



Agenda
Utility Advisory Committee Meeting
Tuesday, September 8, 2020
Via Go To Meeting
(786) 535-3211
Access Code 357-117-973

Note: Pursuant to Resolution No. 100-20, this meeting will be conducted remotely. The public may attend this meeting remotely by calling the phone number provided.

Committee Members: Chair Sanders, Vice-Chair Parker and Committee Members Larkin, Porter, LoPresti, Anderson and Gregoire

Liaisons: Council Liaison Lemley
Staff Liaison Energy Services Director Whitney

Regular Meeting – 3:00 p.m.

Call to Order / Attendance:

Approval of Agenda: (Approved by Motion)

Approval of Minutes: (Approved by Motion)

Approval of July 14, 2020 Meeting Minutes

Public Comments:

Items of Business:

- I. Status - Each City Utility (20 Minutes)
 - Clint Whitney, Energy Services Director
 - Pete Rogalsky, Public Works Director
 - Tom Huntington, Fire & Emergency Services Director
2. Solid Waste Rate Structure and Landfill Services (20 Minutes)
 - Pete Rogalsky, Public Works Director
 - John Marlow, Public Works Capital Projects Manager
3. Horn Rapids Solar, Storage and Training Status and Virtual Tour (20 Minutes)
 - Clint Whitney, Energy Services Director

Unfinished Business:

Other Informational Items:

- I. Energy Services Monthly Capital Work Plan
 - Clint Whitney, Energy Services Director
2. Bonneville Power Administration Highlights
 - Clint Whitney, Energy Services Director
3. Forward Planning Agenda
 - Clint Whitney, Energy Services Director

Adjournment

The next Utility Advisory Committee Meeting is November 10, 2020.

Richland Public Library is ADA accessible with special parking and access available at the entrance facing Northgate Drive. Requests for sign interpreters, audio equipment, and/or other special services must be received 48 hours prior to the Utility Advisory Committee Meeting by calling the City Clerk's Office at 942-7389.



UTILITY ADVISORY COMMITTEE AGENDA ITEM COVERSHEET

Meeting Date: 9/8/2020

Agenda Category: Approval of Minutes

Prepared By: Clint Whitney, Energy Services Director

Subject:

Approval of July 14, 2020 Meeting Minutes

Department:

Energy Services

Recommended Motion:

Approve minutes of the July 14, 2020 Utility Advisory Committee meeting.

Summary:

Fiscal Impact:

Attachments:

1. 071420 UAC Minutes - FOR APPROVAL



MINUTES

UTILITY ADVISORY COMMITTEE REGULAR MEETING

Zoom ~ Meeting ID 953 0702 6963

July 14, 2020 ~ 3:00 p.m.

DRAFT

CALL TO ORDER:

Chair Sanders called the meeting to order at 3:05 p.m.

ATTENDANCE:

Chair James Sanders, Vice-Chair Graham Parker, Committee Members Dave Larkin, Dan Porter, Amy Anderson, and Don Gregoire were present. Committee Member Charles LoPresti was absent. Also present were Council Liaison Lemley, Staff Liaison and Energy Services Director Whitney, Public Works Director Rogalsky, Fire & Emergency Services Director Huntington, Business Services Manager Edgemon, Energy Specialist Senger, Power Analyst Manzo, and Administrative Assistant II Grimes.

APPROVAL OF THE AGENDA:

MEMBER PARKER MOVED AND MEMBER PORTER SECONDED THE MOTION TO APPROVE THE AGENDA AS PUBLISHED. THE MOTION CARRIED 6-0.

APPROVAL OF MINUTES:

MEMBER PORTER MOVED AND MEMBER PARKER SECONDED THE MOTION TO APPROVE THE MARCH 10, 2020 MEETING MINUTES AS PUBLISHED. THE MOTION CARRIED 6-0.

PUBLIC COMMENTS:

There were no public comments.

ITEMS OF BUSINESS:

1. Status – Each City Utility

Staff Report: Directors from Fire & Emergency Services, Public Works, and Energy Services presented.

Director Huntington updated the committee on progress of the department's draft strategic plan. Due to the COVID19 Pandemic, work on the plan has been slow and Mr. Huntington hopes to be back at the November meeting with a draft plan for the committee to view. Preliminary indications show there may not be a need for rates to increase in the Ambulance utility next year due to additional Ground Emergency Medical Transport funding.

Director Rogalsky gave an update to the committee on financials for the water utility. Due to significant savings on a couple Capital Improvement projects the utility is able to put off a bond issuance that was forecasted for this year. The water rights for irrigation in Horn Rapids has hit a stalemate with WA Department of Ecology. Legal counsel has suggested an alternative strategy to request that Ecology suspend work on finalizing the water right and allow the City to remain in permit status. This would allow the utility to continue to develop and use the water for our needs without having the analysis of an old operating situation constrain it. The Advanced Metering Infrastructure (AMI) project will begin implementation after an amendment to the contract that includes an upgrade in new technology that is now available. There is a slight cost savings to the water utility for upgrade.

For the wastewater utility there was a decline in sewer plant flows due to the COVID19 Pandemic. While it has returned back to normal now, there could be minor revenue impacts, but no impact to the rate schedule. The wastewater plant is in the process of engineering design for equipment replacements of the backup generator and substantial modification to the aeration process. The sewer collection system had experienced frequent plugs and backups for quite a few years that resulted in private property damage in the older section of Richland. This past year staff reworked the program and had a reduction of approximately 75% in plugging and backup issues.

For solid waste, the utility had more frequent use and visits at the landfill due to regional facilities closing public facing solid waste services in the beginning of the COVID19 response. Similarly, to the water utility, solid waste has had cost savings in their Capital projects which resulted in deferring any rate increase in 2021. Mr. Rogalsky will present possible rate adjustments for landfill services at the September meeting along with a review of the recycle program. In 2021 the solid waste utility will start servicing customers that were annexed in 2010. Overnight the utility will gain the number of customers that would be a normal two years' worth of development.

For the stormwater utility, construction will begin this fall on applying water quality retrofit infrastructure to outfall pipes to a few locations on Columbia Park Trail.

The UAC Members had several clarifying questions and stated their views on the topic. Discussion included: Whether the AMI technology upgrade would create any schedule changes, if the water pipe on Duportail Bridge is in use now, and if COVID19 revenue challenges have created any major problems for any of the utilities.

Director Whitney updated the committee on the electric utility's financials due to the COVID19 Pandemic. Overall, revenue is up along with reliability and capital projects are progressing. With more customers staying home, residential consumption increased and commercial consumption decreased with businesses being closed. While the consumption of each mostly offset each other, the residential rate is higher and therefore revenue has increased. Due to the Governor's proclamation, there have been no shut offs for non-pay. Preliminary indications in rate forecasting show a rate increase is not needed until January 2022.

2. Optimum Resource Mix by Energy Northwest – E3 Study

Staff Report: Director Whitney introduced Greg Cullen with Energy Northwest to present on this topic. Mr. Cullen provided an overview to the committee of a study Energy Northwest contracted with Energy Environmental & Economics (E3) to study the resource adequacy in the PNW region. The adequacy of generation resources is exacerbated by carbon legislation and the closure of baseload coal generation. While renewable energy generation will be continuing, the number of overbuilding required for these projects makes it less feasible as an optimized resource due to the legislation. The study indicated that small modular reactors (SMR) is the best resource optimization and should be a part of our industry future.

The UAC Members had several clarifying questions and stated their views on the topic. Discussion included: whether the study included transmission impacts of new infrastructure or large nuclear plants. Also discussed was the separate groups involved in clean energy legislation and how they view each carbon-free type of energy and next steps that can be taken to move forward on projects.

3. Richland Energy Services Integrated Resource Plan

Staff Report: Director Whitney had Sandi Edgemon, Business Services Manager, introduce Steve Andersen from EES Consulting who presented the draft Integrated Resource Plan (IRP) to the committee. Mr. Andersen walked the committee through how the IRP was developed using the 2019 Conservation Potential Assessment (CPA) and data to evaluate the demand and supply side resources on an equal basis. Near-term challenges include integrating an increasing amount of distributed generation and demand side resources into the system. Long-term challenges include transitioning initially to a 100% carbon-neutral electricity supply by 2030 and later to a 100% carbon-free electricity supply and achieving all cost-effective conservation. This IRP recommends to not take any action to decrease Bonneville Power Administration (BPA) Tier 1 Power, implement cost-effective energy efficiency, and make market purchases that comply with renewable energy purchase requirements.

The UAC Members had several clarifying questions and stated their views on the topic. Discussion included: whether the renewable resources of solar and wind power generation will be available to the utility to take advantage of and how to use cost-effective energy efficiency to decrease the available conservation need as time progresses.

MEMBER PARKER MOVED AND MEMBER PORTER SECONDED THE MOTION TO ENDORSE THE IRP AND RECOMMEND THAT CITY COUNCIL ADOPT THE 2020 INTEGRATED RESOURCE PLAN.

THE MOTION CARRIED 6-0.

4. RMC Title 14 – Addition of Small Cell and Revised Rate Schedule

Staff Report: Director Whitney informed the committee of changes to Richland Municipal Code (RMC) Title 23 and Title 28 in regards to the zoning and franchise provisions

respectively for small cell facilities. Due to these changes there is a need to revise Title 14 to add a rate for small cell services. Staff recommends adding small sell electrical service to existing Schedule 90 for Cable TV Amplifiers and aligning the energy rate to be the same as Schedule 20 – Small General Service.

MEMBER PORTER MOVED AND MEMBER ANDERSON SECONDED THE MOTION TO SUPPORT THE MODIFICATION OF RMC TITLE 14 WITH THE ADDITION OF SMALL CELL AND A REVISED RATE SCHEDULE.

THE MOTION CARRIED 6-0.

OTHER INFORMATION:

- 1. Bonneville Power Administration's Financial Reserve Policy Surcharge Suspension**
- 2. Energy Services Monthly Capital Work Plan**
- 3. Energy Services Reliability Analysis**
- 4. Energy Services Financial Status Update**
- 5. Forward Planning Agenda**

The UAC Members discussed: the two UAC positions that will be open after September 30, 2020 and encouragement to the current members to seek other residents around them to apply. Also discussed was the delay in construction of the Horn Rapids Solar Storage Training project due to COVID19. Commercial Operation is now set for the end of September 2020.

ADJOURNMENT

Chair Sanders adjourned the meeting at 5:10 p.m.

Respectfully submitted:

Kylie Grimes, Administrative Assistant II

Reviewed by:

Clinton R. Whitney, Energy Services Director

Date Approved:

Date Published:



UTILITY ADVISORY COMMITTEE AGENDA ITEM COVERSHEET

Meeting Date: 9/8/2020

Agenda Category: Items of Business

Clint Whitney, Energy Services Director

Prepared By: Pete Rogalsky, Public Works Director

Tom Huntington, Fire & Emergency Services Director

Subject:

Status - Each City Utility (20 Minutes)

Department:

Energy Services

Recommended Motion:

Summary:

Per request from UAC members, a representative for each of the five City utilities will present a policy summary.

A memo is attached to facilitate discussion during the Energy Services utility update portion.

Fiscal Impact:

Attachments:

1. Utility Status Update - RES



MEMORANDUM

TO: Utility Advisory Committee

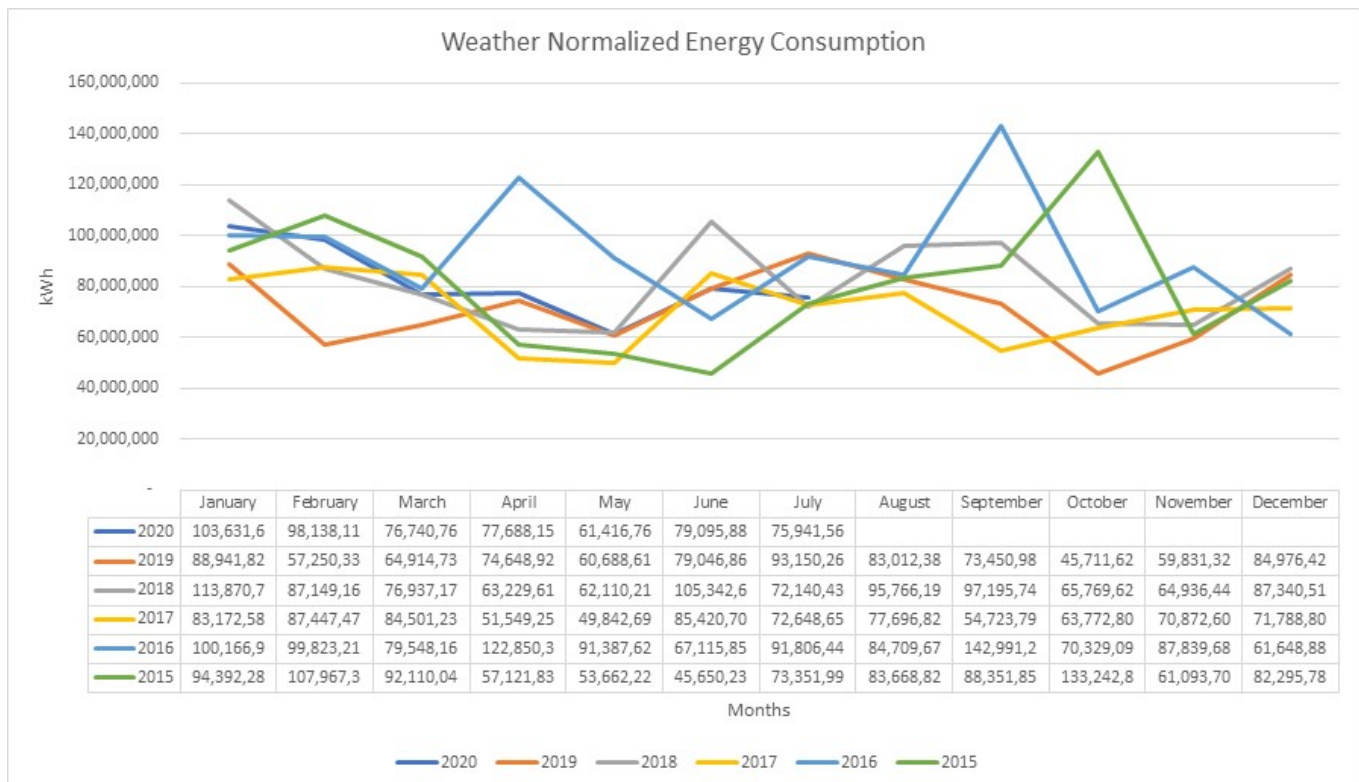
FROM: Clint Whitney, Energy Services Director

DATE: September 8, 2020

SUBJECT: Utility Status Update - RES

Recently, the City answered questions from S&P Global on how the COVID-19 pandemic has impacted the electric utility. S&P Global is a bond rating agency and considering risks to revenue bond holders. Below is part of the response showing a weather normalized graph of energy total consumption compared to previous years. After weather normalizing electrical consumption through July 2020, total consumption is up 3% compared to a five-year average and up 10% compared to same period in 2019.

