Unit 1	100 %	152 MWh	No Outages to Report.
Spicer Unit 2	100 %	770 MWh	No Outages to Report.
Spicer Unit 3	100 %	195 MWh	No Outages to Report.

Operations & Maintenance Activities:

- CMMS work orders
- McKays Reservoir Intake Gate Trash rack cleanout with Divers
- Collierville Dual Unit Outage/Unit Maintenance
- Completed additional Unit functionality Testing during dual unit outage
- Prepared annual update of Project 2409/11563 Security Assessment and Security Plans
- Filed with DSOD/FERC updated Project 11563 Dam Safety Surveillance Monitoring Plan and Dam Safety Surveillance Monitoring Report
- Completed EAP crew training and emergency response agency face-to-face meeting
- Filed with FERC updated Owner's Dam Safety Program
- Performed field observations and drone flights of McKays reservoir during drawdown in support of sediment removal project

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

- There were no Cal OSHA recordable, lost time accidents, or vehicle accidents in the month of December.
- 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 was updated through the payroll period ended December 21, 2019.
- 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.

December 2019 Generation Services Safety Report

	Hydro	GEO	CT Group *	NCPA HQ **
Cal OSHA Recordable (this month)	0	0	0	0
Cal OSHA Recordable (calendar year)	2	0	0	0
Days since Recordable	185	515	1,720	6,788
Work Hours Since Last Recordable	17,444	109,371	255,166	2,477,171
LTA's (this month)	0	0	0	0
LTA's (calendar year)	0	0	0	0
Days without LTA	4,454	1,583	9,624	5,717
Work Hours without LTA	406,341	326,346	695,710	2,099,189
Vehicle Incident (month)	0	0	0	0
Vehicle Incident (calendar year)	1	3	0	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 December 21, 2019

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 2019 Data

	December 2019		Calendar Year 2019	
	Peak MW	MWh	Peak MW	MWh
NCPA Pool	335.63 12/16 @1900	197,077	478.77 8/15 @ 1700	2,332,414
SVP	477.61 12/12 @1400	313,542	587.78 6/11 @1600	3,729,335
MSSA	798.65 12/16 @ 1800	510,619	1057.99 8/15 @ 1700	6,061,749

Last Year 2018 Data*

	December 2018		Calendar Year 2018	
	Peak MW	MWh	Peak MW	MWh
NCPA Pool	337.84 12/4 @1800	197,945	419.2 7/25 @1700	2,310,521
SVP	456 12/14 @1200	305,129	529.29 8/9 @1700	3,694,417
MSSA	787.46 12/3 @ 1800	503,074	945.44 8/9 @ 1700	6,004,938

*Last year's data added for comparison purposes only

System Peak Data

	All Time Peak Demand	2019 Peak Demand
NCPA Pool	517.83 MW on 7/24/06 @ 1500	478.77 8/15 @ 1700
SVP	587.78 MW on 6/11/19 @ 1600	587.78 6/11 @ 1600
MSSA	1070.79 MW on 9/1/17 @ 1700	1057.99 8/15 @ 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		
	December 2019	Calendar Year 2019
MSSA % Within the Band	97.47%	96.57%

- Spicer Meadows:
 - No curtailments

- Geothermal Units:
 - December 1 - 31, Unit 1 and 2 remain off line due to Geysers 9 – Lakeville 230kV line outage

- Lodi Energy Center:
 - No curtailments

- Alameda CTs:
 - December 13 @ 0800 – 1230, Unit 2 o/s due to gas leak
 - December 19 @ 1730 – December 20 @ 1132, Unit 2 unavailable following starting issues

- Lodi CT:
 - December 12 @ 1100 – December 13 @ 0753, unit o/s due to bleed valve trouble

- Collierville Units:
 - December 7 - 8, Unit 1 and 2 o/s for annual dual unit maintenance, and intake trash rack cleaning and sediment removal

- STIG:
 - No curtailments

Pooling, Portfolio Planning & Forecasting

- NCPA Pool load during December 2019 was 197,078 MWh, or 97.2% of forecast. Pool load through January 6th has been 36,348 MWh; about 5% lower as compared to the same period during January 2019.
- Lodi Energy Center (LEC) operated every day during December 2019, with 34,275 MWh generated for the Pool, or 89% of the pre-month forecast. Production was high and steady due to low solar and wind generation during December, the Diablo Canyon unit refueling outage continued until mid-month, and high SoCal gas prices pushed power burn into NP15. Through January 6th, LEC had generated 4,227 MWh for the Pool.
- During December 2019, 12.59" of rain was recorded at the Big Trees gage. Average December Big Trees precipitation is 9.58".
- The Value of Storage (VOS) of New Spicer Meadow Reservoir (NSMR) has been decreased from \$60/MWh to \$55/MWh.
- NSMR storage as of December 31, 2019 was at 89,702 acre feet. The historical average NSMR storage at the end of December is 80,499 acre feet. As of January 7, 2020 NSMR storage is 87,558 acre feet. The current NCPA Pool share of NSMR storage is 44,818 acre feet.
- Combined Calaveras Project generation for the Pool in December 2019 totaled 12.9 GWh, up from 11.8 GWh in November 2019. The Pool's 12.9 GWh in December 2019 was above the pre-month forecast of 8.9 GWh.
- Western Base Resource (BR) deliveries for the Pool for December 2019 were 20,786 MWh, including Displacement energy totaling 925 MWh. The total was 164% of Western's pre-month forecast. Through January 6th the Pool had received 3,255 MWh. The Pool's portion of Western's latest forecast for January 2020 is 20,266 MWh.
- The PG&E Citygate gas index averaged \$3.255/MMBtu for delivery on January 7, 2020, below the average PG&E gas price during December of \$3.38/MMBtu as Western gas prices remain the highest in the country. Strong production nationwide continued in December, with supply outgrowing demand for now. The January 2020 PG&E Bidweek price is \$3.54/MMBtu, 48.5 cents lower than the December Bidweek price at \$4.025/MMBtu.
- Day-ahead NP15 electricity prices averaged \$42.48/MWh (HLH) and \$36.45 (LLH) during December 2019, with the hourly TH_NP15 maximum at \$72.03 on the 11th of December.

NCPA Pool Loads & Resources Value Summary								
Peak and Energy Summary Dec-19					Estimated Production Costs		Cost of Serving Demand	
	Coincident		Pre-Month Forecast		NCPA Pool		Totals	Avg (\$/MWh)
	Peak (MW)	Total MWh	Values	Avg. MW	Cost/Revenue (Estimate)	Variable Cost (\$/MWh)		
Demand	335.6	197,078	202,785	264.9	N/A	N/A		
WAPA	-	20,786	12,643	27.9	\$ 962,106	\$ 46.29	\$ 8,229,950	\$ 41.76
Geothermal	-	15,944	26,701	21.4	302,932	19.00		
Hydro	-	12,219	9,151	16.4	73,311	6.00		
Stig & CTs	-	68	739	0.1	3,701	54.50		
LEC	-	34,275	38,734	46.1	1,209,893	35.30		
Contracts	-	96,674	99,455	129.9	4,879,535	50.47	\$ 8,138,150	\$ 41.29
Market - Net (Net Sales = Negative)	335.6	17,113	15,362	23.0	703,331	41.10		
Net Total	335.6	197,078	202,785	264.9	\$ 8,134,810	\$ 41.29		

Monthly Market Summary						
	Pool Energy (MWh)	HLH Avg MCP (\$/MWh)	Avg Variable Cost of Pool Generation (\$/MWh)	Forward Prices (EOX NP15 HLH Ask Prices)		
				NP15 12/2/2019 (\$/MWh)	1/6/2020 (\$/MWh)	
Jan-19	197,652	\$ 42.93	\$ 45.13	Jan-20	\$ 39.92	\$ 43.23
Feb-19	180,866	\$ 79.12	\$ 41.57	Feb-20	\$ 37.28	\$ 42.13
Mar-19	187,890	\$ 39.02	\$ 24.83	Mar-20	\$ 31.02	\$ 32.94
Apr-19	178,692	\$ 24.88	\$ 28.55	Q2 2020	\$ 25.75	\$ 28.80
May-19	183,123	\$ 20.05	\$ 32.01	Q3 2020	\$ 44.29	\$ 51.87
Jun-19	198,698	\$ 25.83	\$ 38.09	Q4 2020	\$ 35.58	\$ 42.03
Jul-19	212,102	\$ 33.30	\$ 56.98	CY2021	\$ 35.29	\$ 41.07
Aug-19	224,328	\$ 34.79	\$ 37.80	CY2022	\$ 34.17	\$ 40.06
Sep-19	200,894	\$ 37.46	\$ 40.97	CY2023	\$ 31.81	\$ 37.41
Oct-19	186,955	\$ 38.43	\$ 33.39	CY2024	\$ 31.12	\$ 36.63
Nov-19	182,993	\$ 43.69	\$ 40.97	CY2025	\$ 30.84	\$ 36.31
Dec-19	197,078	\$ 41.76	\$ 41.29	CY2026	\$ 30.61	\$ 36.09

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.