While many utilities may see very different impacts from COVID-19, the financial impacts appear to be minimal for the City's Energy Services Department. However, the potential financial impact will increase as the Governor's moratorium on disconnects for non-payment continues.





UTILITY ADVISORY COMMITTEE AGENDA ITEM COVERSHEET

Meeting Date: 9/8/2020

Agenda Category: Items of Business

Prepared By: Pete Rogalsky, Public Works Director
John Marlow, Public Works Capital Projects Manager

Subject:

Solid Waste Rate Structure and Landfill Services (20 Minutes)

Department:

Public Works

Recommended Motion:

The Utility Advisory Committee recommends that the City Council revise service rates at the Horn Rapids Landfill and for curbside recycling service to reflect updated cost of service.

Summary:

See the attached memo to facilitate discussion on this topic.

Fiscal Impact:

Attachments:

1. Staff Report Memo



MEMORANDUM

TO: Utility Advisory Committee

FROM: Pete Rogalsky, Public Works Director
Jay Marlow, Public Works Capital Projects Manager

THROUGH: Clint Whitney, Energy Services Director

DATE: September 8, 2020

SUBJECT: Solid Waste Rate Structure and Landfill Services

Staff is seeking the Utility Advisory Committee's review of proposed changes to the rate structure at the Horn Rapids Landfill.

Earlier in the year staff worked with FCS Consultants to update the Solid Waste Utility rate model with the anticipation that rates would most likely be raised due to Capital Improvement projects completed as part of the landfill expansion efforts. The work performed showed that no general rate increases are needed for collection services due to on-going operational efficiency improvements and a significant increase of revenue associated with construction debris received at the Horn Rapids Landfill in 2019.

The updated cost of service analysis does show that some landfill disposal rates need adjustment. The work performed by staff and FCS found some rates associated with specific waste streams received at the landfill should be updated to recover actual costs associated with the handling and disposal of these materials. The rate changes proposed as a result of the analysis are the following:

- Commercial sale of compost – Current rate \$15 per ton. Recommended rate \$25 per ton. This proposed adjustment is simply to price this product at the current market price.
- Richland Commercial Greenwaste – Current rate \$25 per ton. Recommended rate \$36 per ton.
- Non-Richland Residential Greenwaste – Current minimum load rate \$15. Recommended rate \$30.

- Non-Richland Commercial Greenwaste – Current rate \$40 per ton.
Recommended rate \$57 per ton
- Non-Richland Residential Waste – Current minimum load rate of \$25.
Recommended rate \$40.
- Richland Commercial Un-contaminated Rock/Soil – Current rate \$25 per ton.
Recommended rate \$21 per ton.
- Richland Commercial Concrete/Asphalt (Inert) – Current rate \$25 per ton.
Recommended rate \$40 per ton.
- Non-Richland Commercial Un-contaminated Rock/Soil – Current rate \$25 per ton.
Recommended rate \$40 per ton.
- Non-Richland Commercial Concrete/Asphalt (Inert) – Current rate \$25 per ton.
Recommended rate \$76.15 per ton.
- A non-published rate applicable only to the Wastewater Division is for the disposal of bio-solids. Current rate is \$5.69 and the recommended rate is \$18 per ton.

Staff is also recommending that a new service be added to the landfill operation. The new service would allow self-service loading and purchase of the City-produced compost by residential customers. At present the City's compost is marketed to wholesale purchasers and bulk haulers only. This results in Richland's compost being available at various area nurseries, where residents can typically have the material loaded into their vehicle by retail staff. City staff do not want to duplicate or compete with the business model, but are regularly approached by residents interested in purchasing the City's compost. Staff believes that a small market of individuals would purchase the City's compost through a self-service station at the landfill and that setting up and supporting this service would impose minimal effort on landfill staff. Staff recommends that this new service be created and that the price be set at \$25 per load.

Finally, in 2018 the City implemented step one of a planned two-step increase in curbside recycling rates. During this year's cost of service update FCS Group and City staff confirmed that the cost of service remains higher than the current service rate. Staff proposes to implement step two of the planned increase, effective January 1, 2021, by raising the monthly service charges for curbside recycling services to \$7.68 for a residential container and \$23.66 for a 300-gallon container.



UTILITY ADVISORY COMMITTEE AGENDA ITEM COVERSHEET

Meeting Date: 9/8/2020

Agenda Category: Items of Business

Prepared By: Clint Whitney, Energy Services Director

Subject:

Horn Rapids Solar, Storage and Training Status and Virtual Tour (20 Minutes)

Department:

Energy Services

Recommended Motion:

Summary:

See attached memo to facilitate discussion on this topic.

Fiscal Impact:

Attachments:

1. HRSST Status Memo

MEMORANDUM

TO: Utility Advisory Committee

FROM: Clint Whitney, Energy Services Director

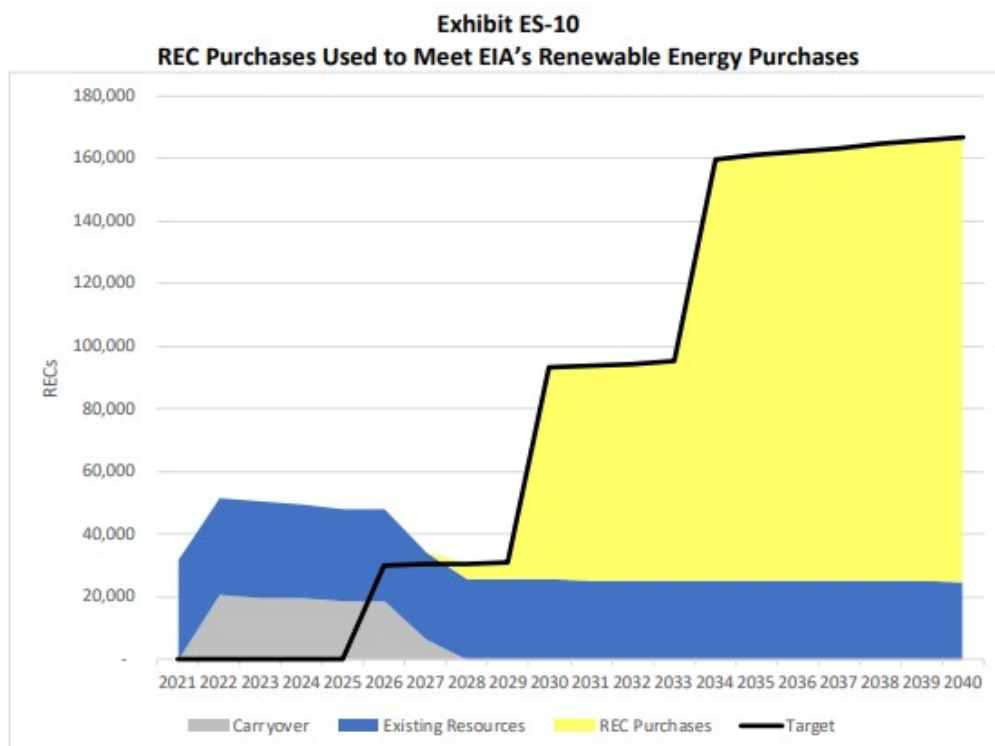
DATE: September 8, 2020

SUBJECT: Horn Rapids Solar, Storage and Training Status and Virtual Tour

The Horn Rapids Solar, Storage, and Training (HRSST) project is nearing the end of construction. The solar portion is scheduled to be energized September 30 while the energy storage is expected to be energized October 5.

In lieu of a site visit this month, we will plan to review the time lapse camera which can also be viewed at: <https://www.senserasystems.com/public/embed/M78054206981>

Background: The HRSST project is a collaboration between Energy Northwest (EN) owning and operating a 1MW/4MWh lithium-ion battery for the City of Richland's benefit. In addition, the HRSST project has a 4MW solar component owned by Tucci Energy Services with a Power Purchase Agreement for the City of Richland's benefit. The combined project provides a 2.2 multiplier on the Renewable Energy Credits (RECs) from the energy generated. The HRSST RECs, along with others received from Bonneville Power Administration (BPA) for generation improvements, will allow the City to meet most Washington State Energy Independence Act (EIA) renewable obligations through 2027. Exhibit ES-10 from the Integrated Resource Plan, included in the July 14, 2020 UAC packet, shows the existing renewable energy resources as well as the potential future requirements.



The HRSST began construction in February 2020 and quickly had force majeure delays from COVID-19 impacting international material deliveries. Total project costs are \$6.7M with costs through July of \$4.5M. COVID-19 has caused EN additional costs of \$27k and BPA additional costs of \$92k. The project has a WA Department of Commerce grant of \$3M with grant proceeds through July of \$1.4M. The City has paid invoices through July of \$2.2M with the balance of \$1.5M expected in October.

The battery container was placed August 18 and batteries were planned for installation on August 25. The fencing around the solar panels, racking, and transformers have been installed. The solar panels will be completely installed by September 30.

BPA has reversed course from expanding work because of recent COVID-19 issues. BPA had planned to begin construction of the metering August 17th. However, BPA is now not expected to be able to meet meter energization dates of September 30th and has agreed to utilize City metering until they can complete their metering installation.



UTILITY ADVISORY COMMITTEE AGENDA ITEM COVERSHEET

Meeting Date: 9/8/2020

Agenda Category: Other Informational Items

Prepared By: Clint Whitney, Energy Services Director

Subject:

Energy Services Monthly Capital Work Plan

Department:

Energy Services

Recommended Motion:

This is an informational item only.

Summary:

The attached Energy Services Capital Working Plan (CWP) monthly report includes data from up to July 2020.

Fiscal Impact:

Attachments:

1. RES Capital Working Plan Status Report



Richland Energy Services Capital Work Plan July 2020

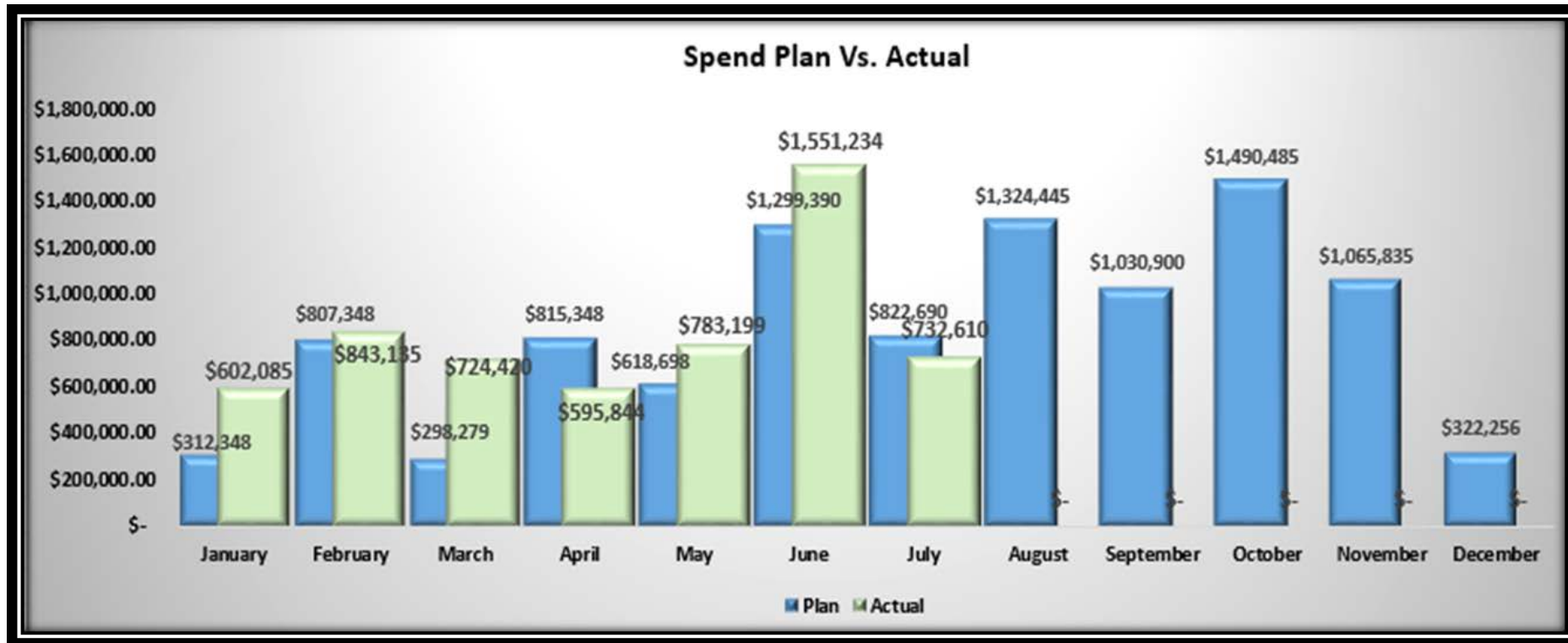


CWP Costs for July

	Approved 2020 Budget	Total Project Costs	Actual	Sum of Remaining	July
+ Leslie Rd. Substation	\$ 1,421,900	\$ -	\$ -	\$ -	\$0.00
+ Line Extensions	\$ 1,288,000	\$ 1,288,000	\$ 708,839	\$ 579,161	\$107,920.66
+ Smart Grid - Advanced Metering Infrastructure	\$ 3,771,000	\$ 1,176,312	\$ 176,137	\$ 1,000,175	\$30,009.25
+ System Improvements	\$ 4,384,000	\$ 3,730,352	\$ 2,501,729	\$ 1,228,623	\$85,842.72
+ Renewal and Replacement	\$ 1,934,200	\$ 3,091,658	\$ 2,256,092	\$ 835,566	\$448,334.11
+ Gateway Substation	\$ 1,112,000	\$ 562,700	\$ 187,841	\$ 374,859	\$59,500.45
+ Purchase Southwest Service Area Infrastructure	\$ 359,000	\$ 359,000	\$ 1,889	\$ 357,111	\$1,003.04
Grand Total	\$ 14,270,100	\$ 10,208,022	\$ 5,832,527	\$ 4,375,495	\$732,610.23

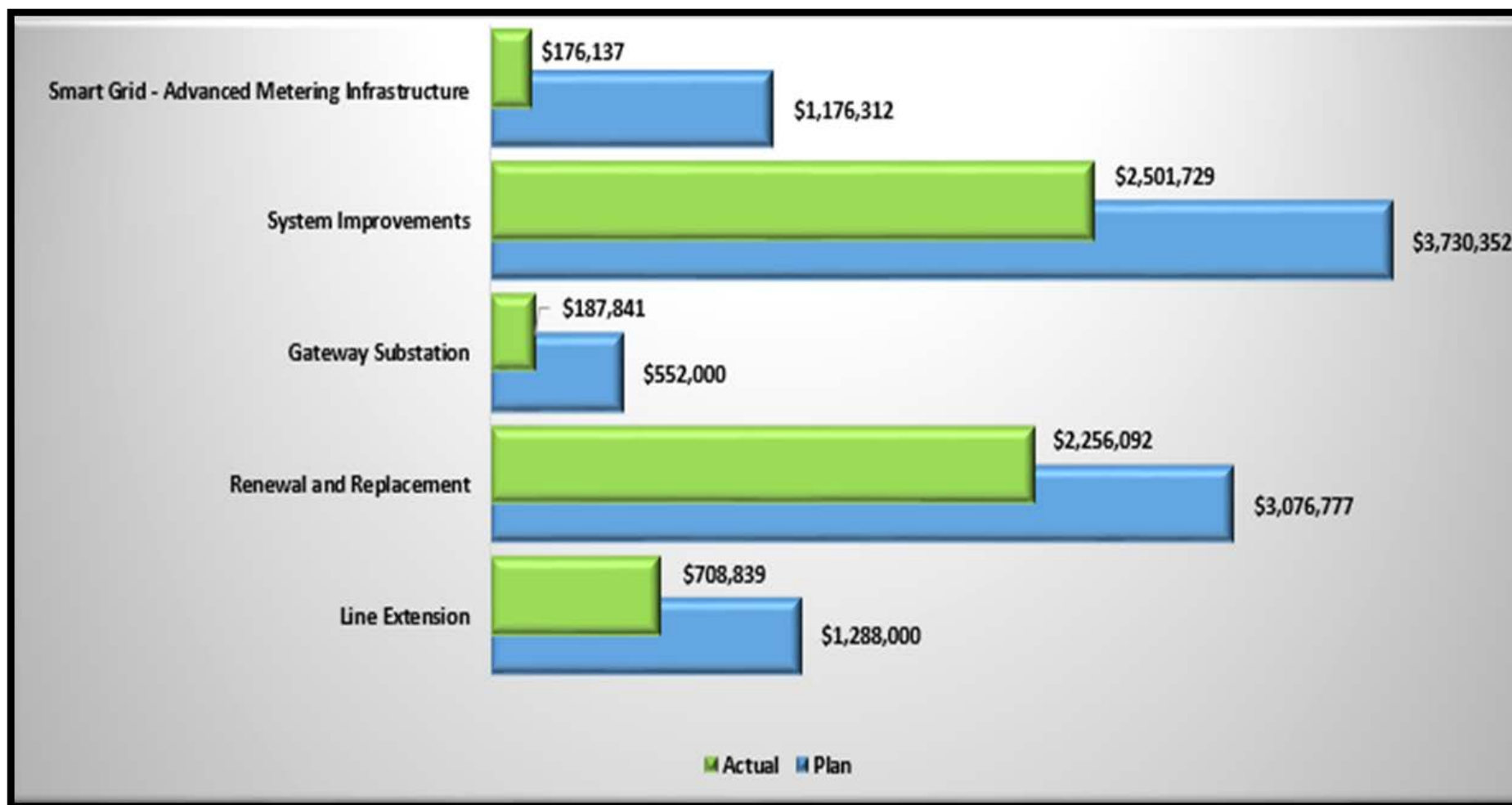
Cost Performance YTD:	\$5,832,577
Cost Performance remaining:	\$4,375,495
YTD % Complete	57%

CWP Monthly Spend Actuals

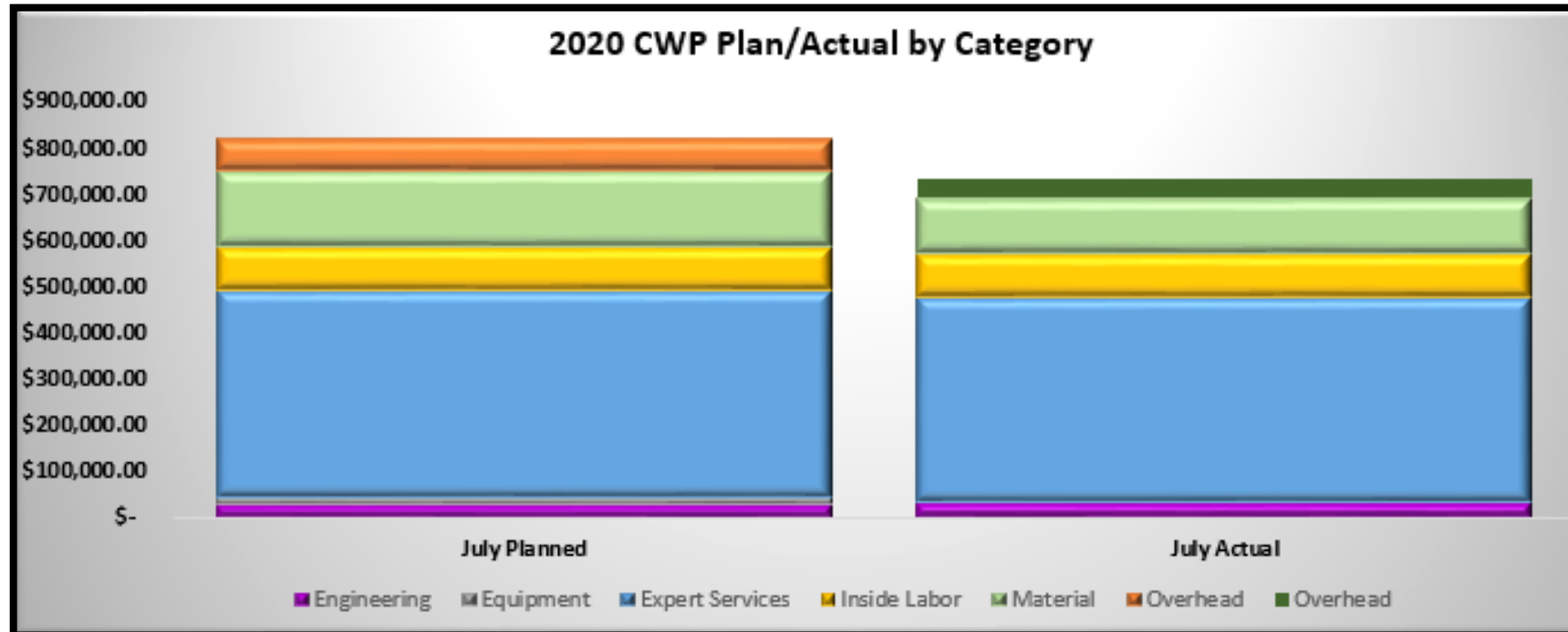


% Complete of Overall Spend Plan		
To-Date Projected	\$	4,974,101
To-Date Actual	\$	5,832,527
Variance	\$858,426	117%

Costs by Category



CWP Cost Types



Cost Type	July Planned	July Actual
Engineering	\$ 26,686.13	\$ 33,960.08
Equipment	\$ 15,400.70	\$ -
Expert Services	\$ 454,731.43	\$ 444,634.21
Inside Labor	\$ 90,468.13	\$ 93,235.00
Material	\$ 165,452.04	\$ 121,660.01
Overhead	\$ 69,951.59	\$ 40,539.38
Total	\$ 822,690.00	\$ 732,610.00



CWP Project Costs for July

	Approved 2020 Budget	Total Project Costs	Actual	Sum of Remaining	July
+ Line Extensions	\$ 1,288,000	\$ 1,288,000	\$ 708,839	\$ 579,161	\$107,920.66
+ Smart Grid - Advanced Metering Infrastructure	\$ 3,771,000	\$ 1,176,312	\$ 176,137	\$ 1,000,175	\$30,009.25
= System Improvements	\$ 4,384,000	\$ 3,730,352	\$ 2,501,729	\$ 1,228,623	\$85,842.72
= System Improvements					
+ M&O Horn Rapids Solar Storage and Training	\$ 3,500,000	\$ 2,500,000	\$ 1,238,195	\$ 1,261,805	\$0.00
+ METER INSTALLATION MATERIALS	\$ 74,000	\$ 74,000	\$ 115,282	\$ (41,282)	\$8,070.74
+ NEW & ALT SVCS - UNDERGROUND	\$ 405,000	\$ 405,000	\$ 288,126	\$ 116,874	\$40,972.95
+ Relocation of electrical facilities for the Dupont	\$ 112,000	\$ 311,352	\$ 288,142	\$ 23,210	\$14,852.21
+ Synergi - Development of ESRI Based Model	\$ -	\$ 48,000	\$ 12,220	\$ 35,780	\$0.00
+ THAYER FEEDER X-25 UG R&R	\$ -	\$ -	\$ 355,440	\$ (355,440)	\$12,274.16
+ Relay Replacement	\$ 293,000	\$ 293,000	\$ 82,046	\$ 210,954	\$919.30
= Renewal and Replacement	\$ 1,934,200	\$ 3,091,658	\$ 2,256,092	\$ 835,566	\$448,334.11
+ Renewal and Replacement	\$ 859,200	\$ 635,090	\$ 695,054	\$ (59,964)	\$37,434.67
+ Pole Replacement Program	\$ 864,000	\$ 257,000	\$ -	\$ 257,000	\$0.00
= 2020 Boring					
+ Quailwood Apartment Complex-R&R~750	\$ -	\$ 196,604	\$ 164,437	\$ 32,167	\$2,022.68
+ MAPLE RIDGE/WINDSONG UG R&R	\$ -	\$ 709,573	\$ 398,785	\$ 310,788	\$217,688.98
+ GARDEN PARK #3-UG R&R (Deferred)	\$ 211,000	\$ 472,139	\$ 393,131	\$ 79,008	\$2,919.87
= Dock Crew					
+ RIVERCREST UG R&R	\$ -	\$ 261,248	\$ 146,313	\$ 114,935	\$3,849.58
+ WASHINGTON PARK 2&3 UG R&R	\$ -	\$ 216,350	\$ 178,645	\$ 37,705	\$105.02
+ LYNNWOOD TERRACE - UG R&R	\$ -	\$ 297,640	\$ 273,974	\$ 23,666	\$180,498.58
+ THAYER/MC MURRY, UG R&R	\$ -	\$ 46,014	\$ 5,753	\$ 40,261	\$3,814.73
+ Gateway Substation	\$ 1,112,000	\$ 562,700	\$ 187,841	\$ 374,859	\$59,500.45
+ Purchase Southwest Service Area Infrastructure	\$ 359,000	\$ 359,000	\$ 1,889	\$ 357,111	\$1,003.04
Grand Total	\$ 14,270,100	\$ 10,208,022	\$ 5,832,527	\$ 4,375,495	\$732,610.23



UTILITY ADVISORY COMMITTEE AGENDA ITEM COVERSHEET

Meeting Date: 9/8/2020

Agenda Category: Other Informational Items

Prepared By: Clint Whitney, Energy Services Director

Subject:

Bonneville Power Administration Highlights

Department:

Energy Services

Recommended Motion:

This is an informational item only

Summary:

See attached memo and enclosures for this informational item.

Fiscal Impact:

Attachments:

1. BPA Highlights Memo
2. Timeline for Post 2028 Power Policy, Rates, and Contracts
3. CAISO California PUC Testimony

**MEMORANDUM**

TO: Utility Advisory Committee

FROM: Clint Whitney, Energy Services Director

DATE: September 8, 2020

SUBJECT: Bonneville Power Administration Highlights

BPA Administrator Departure

On August 6, Elliot Mainzer announced his departure as Bonneville Power Administration's (BPA) Administrator effective August 31. There were indications from him earlier this year of this possibility. With BPA reporting to the Assistant Secretary for Electricity within the Department of Energy (DOE), DOE announced John Hairston as the acting Administrator. Mr. Hairston is BPA's current Chief Operating Officer.

The departure of BPA's Administrator is significant to the City as BPA provided approximately 93% of a \$43M wholesale power budget in 2019. While the City has hedged some costs with non-federal wholesale purchases, BPA is still expected to provide 90% of wholesale power through 2028. As part of the July 14, 2020 Integrated Resource Plan (IRP) presented to UAC, BPA's Tier 1 resource is recommended to be a significant wholesale resource even after the contract with BPA expires in 2028. Recognizing the importance of the BPA Administrator to the City's wholesale power costs, the City is engaged with the selection process for the permanent BPA Administrator through Public Power Council (PPC) and Northwest Requirements Utilities (NRU). PPC represents 88 utilities while NRU represents 54 of BPA's load following customers. PPC has already communicated with DOE and Northwest congressional legislators.