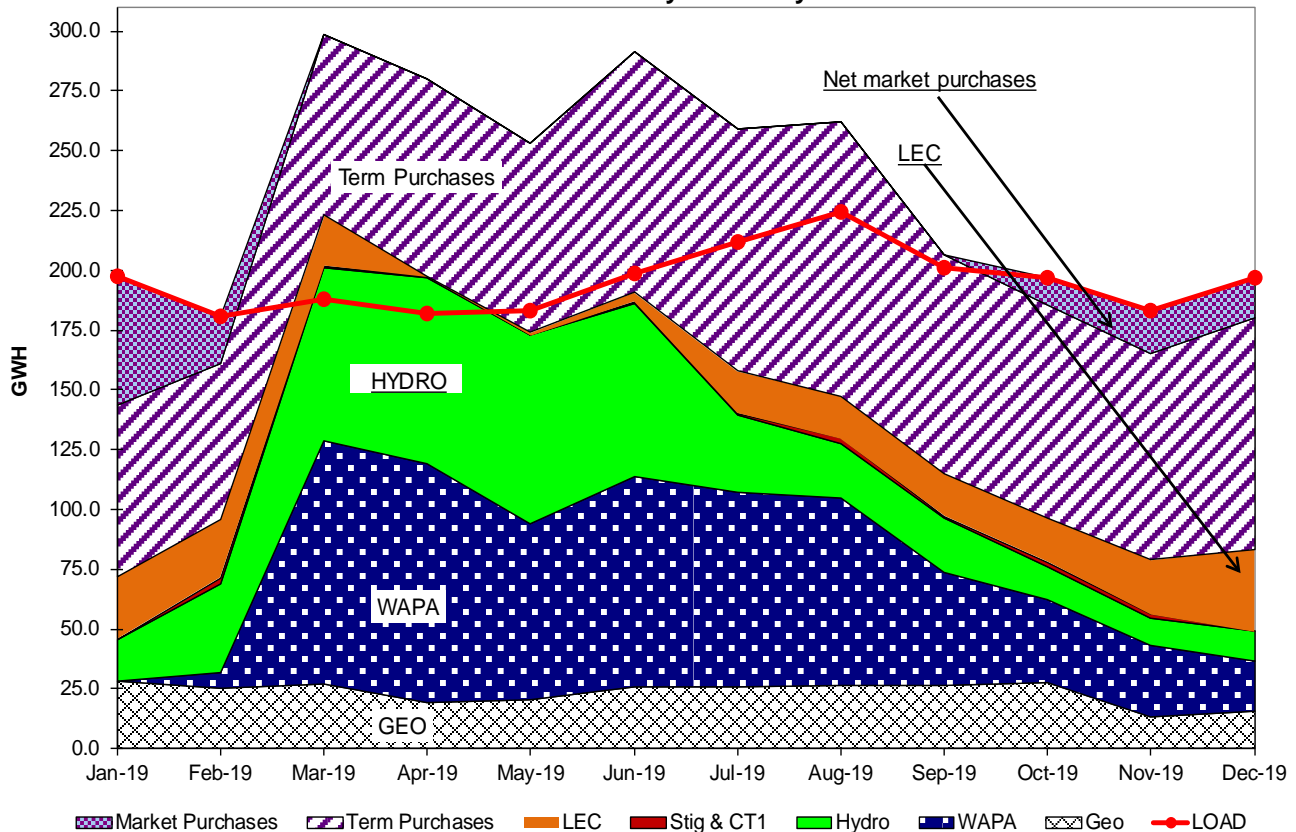
* STIG and CT costs include forward natural gas and basis hedge transactions.

* 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
Calendar 2019 Summary: January - December Actual**



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 2020:
 - Monthly System Resource Adequacy Demonstration (filed December 18, 2019)
 - Monthly Supply Plan (filed December 18, 2019)

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 key active initiatives:

Extended Day Ahead Market

- This initiative will develop an approach to extend participation in the day-ahead market to the Western Energy Imbalance Market (EIM) entities in a framework similar to the existing EIM approach for the real-time market, rather than requiring full integration into the California ISO balancing area. The extended day-ahead market (EDAM) will improve market efficiency by integrating renewable resources using day-ahead unit commitment and scheduling across a larger area.
- CAISO responded to stakeholder concerns and is extending the process to include more workshops to deal issues such as transmission cost allocation. The next meeting is scheduled for 2/11/2020.

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.
- CAISO is proposing massive overhauls to its RA program in conjunction with CPUC changes. Specific areas the CAISO is looking at are termination of the Resource Adequacy Availability Mechanism for System capacity and replacing it with "less complicated" counting rules similar to eastern RTOs, import eligibility, exemptions, maximum import capability calculations and allocations, redefining Planned and Forced outages, new "fast" and "long" ramping products.
- CAISO published a Third Revised Straw Proposal and scheduled a stakeholder meeting for 1/7/2020. CAISO failed to adequately address NCPA's concerns regarding jurisdiction, hydro counting, and the unjust UCAP deficiency tool, among others. NCPA will continue to advocate at meetings and in comments.

Day-Ahead Market Enhancements

- This initiative will explore new day-ahead products that will address ramping needs between intervals and uncertainty that can occur between the day-ahead and real-time markets.
- CASIO reviewed the need for new products along with data supporting uncertainty concerns:

- Uncertainty between day-ahead and real-time market has increased from 2017 to 2019 and CAISO operators are addressing this development with out of market actions which disrupts market efficiency
- Historically, generators had higher certainty to know if they would be scheduled in real-time
- Due to uncertainty and changing resource fleet, commitment decisions are no longer necessarily known
- Gas, hydro, storage, and imports need to cover costs to be available for dispatch in real-time – this will be accomplished with imbalance reserves
- New Imbalance Reserve Product (IRP) will be designed to address granularity and uncertainty between day-ahead and real-time markets:
 - Hourly product; 15-minute dispatchable; Biddable; Covers granularity difference and uncertainty between DAM and FMM; All awards are co-optimized and settled simultaneously; DAM has no energy price formation issue because the market solves all hours in a single optimization; Stepped relaxation parameters (proposed)
- CAISO reviewed two options for applying IRP:
 - Option 1 – Financial
 - Co-optimizes bid-in demand, ancillary services and imbalance reserves
 - Imbalance reserves cover historical uncertainty between IFM cleared net load and FMM net load
 - Exceptional dispatch if IFM clears inconsistent with operational needs
 - Option 2 – Financial + Forecast
 - Co-optimizes bid-in demand, ISO reliability capacity, ancillary services and imbalance reserves
 - Imbalance reserves cover historical uncertainty between ISO's day-ahead net load forecast and FMM net load
 - Reliability capacity covers differences between ISO net load and cleared net load
 - Exceptional dispatch if IFM/RUC clears inconsistent with operational needs
- CAISO reviewed policy alignment and relationships among Day Ahead Market Enhancements, Extending Day Ahead Market to EIM, and Resource Adequacy Enhancements.
- NCPA Comments included tentative support of Option 2 along with requests for special Load Following MSS cost allocation netting.
- The next meeting is scheduled for February

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.
- CAISO's draft final proposal includes a hybrid billing determinate consisting of volumetric and peak demand functions in order to address costs shifts as well as the full impact of high coincident peak demand, low load factor UCD areas that have

relatively lower volumetric use compared to high load factor areas. It received general support from the market and will be presented to the CAISO board this year.

- NCPA performed an impact analysis and determined that NCPA members would mostly benefit or be indifferent to the new billing determinant so long as certain LFMSS benefits remain in place.

Hybrid Resources

- CAISO published a Revised Straw Proposal and held a working group meeting on December 17, 2019. The proposal further establishes barriers to Hybrid Resources (i.e., multiple technologies share a meter and resource ID) by proposing requirement to submit forecast for storage component.
- As generation developers become increasingly interested in pairing energy storage with existing or proposed generation, this initiative will explore how such “hybrid” generation resources can be registered and configured to operate within the ISO market. This initiative will develop solutions allowing developers to maximize the benefits of their resource’s configuration. Hybrid resource configurations also raise new operational and forecasting challenges that ISO plans to address during this initiative.
- CAISO refers to hybrid projects or hybrid resources as a combination of multiple technologies or fuel sources combined into a single resource with a single point of interconnection. Projects are not required to include storage to be considered hybrid resources.
- Approximately 41% of the total capacity currently seeking interconnection is hybrid resource configurations.
- Initial Objectives:
 - Promote the reliable and efficient integration of hybrid resources
 - Address additional technical questions surfaced by increasing numbers and interest in hybrid resources:
 - Configurations, metering, operations, market participation, and settlements
 - Address new operational and forecasting challenges raised by hybrid resources
 - New requirements may be needed to provide reliable participation by hybrid resources
- CAISO prefers customers to register a resource ID for each technology/fuel source for increased visibility in order to address uncertainty issues. CAISO reminds participants that separate resource IDs are required to provide forecasts for hybrid resources that include eligible/participating intermittent resources. The forecasts help to minimize uninstructed imbalance energy charges.

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)	Base Resource & Restoration Fund (\$)	Monthly Cost of BR ² (\$/MWh)	CAISO LMP Differential ³ (\$/MWh)	12-Mo Rolling Avg. Cost of BR ⁴ (\$/MWh)
Jul-19	95,615	81,155	(14,460)	\$2,134,816	\$ 26.31	\$ (0.02)	\$ 30.98
Aug-19	75,245	78,474	3,229	\$2,134,816	\$ 27.20	\$ (0.02)	\$ 30.65
Sep-19	46,290	47,422	1,133	\$2,049,840	\$ 43.23	\$ (0.17)	\$ 31.31
Oct-19	23,193	54,290	31,097	\$962,107	\$ 17.72	\$ 0.06	\$ 30.64
Nov-19	7,602	29,611	22,009	\$962,107	\$ 32.49	\$ 0.04	\$ 30.47
Dec-19	6,564	20,786	14,222	\$962,107	\$ 46.29	\$ 0.11	\$ 30.64
Jan-20	9,331	-	(9,331)	\$962,107	\$ 103.11	\$ -	\$ 31.07
Feb-20	17,163	-	(17,163)	\$962,107	\$ 56.06	\$ -	\$ 31.42
Mar-20	27,643	-	(27,643)	\$962,107	\$ 34.80	\$ -	\$ 30.88
Apr-20	52,877	-	(52,877)	\$2,167,410	\$ 40.99	\$ -	\$ 30.71
May-20	84,464	-	(84,464)	\$2,167,410	\$ 25.66	\$ -	\$ 31.42
Jun-20	90,039	-	(90,039)	\$2,167,410	\$ 24.07	\$ -	\$ 31.81
1/ As forecasted in NCPA 19/20 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.							

- NCPA Pool received 20,786 MWh Base Resource (BR) energy in December 2019. This includes 925 MWh of Displacement Energy for an estimated savings of \$5,100 or about \$5.60/MWh.
- Pool Members' total savings under Market Efficiency Enhancement Agreement (MEEA) for Pool Members was approximately \$2,200 in December 2019. FY 2020 so far shows a net MEEA savings of negative \$1,500 due to lower congestion prices for import at COTP as opposed to MEEA prices (July 2019 through October 2019). Despite MEEA Benefits are negative June 2019 through September 2019, there are significant benefits for MEEA prices since the program started in December 2015. NCPA will continue to closely monitor MEEA Benefits.

Western Base Resource Scheduling Flexibility

- WAPA and BOR implemented Base Resource Min-Take Experiment 3 customer pre-disclose energy beginning operating date July 11, 2019. The intent is to potentially lower the Base Resource Min-Take even more for all Base Resource customers during the low value hours. NCPA calculated Pool Members has an increased flexible energy of 13,760 MWh and added BR Market value of \$67,516, which calculated an average of \$5.80/MWh of additional flexibility for July 2019 through November 2019. Experiment 3 was suspended effective operating date December 16, 2019 due to decrease in BR availability.