Post 2028 Wholesale Power Contract Timeline

While 2028 seems like a faraway date for the expiration of the wholesale power contract with BPA, key dates are expected beginning in 2021 through 2025. In reality, contracts are expected to be signed by the end of 2025. Attached is a list of key dates pertaining to the BPA wholesale power contract. They are summarized as:

- 2020 – Customer engagement and goal development
- 2021 – Key issues for contract and rates
- 2022 – Stakeholder workshops for input
- 2023 – BPA to release draft policy followed by final record of decision

- 2024 – Draft contract templates and rate methodology
- 2025 – BPA makes contract offers
- 2026-2028 – Development work for 10/2028 power delivery

Resource Adequacy

Recall from the July 14 UAC meeting an E3 Study presented by Energy Northwest (EN). The E3 Study identified capacity resource adequacy questions in the Northwest beginning to occur. This is being exacerbated by carbon legislation and closure of baseload generation. The key takeaway is that renewable energy projects by themselves are not a solution to baseload generation capacity. While the Northwest Power Pool (NWPP) is tasked with developing generation adequacy standards, California recently experienced the results of resource inadequacy.

On Friday, August 14, 2020 and again on Saturday, August 15, California Independent System Operator (CAISO) declared an emergency and rolling electrical outages occurred at Pacific Gas & Electric, Southern California Edison and San Diego Gas & Electric as well as other utilities. This was not unexpected even with the compounding from a heat wave. A summary of the recent rolling outage can be read at:

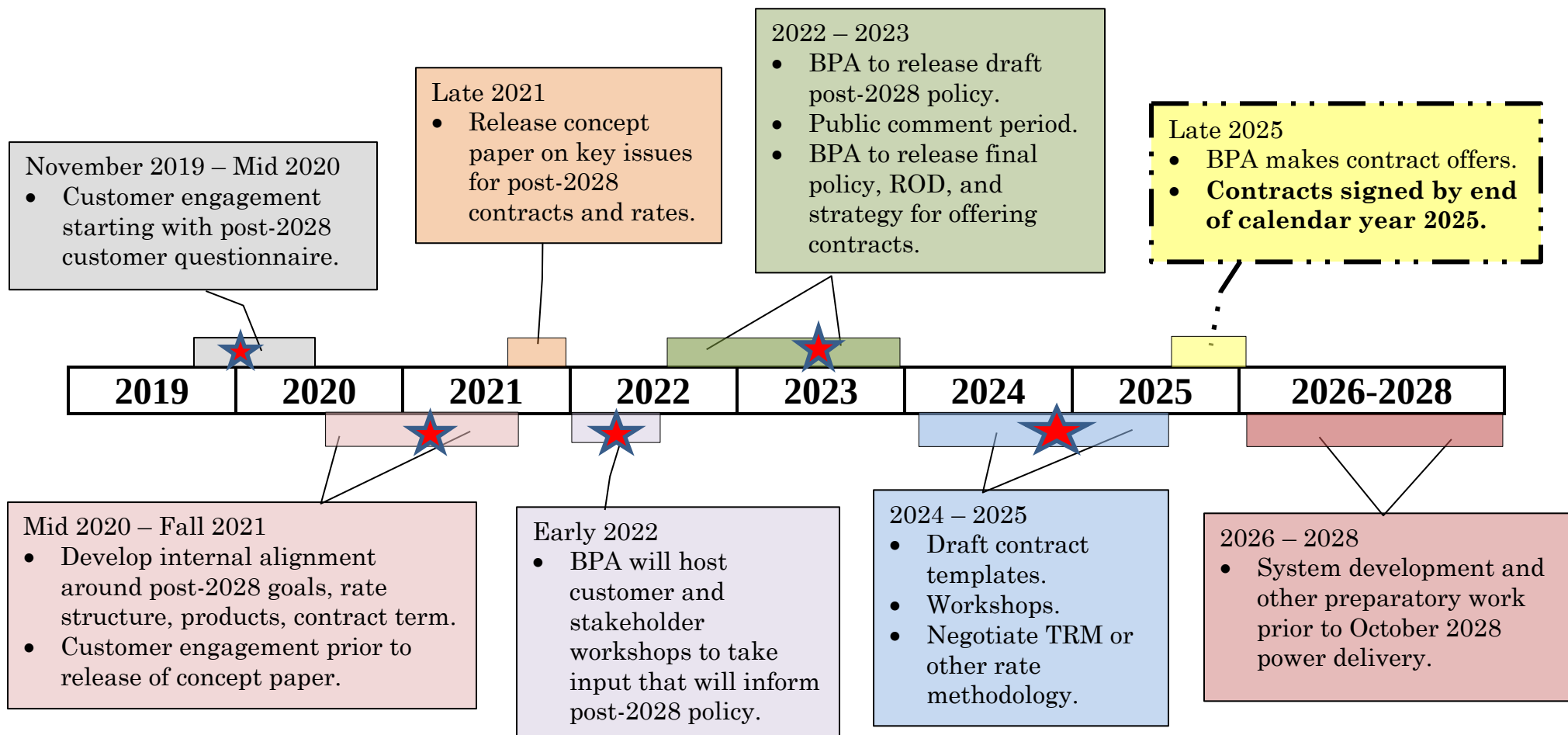
<https://www.kpbs.org/news/2020/aug/18/california-power-grid-operator-cancels-rolling-bla/>

Also attached are comments dated August 12, 2019 from CAISO to the California Public Utilities Commission (PUC) in which they identified a resource adequacy shortfall of 500MW in 2020 which increases to 2,300MW in 2021 and 2,200MW in 2022. The resource inadequacy occurs between hours ending 1700-1900 as solar generation drops off while loads actually increase. CAISO recommended PUC take action including: defer the shutdown of once through cooling (OTC) natural gas generation, take advantage of import contracting, direct procurement of new resources.

The next two years will be interesting for California and a good tell for resource adequacy issues coming in the Northwest.

As a final comment, Elliot Mainzer announced he has accepted the position of CEO for the CAISO beginning September 30, 2020.

Timeline for Post-2028 Power Policy, Rates, and Contracts



- This timeline outlines BPA's current expectation for the path to signed post-2028 power sales contract. This timeline is subject to adjustment. Expected customer engagement (though BPA expects customer engagement to occur *throughout* the process).

Timeline for Post-2028 Power Policy, Rates, and Contracts



Key Issues for Post-2028 Contracts and Rates

- Core product and service offerings
- Rate design
- Transfer service costs and business line functionalization
- Rate discounts (Low Density Discount, Irrigation Rate Discount)
- Energy Efficiency costs
- Treatment of carbon attributes and renewable energy certificates (RECs)
- Residential Exchange Program

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

Order Instituting Rulemaking to Develop an
Electricity Integrated Resource Planning
Framework and to Coordinate and Refine
Long-Term Procurement Planning
Requirements.

Rulemaking 16-02-007
(Filed February 11, 2016)

**REPLY COMMENTS OF THE CALIFORNIA INDEPENDENT
SYSTEM OPERATOR CORPORATION**

Roger E. Collanton
General Counsel
Anthony J. Ivancovich
Deputy General Counsel
Anna A. McKenna
Assistant General Counsel
Jordan Pinjuv
Senior Counsel
California Independent System
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 351-4429
Fax: (916) 608-7222
Email: jpinjuv@caiso.com

Dated: August 12, 2019

Table of Contents

I.	Introduction.....	1
II.	Discussion.....	2
A.	All Analyses Support Moving Forward with OTC Compliance Date Extensions. 2	
1.	CAISO’s System Resource Adequacy Analysis Is Directionally Consistent with SCE’s Similar Methodological Analysis.	3
2.	Commission Should Use CAISO’s System Resource Adequacy Analysis to Authorize Additional Resource Procurement and Seek OTC Compliance Date Extensions.	7
3.	The Commission Should Use the CAISO’s Operational Analysis to Guide Procurement Directives.....	8
III.	Responses to specific opening comments.....	11
A.	The Resource Adequacy Program is the Most Appropriate Mechanism to Retain OTC Resources.	12
B.	The Commission Should Diversify the Resource Adequacy Fleet to Address Reliability After the Peak Hour.	12
C.	The Commission Should Strengthen Resource Adequacy Import Rules to Take Advantage of Additional Contracting as Soon as Possible.....	12
IV.	Conclusion	13

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE
STATE OF CALIFORNIA**

Order Instituting Rulemaking to Develop an
Electricity Integrated Resource Planning
Framework and to Coordinate and Refine
Long-Term Procurement Planning
Requirements.

Rulemaking 16-02-007
(Filed February 11, 2016)

**REPLY COMMENTS OF THE CALIFORNIA INDEPENDENT
SYSTEM OPERATOR CORPORATION**

Pursuant to the *Assigned Commissioner and Administrative Law Judge's Ruling Initiating Procurement Track and Seeking Comment on Potential Reliability Issues* (Ruling) issued on June 20, 2019, the California Independent System Operator Corporation (CAISO) hereby provides reply comments in response parties' July 22, 2019 opening comments filed regarding potential reliability issues.

I. Introduction

Opening comments in response to the Ruling indicate that the vast majority of parties agree with Energy Division staff's assessment that there are significant impending system reliability concerns by 2021. Supplemental analyses conducted by the CAISO, Southern California Edison Company (SCE), and the California Public Advocates Office (Cal Advocates) corroborate Energy Division's analysis, though the system resource deficiencies differ based on input assumptions and study methodologies. Based on the broad agreement regarding near-term system needs and the consistency between the various analyses, the CAISO recommends that the Commission:

(1) Move forward with efforts to extend the once-through-cooling (OTC) regulation compliance dates for existing generation resources. At minimum, the Commission should work toward extending the OTC compliance date for the Alamitos Generating Station (Alamitos) as it provides both local and system reliability benefits. The Commission should identify any other OTC units that will be needed for system reliability, taking into account ongoing efforts to procure existing, under development, or new resources (including reliable imports). The Commission should make the case for

extending any additional OTC compliance dates to the State Water Resources Control Board as necessary to maintain system reliability, with the understanding that the requested compliance extension(s) may not ultimately be needed.

(2) Develop a procurement plan for 2020-2022 to meet reliability needs and facilitate the retirement of any generating unit that receives an OTC compliance date extension. At a minimum, this comprehensive plan should:

- a. Direct resource adequacy procurement for uncontracted resources that are operational or mothballed;
- b. Direct increased resource adequacy procurement for uncontracted import resources;
- c. Ensure resources under construction are on-track for their online dates so that they do not exacerbate reliability concerns; and
- d. Direct procurement for new resources.

To assist the Commission in making these determinations, the CAISO conducted a system resource adequacy analysis—similar to those conducted by Energy Division staff and SCE—that further demonstrates the short-term reliability needs. The CAISO’s system resource adequacy analysis identifies a 500 MW system resource adequacy deficiency in 2020, which increases to 2,300 MW and 2,200 MW in 2021 and 2022, respectively. In addition, the CAISO refined its operational analysis presented in opening comments. These refinements indicate a greater operational deficiency reaching maximums of 2,300 MW, 4,400 MW, and 4,700 MW in 2020, 2021, and 2022, respectively. The CAISO recommends that the Commission take immediate action on the basis of these deficiencies to ensure short-term resource adequacy sufficiency.

II. Discussion

A. All Analyses Support Moving Forward with OTC Compliance Date Extensions.

The CAISO, SCE, and Cal Advocates conducted separate system resource adequacy analyses that complement Energy Division’s system resource adequacy analysis. These analyses identify consistent near-term system resource adequacy needs, though the quantity of the need varies based on the different assumptions and methodologies used.

Since filing its opening comments, the CAISO further validated the near-term system resource adequacy need by (1) providing a new system resource adequacy analysis using net qualifying capacity (NQC) and effective load carrying capability (ELCC) counting principles and (2) refining the operational analysis provided in opening comments. The CAISO's system resource adequacy analysis provides an apples-to-apples comparison with the analysis submitted by SCE (Southern California Edison Company, *Opening Comments*, July 22, 2019, (SCE Opening Comments)).¹ The CAISO used a methodology similar to the one employed by SCE to identify a 500 MW system resource adequacy deficiency in 2020, which increases to 2,300 MW and 2,200 MW in 2021 and 2022, respectively. The CAISO's updated operational analysis again focuses on the hours after peak. The CAISO refined the operational analysis to more accurately reflect the expected available generation from solar, wind, and hydro resources during the post-system peak hours. The CAISO's operational analysis shows a reliability deficiency greater than previously projected—up to 2,300 MW, 4,400 MW, and 4,700 MW in 2020, 2021, and 2022, respectively. The CAISO describes both its resource adequacy analysis and its updated operational analysis below.

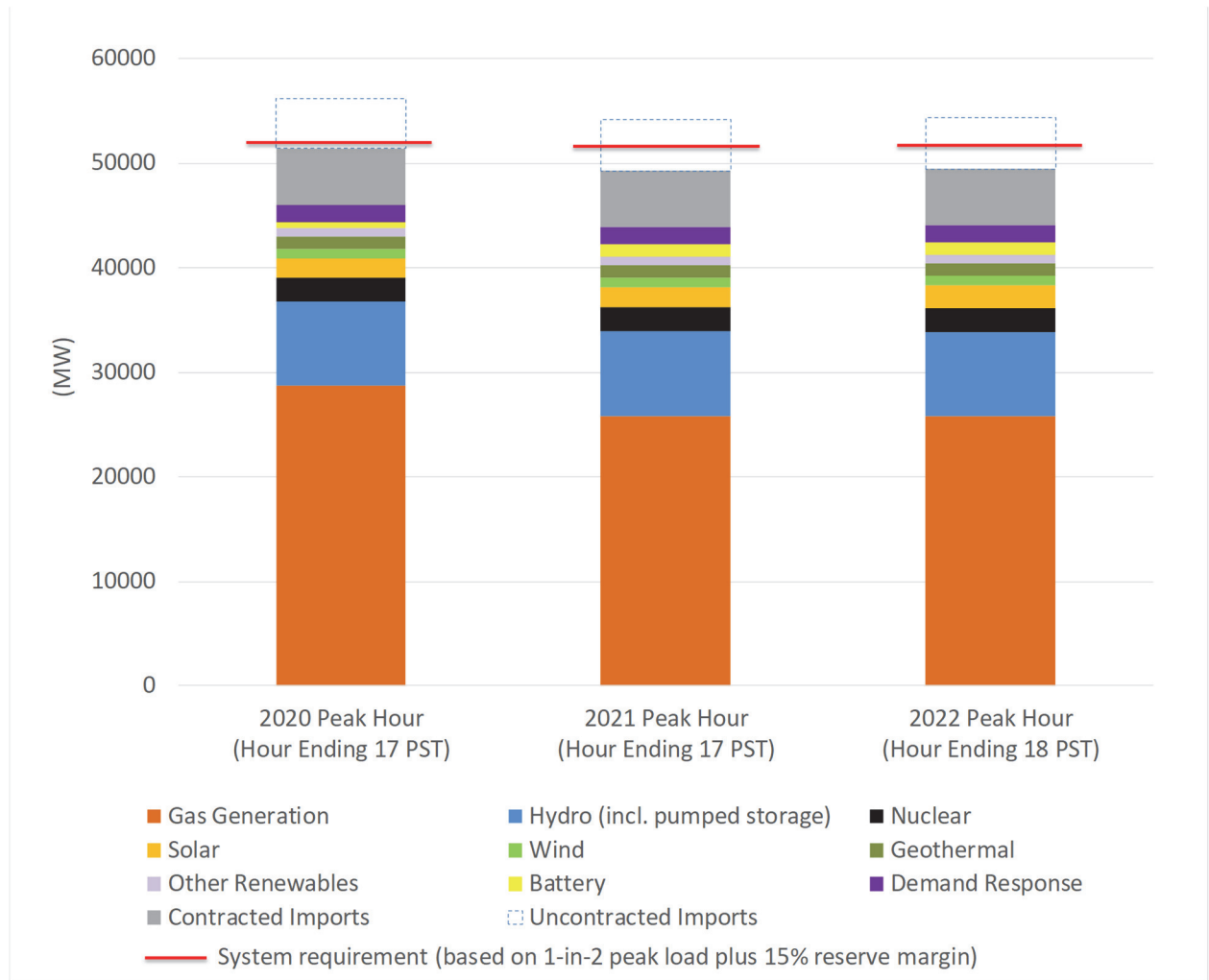
1. CAISO's System Resource Adequacy Analysis Is Directionally Consistent with SCE's Similar Methodological Analysis.

In opening comments, SCE provided a system resource adequacy (single peak hour) analysis using NQC and ELCC counting principles to estimate a system resource adequacy shortfall of 1,443 MW in 2020, 5,517 MW in 2021, and 4,458 MW in 2022.² In response, the CAISO conducted its own resource adequacy analysis to test SCE's results. The CAISO's resource adequacy analysis shows a 500 MW system resource adequacy deficiency in 2020, which increases to 2,300 MW and 2,200 MW in 2021 and 2022, respectively. These results are summarized in Figure 1 below.

¹ The CAISO developed a comparison with SCE's analysis because SCE provided detailed numerical data to allow for a more robust investigation.

² SCE Opening Comments, Table 8: Estimated System RA Shortfall (RA Capacity (MW)), p. 27.

Figure 1: 2020, 2021, 2022 System Resource Adequacy



The CAISO’s resource adequacy analysis generally uses the same inputs and assumptions as SCE’s analysis and adheres to the Commission’s resource adequacy program counting rules using September NQC or ELCC values, as appropriate. To calculate the system resource requirements per the Commission’s guidelines, the CAISO used the California Energy Commission (CEC) 2018 Integrated Energy Policy Report Update (2018 IEPR Update) 1-in-2 mid-mid peak load forecast for the coincident CAISO footprint and applied a 15 percent reserve margin.³ The peak hour of the year occurs consistently in September. In 2020 and 2021, the

³ California Energy Commission, *2018 Integrated Energy Policy Report Update*, March 21, 2019, (2018 IEPR Update), <https://efiling.energy.ca.gov/GetDocument.aspx?tn=226461&DocumentContentId=57240> and California Public Utilities Commission, *2018 Resource Adequacy Report*, available at: <https://www.cpuc.ca.gov/ra/>.

projected peak falls within hour ending 17 (based on P.S.T. or 6:00 p.m. P.D.T.).⁴ By 2022, the peak shifts to hour ending 18 (based on P.S.T. or 7:00 p.m. P.D.T.).

The CAISO used the September values from the 2019 NQC list for all natural gas-fired, hydro, nuclear, and renewable resources (excluding wind and solar).⁵ The CAISO included the 1,020 MW Moss Landing Power Plant (Moss Landing), which is subject to OTC compliance. The CAISO's included Moss Landing in its analysis because as recently as March 2019, the Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) stated that is expected to comply with OTC regulation by making the necessary capital investment upgrades to reduce impingement and entrainment.⁶ In a change from the CAISO's July 22 analysis, the 500 MW Sutter Energy Center was removed from the available internal generation because it is not currently in the CAISO balancing authority area and therefore should fall into the category of potential "Uncontracted Imports."⁷

The CAISO's existing wind and solar installations are based on the 2019 NQC list, while resources with online dates from 2020 through 2022 are based on full capacity deliverability status resources from the 2017 IRP RESOLVE dataset.⁸ All resource adequacy values for wind and solar are based on September ELCC values adopted in Decision 19-06-026.⁹ Battery storage resources include existing batteries, incremental investor-owned utility procured batteries based on the most recent *Unified Resource Adequacy and Integrated Resource Plan Inputs and Assumptions*¹⁰ document, and 558 MW of transmission- and distribution-connected batteries from PG&E's recent procurement authorized in Resolution E-4949. Demand response quantities are based on data provided by the investor-owned utilities to the CAISO in its 2019-2020

⁴ The CAISO's analysis is conducted in Pacific Standard Time (P.S.T.) and does not account for daylight savings. In September of each year, hours ending 15 through 20 correspond to 4:00 p.m. through 9:00 p.m. Pacific Daylight Time (P.D.T.).

⁵ <http://www.caiso.com/Documents/NetQualifyingCapacityList-2019.xlsx>

⁶ *2019 Report of the Statewide Advisory Committee on Cooling Water Intake Structures*, (March 8, 2019), pp. 19-21. Available at: https://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/saccwis/docs/sac2019fnl.pdf

⁷ The CAISO notes that Sutter can effectively meet system capacity requirements if the proper contracting and import arrangements are in place.

⁸ The RESOLVE model with updated 2017 IEPR assumptions file "RESOLVE_2017IEPRupdate_2018-04-17.zip," available at: <ftp://ftp.cpuc.ca.gov/resources/electric/irp2017/resolvemodel>.

⁹ See D.19-06-026, *Order Instituting Rulemaking to Oversee Resource Adequacy*, July 5, 2019, Appendix A, Ordering Paragraph 19, p. 64.

¹⁰ California Public Utilities Commission, Energy Resource Modeling Section, Energy Division, *Unified Resource Adequacy and Integrated Resource Plan Inputs and Assumptions – Guidance for Production Cost Modeling and Network Reliability Studies*, March 29, 2019, p. 80, see footnote 96: http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/2018/Combined_IOU_Storage_2017update_public.xlsx

Transmission Planning Process and were held constant from 2020 through 2022. The CAISO also used a fixed quantity of contracted imports for its analyses based on the simple average of September imports from 2015 through 2018. Detailed input assumptions for the resource adequacy-based analysis are described in Attachment A to these comments.

The CAISO's resource adequacy analysis generally agrees with the direction of SCE's findings and notes that differences between the analyses are largely explained by different assumptions for hydro, natural gas-fired resources, and batteries. There is an approximately 3,200 MW difference between SCE's (5,517 MW) and the CAISO's (2,300 MW) shortfall in 2021 as shown in Table 1.

Table 1:
Sample 2021 CAISO and SCE System Resource Adequacy Analysis Reconciliation (MW)

	CAISO analysis	SCE analysis	Difference
	[A]	[B]	[C]
<i>Calculations</i>			<i>[A] minus [B]</i>
Hydro	8,074	6,358	1,716
Natural gas	25,833	24,864	969
Battery (existing and future)	1,223	673	550
Total			3,235

Hydro resources accounted for a net difference of approximately 1,700 MW, because the CAISO included all hydro resources as listed on the 2019 NQC list published July 2019 whereas SCE used the 2019 NQC list as of February 12, 2019.¹¹ In addition, the CAISO notes that it accounted for Hoover as an import, whereas SCE included Hoover generation as a hydro resource.

The CAISO's analysis includes approximately 1,000 MW more natural gas resources than SCE's analysis, largely because the CAISO includes Moss Landing (1,020 MW) as an available unit. On the other hand, the CAISO removed the Sutter Energy Center (500 MW) as an available resource, which is included in the SCE analysis.¹² The Sutter Energy Center's

¹¹ SCE Opening Comments, p. 15.

¹² As noted above, the CAISO removed the Sutter Energy Center from the available thermal generation list because it is not in the CAISO balancing authority area and therefore should fall into the category of potential "Uncontracted

exclusion, however, is offset by the CAISO including approximately 450 MW in thermal resources that are not included SCE's analysis.¹³

The CAISO's analysis includes approximately 550 MW more in battery capacity than SCE's analysis.¹⁴ The CAISO analysis includes existing batteries, incremental investor-owned utility procured batteries,¹⁵ and 558 MW of transmission- and distribution-connected batteries from PG&E's recent procurement authorized in Resolution E-4949. The CAISO assumes all battery resources procured and under construction will be operational according to publicly available schedules, whereas the CAISO understands SCE made some conservative adjustments to the battery amounts to reflect expectations of in-service dates.

There are minor differences between the CAISO and SCE analyses for contracted imports, demand response, wind, solar, and other renewable (RPS eligible) resources, the differences effectively net out. Collectively, these capacity counting differences help explain the variance between SCE's and CAISO's resource adequacy-based analyses.

2. Commission Should Use CAISO's System Resource Adequacy Analysis to Authorize Additional Resource Procurement and Seek OTC Compliance Date Extensions.

The CAISO's resource adequacy-backed analysis represents a detailed and accurate representation of the near-term reliability challenges to the electric system. The Commission sets system resource adequacy requirements based on a 1-in-2 peak load forecast using NQC values to quantify capacity availability. The CAISO's resource adequacy analysis shows that there will be a capacity deficiency in excess of 2,000 MW in 2021 based on current Commission adopted NQC counting methodologies and planning reserve margin criteria. The CAISO's analysis provides the most detailed and accurate assessment of the deficiency and it

Imports." The CAISO notes that Sutter can effectively meet system capacity requirements if the proper contracting and import arrangements are in place.

¹³ This 450 MW difference includes 100 MW of mothballed units that the CAISO analysis assumes can be contracted for, 165 MW assumed retired by SCE, and 185 MW of NQC list discrepancies or missing units.

¹⁴ For CAISO's battery numbers, see Attachment A for a detailed discussion on how Commission Energy Division staff for IRP included all domains of battery storage (customer, distribution, and transmission) towards the resource adequacy system requirement. The CAISO is concerned by this practice as behind-the-meter customer sited resources do not have the same must offer obligations or be required to respond to CAISO dispatch.

¹⁵ California Public Utilities Commission, Energy Resource Modeling Section, Energy Division, *Unified Resource Adequacy and Integrated Resource Plan Inputs and Assumptions – Guidance for Production Cost Modeling and Network Reliability Studies*, March 29, 2019, p. 80, see footnote 96:
http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/2018/Combined_IOU_Storage_2017update_public.xlsx

comports with the current methodology for setting and meeting resource adequacy obligations. As a result, the Commission should use this analysis to establish a minimum procurement requirement from new resources or resources that receive an extension to their OTC regulation compliance date. The Commission should also use the CAISO's analysis to justify extending the OTC regulation compliance date for Alamitos at the least. The Commission should identify any other OTC units that will be needed for system reliability, taking into account ongoing efforts to procure existing, under development, or new resources (including reliable imports). The Commission should make the case for extending any additional OTC compliance dates to the State Water Resources Control Board as necessary, with the understanding that the requested compliance extension(s) may not ultimately be needed.

The Commission should also consider whether additional procurement is necessary to address potential delays in the in-service dates for any new resources assumed in the CAISO system resource adequacy analysis. For example, the Commission should seek confirmation from PG&E on whether battery resources authorized under Resolution E-4949 included in the CAISO's analysis are proceeding in light of PG&E's bankruptcy.¹⁶ Similarly, the Commission should ensure other projects under construction meet their in-service dates.

3. The Commission Should Use the CAISO's Operational Analysis to Guide Procurement Directives.

As described in opening comments, CAISO's operational analysis complements the system resource adequacy analysis by showing the capability of the projected resource adequacy fleet to serve load after the gross peak hour based on historical operational performance rather than static NQC and ELCC capacity values. The CAISO updated some of its assumptions as described below and as provided in detail in Attachment B.

As in its prior analysis, the CAISO assumed all resources would produce energy up to their NQC value except wind, solar, and hydro (including pumped storage) resources.¹⁷ The CAISO modeled wind, solar, and hydro resources based on the actual generation profiles for those resources. In contrast to the analysis submitted in its opening comments, the CAISO used historical data from September 2015 through 2018 to calculate median generation per hour for

¹⁶ See Attachment A for detailed discussion on battery storage treatment.

¹⁷ See Attachment B for detailed assumptions and inputs. Wind and solar are based on a generalized generation profile for each resource. Hydro (including pumped storage) resources are assumed to produce approximately 70 percent of the total NQC value to reflect historical generation plus provision of ancillary services.

wind and solar generation profiles. In the previously submitted operational analysis CAISO used a projected September 2030 generic resource profile. The change was necessary because the generic 2030 solar generation profile assumed a larger penetration of solar resources with tracking capability than currently exists. For consistency, the CAISO updated the wind and hydro generation profiles to reflect the historical September 2015 through 2018 median generation as well.

The CAISO's analysis includes energy from "contracted imports" based on the average resource adequacy-backed import levels from September from 2015 through 2018. The average reflects recent contracting experience during both drought and non-drought years. In addition to the projected resource adequacy capacity, the analysis includes a provision for "uncontracted imports." These uncontracted imports reflect uncontracted energy up to the maximum import capability (MIC), which the CAISO assumed to be static (at 10,193 MW) for the analysis.

The CAISO continued to use the CEC's 2018 IEPR Update in its operational analysis to establish the projected load per hour and to calculate an hourly capacity need based on the maximum load in each hour plus a planning reserve margin (PRM) equal to 15 percent of the hourly demand. This hourly capacity need shows that although loads remain high after the peak hour, the reduction in solar generation greatly reduces the total resource adequacy-backed available energy output.