Draft 2025 Base Resource Contract

- WAPA continues to review the draft 2025 BR Contract with customers. The next meeting will be held on January 23, 2020 to review Draft 5. The contract provisions permit termination at least every five years. NCPA and other customers continue to work with WAPA on refinement of contract language on the triggers for termination. WAPA expects to finalize the contract language to existing customers and new customers in February 2020, and each entity will have six months to execute. Service will begin on January 1, 2025.

Interconnection Affairs

PG&E Update

Kincaid Fire and Geo Plants

- NCPA Geo Plant 2 has been online since 11-04-2019. Geo Plant 1 is planned to come online on January 21, 2020, however Geo Plant 2 will become offline from Jan 22 until Feb 29, 2019.
- NCPA continues to work with PG&E and CAISO to approve an intertie between Plant 1 and Plant 2 in order to generate onto one circuit/point of interconnection.

TO-20 Rate Case

- This case is close to settlement except on ROE. Partial settlement is planned to be filed at FERC by March 31, 2020 or sooner. Staff will monitor progress and report back.
- FERC 890 case/PG&E's self-approved projects stakeholder process is now part of the TO-20 settlement discussions. CPUC and Joint Interveners have proposed Stakeholder Review Process as an appendix to the TO-20 settlement. Next settlement call on this particular issue is scheduled for Jan 10, 2020.

Cotenancy Agreement

- PG&E with support from NCPA and SVP filed an amendment that acknowledged CDWR's request for termination. The amendment rejected CDWR's request, pending resolution of the Cost of Removal dispute. All other matters have been delayed until this issue is resolved.
- On September 27, 2019 FERC rejected PG&E's amendment stating PG&E cannot unilaterally extend the term of the Agreement. FERC did not address the cost of removal aspect and the calculation methodology. NCPA has initiated discussions with members as to how much capacity from CDWR's share should NCPA take. Pending the outcome of the capacity discussion, NCPA and SVP will look at next steps. More updates will be provided to members as it becomes available.

Debt and Financial Management

- The Federal Reserve chose to keep things steady at its December meeting, ending the year as we started with a policy pause keeping the federal funds target range at 1.50% - 1.75%. After three rate cuts in as many meetings to protect against downside risks to the economy, it remains to be seen whether 2020 will hold further cuts or a continued hold. However, we expect the Fed to hold the key fed funds rate steady well into 2020 implying that interest rates should remain within a narrow range.
- The U.S. Treasury yield curve moved higher over the month, with one- to 10-year maturities up nine to 13 basis points (bps). A stable Fed, abundant liquidity, and reduced trade risks stabilized the U.S. rate outlook.
- The Capital Facilities bond refunding (STIG project) was completed on December 12th and the results were positive for the project participants. The project participants realized a NPV savings of \$2.4m or 9.55% of refunded bonds and we were able to shorten the life of the outstanding debt by eliminating the final year of maturity. NCPA staff in partnership with PFM (NCPA's Financial Advisor) and JPMorgan (Underwriter) went into this financing with a strategy of eliminating drag by using only the highest rating (Moody's), forgoing bond insurance, removing the debt service reserve fund and urging the market to stretch. The results below showed this success. Given how CA bonds trade, we looked exclusively at CA deals and examined tax-exempt transactions and bonds shorter than 10-years. There were three similar transactions that showed LADWP pricing almost in line with Orange County (OC) AAA bonds. NCPA's bonds (A1) were approximately 7-10 bps back from the OC transaction which was four rating notches higher. We concluded the strategy was successful and are very happy with the results.

Issuer/Issue	Northern California Power Agency Capital Facilities Revenue Bonds, 2019 Refunding Series A	Department Of Water And Power Of The City Of Los Angeles Power System Revenue Bonds, 2019 Series D	Orange County Water District Refunding Revenue Bonds Series 2019C	Santa Ana California Gas Tax Revenue Refunding Bonds 2019
Rating	A1/NR/NR	Aa2/NR/AA	NR/AAA/AAA	NR/AA-/NR
Maturity Year	Spread (bps)	Spread (bps)	Spread (bps)	Spread (bps)
2019				
2020	-7		-14	-10
2021	-5		-15	-8
2022	-4		-15	-8
2023	-5		-12	-8
2024	-7		-16	-8
2025			-18	-8
2026		-18	-17	-7
2027		-15	-16	-7
2028		-12	-14	-8
2029		-9	-13	-6
Par Amount	20,450,000	281,530,000	99,065,000	44,650,000
State	CA	CA	CA	CA
Credit Enhance	None	None	None	None
Call Feature	NA	NA for maturities above	NA for maturities above	NA for maturities above
Formal Award Date	12/12/2019	12/12/2019	12/3/2019	11/21/2019
Maturity	Aug 1	Jul 1	Aug 1	Jan 1
Underwriter	JP MORGAN SECURITIES LLC	SIEBERT WILLIAMS SHANK CO	GOLDMAN SACHS & COMPANY	SAMUEL A RAMIREZ & CO INC
Security	REVENUE BONDS	REVENUE BONDS	REVENUE BONDS	REVENUE BONDS

Schedule Coordination Goals

Software Development

- Staff, in collaboration with Power Management, Generation Services, and a consultant, have successfully tested the Multi-Stage Generation (MSG) capability for the Lodi Energy Center in the CAISO Market Simulation Environment. Anticipated go-live is early 2020.
- Technology upgrade and development of the NADS application is in progress. Go live date scheduled to coincide with the MSG rollout for LEC.
- Work continues in automating and integrating members' monthly Resource Adequacy (RA) demonstrations and supply plans into NCPA's bid-to-bill system. Power Management has been actively recording the RA contracts in Deal Manager, identifying potential enhancements for future integration. Target completion is middle of next year.
- Phase 1 of the Data Exchange app was rolled out to the Settlements staff albeit additional requirements have surfaced.
- IS Staff is coordinating with Power Management Dispatch and Scheduling and SVP to provide manpower assistance to SVP's real-time operations during the weekend shifts. Additional computer hardware has been procured to support the extended SC and Dispatch operation. January 2020 timeframe is the anticipated start of the transition.
- Review is underway of the current Accounting Business Process and the intended upgrade of the main accounting system, Microsoft Dynamics GP. Completion anticipated middle of next year.

Network

- Progress continues to be made upgrading staff to Windows 10 with over 80% of the Agency on the new Operating System. The goal is to have all workstations moved over before the end of 2020.
- The Ops and Support group has been working alongside Power Management and Settlements in preparation for the CAISO MSG market simulation later this year. Part of this effort will include enhancements to SCADA control logic for LEC configurations along with updating dispatch control center screens.
- Information Services department has made the necessary changes to comply with the new NERC CIP003-7 Low Impact requirements for the HQ and DRC Control Centers. These include Electronic Access, Physical Access and Transient Cyber Asset and Removable Media Code Risk Mitigation plans.
- Although NCPA has yet to be identified as a NERC CIP medium entity, the Information Services and Compliance departments have started working to put

policies, procedures and technical controls in place in preparation for transition later this calendar year.

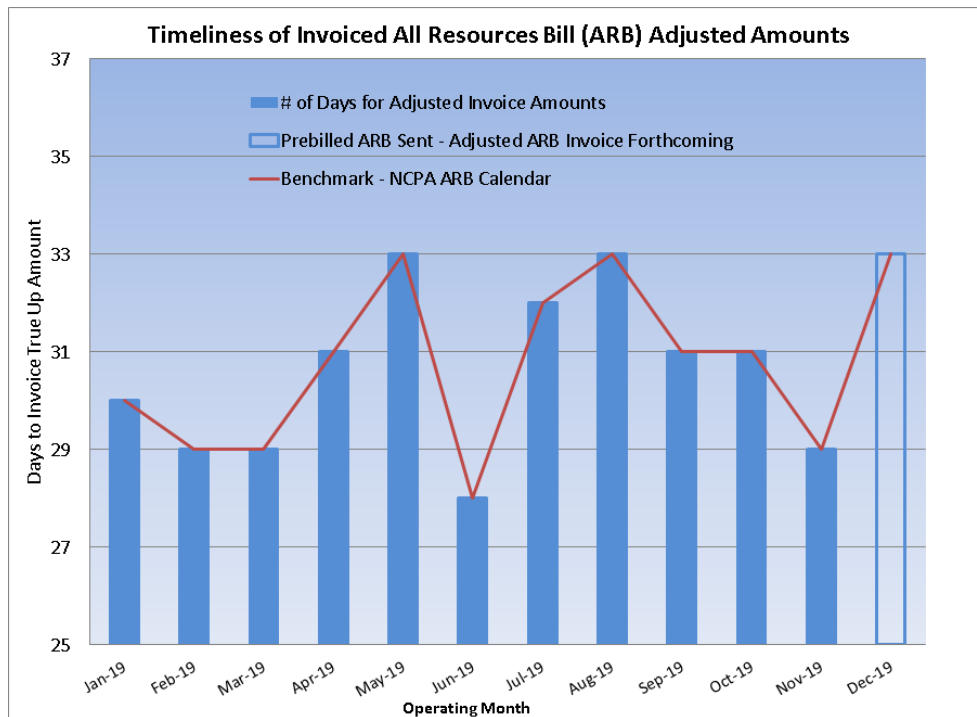
NCPA Bills & Settlements

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 November 2019 NCPA All Resources Bill (ARB) monthly invoice sent to members on November 24, 2019 contains:

- December 2019 monthly pre-billed budget/forecast amounts;
- October 2019 (1st Adjustment) NCPA Project and CAISO Initial settlement true-ups;
- September 2019 (2nd Adjustment) NCPA Project settlement true-up and T+12 business day recalculated CAISO settlement true-up allocations;
- July 2019 (3rd Adjustment) T+55 business day recalculated CAISO settlement true-up allocations and NCPA Projects true-up;
- January 2019 (4th Adjustment) T+9 month recalculated CAISO settlement true-up allocations;
- March 2018 (5th Adjustment) T+18 month recalculated CAISO settlement true-up allocations;
- December 2016 (6th Adjustment) T+33 month recalculated CAISO settlement true-up;
- September 2016 (7th Adjustment) T+35 month CAISO settlement true-up;



Legislative & Regulatory

Political Arena State/Federal/Western Programs

On January 6, 2020, the State Legislature returned to kick-off the second year of the 2019-20 legislative session. This month is a critical time for legislators to move forward with policy proposals, with key deadlines for bills carrying-over from last year to be heard in policy committees and voted on in their respective houses before the end of the month. The Legislature has until February 21 to introduce new legislation. NCPA staff are monitoring bill amendments and introductions and analyzing bills for potential impacts to members. We anticipate legislation related to Public Safety Power Shut-offs and utility de-energization practices, wildfire mitigation oversight, and resource procurement requirements, among other topics.

On January 7, 2020, the California Public Utilities Commission finalized the Governance Agreement for the Clean Fuel Report Program, formally kick-starting the implementation process for a new point-of-purchase incentive for electric vehicles. This instant rebate will be available at any participating car dealership within the state and is funded entirely by a percentage of utilities' Low Carbon Fuel Standard credits resulting from residential EV charging. Under the CFR Program, Californians should be able to walk in to any car dealership in California and instantly receive a discounted price for any electric vehicle available, as well as utility-specific information on chargers and rates. The Clean Fuel Reward program is expected to launch during the second half of 2020.

Human Resources

Hires:

Rod Stagg joined NCPA on December 23, 2019 as a Computer Technology Analyst III (Software Developer and SharePoint Administrator). Rod has over 19 years of experience in all aspects of software solution development. His recent work included the design and development of innovative and national award-winning procurement tracking and reporting system for Fortune 500 clients such as Microsoft and Amazon.

Intern Hires:

None

Promotions/Position Changes:

Jeremy Lawson was promoted to Supervisor III, Director of Engineering at our Roseville Headquarters office, effective December 8, 2019. Jeremy was most recently the Plant Engineer for our Lodi Energy Center (LEC) facility. He has had a progressively responsible twenty-year career with NCPA, including positions as the CT Operations Supervisor and Plant Engineer during the construction of LEC. Jeremy has a BSMET from California State University, Sacramento and an MBA from the University of Phoenix.

Separations:

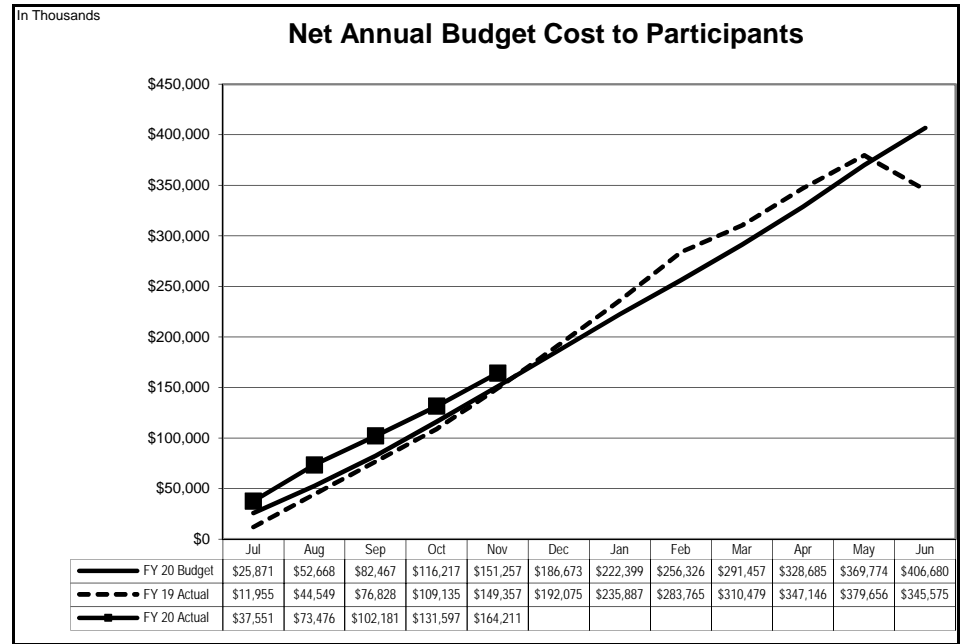
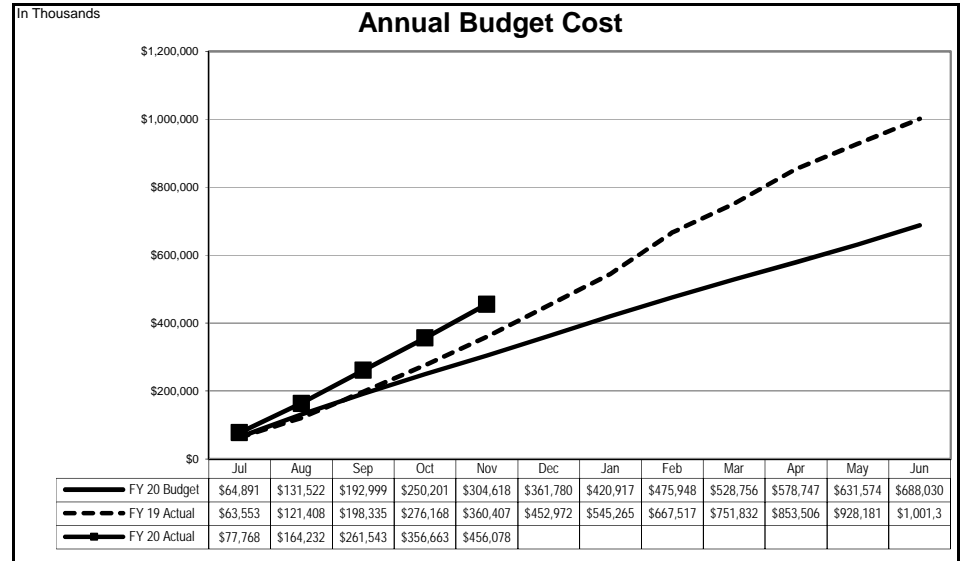
Ken Speer, Assistant General Manager, Generation Services, retired from his position at our Roseville Headquarters office after 12 years of service with NCPA, effective December 20, 2019.

Marty Lebrecht, Plant Manager, Geothermal Facilities, retired from his position at our Geothermal Plant Facilities after 14 years of service with NCPA, effective December 20, 2019.

Mark Verbitsky, System Dispatcher, retired from his position at our Roseville Headquarters office after seven years of service with NCPA , effective December 6, 2019.

**Annual Budget
2019-2020 Fiscal Year To Date
As of November 30, 2019**

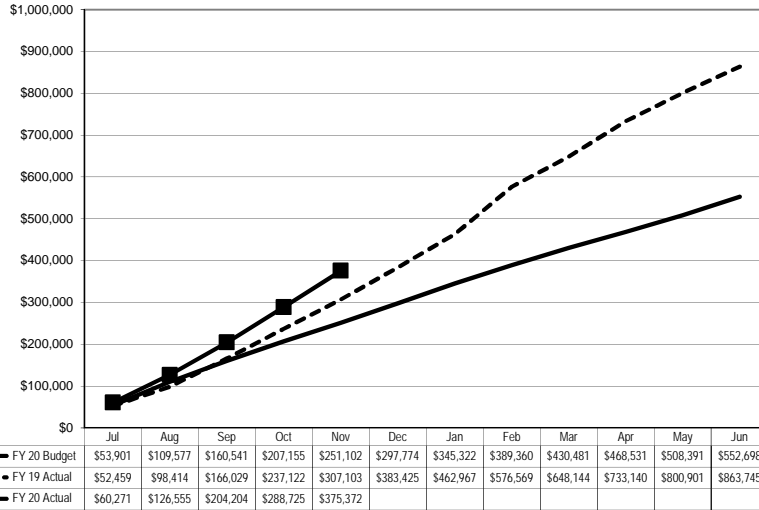
In Thousands	Program			
	Annual Budget	Actual	Under(Ovr) Budget	YTD % Remaining
GENERATION RESOURCES				
NCPA Plants				
Hydroelectric	54,074	21,779	\$ 32,295	60%
Geothermal Plant	35,311	14,973	20,338	58%
Combustion Turbine No. 1	6,170	2,542	3,628	59%
Combustion Turbine No. 2 (STIG)	9,438	3,944	5,494	58%
Lodi Energy Center	92,960	32,929	60,031	65%
	197,953	76,167	121,786	62%
Member Resources - Energy	56,229	28,008	28,221	50%
Member Resources - Natural Gas	3,541	1,781	1,760	50%
Western Resource	23,325	9,523	13,802	59%
Market Power Purchases	15,123	9,996	5,128	34%
Load Aggregation Costs - ISO	256,030	248,398	7,632	3%
Net GHG Obligations	497	1,500	(1,003)	-202%
	552,698	375,372	177,326	32%
TRANSMISSION				
Independent System Operator	117,089	73,544	43,544	37%
MANAGEMENT SERVICES				
Legislative & Regulatory				
Legislative Representation	2,132	800	1,333	62%
Regulatory Representation	748	263	485	65%
Western Representation	745	235	510	68%
Customer Programs	424	88	336	79%
	4,049	1,386	2,664	66%
Judicial Action	625	99	526	84%
Power Management				
System Control & Load Dispatch	6,082	2,480	3,602	59%
Forecasting & Prescheduling	2,934	1,016	1,918	65%
Industry Restructuring	414	143	271	65%
Contract Admin, Interconnection Svcs & Ext. Affairs	954	388	566	59%
Gas Purchase Program	77	27	51	65%
Market Purchase Project	111	37	74	66%
	10,573	4,092	6,481	61%
Energy Risk Management	212	67	144	68%
Settlements	980	323	656	67%
Integrated System Support	243	16	227	93%
Participant Pass Through Costs	1,560	566	995	64%
Support Services	-	611	(611)	
	18,243	7,161	11,082	61%
TOTAL ANNUAL BUDGET COST	688,030	456,078	231,952	34%
LESS: THIRD PARTY REVENUE				
Plant ISO Energy Sales	127,624	42,684	84,940	67%
Member Resource ISO Energy Sales	29,156	12,697	16,459	56%
Member Owned Generation ISO Energy Sales	67,108	34,870	32,238	48%
NCPA Contracts ISO Energy Sales	15,623	8,214	7,409	47%
Western Resource ISO Energy Sales	18,304	11,956	6,349	35%
Load Aggregation Energy Sales	-	134,987	(134,987)	
Ancillary Services Sales	4,197	3,543	654	16%
Transmission Sales	110	46	64	58%
Western Credits, Interest & Other Income	19,227	42,871	(23,643)	-123%
	281,350	291,867	(10,517)	-4%
NET ANNUAL BUDGET COST TO PARTICIPANTS	406,680	164,211	\$ 242,469	60%