Figures 2, 3, and 4 below show the energy production from the projected resource adequacy fleet from hours ending 15 through 20 in 2020, 2021, and 2022, respectively.¹⁸

¹⁸ The CAISO's analysis is conducted in Pacific Standard Time (P.S.T.) and does not account for daylight savings. In September of each year, hours ending 15 through 20 correspond to 4:00 p.m. through 9:00 p.m. Pacific Daylight Time (P.D.T.).

Figure 2: 2020 Projected Energy Production from Resource Adequacy Fleet

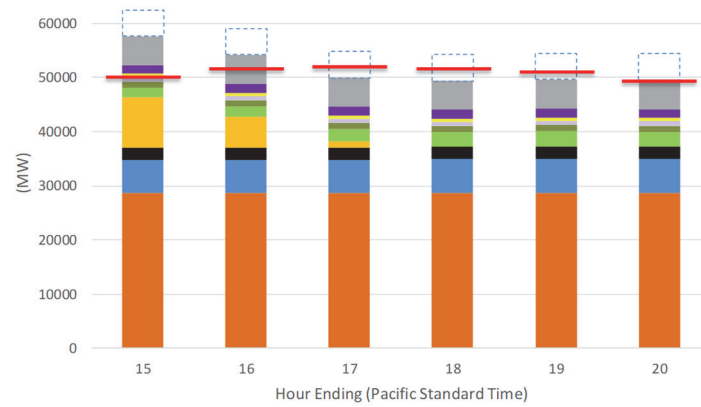


Figure 3: 2021 Projected Energy Production from Resource Adequacy Fleet

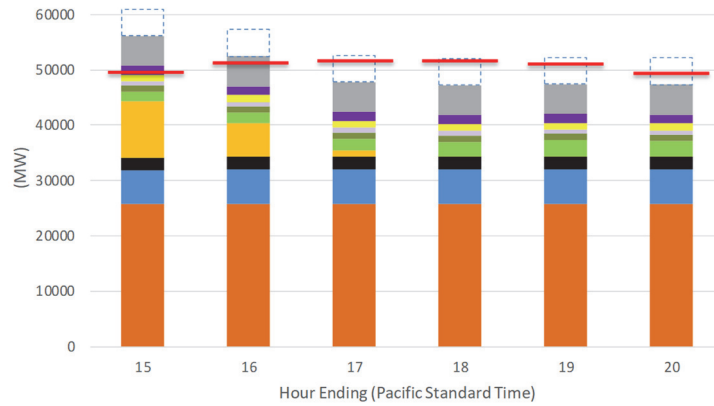
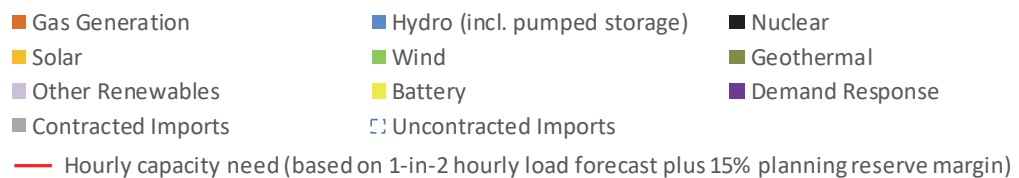
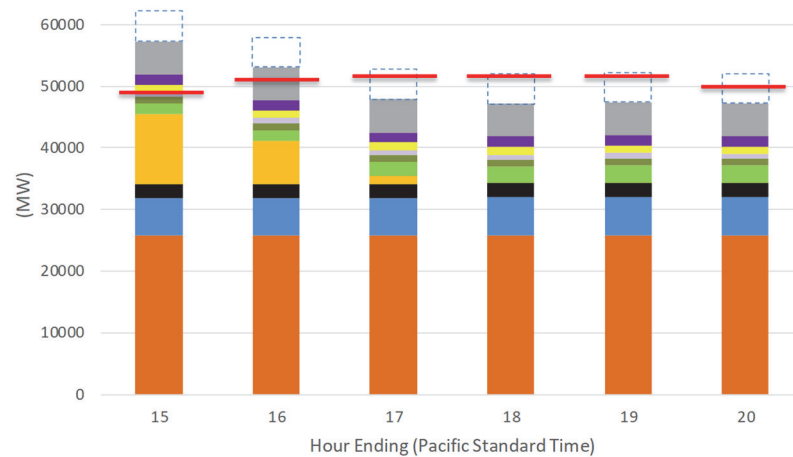


Figure 4: 2022 Projected Energy Production from Resource Adequacy Fleet



In Figure 2, the 2020 analysis shows a reliability concern at peak (hour ending 17) and in the two hours immediately after. Specifically, resource adequacy-backed energy exceeds the hourly capacity need only through hour ending 16. In hours ending 17 through 19, the resource adequacy-backed energy is 2,200 MW, 2,300 MW, and 1,500 MW less than the hourly capacity need, respectively. In hour ending 20 the energy need is at the margin of what resource-adequacy backed capacity can supply. The disparity between resource adequacy-backed energy and the hourly capacity need reflects the reliability gap the Commission should address to ensure the CAISO has the resources to serve load reliably. This analysis also shows that the system is implicitly relying on uncontracted (non-resource adequacy) imports to balance demand.

Figure 3 shows that the 2021 reliability gap expands to cover four hours—from hours ending 17 through 20. The reliability gap is 4,000 MW, 4,400 MW, 3,800 MW, and 2,200 MW during hours ending 17, 18, 19, and 20, respectively.

Figure 4 shows that the 2022 reliability gap continues to cover hours ending 17 through 20, though the peak hour shifts from hour ending 17 to 18. The reliability gap is 3,900 MW, 4,700 MW, 4,200 MW, and 2,600 MW during hours ending 17, 18, 19, and 20, respectively.

These results almost double the reliability gap described in CAISO’s opening comments yet may still be considered conservative. In addition to the concerns noted in CAISO’s opening comments,¹⁹ this updated operational analysis still does not account for the significant range of wind generation actually observed during hours ending 17, 18, 19 and 20. As noted above, the analysis relies on new resources assumed to be online to support reliability, including the 558 MW of transmission-connected battery resources authorized under Resolution E-4949. The Commission should seek confirmation from PG&E on whether these battery projects are proceeding on schedule. Similarly, the Commission should ensure other projects under construction meet their in-service dates.

III. Responses to specific opening comments

The CAISO provides responses to specific opening comments below.

¹⁹ See California Independent System Operator Corporation, *Opening Comments*, July 22, 2019, p. 6.

A. The Resource Adequacy Program is the Most Appropriate Mechanism to Retain OTC Resources.

PG&E and SCE both recommend that the CAISO use the reliability must run (RMR) mechanism to procure OTC resources.²⁰ Although the CAISO retains the right to exercise the RMR mechanism, the resource adequacy program is the “frontstop” and as such, any needed OTC resources should be pursued in the first instance through LSE bilateral procurement.

B. The Commission Should Diversify the Resource Adequacy Fleet to Address Reliability After the Peak Hour.

Some parties have either requested additional solar resource procurement or intend to make additional solar resource procurement to counts towards system resource adequacy.²¹ For example, California Community Choice Association (CalCCA) noted in opening comments that 1,047 MW of the 1,597 MW in nameplate capacity contracted to come online before August 2021 is solar.²² Though the September ELCC value is currently 14 percent, the later peak hour in 2022 (hour ending 18 or 7 p.m.) reduces average solar generation to only 0.04 percent of maximum generation.²³ In other words, the 1,047 MW of new contracted for solar capacity will effectively be providing on average, under non-cloudy conditions 42 MW of energy during peak system demand. As the CAISO analysis shows, the reliability gap in the hours after peak is almost twice as much as during the peak hour. The Commission should ensure diversity in the resource adequacy fleet so that it can provide sufficient energy both during the peak and in the hours immediately after the peak.

C. The Commission Should Strengthen Resource Adequacy Import Rules to Take Advantage of Additional Contracting as Soon as Possible.

The CAISO agrees with parties that there is no reason to discount the resource adequacy

²⁰ Pacific Gas & Electric Company, *Opening Comments*, July 22, 2019, pp. 5-6 and SCE Opening Comments, p. 33.

²¹ California Community Choice Association, *Opening Comments*, July 22, 2019 p. 11 (CalCCA Opening Comments), p. 11; Solar Energy Industries Association opening comments, p. 7.

²² CalCCA Opening Comments, p. 11.

²³ See Attachment B for CAISO assumptions on solar generation profile.

qualifying capacity for incremental imports.²⁴ While the MIC itself is not a limiting factor,²⁵ it is critical that the Commission ensure that needed imports are contracted for earlier because supplies are becoming increasingly scarce in light of prevailing changes throughout the west.²⁶ For example, the Northwest Power and Conservation Council, which releases periodic regional power plans covering Idaho, Montana, Oregon, and Washington, noted several significant changes since its last plan in 2016.²⁷ Specifically, the changes include major coal plant retirements, a tightening of resource adequacy in the northwest, policy direction to reduce carbon emissions and increase renewable procurement. Similarly, there have been observations that merchant generation in the southwest capable of importing energy into California are being procured by utilities in Arizona.²⁸ Given these trends, the Commission should strengthen its resource adequacy import rules as proposed by the CAISO²⁹ so that incremental imports can be procured as soon as possible to address the near-term reliability gap. The most appropriate entities to conduct market analysis on import trends or feasibility are the load serving entities who can then provide such information to the Commission.³⁰

IV. Conclusion

The CAISO's resource adequacy analysis shows that there will be a capacity deficiency in excess of 2,000 MW based on current NQC counting methodologies. The CAISO's analysis provides the most detailed and accurate assessment of the deficiency and it comports with the current methodology for setting and meeting resource adequacy obligations. As a result, the Commission should use this analysis to establish a minimum procurement requirement from new resources or resources that receive an extension to their OTC regulation compliance date. The

²⁴ Bonneville Power Administration, *Opening Comments*, July 22, 2019, p. 4; Department of Market Monitoring of the California Independent System Operator Corporation, *Opening Comments*, July 22, 2019, p. 5; Powerex Corp., *Opening Comments*, July 22, 2019, p. 4 (Powerex Opening Comments); Public Generating Pool, *Opening Comments*, July 22, 2019, pp. 6-7.

²⁵ CalCCA Opening Comments, p. 14; City and County of San Francisco *Opening Comments*, July 22, 2019 p.7, (CCSF Opening Comments); Powerex Opening Comments, p. 5.

²⁶ Calpine Corporation *Opening Comments*, July 22, 2019, p. 4; Center for Energy Efficiency and Renewable Technologies, *Opening Comments*, July 22, 2019, pp. 2-3; Powerex Opening Comments, p.4.

²⁷ See https://www.nwcouncil.org/sites/default/files/2019_0716_p1.pdf

²⁸ See Comments of Calpine Corporation: <http://www.caiso.com/Documents/CalpineComments-ResourceAdequacyEnhancements-StrawProposalPart1.pdf>

²⁹ CAISO opening and reply comments to Assigned Commissioner's Ruling Seeking Comment on Clarification to Resource Adequacy Import Rules, July 3, 2019, R. 17-09-020.

³⁰ CalCCA Opening Comments, p. 15.

Commission should also use the CAISO's analysis to justify extending the OTC regulation compliance date for at least Alamitos.

Several parties³¹ have requested more rigorous or complex analysis to better under the reliability gap. For system resource adequacy, a spreadsheet-based analyses, such as the one provided by the CAISO, is sufficient for meeting the Commission's established standard. While the CAISO encourages the Commission to develop more sophisticated reliability-based analysis in the future, the near-term needs are clear, well supported, and extremely urgent. The CAISO urges the Commission to take decisive action now to address these near-term needs. The CAISO appreciates the opportunity to provide these reply comments and looks forward to working with the Commission to address these reliability issues.

Respectfully submitted,

By: /s/ Jordan Pinjuv

Roger E. Collanton
General Counsel
Anthony J. Ivancovich
Deputy General Counsel
Anna A. McKenna
Assistant General Counsel
Jordan Pinjuv
Senior Counsel
California Independent System
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 351-4429
Fax: (916) 608-7222
Email: jpinjuv@caiso.com

Attorneys for the California Independent System
Operator Corporation

Date: August 12, 2019

³¹ For example: Alliance for Retail Energy Markets, *Opening Comments*, July 22, 2019, p. 4; CalCCA Opening Comments, p. 9; CCSF Opening Comments, p. 2; First Solar, Inc., *Opening Comments*, July 22, 2019 p. 2; Vote Solar, *Opening Comments*, July 22, 2019, p. 3; Western Power Trading Forum, *Opening Comments*, July 22, 2019, pp. 3-4.

Attachment A
CAISO Input Assumptions and Tabular Data for Resource Adequacy Analysis

Table A-1 below summarizes the input assumptions for Figure 1 and Table 1.

Table A-1: CAISO Load and Resource Assumptions for Resource Adequacy Analysis

System Requirement	
System Requirement	California Public Utilities Commission: “System requirements are determined based on the each LSEs CEC adjusted forecast plus a 15% planning reserve margin.” https://www.cpuc.ca.gov/ra/
Load	California Energy Commission 2018 Integrated Energy Policy Report Update (2018 IEPR Update) 1-in-2 system peak Mid/Mid Load (2020 and 2021 peak hour = hour ending 17 PST; 2022 peak hour = hour ending 18 PST). https://efiling.energy.ca.gov/GetDocument.aspx?tn=226461&DocumentContentId=57240
Planning Reserve Margin	15% https://www.cpuc.ca.gov/ra/
Generation	
Net Qualifying Capacity	2019 Net Qualifying Capacity (NQC) list: http://www.caiso.com/Documents/NetQualifyingCapacityList-2019.xlsx (Version dated July 10, 2019.) Resource IDs from the NQC list were cross-referenced with CAISO MasterFile for resource category verification.
Mothballed Units	CAISO’s list is http://www.caiso.com/Documents/AnnouncedRetirementAndMothballedList.xlsx#search=mothball
Gas Generation	
Existing Gas Generation	Existing generators from 2019 NQC list based on September values. Does not include once-through cooling (OTC), Mothballed, Announced Retired and New Units. Dynamic scheduled generators included in Imports.
Once-through Cooling compliance	Once-through Cooling (OTC) retirements based upon compliance dates. Moss Landing is assumed to continue operation. https://efiling.energy.ca.gov/GetDocument.aspx?tn=228353&DocumentContentId=59542

Mothballed	Based on CAISO's published list (see above). Mothballed units are assumed available, except for Inland Empire. Inland Empire is assumed retired by end of 2019. <i>See</i> Inland Empire Energy Center Decommissioning and Demolition Plan, Docket Number: 01-AFC-17C, TN Number: 228806, June 20, 2019, p.1.
New Units	Announced new gas generation (includes repowering for Huntington Beach and Alamitos).
Sutter Energy Center	Not included in analysis because not in CAISO balancing authority area and currently uncontracted (considered Uncontracted Imports)
Hydro (including Pumped Storage)	
Large Hydro	>30 MW hydro resources within the CAISO footprint. Qualifying capacity based on 2019 NQC list based on September values. Hoover accounted for under Contracted Imports.
Small Hydro	≤30MW, RPS eligible resources within the CAISO footprint. Qualifying capacity based on 2019 NQC list based on September values.
Pumps with net qualifying capacity	Pumps designated to provide ancillary services with an NQC value. Qualifying capacity based on 2019 NQC list based on September values.
Pumped Storage	Includes Helms, San Luis and Eastwood.
Nuclear	
Nuclear	Diablo Canyon only. Qualifying capacity based on 2019 NQC list based on September values. Palo Verde accounted for under Contracted Imports.
Solar	
Existing Solar	Total installed values from 2019 NQC list based on September values. Qualifying capacity based on effective load carrying capability for September from D.19-06-026 (<i>i.e.</i> , 14%).
Future Solar	Total installed values from the Commission's RESOLVE model with updated 2017 IEPR assumptions file "RESOLVE_2017IEPRupdate_2018-04-17.zip" is available at: ftp://ftp.cpuc.ca.gov/resources/electric/irp2017/resolvemodel . Resource Build = FCDS. Since RESOLVE only produces outputs for 2018 and 2022, buildout for 2020 through 2022 were cross referenced against the CAISO interconnection queue. Qualifying capacity based on effective load carrying capability for September from D.19-06-026 (<i>i.e.</i> , 14%).
Wind	
Existing Wind	Total installed values from 2019 NQC list based on September values. Qualifying capacity based on effective load carrying capability for September from D.19-06-026 (<i>i.e.</i> , 15%).

Future Wind	Total installed values from the Commission’s RESOLVE model with updated 2017 IEPR assumptions file “RESOLVE_2017IEPRupdate_2018-04-17.zip” is available at: ftp://ftp.cpuc.ca.gov/resources/electric/irp2017/resolvemodel. Resource Build = FCDS. Since RESOLVE only produces outputs for 2018 and 2022, buildout for 2020 through 2022 were cross referenced against the CAISO interconnection queue. Qualifying capacity based on effective load carrying capability for September from D.19-06-026 (<i>i.e.</i>, 15%).
Geothermal	
Geothermal	Qualifying capacity based on 2019 NQC list based on September values.
Other Renewables	
Other Renewables	Includes Biomass, Biogas, Heat recovery, Waste and Other. Qualifying capacity based on 2019 NQC list based on September values.
Battery	
Existing and Procured	Assumes all capacity is 4 hour duration. Existing storage qualifying capacity based on 2019 NQC list based on September values. Incremental procurement based on most recently available investor-owned utility storage procurement compiled by Commissioner Energy Division staff (IOU procurement) available at: http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/2018/Combined_IOU_Storage_2017update_public.xlsx Note that the IOU procurement spreadsheet also includes existing resources. Based on Commission guidance, all domains (customer, distribution and transmission-connected) listed in the IOU procurement spreadsheet were assumed to count towards resource adequacy obligations. See discussion below. Annual distributions for 2020 through 2022 based on Commission Energy Division staff guidance for the CAISO’s Transmission Planning Process.
Resolution E-4949	Based on authorized storage procurement by PG&E. 10 MW of customer behind-the-meter storage was removed. http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M240/K050/240050937.PDF
Demand Response	
Demand Response	Based on investor owned-utility submitted data into CAISO’s 2019-2020 Transmission Planning Process Study Plan (pages 25-27). http://www.caiso.com/Documents/Final2019-2020StudyPlan.pdf

Imports (based on total maximum import capability of 10,193 MW)	
Contracted Imports	5,340 MW was used for 2020 through 2022. Based on average of historical contracted imports from 2015 through 2018 for September, which includes both drought and non-drought years. (Values are: 4,486 MW in 2015; 5,178 MW in 2016; 5,885 MW in 2017; and 5,813 MW in 2018.) Includes Palo Verde and Hoover.
Uncontracted Imports	Calculated as the difference between the maximum import capability and Contracted Imports.

Battery discussion

The *2019 Unified Resource Adequacy and Integrated Resource Plan Inputs and Assumptions* (2019 Unified I&A) provided the following guidance on how to treat batteries:

CPUC staff assumed that the full 1,325 MW is online by 2024 and has an average duration of 4 hours, meaning the full 1,325 MW counts towards RA obligations, is dispatchable, and can be used to provide ancillary services, regardless of interconnection domain (transmission-connected, distribution-connected, BTM). This was consistent with the assumptions used in the RESOLVE model and the IRP Reference System Plan.³²

The CAISO is concerned by Commission Energy Division staff guidance to count all domains toward resource adequacy. Customer sited (behind-the-meter) storage should not count towards resource adequacy as these resources will likely not have a must-offer obligation or be required to respond to CAISO dispatch. Nonetheless, for this analysis, the CAISO stayed consistent with Commission Energy Division staff guidance and assumed all domains count towards the system resource adequacy requirement, including approximately 200 MW of customer domain batteries. Recent filings made by PG&E noting an over-procurement in transmission-connected storage resources beyond their allocated procurement amount directed by Commission Decision (D.) 13-

³² California Public Utilities Commission, Energy Resource Modeling Section, Energy Division, *Unified Resource Adequacy and Integrated Resource Plan Inputs and Assumptions – Guidance for Production Cost Modeling and Network Reliability Studies*, March 29, 2019, p. 55.

10-040 may counterbalance the inappropriate inclusion of customer domain storage.³³ The CAISO did not attempt to reconcile PG&E’s subsequent advice letter filing. The Commission should seek confirmation from PG&E on whether these battery projects are proceeding in light of PG&E’s bankruptcy.

The 2019 Unified I&A also provided a link to a spreadsheet detailing the progress of investor-owned utility (IOU) battery procurement across all three domains.³⁴ Annual distributions for 2020 through 2022 based on Commission Energy Division staff guidance for the CAISO’s Transmission Planning Process.

Procurement from Resolution E-4949 is incremental to the existing and procured amounts described above. Of the total 567.5 MW authorized, the CAISO removed 10 MW in the customer domain which will be behind the retail meter.³⁵

The total procurement by 2022 (existing and procured plus Resolution E-4949) is equal to 1,128 MW of capacity. This was cross-checked with the total 2022 installed battery value from the Commission’s RESOLVE model with updated 2017 IEPR assumptions of 1,113 MW.³⁶

Table A-2 below is the tabular data used to create Figure 1 and Table 1.

³³ See Table 1, p. 2 at: https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_5427-E.pdf.

³⁴ California Public Utilities Commission, Energy Resource Modeling Section, Energy Division, *Unified Resource Adequacy and Integrated Resource Plan Inputs and Assumptions – Guidance for Production Cost Modeling and Network Reliability Studies*, March 29, 2019, p. 80 and available at: http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/2018/Combined_IOU_Storage_2017update_public.xlsx.

³⁵ See Table 5, p. 26: <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M240/K050/240050937.PDF>.

³⁶ See “RESOLVE_2017IEPRupdate_2018-04-17.zip” available at: <ftp://ftp.cpuc.ca.gov/resources/electric/irp2017/resolvemodel>.

Table A-2: CAISO Load and Resource Calculations for Resource Adequacy Analysis

	2020	2021	2022
[1] Gas Generation	28,689	25,833	25,779
[2] Existing Gas Generation	24,349	24,349	24,295
[3] Once Through Cooling Units	4,239	0	0
[4] Mothballed	101	101	101
[5] New Units	0	1,382	1,382
[6] Hydro (incl. pumped storage)	8,074	8,074	8,074
[7] Large Hydro	5,423	5,423	5,423
[8] Small Hydro	635	635	635
[9] Pumps with net qualifying capacity	559	559	559
[10] Pumped Storage	1,457	1,457	1,457
[11] Nuclear	2,280	2,280	2,280
[12] Solar	1,797	1,937	2,168
[13] Existing Solar	1,657	1,657	1,657
[14] Future Solar	140	280	511
[15] Wind	968	968	968
[16] Existing Wind	917	917	917
[17] Future Wind	51	51	51
[18] Geothermal	1,140	1,140	1,140
[19] Other Renewables	814	814	814
[20] Battery	566	1,223	1,233
[21] Existing and Procured	566	666	676
[22] Resolution E-4949	0	558	558
[23] Demand Response	1,660	1,660	1,660
[24] Imports	10,193	10,193	10,193
[25] Contracted Imports	5,430	5,340	5,340
[26] Uncontracted Imports	4,763	4,853	4,853
[27] Total Resources (excl. Uncontracted Imports)	51,418	49,269	49,455
[28] System Requirement	51,882	51,549	51,678
[29] Load	45,115	44,825	44,937
[30] Planning Reserve Margin (15%)	6,767	6,724	6,741
[31] System Resource Adequacy (Shortfall)	(464)	(2,280)	(2,222)

Attachment B
CAISO Input Assumptions and Tabular Data for Operational Analysis

Table B-1 below summarizes the input assumptions for Figures 2, 3, and 4.

Table B-1: CAISO Load and Resource Assumptions for Operational Analysis

Hourly Capacity Need	
Hourly Capacity Need	Based on the same concept as the system requirement for resource adequacy per California Public Utilities Commission rules, except the hourly capacity need varies from hour to hour. System requirement needs are: “System requirements are determined based on the each LSEs CEC adjusted forecast plus a 15% planning reserve margin.” https://www.cpuc.ca.gov/ra/
Load	California Energy Commission 2018 Integrated Energy Policy Report Update (2018 IEPR Update) 1-in-2 system peak Mid/Mid Load (2020 and 2021 peak hour = hour ending 17 PST; 2022 peak hour = hour ending 18 PST). For the operational analysis, used hourly data. https://efiling.energy.ca.gov/GetDocument.aspx?tn=226142&DocumentContentId=56881
Planning Reserve Margin	15% https://www.cpuc.ca.gov/ra/
Generation	
Net Qualifying Capacity	2019 Net Qualifying Capacity (NQC) list: http://www.caiso.com/Documents/NetQualifyingCapacityList-2019.xlsx (Version dated July 10, 2019.) Resource IDs from the NQC list were cross-referenced with CAISO MasterFile for resource category verification. Resources based on NQC values are assumed to generate up to its full NQC value per hour unless otherwise noted.
Mothballed Units	CAISO’s list is http://www.caiso.com/Documents/AnnouncedRetirementAndMothballedList.xlsx#search=mothball
Gas Generation	
Existing Gas Generation	Existing generators from 2019 NQC list based on September values. Does not include once-through cooling (OTC), Mothballed, Announced Retired and New Units. Dynamic scheduled generators included in Imports.

Once-through Cooling compliance	Once-through Cooling (OTC) retirements based upon compliance dates. Moss Landing is assumed to continue operation. https://efiling.energy.ca.gov/GetDocument.aspx?tn=228353&DocumentContentId=59542
Mothballed	Based on CAISO's published list (see above). Mothballed units are assumed available, except for Inland Empire. Inland Empire is assumed retired by end of 2019. <i>See</i> Inland Empire Energy Center Decommissioning and Demolition Plan, Docket Number: 01-AFC-17C, TN Number: 228806, June 20, 2019, p.1.
New Units	Announced new gas generation (includes repowering for Huntington Beach and Alamitos).
Sutter Energy Center	Not included in analysis because not in CAISO balancing authority area and currently uncontracted (considered Uncontracted Imports)
Hydro (including Pumped Storage)	
Large Hydro	Includes >30 MW hydro resources within the CAISO footprint. Generation profile calculated as 70% of qualifying capacity based on 2019 NQC list for September values. 70% generation was derived by taking the median generation value during the single peak hour for all days in September from 2015 through 2018. The selected near-term historical years include both drought and non-drought years. The generation profile was held constant over the analysis hours. Hoover accounted for under Contracted Imports.
Small Hydro	Includes ≤ 30 MW, RPS eligible resources within the CAISO footprint. Generation profile calculated as 70% of qualifying capacity based on 2019 NQC list for September values. 70% generation was derived by taking the median generation value during the single peak hour for all days in September from 2015 through 2018. The selected near-term historical years include both drought and non-drought years. The generation profile was held constant over the analysis hours.