Annual Budget Budget vs. Actual By Major Area As of November 30, 2019

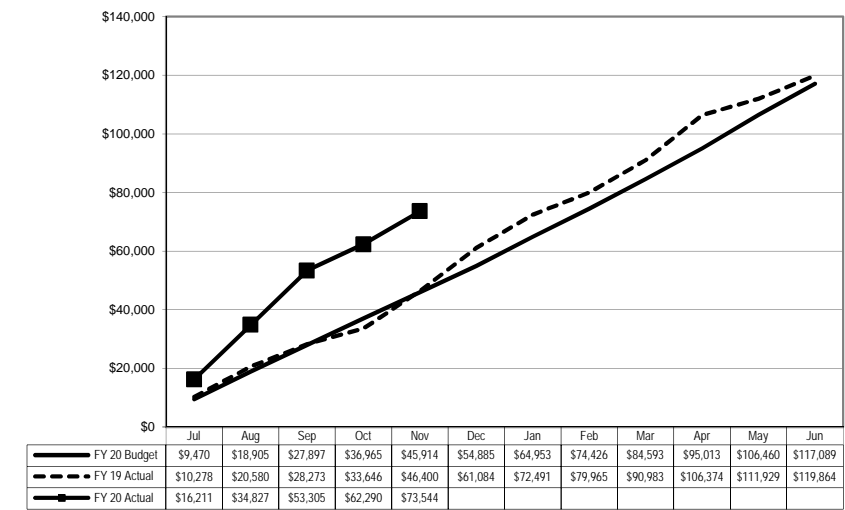
In Thousands

Generation Resources



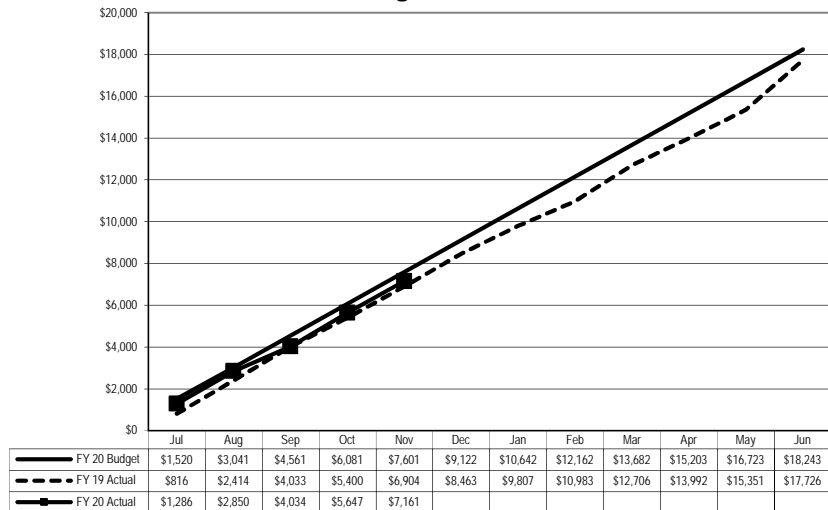
In Thousands

Transmission-ISO



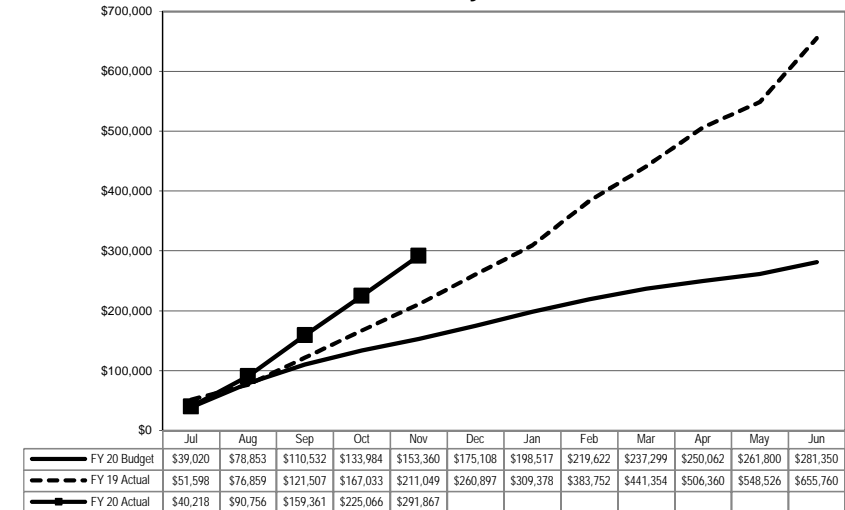
In Thousands

Management Services



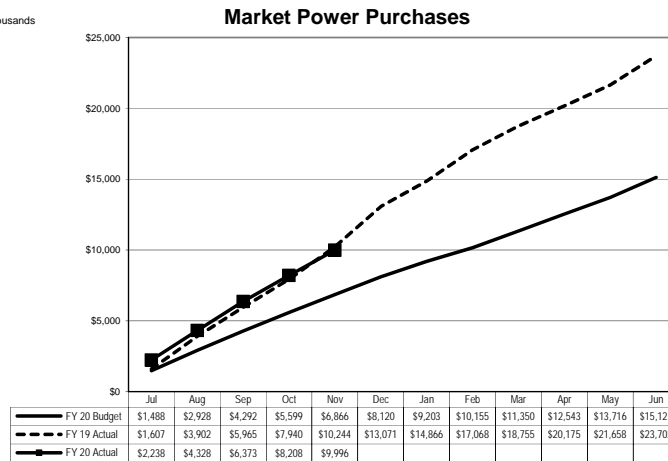
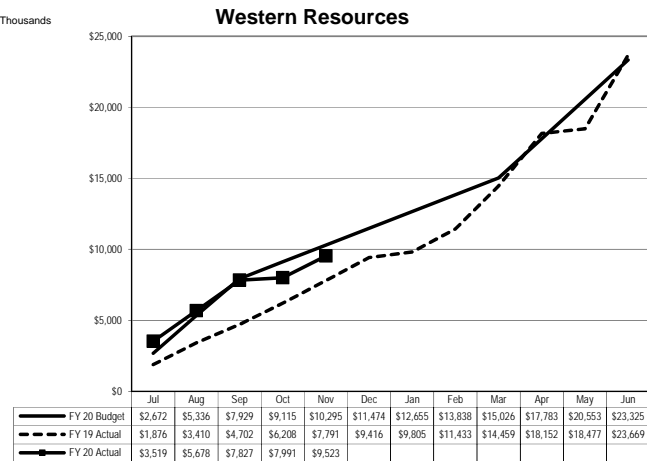
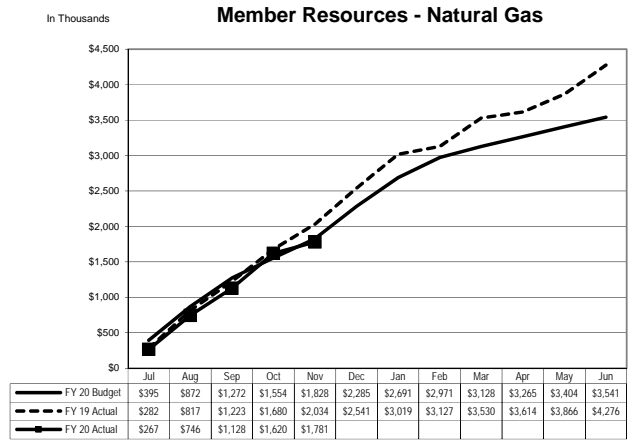
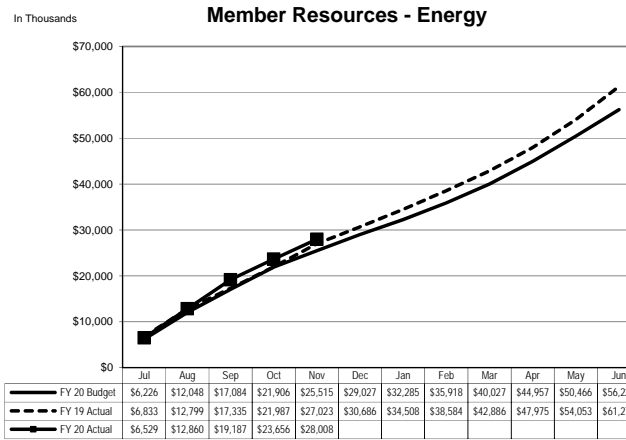
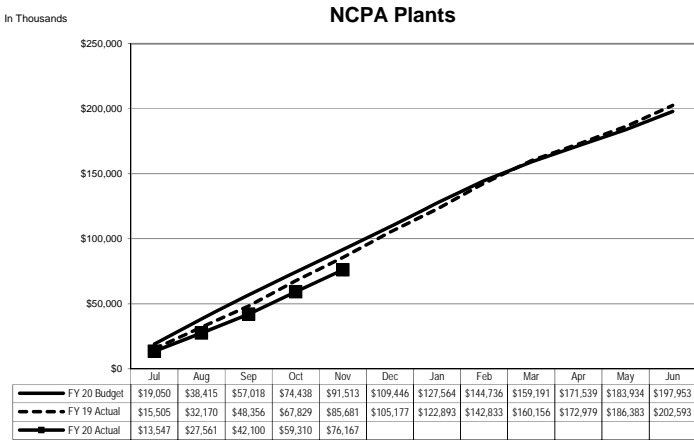
In Thousands

Third Party Revenue



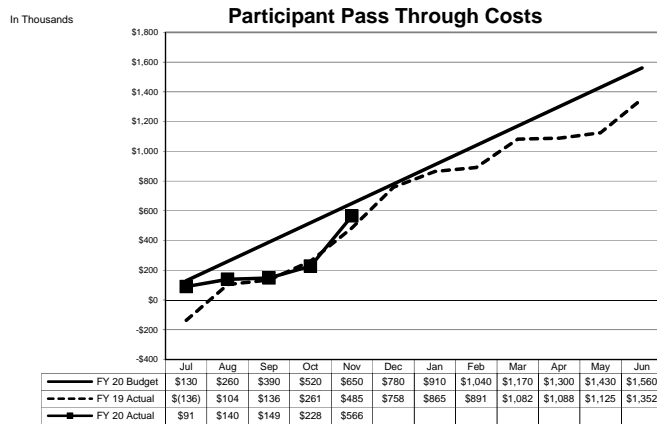
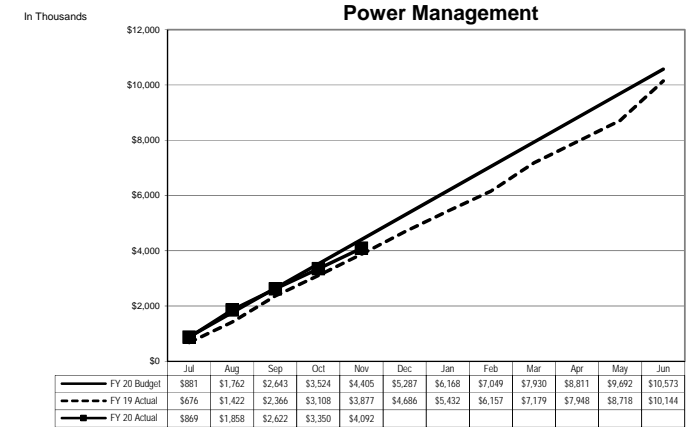
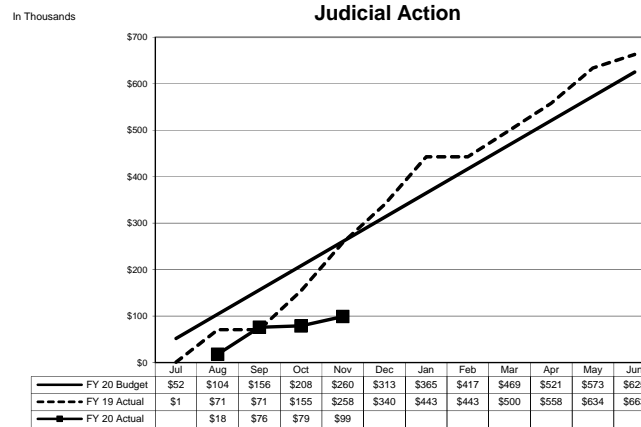
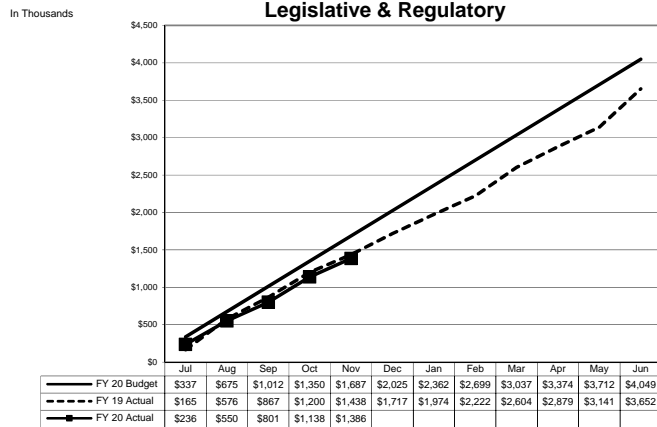
Footnote: Transmission is solely reflective of Independent System Operator (ISO) costs

**Annual Budget Cost
Generation Resources Analysis By Source
As of November 30, 2019**



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, 2019

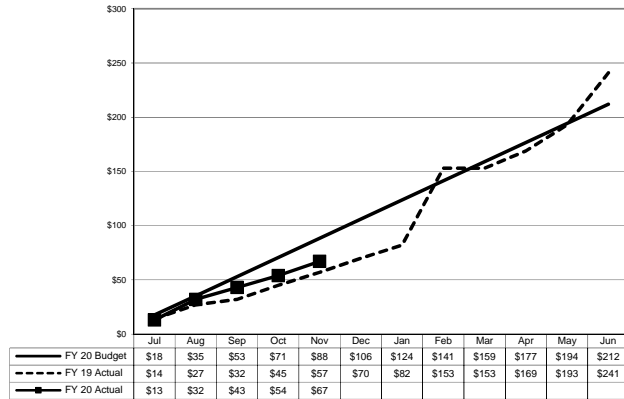


**Annual Budget Cost
Management Services Analysis By Source
As of November 30, 2019**

In Thousands

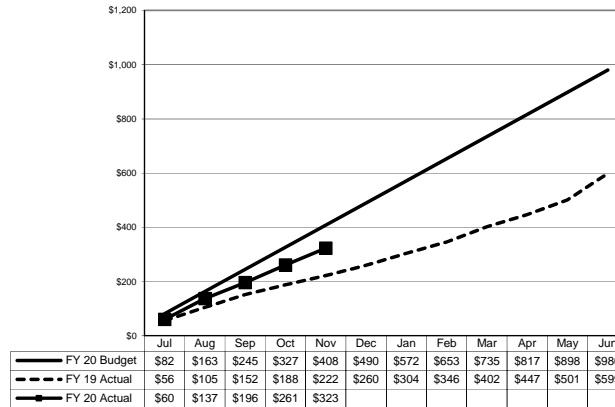
Energy Risk Management

In Thousands

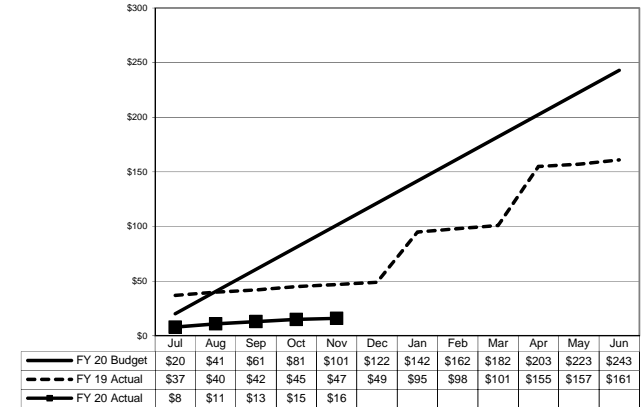


Settlements

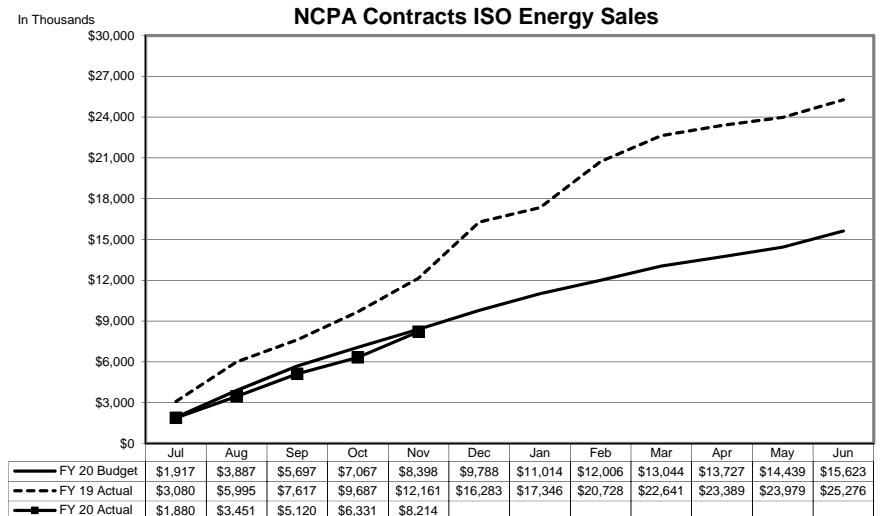
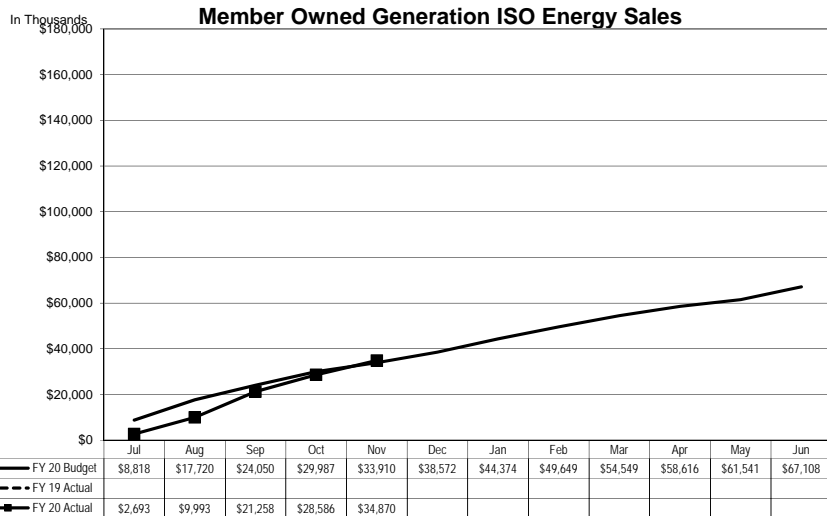
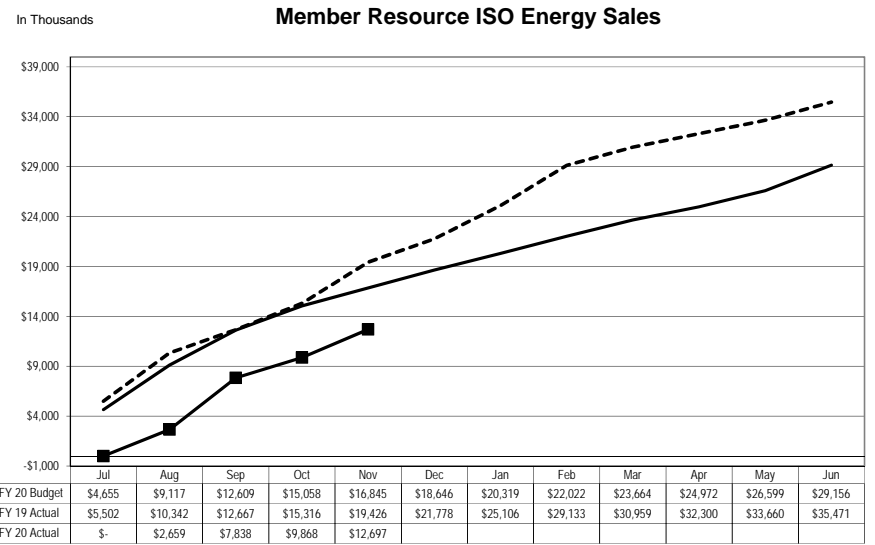
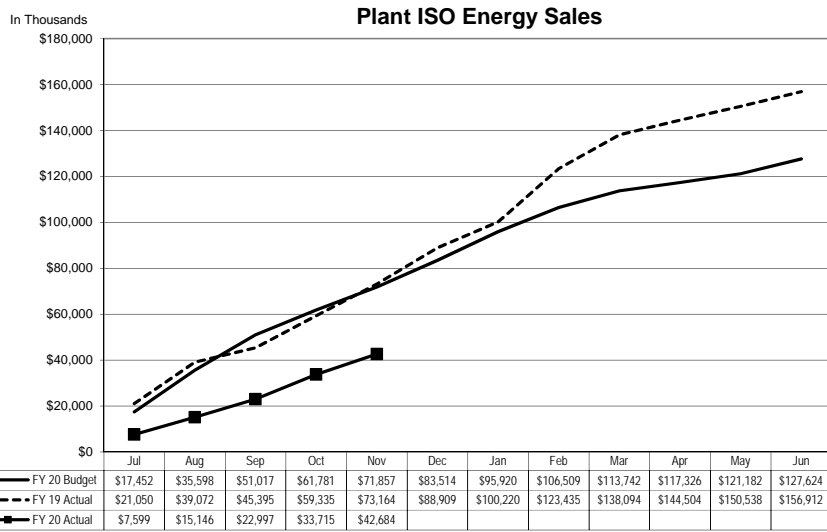
In Thousands



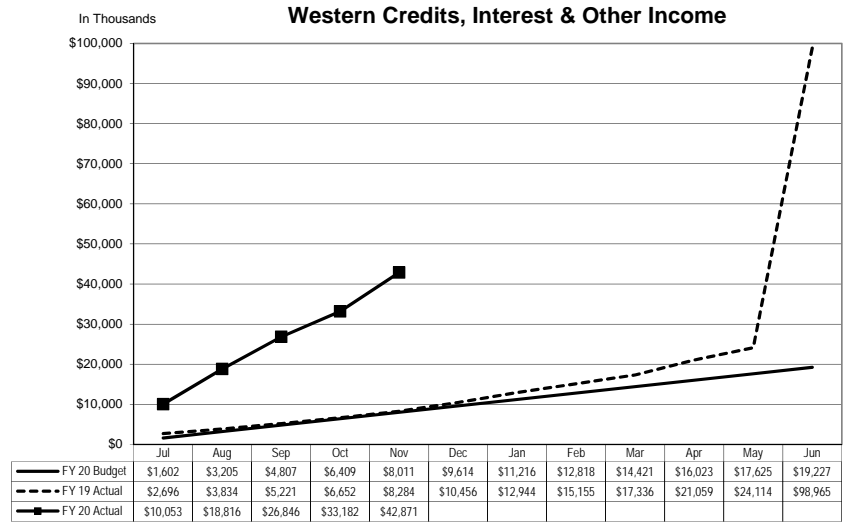
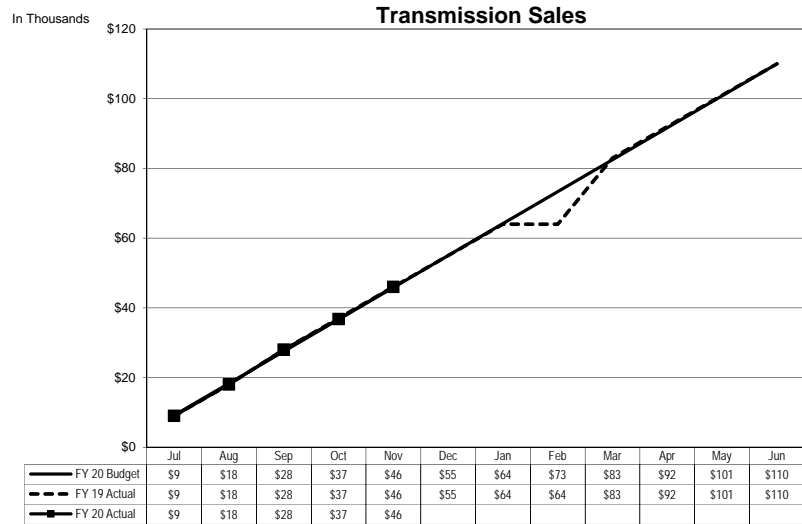
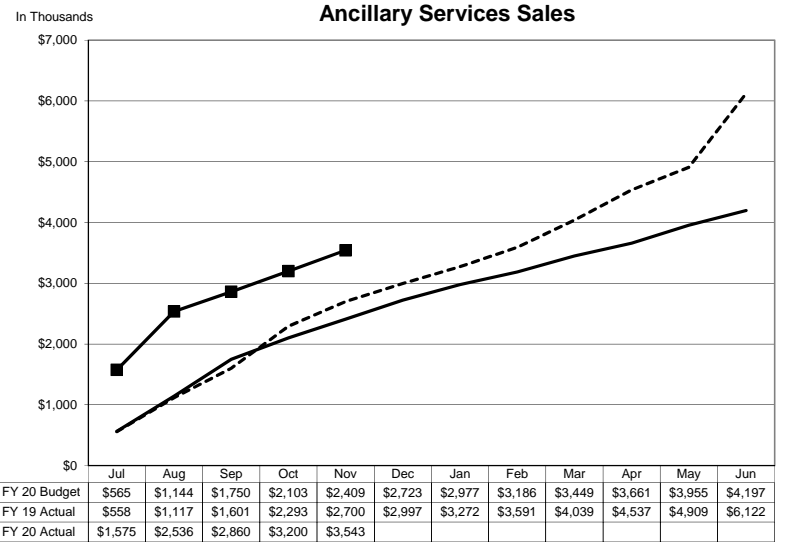
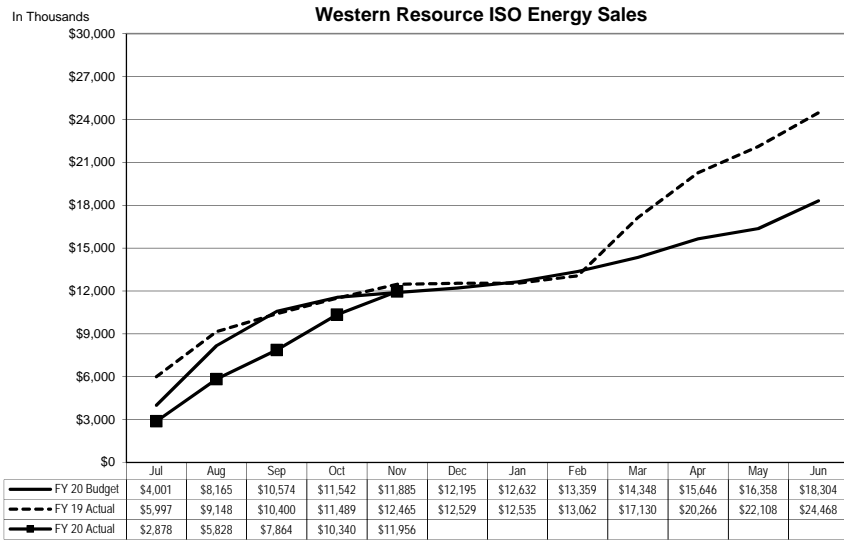
Integrated Systems Support



**Annual Budget Cost
Third Party Revenue Analysis By Source
As of November 30, 2019**



**Annual Budget Cost
Third Party Revenue Analysis By Source
As of November 30, 2019**



**Annual Budget
NCPA Generation Detail Analysis By Plant
As of November 30, 2019**

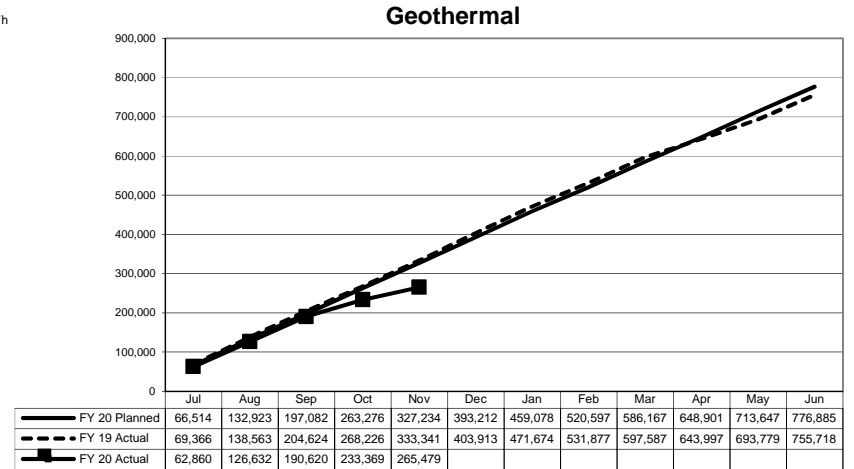
Generation Cost Analysis

\$ in thousands

	Geothermal				
	Budget	Actual	\$/MWh	Under(Over)	YTD %
			Actual	Budget	Remaining
Routine O & M	\$ 18,456	\$ 7,840	\$ 29.53	\$ 10,616	58%
Capital Assets/Spare Parts Inventories	3,645	1,563	5.89	2,082	57%
Other Costs	7,640	3,028	11.41	4,611	60%
CA ISO Charges	625	482	1.81	143	23%
Debt Service	4,946	2,061	7.76	2,885	58%
Annual Budget	35,311	14,973	56.40	20,338	58%
Less: Third Party Revenue					
Interest Income	382	104	0.39	278	73%
ISO Energy Sales	29,481	9,432	35.53	20,048	68%
Ancillary Services Sales	-	-	-	-	-
Effluent Revenues	750	270	1.02	480	64%
Misc	110	47	0.18	64	58%
	30,723	9,853	37.11	20,870	68%
Net Annual Budget Cost to Participants	\$ 4,588	\$ 5,120	\$ 19.29	\$ (532)	-12%
Net Generation--MWh @ Meter	776,885	265,479			
\$/MWh (A)	\$ (0.46)	\$ 11.52			

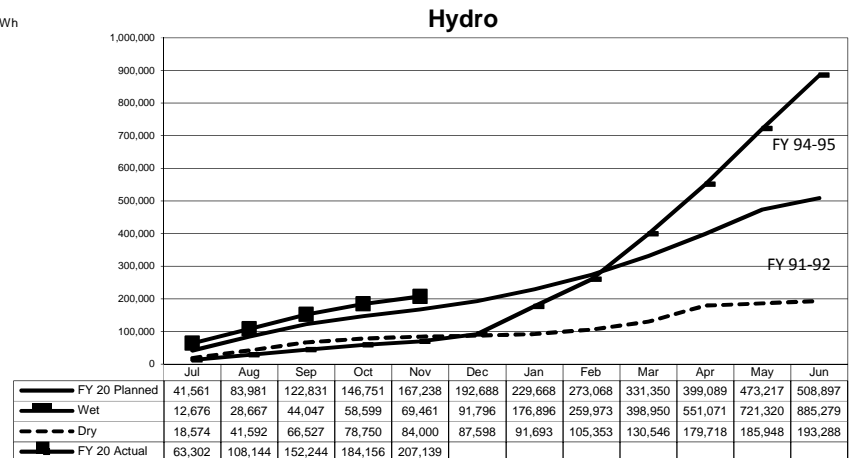
MWhs Generated

In MWh



	Hydroelectric				
	Budget	Actual	\$/MWh	Under(Over)	YTD %
			Actual	Budget	Remaining
Routine O & M	\$ 450	\$ 3,165	\$ 15.28	\$ (2,715)	-604%
Capital Assets/Spare Parts Inventories	4,775	2,045	9.87	2,730	57%
Other Costs	12,078	1,225	5.91	10,853	90%
CA ISO Charges	3,465	1,466	7.08	1,998	58%
Debt Service	33,307	13,878	67.00	19,429	58%
Annual Budget	54,074	21,779	105.14	32,295	60%
Less: Third Party Revenue					
Interest Income	670	187	0.90	483	72%
ISO Energy Sales	23,455	8,161	39.40	15,294	65%
Ancillary Services Sales	2,539	2,621	12.66	(82)	-3%
Misc	-	128	0.62	(128)	
	26,664	11,098	53.58	15,567	58%
Net Annual Budget Cost to Participants	\$ 27,410	\$ 10,682	\$ 51.57	\$ 16,728	
Net Generation--MWh @ Meter	508,897	207,139			
\$/MWh (A)	\$ (11.59)	\$ (15.43)			

In MWh



Footnotes:

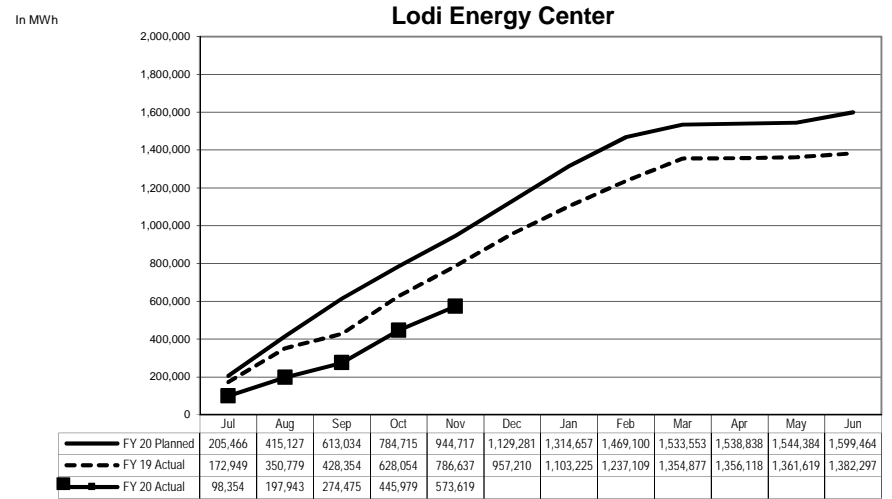
(A) Aggregate fiscal year generation in \$/MWh (excluding debt service)

**Annual Budget
NCPA Generation Detail Analysis By Plant
As of November 30, 2019**

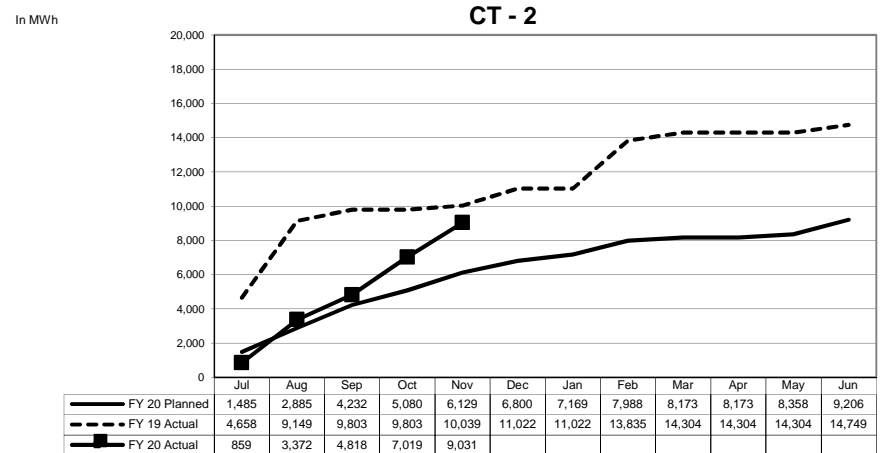
Generation Cost Analysis

	Lodi Energy Center				
	Budget	Actual	\$/MWh Actual	Under(Over) Budget	YTD % Remaining
Routine O & M	\$ 14,101	\$ 5,019	\$ 8.75	\$ 9,081	64%
Fuel	39,513	14,081	24.55	25,432	64%
AB 32 GHG Offset	-	-	-	-	0%
CA ISO Charges and Energy Purchases	4,710	1,088	1.90	3,622	77%
Capital Assets/Spare Parts Inventories	5,333	650	1.13	4,683	88%
Other Costs	3,249	1,234	2.15	2,015	62%
Debt Service	26,054	10,856	18.93	15,198	58%
Annual Budget	92,960	32,929	57.41	60,031	65%
Less: Third Party Revenue					
Interest Income	386	294	0.51	92	24%
ISO Energy Sales	72,603	23,765	41.43	48,837	67%
Ancillary Services Sales	1,433	617	1.08	815	57%
Transfer Gas Credit	-	-	-	-	0%
Misc	-	1	0.00	(1)	0%
	74,421	24,677	43.02	49,744	67%
Net Annual Budget Cost to Participants	\$ 18,539	\$ 8,251	\$ 14.38	\$ 10,288	55%
Net Generation--MWh @ Meter	1,599,464	573,619			
\$/MWh (A)	\$ (4.70)	\$ (4.54)			

MWhs Generated



	Combustion Turbine No. 2 (STIG)				
	Budget	Actual	\$/MWh Actual	Under(Over) Budget	YTD % Remaining
Routine O & M	\$ 1,595	\$ 618	\$ 68.43	\$ 978	61%
Fuel and Pipeline Transport Charges	1,089	504	55.76	586	54%
Capital Assets/Spare Parts Inventories	418	152	16.79	267	64%
Other Costs	486	186	20.60	300	62%
CA ISO Charges	53	70	7.77	(17)	-32%
Debt Service	5,796	2,415	267.44	3,381	58%
Annual Budget	9,438	3,944	436.78	5,494	58%
Less: Third Party Revenue					
Interest Income	109	64	7.07	45	41%
ISO Energy Sales	819	669	74.04	151	18%
Ancillary Service Sales	-	-	-	-	0%
Fuel and Pipeline Transport Credits	1,687	753	83.38	934	55%
Misc	-	-	-	-	0%
	2,615	1,485	164.49	1,130	43%
Net Annual Budget Cost to Participants	\$ 6,823	\$ 2,459	\$ 272.29	\$ 4,364	64%
Net Generation--MWh @ Meter	9,206	9,031			
\$/MWh (A)	\$ 111.53	\$ 4.85			



Footnotes:

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

**Annual Budget
NCPA Generation Detail Analysis By Plant
As of November 30, 2019**

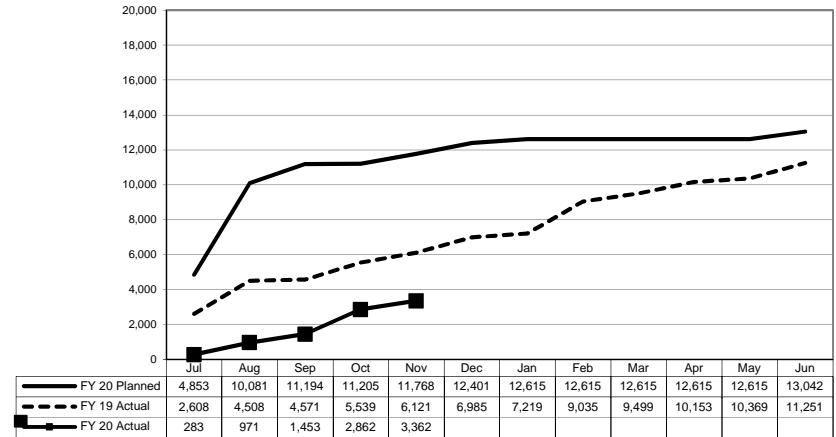
Generation Cost Analysis

	Combustion Turbine No. 1				
	Budget	Actual	\$/MWh Actual	Under(Over) Budget	YTD % Remaining
Routine O & M	\$ 2,268	\$ 777	\$ 231.17	\$ 1,491	66%
Fuel and Pipeline Transport Charges	975	253	75.35	722	74%
Capital Assets/Spare Parts Inventories	2,110	1,060	315.37	1,050	50%
Other Costs	747	290	86.37	456	61%
CA ISO Charges	69	161	47.82	(91)	-132%
Debt Service	-	-	-	-	
Annual Budget	6,170	2,542	756.07	3,628	59%
Less: Third Party Revenue					
Interest Income	-	6		(6)	
ISO Energy Sales	1,266	657	195.29	609	48%
Ancillary Services Sales	-	-	-	-	0%
Misc	-	16	4.65	(16)	0%
	1,266	678	199.94	588	46%
Net Annual Budget Cost to Participants	\$ 4,904	\$ 1,864	\$ 554.35	\$ 3,040	62%
Net Generation--MWh @ Meter	13,042	3,362			
\$/MWh (A)	\$ 375.97	\$ 554.35			

MWhs Generated

In MWh

CT - 1



Footnotes:

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