Hydro and Pump Provision of Ancillary Services	Approximately 800 MW to 1,000 MW per hour. The same profile was used for 2020 through 2022. Based on observed provision of ancillary services (regulation up, regulation down, spinning reserves and non-spinning reserves) from all hydro resources and pumps from 2018 during the time of peak loading periods during summer. Only 2018 observations for ancillary services were used due to the change in BAL-002-2 standards effective January 1, 2018. See BAL-002-2 and operating reserve requirement changes implemented by the ISO is available here: http://www.caiso.com/Documents/Presentation-BAL-002-2DisturbanceControlStandardkContingencyReserveforRecoveryfromaBalancingContingencyEvent.pdf or in the NERC BAL-002-2 reliability standard here: http://www.nerc.com/pa/Stand/Reliability%20Standards/BAL-002-2.pdf .																		
Pumped Storage	Includes Helms, San Luis and Eastwood. Generation profile calculated as 70% of qualifying capacity based on 2019 NQC list for September values. 70% generation was derived by taking the median generation value during the single peak hour for all days in September from 2015 through 2018. The selected near-term historical years include both drought and non-drought years. The generation profile was held constant over the analysis hours.																		
Nuclear																			
Nuclear	Diablo Canyon only. Qualifying capacity based on 2019 NQC list based on September values. Palo Verde accounted for under Contracted Imports.																		
Solar																			
Existing Solar	Based on the following generation profile as applied to total installed values from 2019 NQC list based on September values: <table><tr><td>Hour ending 15 P.S.T.</td><td>4 p.m.</td><td>72.61%</td></tr><tr><td>Hour ending 16 P.S.T.</td><td>5 p.m.</td><td>44.19%</td></tr><tr><td>Hour ending 17 P.S.T.</td><td>6 p.m.</td><td>8.47%</td></tr><tr><td>Hour ending 18 P.S.T.</td><td>7 p.m.</td><td>0.04%</td></tr><tr><td>Hour ending 19 P.S.T.</td><td>8 p.m.</td><td>0.00%</td></tr><tr><td>Hour ending 20 P.S.T.</td><td>9 p.m.</td><td>0.00%</td></tr></table> Generation profile calculated as the median generation value per hour in all days in September from 2015 through 2018 divided by the maximum generation during the same time period.	Hour ending 15 P.S.T.	4 p.m.	72.61%	Hour ending 16 P.S.T.	5 p.m.	44.19%	Hour ending 17 P.S.T.	6 p.m.	8.47%	Hour ending 18 P.S.T.	7 p.m.	0.04%	Hour ending 19 P.S.T.	8 p.m.	0.00%	Hour ending 20 P.S.T.	9 p.m.	0.00%
Hour ending 15 P.S.T.	4 p.m.	72.61%																	
Hour ending 16 P.S.T.	5 p.m.	44.19%																	
Hour ending 17 P.S.T.	6 p.m.	8.47%																	
Hour ending 18 P.S.T.	7 p.m.	0.04%																	
Hour ending 19 P.S.T.	8 p.m.	0.00%																	
Hour ending 20 P.S.T.	9 p.m.	0.00%																	
Future Solar	See Table A-1 for explanation on total installed values. Used same generation profile as Existing Solar.																		
Wind																			

Existing Wind	Based on the following generation profile as applied to total installed values from 2019 NQC list based on September values: <table><tr><td>Hour ending 15 P.S.T.</td><td>4 p.m.</td><td>26.61%</td></tr><tr><td>Hour ending 16 P.S.T.</td><td>5 p.m.</td><td>29.17%</td></tr><tr><td>Hour ending 17 P.S.T.</td><td>6 p.m.</td><td>33.53%</td></tr><tr><td>Hour ending 18 P.S.T.</td><td>7 p.m.</td><td>41.73%</td></tr><tr><td>Hour ending 19 P.S.T.</td><td>8 p.m.</td><td>44.54%</td></tr><tr><td>Hour ending 20 P.S.T.</td><td>9 p.m.</td><td>43.81%</td></tr></table> Generation profile calculated as the median generation value per hour in all days in September from 2015 through 2018 divided by the maximum generation during the same time period. Note that wind generation is highly variable.	Hour ending 15 P.S.T.	4 p.m.	26.61%	Hour ending 16 P.S.T.	5 p.m.	29.17%	Hour ending 17 P.S.T.	6 p.m.	33.53%	Hour ending 18 P.S.T.	7 p.m.	41.73%	Hour ending 19 P.S.T.	8 p.m.	44.54%	Hour ending 20 P.S.T.	9 p.m.	43.81%
Hour ending 15 P.S.T.	4 p.m.	26.61%																	
Hour ending 16 P.S.T.	5 p.m.	29.17%																	
Hour ending 17 P.S.T.	6 p.m.	33.53%																	
Hour ending 18 P.S.T.	7 p.m.	41.73%																	
Hour ending 19 P.S.T.	8 p.m.	44.54%																	
Hour ending 20 P.S.T.	9 p.m.	43.81%																	
Future Wind	See Table A-1 for explanation on total installed values. Used same generation profile as Existing Wind.																		
Geothermal																			
Geothermal	Qualifying capacity based on 2019 NQC list based on September values.																		
Other Renewables																			
Other Renewables	Includes Biomass, Biogas, Heat recovery, Waste and Other. Qualifying capacity based on 2019 NQC list based on September values.																		
Battery																			
Existing and Procured	Assumes all capacity is 4 hour duration. Existing storage qualifying capacity based on 2019 NQC list based on September values. Incremental procurement based on most recently available investor-owned utility storage procurement compiled by Commissioner Energy Division staff (IOU procurement) available at: http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/2018/Combined_IOU_Storage_2017update_public.xlsx Note that the IOU procurement spreadsheet also includes existing resources. Based on Commission guidance, all domains (customer, distribution and transmission-connected) listed in the IOU procurement spreadsheet were assumed to count towards resource adequacy obligations. See discussion in Attachment A. Annual distributions for 2020 through 2022 based on Commission Energy Division staff guidance for the CAISO’s Transmission Planning Process.																		
Resolution E-4949	Based on authorized storage procurement by PG&E. 10 MW of customer behind-the-meter storage was removed.																		
Demand Response																			

Demand Response	Based on investor owned-utility submitted data into CAISO's 2019-2020 Transmission Planning Process Study Plan (pages 25-27). http://www.caiso.com/Documents/Final2019-2020StudyPlan.pdf
Imports (based on total maximum import capability of 10,193 MW)	
Contracted Imports	5,340 MW was used for 2020 through 2022. Based on average of historical contracted imports from 2015 through 2018 for September, which includes both drought and non-drought years. (Values are: 4,486 MW in 2015; 5,178 MW in 2016; 5,885 MW in 2017; and 5,813 MW in 2018.) Includes Palo Verde and Hoover.
Uncontracted Imports	Calculated as the difference between the maximum import capability and Contracted Imports.

Tables B-2, B-3, and B-4 below are the tabular data used to create Figures 2, 3, and 4, respectively.

Table B-2: 2020 CAISO Load and Resource Calculations for Operational Analysis

	HE 15	HE 16	HE 17	HE 18	HE 19	HE 20
[1] Gas Generation	28,689	28,689	28,689	28,689	28,689	28,689
[2] Existing Gas Generation	24,349	24,349	24,349	24,349	24,349	24,349
[3] Once Through Cooling Units	4,239	4,239	4,239	4,239	4,239	4,239
[4] Mothballed	101	101	101	101	101	101
[5] New Units	0	0	0	0	0	0
[6] Hydro (incl. pumped storage)	6,078	6,114	6,131	6,177	6,252	6,161
[7] Large Hydro	3,796	3,796	3,796	3,796	3,796	3,796
[8] Small Hydro	444	444	444	444	444	444
[9] Hydro & Pump Providing Ancillary Services	817	853	870	917	991	900
[10] Pumped Storage	1,020	1,020	1,020	1,020	1,020	1,020
[11] Nuclear	2,280	2,280	2,280	2,280	2,280	2,280
[12] Solar	9,322	5,673	1,087	6	0	0
[13] Existing Solar	8,596	5,232	1,003	5	0	0
[14] Future Solar	726	442	85	0	0	0
[15] Wind	1,718	1,884	2,165	2,694	2,876	2,828
[16] Existing Wind	1,628	1,784	2,050	2,552	2,724	2,679
[17] Future Wind	91	99	114	142	152	149
[18] Geothermal	1,141	1,141	1,141	1,141	1,141	1,141
[19] Other Renewables	814	814	814	814	814	814
[20] Battery	566	566	566	566	566	566
[21] Existing and Procured	566	566	566	566	566	566
[22] Resolution E-4949	0	0	0	0	0	0
[23] Demand Response	1,660	1,660	1,660	1,660	1,660	1,660
[24] Imports	10,193	10,193	10,193	10,193	10,193	10,193
[25] Contracted Imports	5,340	5,340	5,340	5,340	5,340	5,340
[26] Uncontracted Imports	4,853	4,853	4,853	4,853	4,853	4,853
[27] Total Resources (excl. Uncontracted Imports)	57,608	54,160	49,872	49,367	49,617	49,479
[28] Hourly Capacity Need	49,955	51,543	52,069	51,626	51,115	49,417
[29] Load	43,439	44,820	45,277	44,892	44,448	42,971
[30] Planning Reserve Margin (15%)	6,516	6,723	6,792	6,734	6,667	6,446
[31] Hourly Capacity Sufficiency (Shortfall)	7,654	2,617	(2,196)	(2,259)	(1,498)	62

Table B-3: 2021 CAISO Load and Resource Calculations for Operational Analysis

	HE 15	HE 16	HE 17	HE 18	HE 19	HE 20
[1] Gas Generation	25,833	25,833	25,833	25,833	25,833	25,833
[2] Existing Gas Generation	24,349	24,349	24,349	24,349	24,349	24,349
[3] Once Through Cooling Units	0	0	0	0	0	0
[4] Mothballed	101	101	101	101	101	101
[5] New Units	1382	1382	1382	1382	1382	1382
[6] Hydro (incl. pumped storage)	6,078	6,114	6,131	6,177	6,252	6,161
[7] Large Hydro	3,796	3,796	3,796	3,796	3,796	3,796
[8] Small Hydro	444	444	444	444	444	444
[9] Hydro & Pump Providing Ancillary Services	817	853	870	917	991	900
[10] Pumped Storage	1,020	1,020	1,020	1,020	1,020	1,020
[11] Nuclear	2,280	2,280	2,280	2,280	2,280	2,280
[12] Solar	10,049	6,115	1,172	6	0	0
[13] Existing Solar	8,596	5,232	1,003	5	0	0
[14] Future Solar	1,452	884	169	1	0	0
[15] Wind	1,718	1,884	2,165	2,694	2,876	2,828
[16] Existing Wind	1,628	1,784	2,050	2,552	2,724	2,679
[17] Future Wind	91	99	114	142	152	149
[18] Geothermal	1,141	1,141	1,141	1,141	1,141	1,141
[19] Other Renewables	814	814	814	814	814	814
[20] Battery	1,223	1,223	1,223	1,223	1,223	1,223
[21] Existing and Procured	666	666	666	666	666	666
[22] Resolution E-4949	558	558	558	558	558	558
[23] Demand Response	1,660	1,660	1,660	1,660	1,660	1,660
[24] Imports	10,193	10,193	10,193	10,193	10,193	10,193
[25] Contracted Imports	5,340	5,340	5,340	5,340	5,340	5,340
[26] Uncontracted Imports	4,853	4,853	4,853	4,853	4,853	4,853
[27] Total Resources (excl. Uncontracted Imports)	56,135	52,403	47,758	47,168	47,418	47,280
[28] Hourly Capacity Need	49,553	51,257	51,732	51,593	51,170	49,470
[29] Load	43,089	44,572	44,984	44,863	44,495	43,018
[30] Planning Reserve Margin (15%)	6,463	6,686	6,748	6,729	6,674	6,453
[31] Hourly Capacity Sufficiency (Shortfall)	6,582	1,146	(3,974)	(4,425)	(3,752)	(2,191)

Table B-4: 2022 CAISO Load and Resource Calculations for Operational Analysis

	HE 15	HE 16	HE 17	HE 18	HE 19	HE 20
[1] Gas Generation	25,779	25,779	25,779	25,779	25,779	25,779
[2] Existing Gas Generation	24,295	24,295	24,295	24,295	24,295	24,295
[3] Once Through Cooling Units	0	0	0	0	0	0
[4] Mothballed	101	101	101	101	101	101
[5] New Units	1382	1382	1382	1382	1382	1382
[6] Hydro (incl. pumped storage)	6,078	6,114	6,131	6,177	6,252	6,161
[7] Large Hydro	3,796	3,796	3,796	3,796	3,796	3,796
[8] Small Hydro	444	444	444	444	444	444
[9] Hydro & Pump Providing Ancillary Services	817	853	870	917	991	900
[10] Pumped Storage	1,020	1,020	1,020	1,020	1,020	1,020
[11] Nuclear	2,280	2,280	2,280	2,280	2,280	2,280
[12] Solar	11,244	6,843	1,312	7	0	0
[13] Existing Solar	8,596	5,232	1,003	5	0	0
[14] Future Solar	2,648	1,612	309	2	0	0
[15] Wind	1,718	1,884	2,165	2,694	2,876	2,828
[16] Existing Wind	1,628	1,784	2,050	2,552	2,724	2,679
[17] Future Wind	91	99	114	142	152	149
[18] Geothermal	1,141	1,141	1,141	1,141	1,141	1,141
[19] Other Renewables	814	814	814	814	814	814
[20] Battery	1,233	1,233	1,233	1,233	1,233	1,233
[21] Existing and Procured	676	676	676	676	676	676
[22] Resolution E-4949	558	558	558	558	558	558
[23] Demand Response	1,660	1,660	1,660	1,660	1,660	1,660
[24] Imports	10,193	10,193	10,193	10,193	10,193	10,193
[25] Contracted Imports	5,340	5,340	5,340	5,340	5,340	5,340
[26] Uncontracted Imports	4,853	4,853	4,853	4,853	4,853	4,853
[27] Total Resources (excl. Uncontracted Imports)	57,287	53,087	47,853	47,125	47,374	47,236
[28] Hourly Capacity Need	49,170	51,046	51,712	51,869	51,560	49,845
[29] Load	42,757	44,388	44,967	45,103	44,835	43,343
[30] Planning Reserve Margin (15%)	6,414	6,658	6,745	6,765	6,725	6,501
[31] Hourly Capacity Sufficiency (Shortfall)	8,117	2,041	(3,859)	(4,744)	(4,186)	(2,609)



UTILITY ADVISORY COMMITTEE AGENDA ITEM COVERSHEET

Meeting Date: 9/8/2020

Agenda Category: Other Informational Items

Prepared By: Clint Whitney, Energy Services Director

Subject:

Forward Planning Agenda

Department:

Energy Services

Recommended Motion:

This is an informational item only.

Summary:

Proposed future Utility Advisory Committee agenda items:

November 2020 -

Wastewater Capital Program and Financing (PW)

Energy Efficiency Status (RES)

Field Tours (Phased re-start permitting)

January 2021 -

Water Capital Program and Financing (PW)

Advanced Metering Infrastructure Policies (RES)

March 2021 -

Review and Recommendations for Rates (RES)

May 2021 -

Review and Recommendations for Bonds (RES)

July 2021 - Reliability Analysis (RES)

September 2021 -

UAC Applicant Interviews

Fiscal Impact:

Attachments: