Track 3.B Workshop: RA Structural Changes

November 18th, 2020

12:30 – 4:30 p.m.

California Public Utilities Commission

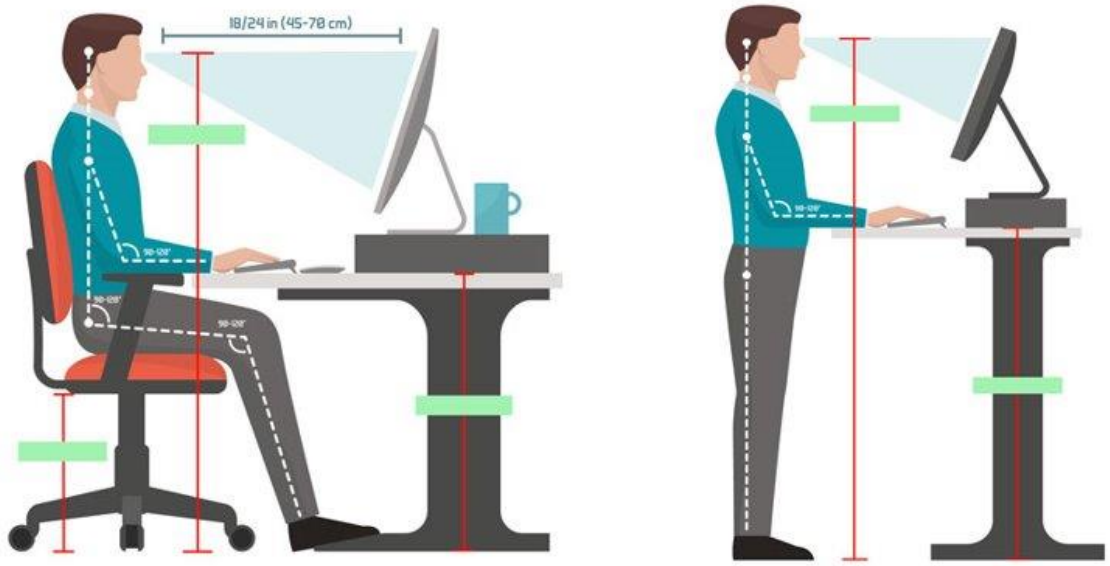
Logistics

- Online only
  - Audio through computer or phone
  - Toll-free 415-655-0002 or 855-282-6330
    Access code: 146 974 4303

- Today's presentations & agenda are available on the WebEx link under "Event Material"
  Type password : track3b1
  - Click "View Info" to download

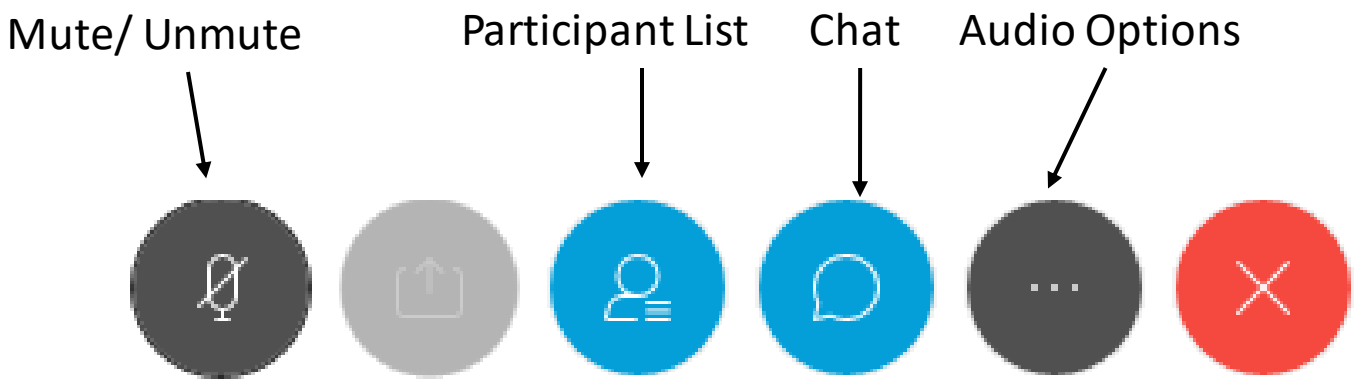
- Hosts (Energy Division Staff)
  - Jaime Rose Gannon
  - Linnan Cao

- Safety
  - Note surroundings and emergency exits
  - Ergonomic check

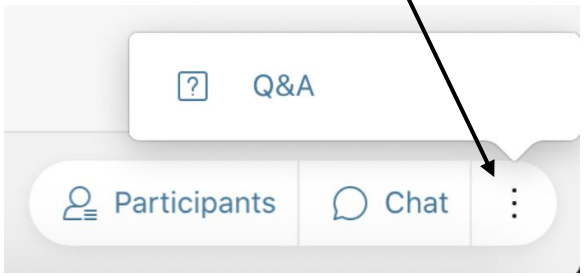


Workshop Logistics

- All attendees have been muted
- Panelist that are presenting have been identified and will be identified as panelist when their issue/topic is being addressed
- To ask questions please use the Q&A function (send "To All Panelists") or raise your hand
- Questions will be read aloud by staff; attendees may be unmuted to respond to the answer. (Reminder: Mute back!)



On the bottom right of screen: click "3 dots" for Q&A



Ground Rules

- Workshop is structured to stimulate an honest dialogue and engage different perspectives.
- Keep comments friendly and respectful.
- Please use Q&A feature only for questions, or technical issues.
- Do NOT start or respond to sidebar conversations in the Chat.

Day 1 – November 18th Agenda

Time	Topics	Presenters/Time Duration
12:30-12:45 p.m.	Introduction on RA Structural Changes	CPUC, Gridworks, 15 min.
12:45-1:45	1. Energy Division Proposal	CPUC, 45 min. **Discussion:** 15 min.
1:45-2	2. PG&E Proposal	PG&E, 10 min. **Discussion:** 5 min.
2-2:15	Stretch Break	
2:15-3:30	3. SCE & CalCCA Proposal	SCE & CalCCA, 45 min. AWEA-CA, 15 min. **Discussion:** 15 min.
3:30-3:45	4. GPI Proposal	GPI, 10 min. **Discussion:** 5 min.
3:45-4	Stretch Break	
4-4:20	5. CESA MCC Bucket Proposal	CESA, 10 min. **Discussion:** 10 min.
4:20-4:30	6. OhmConnect CEDMC Leap MCC Bucket Proposal	OhmConnect, 5 min. **Discussion:** 5 min.

Track 3B Scoping /Schedule and Expectations

1. Examination of the broader RA capacity structure to address energy attributes and hourly capacity requirements, given the increasing penetration of use-limited resources, greater reliance on preferred resources, and rolling off of a significant number of long-term tolling agreements.
2. Other structural changes or refinements to the RA program identified during Track 1 or Track 2, including:
   a. Incentives for load-serving entities that are deficient in year-ahead RA filings, as discussed in D.20-06-031
   b. Multi-year system and flexible RA requirements, as stated in D.20-06-002
   c. Refinements to the MCC buckets adopted in D.20-06-031
   d. Other time-sensitive issues identified by Energy Division or by parties

MODIFIED TRACK 3.B CALENDAR	
EVENT	**DATE**
Workshop on draft Track 3.B proposals submitted August 7, 2020	November 2020
Revised Track 3.B proposals due	December 18, 2020
Comments on revised Track 3.B proposals due	January 15, 2021
Workshop on revised Track 3.B proposal	February 2021
Second revised Track 3.B proposals and comments on additional process due	March 9, 2021
Proposed decision on Track 3.B and Track 4	May 2021
Final decision on Track 3.B and Track 4	June 2021

Potential Timelines to Address Larger RA Structural Changes

- Does the current schedule allow for implementable solutions by 2022, 2023, or 2024?
  - 2022 – may not be realistic
  - 2023 – may be more realistic, allows for time to develop and vet implementation details, will likely require a decision by late 2021 or early 2022
  - 2024 – most realistic, allows sufficient time to develop and vet details, but additional time delays addressing reliability issues for an additional year
- What elements should be expected in a June 2021 decision?
  - RA structural framework direction and necessary milestones/decision points for achieving implementation by 2023 or 2024?
  - Incremental modifications to the existing framework?

Gridworks Remarks

Arthur Haubenstock, Senior Fellow, Gridworks

Resource Adequacy & The Equitable, Clean Energy Transition

Where We Want to Go, & Incremental Steps to Get There

GRIDWORKS

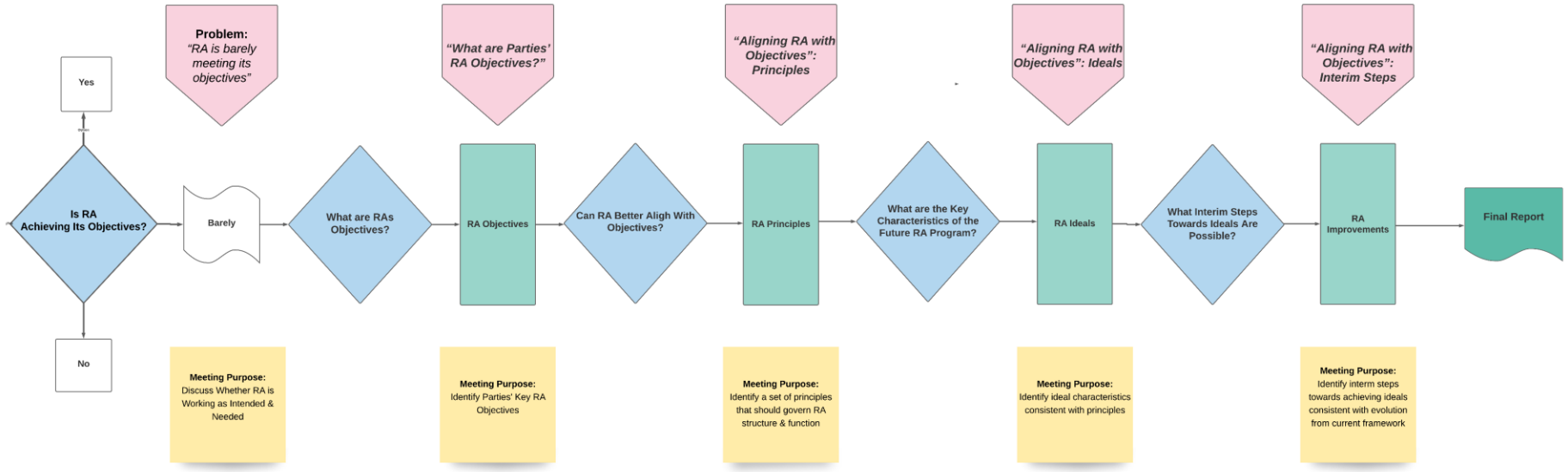
GRIDWORKS

Convene, educate and empower stakeholders to decarbonize electricity grids

If you don't know where you are going, any road can take you there: finding our direction

Process

- Over twenty stakeholder entities, including equity, utility-scale and demand-side resources, utilities & CCAs, regulators & grid operations



GRIDWORKS

First Steps Towards a Future RA Program

Interim Conclusions

- RA should focus on maintaining a balance of supply and demand in the bulk power system
- The pursuit of reliability should be compatible with, rather than drive, other policy objectives
- RA should strive for simplicity

Next Steps

- Strategic: What are the ideal characteristics of the future program?
- Tactical: What near-term improvements can contribute to those ideals?

GRIDWORKS

Presentation 1: Energy Division Issue Paper and Draft Straw Proposal Track 3B

Michele Kito, Supervisor, Resource Adequacy, Energy Division
Jaime Gannon, Senior Analyst, Resource Adequacy, Energy Division

12:45-1:45 p.m.

Overview

- Background -- Energy Crisis
- Current RA Construct
- Reliability Framework Goals
- Key Challenges/Concern
  - Decline in long-term contracting
  - Preliminary capacity and energy analysis
  - Market fragmentation
  - Tightening of supply
  - Potential system level market power
    - DMM Special Report Market Competitiveness, July 30-31
    - Other indicators
- Potential Solutions

Background – Energy Crisis

- **CA Energy Crisis 2000-2001**
  - Low hydro year
  - Little forward fixed price contracts = more spot market purchases
  - Reliance on Federal Power Act to mitigate just and reasonable rates
  - Occurred during the winter when load was lowest
- **Solutions that Stabilized Energy Prices**
  - DWR procures fixed price contracts on behalf of customers stabilizing energy prices (AB1X1)
  - Bundled procurement plan rules (AB 57) limit spot market purchases to 5% of total demand needs and require medium and long term contracting. TeVAR later established. Didn't contemplate retail choice expansion.
  - IOU generation subject to least cost dispatch rules

Energy Crisis: What Happened and Why?

- **What Happened?**
  - Extremely high prices and rolling blackouts
  - Bankruptcy of PG&E and financial instability of the other two IOUs – i.e., SCE and SDG&E
  - Important point -- Rolling blackouts were not necessarily because of lack of supply, but rather because market participants were unwilling to sell to "financially unstable" entities
- **Why?**
  - Gas market disfunction
  - Tightening of supply
  - Lack of long-term contracting (IOUs relying on short-term PX purchases; i.e., lack of hedging)
  - Retail choice and market fragmentation (when prices increased dramatically, load serving entities returned customers to the incumbent utilities)
  - Exertion of market power (withholding, etc.)

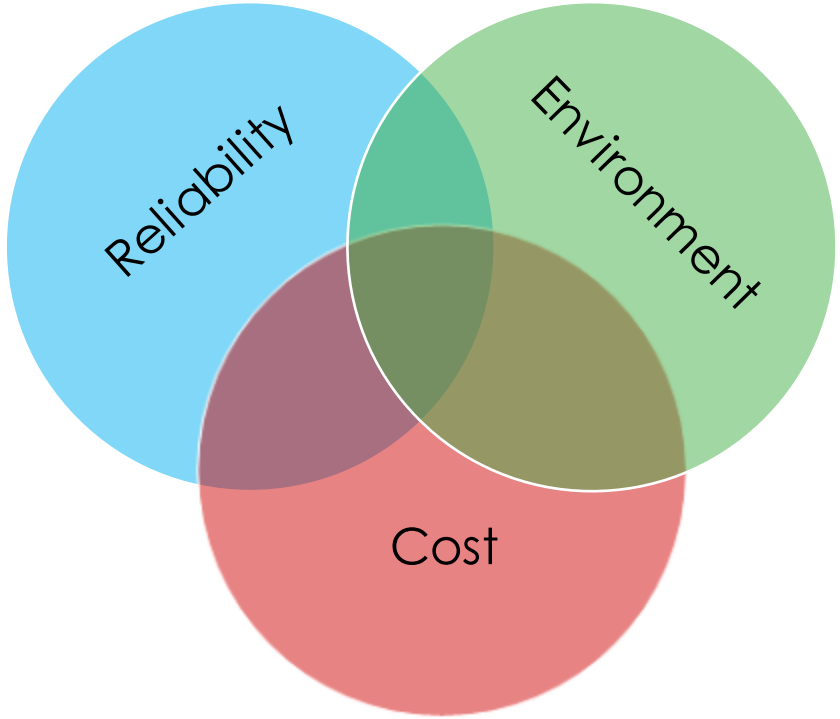
The Current RA Framework

- System RA needs are based on 115% of 1-2 load forecast for each LSE.
- LSEs can meet these their RA requirements through RA-only contracts or RA plus energy contracts or both.
- Maximum Cumulative Capacity (MCC) buckets are used to limit the over reliance on use-limited resources in meeting monthly peak RA requirements.
- All committed RA resources have a must offer obligation into CAISOs energy markets.
- Use limitations are managed through opportunity cost bidding and other mechanisms.

Reliability Framework Goals

- The Commission's reliability construct should balance reliability with least costs to customers while also ensuring that the State is able to facilitate a least-cost transition to a reliable, decarbonized electrical grid, and foster retail competition.

- A capacity framework, such as the one currently in place, may not most efficiently balance these goals.



Key Challenges/Trends

- Significant decline in long-term tolling gas agreements which are being replaced by RA only contracts.
- The capacity construct does not ensure that electrons will flow or curtailment of demand will occur, which can lead to speculative supply issues.
- Dependence on the shrinking gas fleet to meet critical peak hours of the day when must-take variable energy resources are not available.
- Greater dependence on a suite of use limited resources to meet the state's hourly reliability needs.
- Growth in retail choice and the relationship with the provider of last resort makes it difficult to plan for reliability, if entities do not know whether they will be serving future load. This load uncertainty prevents entities from entering long-term contracts with new or existing resources.
- Tightening of supply across the West.
- Lack of an adequate market power mechanism to mitigate energy market price spikes could increase costs for all California customers.

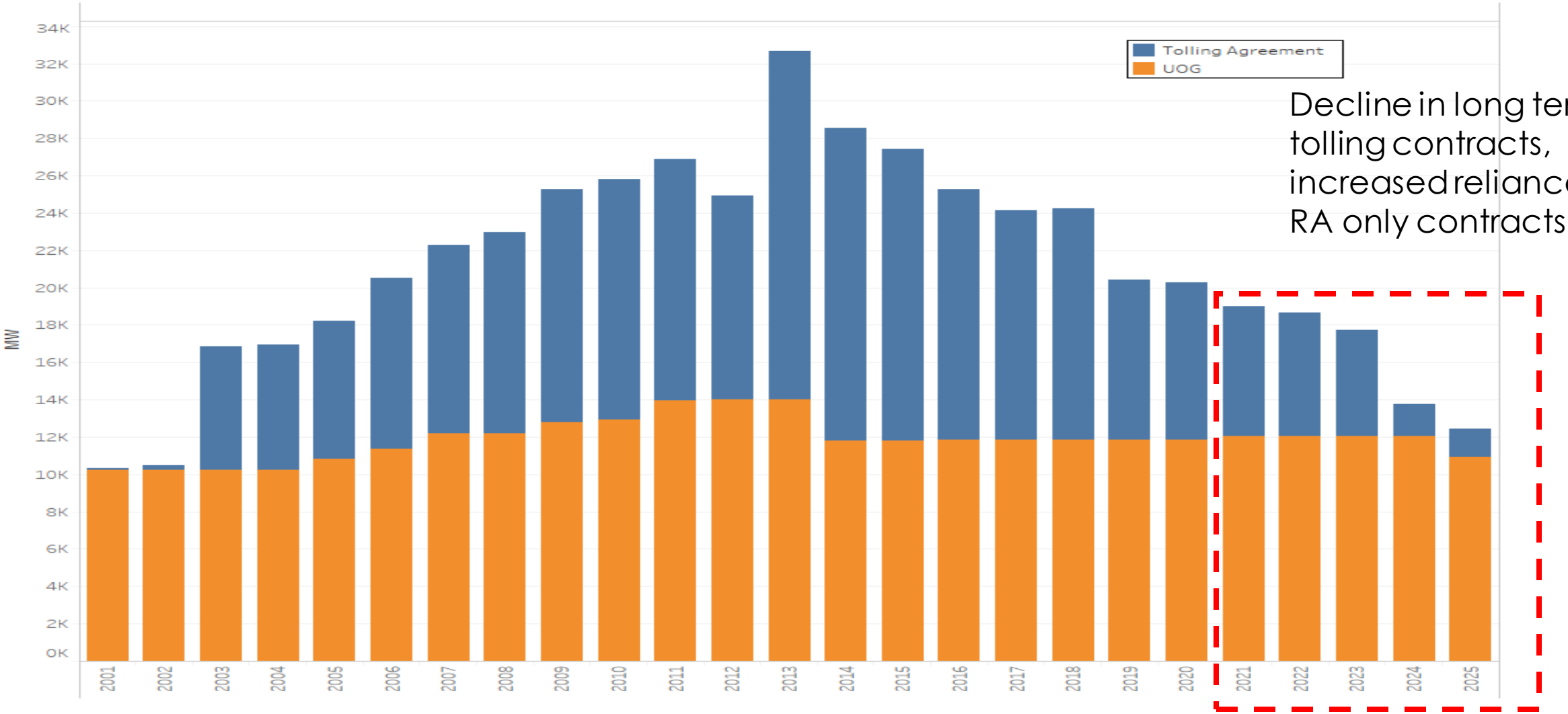
Concern

These trends could detrimentally affect bidding behavior in the energy market, which currently does not have sufficient market power mitigation mechanisms in place (e.g., the price cap in CAISO's market is increasing from $1,000 per MWh to $2,000 per MWh and system market power mitigation does not yet exist, as the western electricity market is assumed to be competitive).

Decline in Long-Term Contracting

- One of the ways California exited the energy crisis, was to sign a series of long-term fixed price contracts, many credit this with helping to address the high prices (FERC also imposed a $250/MWh price cap as well)
- Energy Division staff have documented a considerable decline in long-term contracting
  - When the IOUs had 85 percent of the load, they were willing to sign long-term contracts with large gas-fired generation
  - With increase of CCAs, it makes far less sense to for IOUs to sign these contracts (with dispatch rights)
  - Load serving entities for direct access customers do not typically sign long-term contracts
  - It is not yet clear whether CCAs will sign long-term contracts with gas-fired facilities (both for optics reasons and other business model reasons)
  - Finally, the CPUC is sending/has sent strong signals that it does not want the IOUs to sign long-term contracts with gas-facilities
- All of which means, that the long-term contracting that is likely necessary for the stability of the energy market (and what helped to get CA out of the energy crisis) is rapidly disappearing, just as the system tightens, market fragmentation increases, and market power emerges

IOU Tolling Agreements and Utility Owned Generation



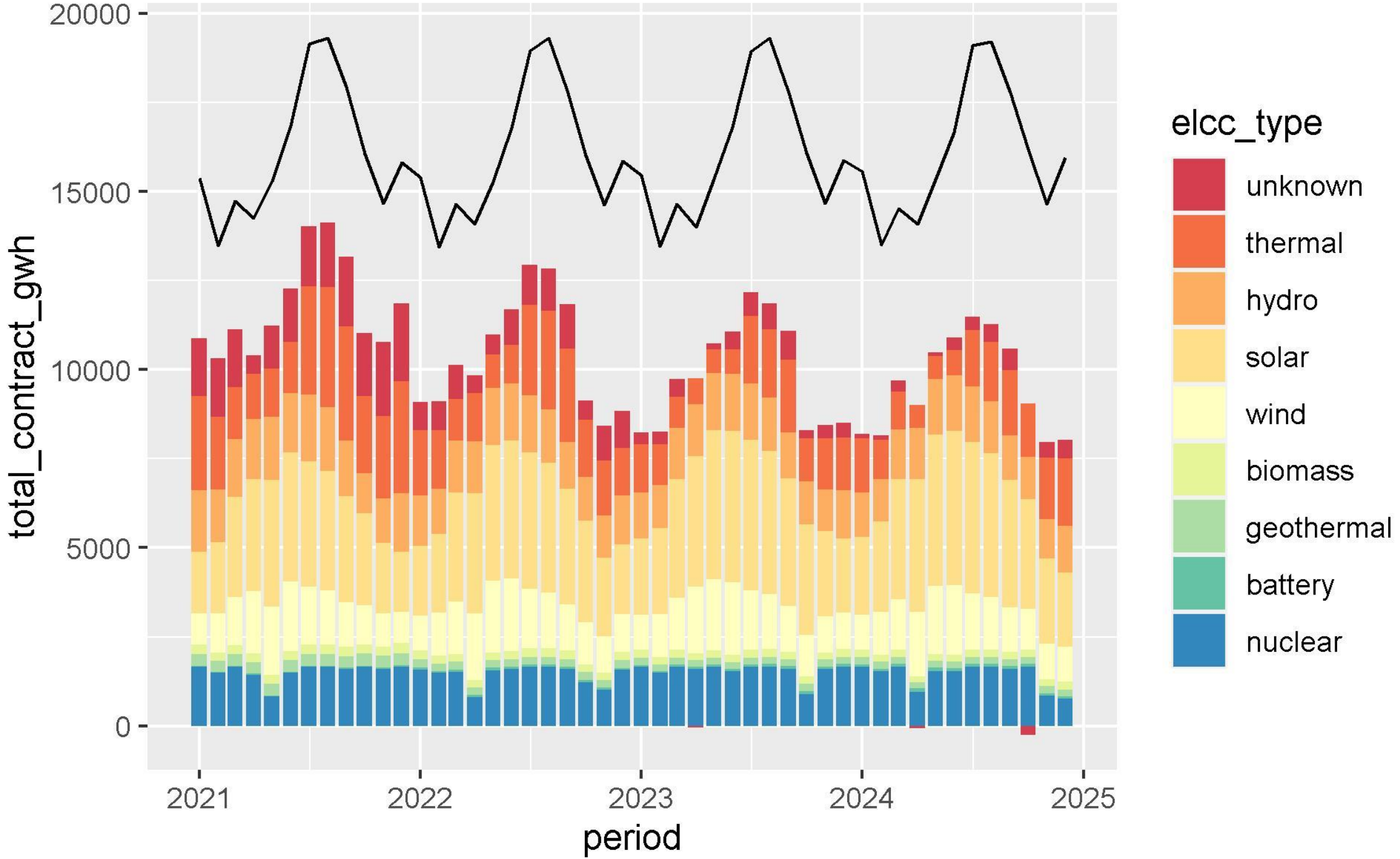
Decline in long term tolling contracts, increased reliance on RA only contracts

Preliminary Energy and Capacity Analysis

- Staff used LSE submitted IRP filings from 41 LSEs: 3 IOUs, 27 CCAs,11 ESPs.
- Contracted GWh and contracted NQC values were used to calculate procurement totals.
- CAM resources and credits were identified and reallocated across LSE types based on monthly load ratio shares.
- System RA requirements were calculated based on the 2021 Final YA load forecast for CPUC jurisdictional LSEs.
- System energy needs were determined based on CEC's 2019 IEPR hourly load forecast for CAISO BA. A CPUC jurisdictional load ratio was applied to these values.
- Planned existing and planned new resources were excluded from the data analysis.

Caveats

- This is a preliminary analysis
- There is still additional work that need to be done to examine the forwarded energy positions across the critical reliability hours.
- IRP data was collected on September 1st, therefore sales and purchases made in the last few months may not be reflected in the data set
- Unspecified includes – transfer purchases, transfers sales, sellers choice contracts, imports (both specified and unspecified)and other resources that were not identified by ELCC type on the resource tab of the IRP template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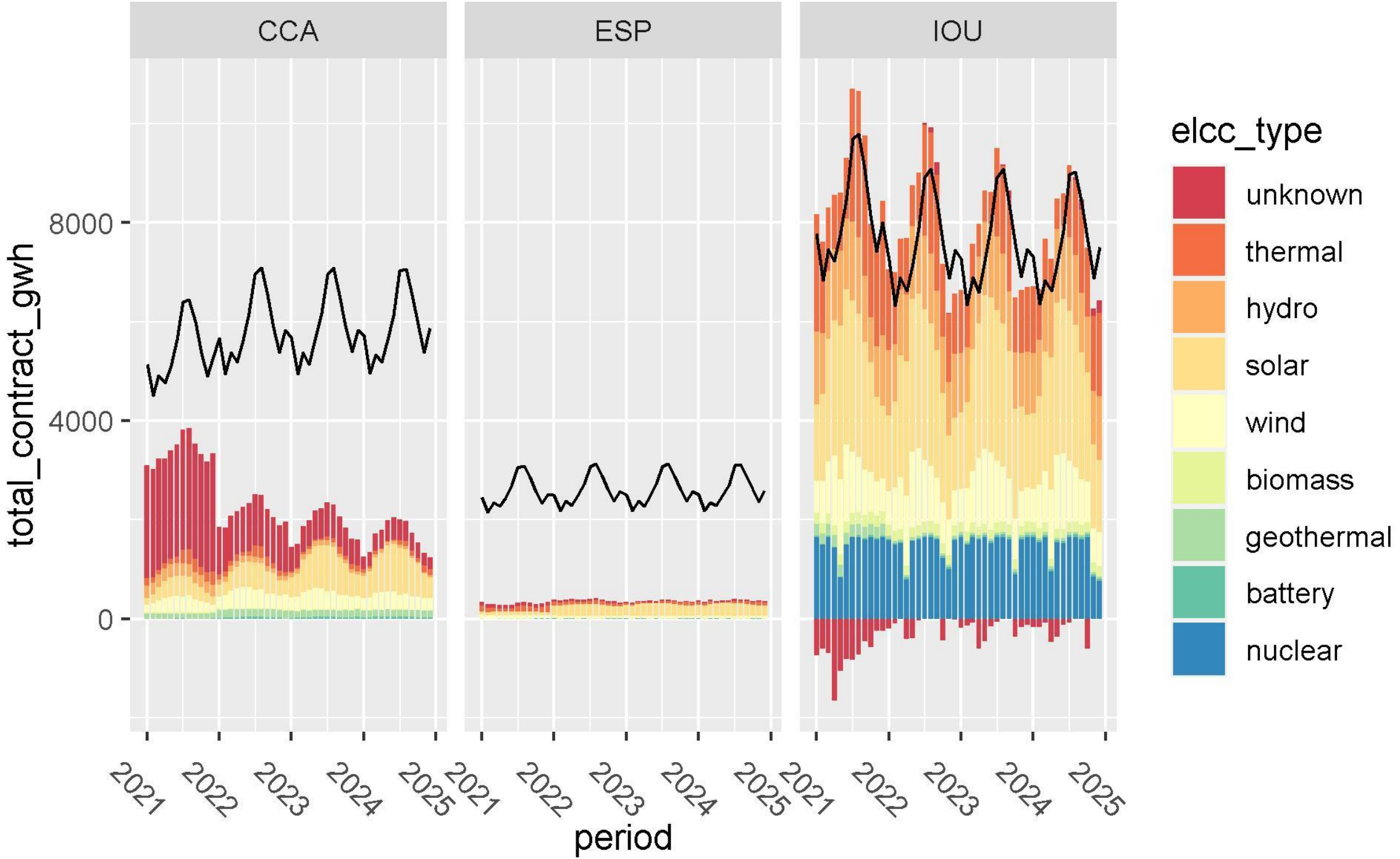
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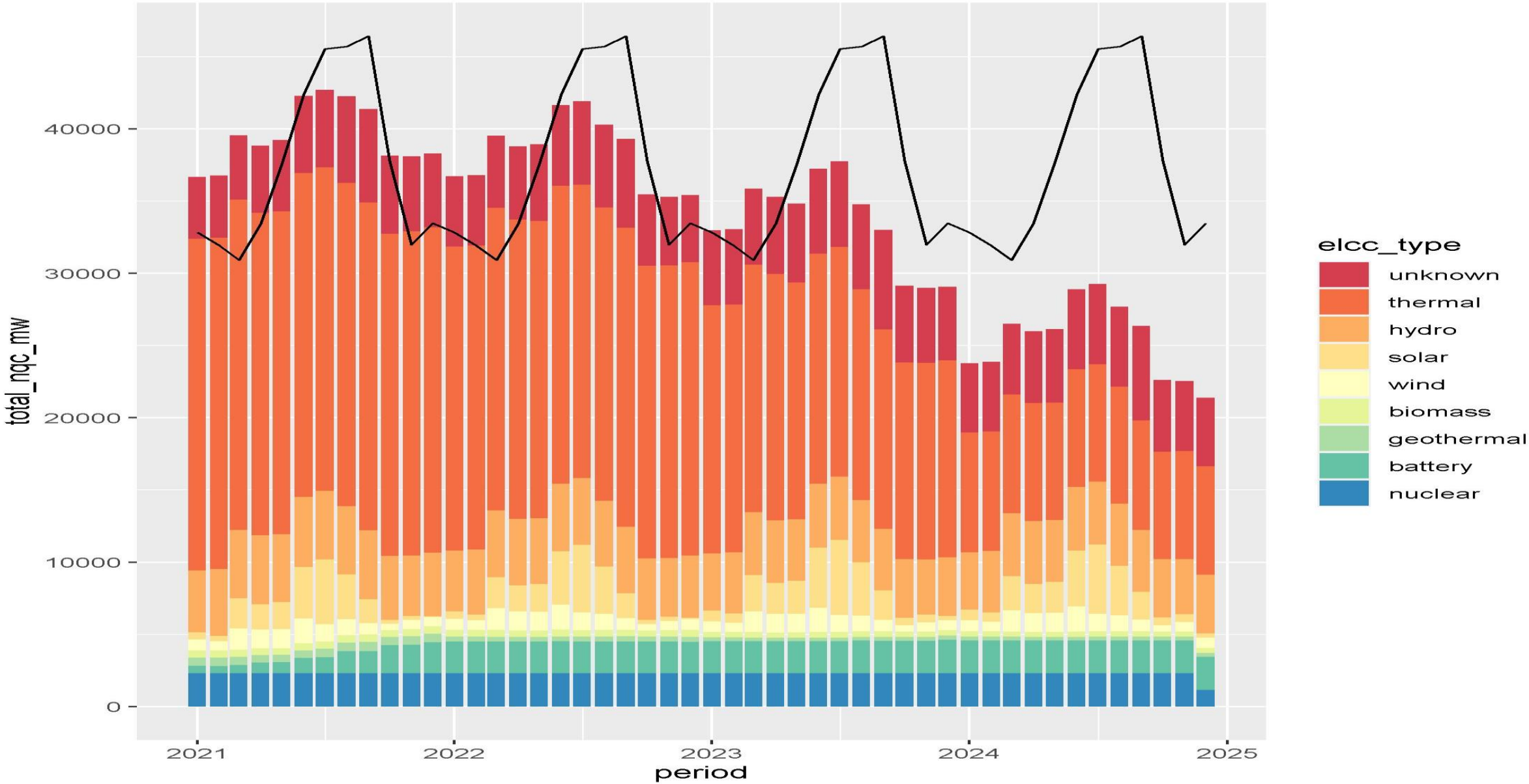
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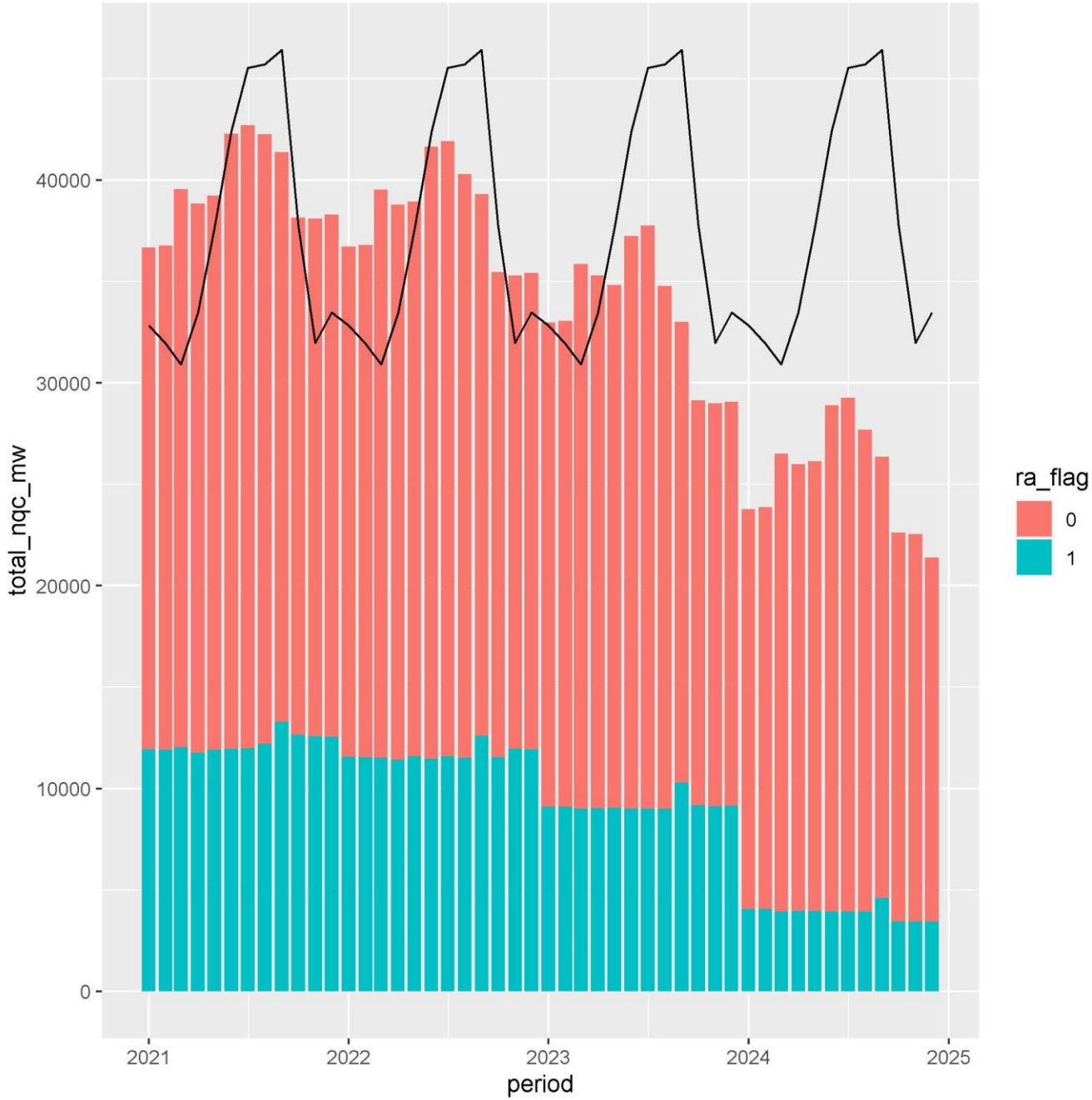
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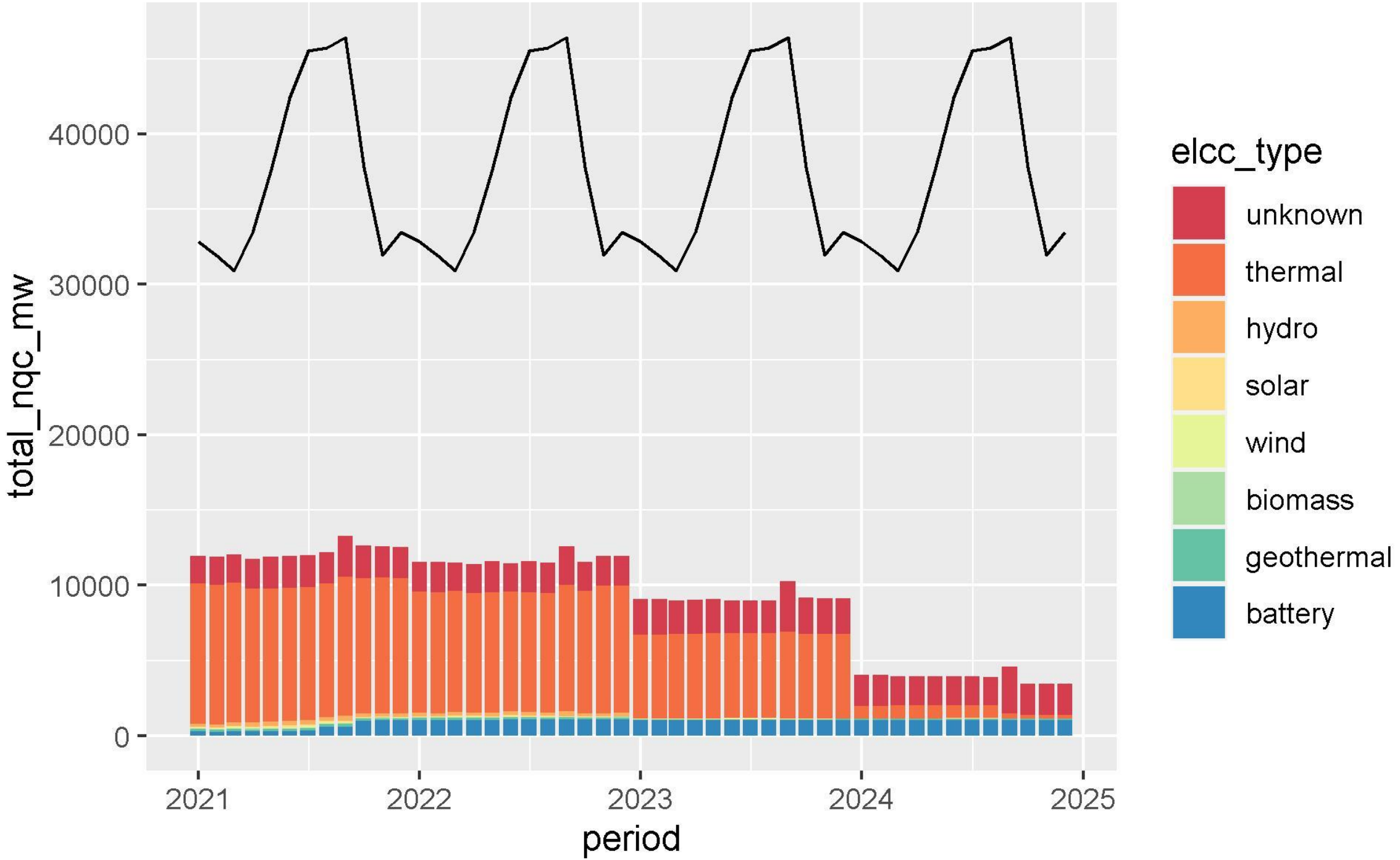
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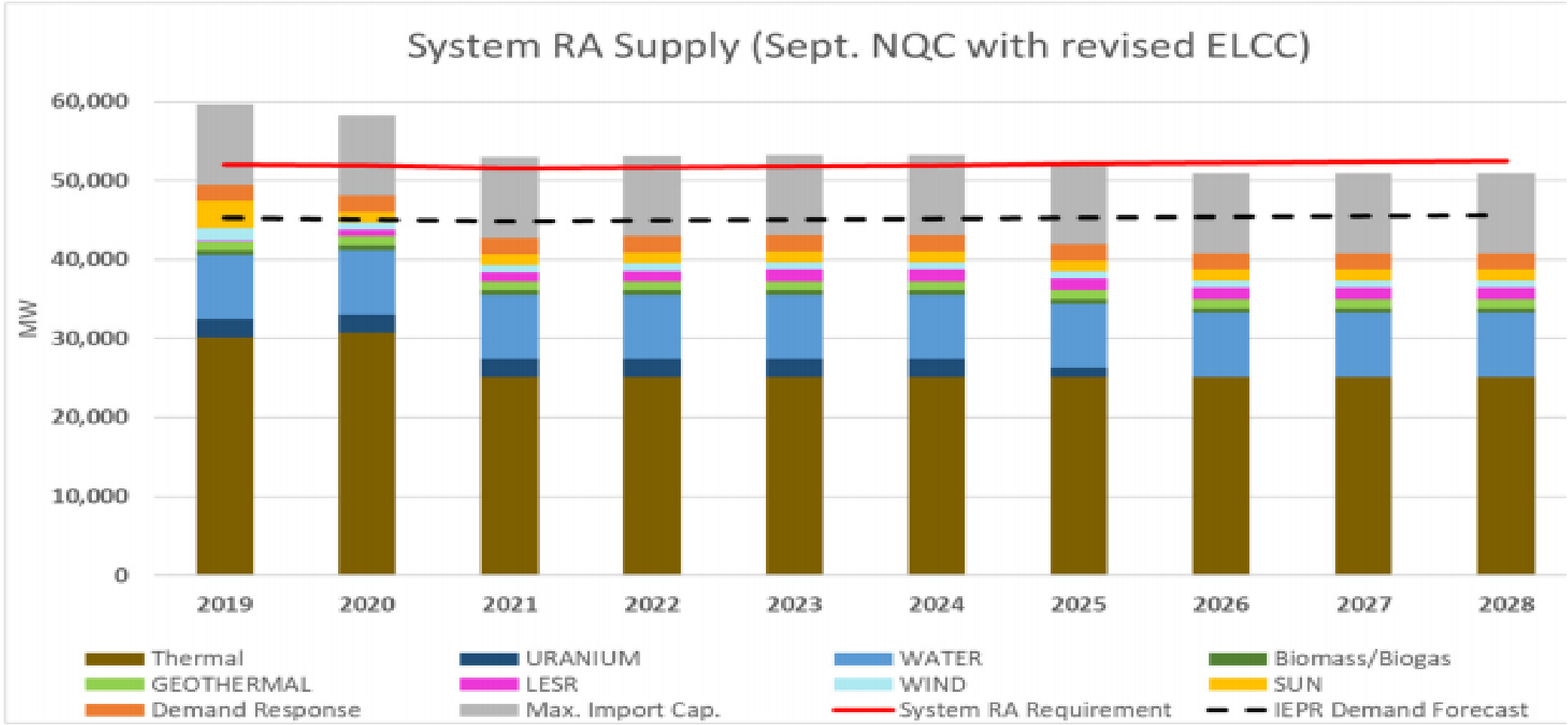
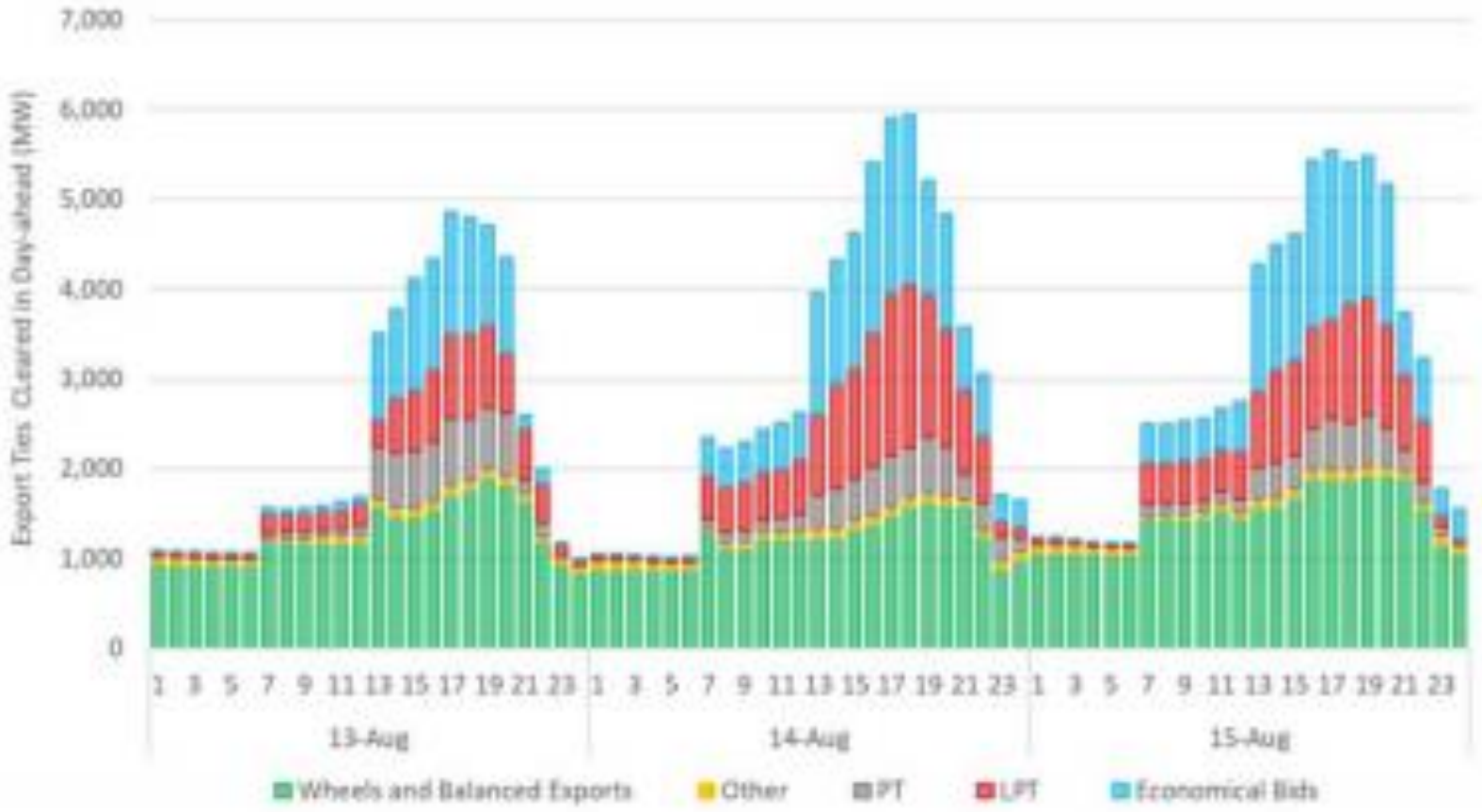
Market Fragmentation

- In 2021, PG&E will serve only ~50% of load, SCE ~70% of load and SDG&E between ~60 – 85% of load
- Why does it matter?
  - Load uncertainty makes it far less likely that the IOUs will want to build resources or sign long-term contracts, if they expect to lose load in the future (and less likely to buy tolling agreements, which is a type of hedge)
  - Same is true for load serving entities serving direct access customers (typically buy power one-year forward)
  - If prices increases and load serving entities are unhedged, they can return customers to the incumbent IOUs (and the IOUs have not hedged for these customers/this load, making them subject to price volatility)
  - Customers voluntarily returning to IOU service go on a CAISO locational marginal price rate (could be high in an "energy crisis" situation)
  - Costs for customers involuntarily returned are supposed to be covered by bonds posted by the load serving entities, but these amounts are not likely to cover "black swan" events, thus leaving the IOUs and their bundled service customers exposed.

Tightening of Supply



Exports Increasingly Important Consideration in Tight Market



Potential System Level Market Power

- CAISO's Department of Market Monitoring DMM has raised the potential for system level market power in annual reports
- In a report on the day-ahead market competitiveness on July 30-31, 2020 DMM found:

This report provides information on the competitiveness of the ISO's day-ahead market on July 30 and July 31, 2020. The report was produced in response to market participant requests for the ISO to provide more transparency on the competiveness of day-ahead market outcomes on relatively high priced days. Key findings in this report include the following:

- Prices in the ISO's day-ahead market on July 30 and July 31 equated to implied heat rates of about 27 to 28 MMBtu/MWh in hour-ending 19 and about 37 to 39 MMBtu/MWh in hour-ending 20 for the SCE and SDG&E areas.
- SCE and SDG&E prices in the ISO's day-ahead market on these days were below corresponding bilateral prices at Mead and Palo Verde.
- On July 30 and 31, bid in load, exports, and virtual demand increased relative to the prior two days, while virtual supply offers decreased.
- Structural measures of market power indicate that the market was potentially uncompetitive during seven hours on July 30 and eight hours on July 31.
- A significant portion of supply from gas-fired resources offered by net sellers was bid at prices significantly above cost-based default energy bids used when local market power mitigation is triggered. Most supply from gas resource offered by load serving entities was offered at prices at or below default energy bids.

Table 1-1. Implied heat rates by LAP area on July 30-31, 2020 (greater than 25 MMBtu/MWh)

Date	Hour	Location	Next-day gas commodity price ($/MMBtu)	Transportation cost ($/MMBtu)	Greenhouse gas emission credit ($/MMBtu)	DA LAP LMP ($/MWh)	Implied Heat Rate (MMBtu/MWh)
30-Jul	19	SCE	$2.60	$2.59	$0.91	$171.65	27.71
	19	SDG&E	$2.60	$2.88	$0.91	$173.42	26.74
	20	SCE	$2.60	$2.59	$0.91	$243.10	39.43
	20	SDG&E	$2.60	$2.88	$0.91	$245.23	37.99
31-Jul	19	SCE	$2.60	$2.59	$0.90	$173.50	27.97
	19	SDG&E	$2.60	$2.88	$0.90	$175.12	26.97
	20	SCE	$2.60	$2.59	$0.90	$237.05	38.38
	20	SDG&E	$2.60	$2.88	$0.90	$238.74	36.92

Prices in the ISO's day-ahead market on July 30 and July 31 equated to implied heat rates of about 27 to 28 MMBtu/MWh in hour-ending 19 and about 37 to 39 MMBtu/MWh in hour-ending 20 for the SCE and SDG&E areas.

Table 2-1. Residual supply index calculation July 30-31, 2020

Date	Hour	RSI1	RSI2	RSI3
30-Jul	17	1.13	1.027	0.971
	18	1.077	0.977	0.921
	19	1.012	0.91	0.855
	20	0.969	0.864	0.807
	21	0.996	0.888	0.828
	22	1.041	0.925	0.862
	23	1.19	1.059	0.988
31-Jul	16	1.149	1.052	0.996
	17	1.134	1.038	0.984
	18	1.089	0.994	0.94
	19	1.031	0.936	0.882
	20	0.988	0.89	0.834
	21	1.021	0.918	0.859
	22	1.078	0.968	0.906
	23	1.186	1.064	0.996

- Structural measures of market power indicate that the market was potentially uncompetitive during seven hours on July 30 and eight hours on July 31.

Figure 3.2 Supply bids (hour 20, July 28 - 31, 2020)

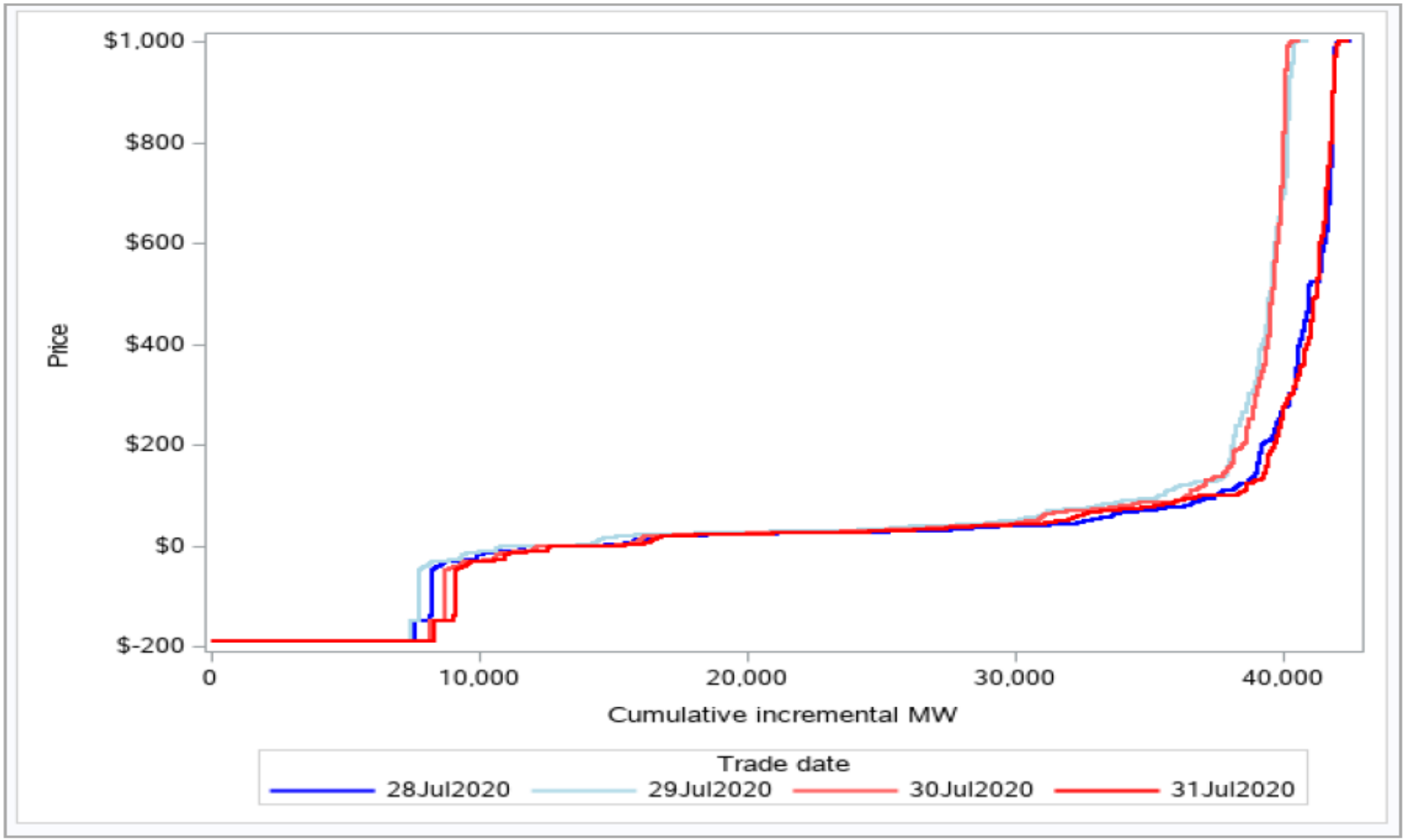


Figure 3.4 Import bids (hour 20, July 28 - 31, 2020)

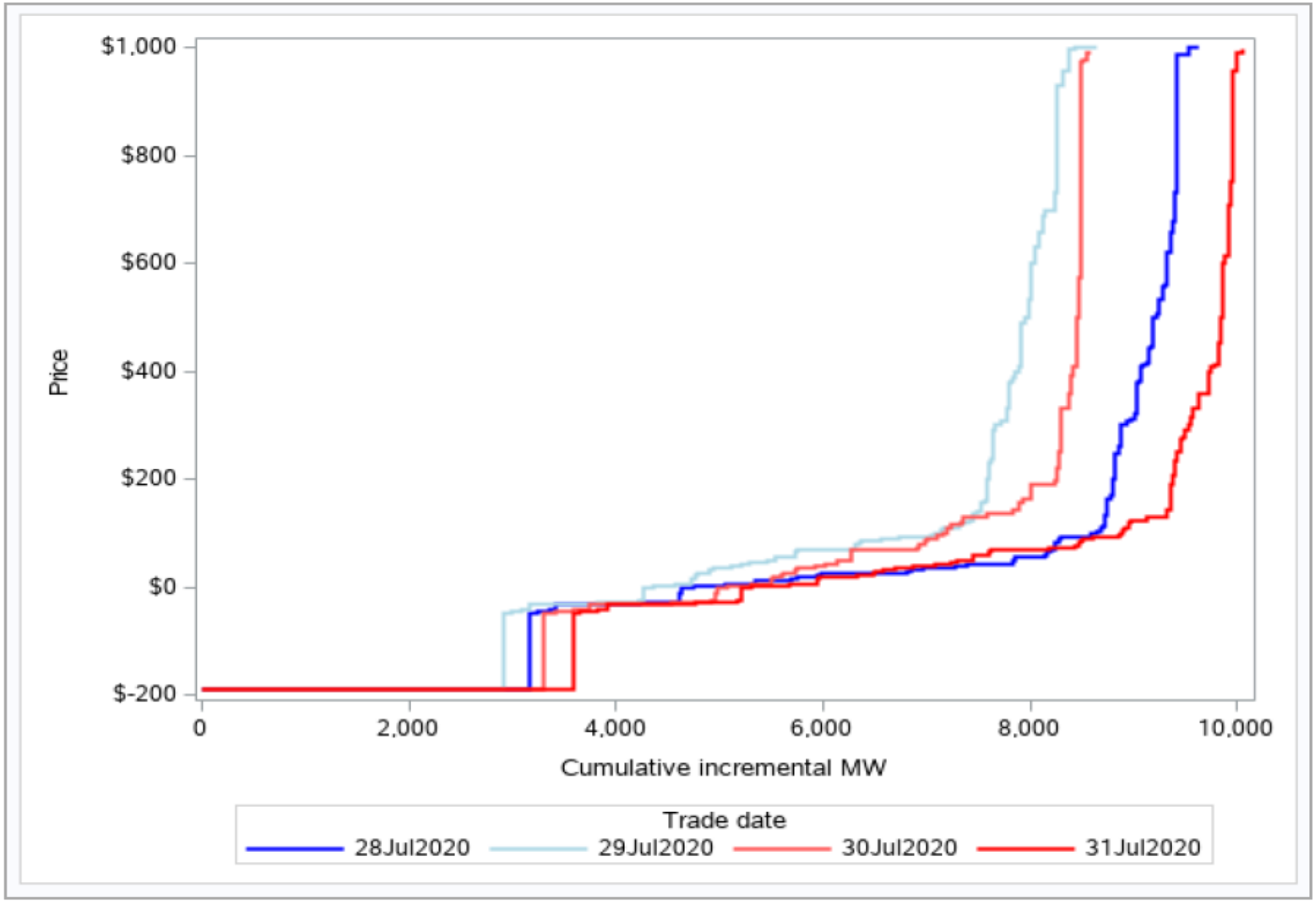


Figure 3.11 Net buyers supply input bid and reference (hour 20, July 30, 2020)

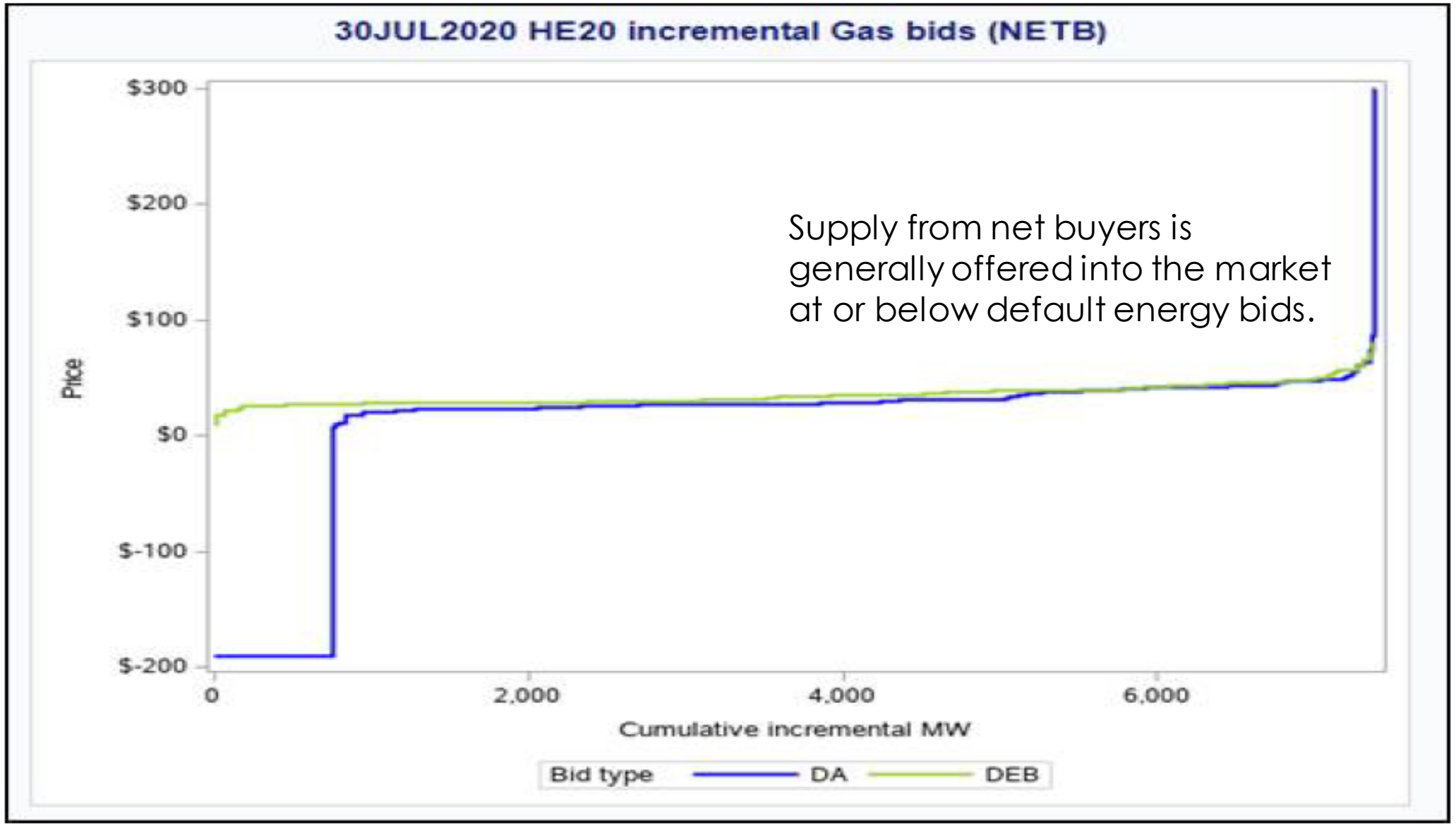
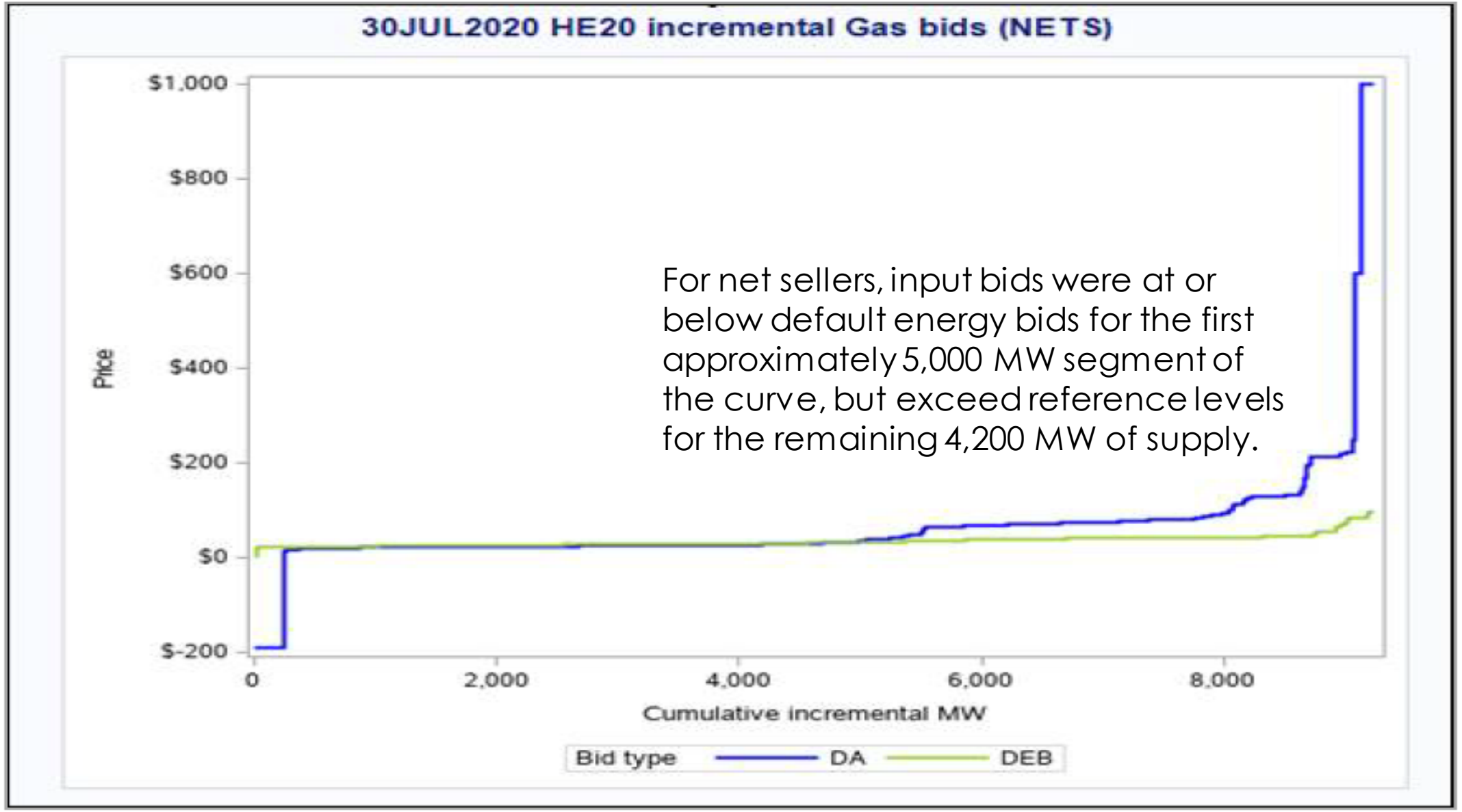


Figure 3.12 Net sellers supply input bid and reference (hour 20, July 30, 2020)



For net sellers, input bids were at or below default energy bids for the first approximately 5,000 MW segment of the curve, but exceed reference levels for the remaining 4,200 MW of supply.

Day-Ahead Prices – August 14

Locational Marginal Prices (LMP)

1 - 12 of ???

Market	Opr Date	Node	LMP Type	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22
DAM	08/14/2020	DLAP_PGAE-APND	LMP	41.09461	43.07000	50.66993	57.21902	69.45987	123.39195	472.89047	856.95654	920.34845	334.09800	79.16841
DAM	08/14/2020	DLAP_PGAE-APND	Congestion	0.00000	-8.93243	-7.84055	-11.85204	-20.82220	-19.40598	-2.74583	-71.42334	-31.47954	0.00000	-7.63720
DAM	08/14/2020	DLAP_PGAE-APND	Energy	41.64431	52.60742	58.69832	69.18868	90.40864	143.28519	479.23053	934.92430	962.51184	337.57500	88.23502
DAM	08/14/2020	DLAP_PGAE-APND	Loss	-0.54970	-0.60499	-0.18783	-0.11762	-0.12657	-0.48717	-3.59423	-6.54447	-10.68388	-3.47702	-1.42941
DAM	08/14/2020	DLAP_SCE-APND	LMP	41.95248	59.42549	64.45106	78.02664	105.75885	158.04690	484.38153	997.00000	997.00000	339.97180	95.44336
DAM	08/14/2020	DLAP_SCE-APND	Congestion	0.00000	6.47087	5.72926	8.85872	15.42254	14.74749	3.71330	58.80343	26.69178	0.00000	6.26422
DAM	08/14/2020	DLAP_SCE-APND	Energy	41.64431	52.60742	58.69832	69.18868	90.40864	143.28519	479.23053	934.92430	962.51184	337.57500	88.23502
DAM	08/14/2020	DLAP_SCE-APND	Loss	0.30817	0.34721	0.02348	-0.02076	-0.07233	0.01433	1.43769	3.27224	7.79635	2.39678	0.94411
DAM	08/14/2020	DLAP_SDGE-APND	LMP	42.70624	59.83830	64.29265	76.82556	104.79580	157.09016	480.84183	1,006.53845	1,002.68380	343.51633	96.83805
DAM	08/14/2020	DLAP_SDGE-APND	Congestion	0.00000	6.18400	4.69038	6.95884	13.42883	11.62713	-7.82954	56.65536	25.73423	0.00000	6.03539
DAM	08/14/2020	DLAP_SDGE-APND	Energy	41.64431	52.60742	58.69832	69.18868	90.40864	143.28510	479.23053	934.92430	962.51184	337.57500	88.23502
DAM	08/14/2020	DLAP_SDGE-APND	Loss	1.06193	1.04689	0.90395	0.67805	0.95833	2.17793	9.44084	14.95879	14.43768	5.94132	2.56764

Is the Current Capacity Framework Providing Value to Ratepayers?

- RA resources have a must-offer obligation (MOO) into CAISO's energy markets that is meant to ensure they are available to meet the demand.
- A MOO does not dictate how a resource will bid into the markets. There is an expectation that resources will bid economically because they have incentives to earn energy rents, but generators, importers and third-party demand-response providers have been bidding seemingly above their marginal costs.
- Some have argued that RA is a call-option at the bid-cap, but this will not ensure reliability at least-cost, nor can you run an efficient market with many bidding uneconomically or at the cap.
- Further, there is no system-level market power mitigation in place in the CAISO market to address these issues.
- IOU resources (where they are the scheduling coordinator) are subject to least cost dispatch rules, which ensure the IOUs are bidding economically, but others are not.
- The RA construct is meant to ensure that the CAISO system has sufficient resources to meet demand, but an RA-only construct does not work if these RA resources flow to the highest bidder and out of the state during reliability events – it seems that only surplus should be exported, consistent with practices for other balancing authorities.

Three Options to Address Concerns Identified with the Current Construct

1) Making several fundamental modifications to the existing capacity construct
   - revising the MCC buckets to make them binding in order to address issues associated with use-limited resources
   - revising the RA product to include a least-cost dispatch requirement or a bid cap;
2) Enhancing or replacing the current RA capacity / CAISO must-offer obligation construct with a forward energy based system hourly load shape framework that requires load serving entities to demonstrate procurement of sufficient energy from specified physical resources that are contractually obligated to flow (or, in the case of DR, curtail) to meet their energy needs on a forward basis; or
3) Replacing the current RA capacity / CAISO must-offer obligation construct with a fixed price forward energy requirement similar to Option 2, but including a financial hedging component that allows for risk arbitrage and price discovery on the part of generators, which can result in lower forward prices for customers.

Questions?

- Should a future solution move from a capacity requirement to a forward energy requirement?
- If a capacity construct is kept is there a need to change the current MOO to require a least cost dispatch requirement?
- What is an adequate level of energy open position 1 year, 2 year 3 years ahead of time?

Presentation 2: PG&E Proposal

Peter Griffes, Chief, Comprehensive Procurement Framework, PG&E

1:45-2 p.m.

Resource Adequacy Track 3B Workshop – Day 1

Peter Griffes (peter.griffes@pge.com)
November 18, 2020

Together, Building
a Better California

Topics

Expectations

- What are we trying to get done by when?

Principles

- PG&E filed in August

Incentives

- How will parties behave?

Counting

- Extending beyond ‘capacity at peak’

Expectations

What are we trying to get done by when?

Large structural changes

Replacement of existing system with one better suited to changing resource mix

- How requirements are set
- How resources count toward meeting requirement
- Any changes should create incentives that support state policy goals, such as reducing GHG emissions

Incremental improvements

How can modifications be incorporated that do not require fundamental changes to the current system?

- Improve current program
- Do not hinder larger changes

Principles

PG&E filed principles to guide the examination of the broader RA capacity structure.

They include:

- Support public policy objectives
- Promote efficient electric-resource investment and operations
- Allocate costs on a fair and equitable basis
- Assign risk fairly and efficiently
- Mitigate the exercise of market power
- Promote innovation and be robust to alternative futures

Incentives

How are parties going to act under proposed structure?

- Generally parties will act in their own self-interests
  - Are individual incentives in line with providing an efficient and equitable system overall?

- How do capacity requirements influence energy market behavior?

Counting

How will resources count under a restructured paradigm?

Extending beyond ‘capacity at peak’

Each major proposal extends program requirements beyond ‘capacity at peak’

Key considerations include:

- When will the resource be needed?
- How much should it count in the periods when it is needed?

Storage and hybrid resources need particular attention

Q&A/Discussion

Stretch Break :)

Please be back at 2:15 p.m.

Image Source: iamthinks.blogspot.com

Presentation 3: SCE&CalCCA Proposal + AWEA-CA Proposal

Stefanie Tanenhaus, Principal Regulatory Analyst, East Bay Community Energy
Eric Little, Principal Manager, SCE
Brian Biering, Attorneys for AWEA-CA

2:15-3:30 p.m.

CALCCA
ADVANCING LOCAL ENERGY CHOICE cal-cca.org

SCE-CalCCA Track 3b Reform

November 18th, 2020
CPUC RA Reform Workshop

SCE-CalCCA Track 3b Proposal

Key Elements:

- Net-Peak Capacity Test
- Energy Sufficiency Test
- Storage Charging Test
- VERs Treated as Net Load
- LSE-Specific Load Profiles

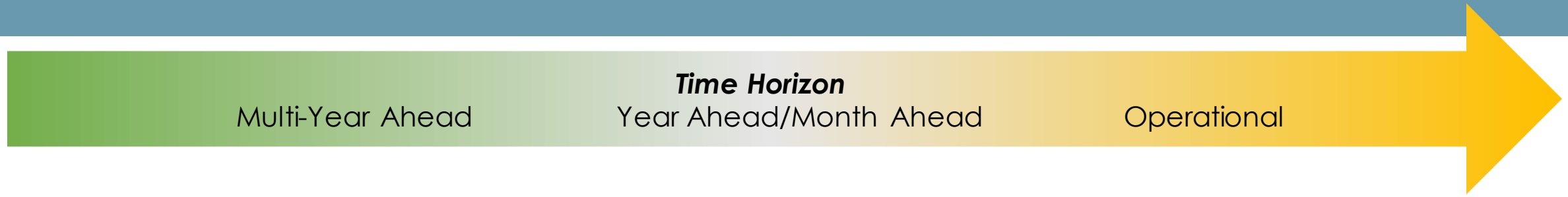
- ✓ The SCE-CalCCA proposal offers critical structural reforms targeting consensus RA program deficiencies
- ✓ The SCE-CalCCA proposal appropriately balances the need for program reform with the need for compliance feasibility and market fluidity
- ✓ The SCE-CalCCA proposal is compatible with further program calibration and reform (e.g. modifications to PRM, MOO, resource counting, etc)
- ✓ Necessary simplifying assumptions are mitigated by existing IRP and CAISO processes which reinforce and address "edge case" reliability risk

Consensus Deficiencies, Consensus Reforms?

- ✓ SCE-CalCCA proposal represents **significant, incremental reform** to the RA program structure while limiting incremental complexity.
- ✓ SCE-CalCCA proposal **does not preclude further reforms** to refine and calibrate the RA program.

Current Program Consensus Deficiencies	Structural Evolutions in SCE-CalCCA Proposal	Calibration Not Precluded by SCE-CalCCA Proposal
• Metrics focus on gross peak capacity sufficiency • Does not assess energy sufficiency • Poorly suited to high levels of non-conventional resources	• Refocuses on LSE-specific monthly net peak • Adds assessment of energy sufficiency • Novel treatment of as-available renewables; explicit accounting for storage charging needs	• Revised Planning Reserve Margin • Revised load forecast / extreme weather sensitivity • Revised Must Offer Obligations • Revised resource counting rules

Reliability Policy Ecosystem



IRP Processes

- System-wide assessment
- LSE submissions and aggregation
- Procurement Track

Ensures reliable resource fleet **exists**.

RA Compliance

- LSE filings
- CAISO Deficiency Testing/Portfolio Assessment

Ensures reliable resource fleet **under contract**.

Reliability Performance

- CAISO Market Dispatch

Ensures reliable resource fleet **economically dispatched**.

"Edge Case" Risk In Context

- The RA program, by necessity, provides a simplified representation of portfolio reliability compared to stochastic assessments performed in the Integrated Resource Planning or CAISO Portfolio Assessment processes.

- While making significant incremental improvements to RA program accuracy, the SCE-CalCCA proposal retains simplifications and approximations to maintain compliance feasibility and market fluidity.

- As a robustness check, SCE, CalCCA and other stakeholders have proposed various "edge cases" which may meet the proposed construct without providing real-world reliability.

- While these edge cases reflect areas for further exploration and refinement, in general, other elements of the reliability framework mitigate the risk of edge case reliability failures:
    - The IRP / IRP Procurement Track safeguard against resource fleet deficiencies by backstopping new resource development.
    - The CAISO Portfolio Assessment and Capacity Procurement Mechanism safeguard against RA fleet deficiencies by backstopping RA contracting.

Process to Arrive at a Q2 2021 Decision

CPUC RA Track 3B Workshop

November 18, 2020

Stated Schedule

MODIFIED TRACK 3.B CALENDAR	
Event	Date
Workshop on draft Track 3.B proposals submitted August 7, 2020	November 2020
Revised Track 3.B proposals due	December 18, 2020
Comments on revised Track 3.B proposals due	January 15, 2021
Workshop on revised Track 3.B proposal	February 2021
Second revised Track 3.B proposals and comments on additional process due	March 9, 2021
Proposed decision on Track 3.B and Track 4	May 2021
Final decision on Track 3.B and Track 4	June 2021

What is expected in the "Final Decision"

- With regard to the Structural Changes to RA component, SCE sees two options:
  - A full implementable solution with a decision in 2021 for implementation in 2022
  - A narrowing of the proposed solutions to a manageable number to evaluate the necessary details to attain an implementable solution
    - This would likely then be a decision in 2022 for implementation in 2023 at the earliest
- In order to make the limited workshops feasible or to determine if additional workshops/processes are necessary it is imperative to decide which of the two objectives (or some other objective) is the ultimate goal

Actions to Narrow the Options by Q2 2021

- Each Option should be further explored
  - This exploration should not be at the level necessary for implementation
  - Rather the explorations should focus on elements that may present a "no-go" determination
  - If none of the options have a "no-go" determination, then the options should be ranked to determine if there is a clear leader or if more than one option should be pursued to arrive at an implementable solution
- The workshop process should be utilized to discuss the elements of each proposal to determine the general requirements they would have to meet the reliability needs of the RA program

SCE/Cal CCA RA Structural Change Proposal Exploration

CPUC RA Track 3B Workshop

November 18, 2020

Items for Further Consideration

- Net Qualifying Energy
  - Temporal Aspect
    - If a resource has 100 MWh available over 30 days, how do you prevent this from meeting a 100 MWh need in one-hour?
  - How is NQE Calculated
    - Inclusion of use limitations
    - Monthly allocations
  - Must offer obligation
    - If a resource has allocated NQE to multiple months, what happens to the must-offer if they reach the NQE during the month
  - Netting of wind and solar
    - Should this be a transactable product (i.e. rather than netting any renewable in one's portfolio, should we net the wind and solar for which the party has bought its RA value)?
  - Hybrid Resources
    - Do they need to be accounted for differently than if they were simply separate renewable and storage devices
- Other elements may also need to be included for further consideration
  - Load forecast process adjustment if necessary
  - Application to local RA and consideration of flex RA
  - PRM determination, UCAP applicable to NQE as necessary

AWEA AMERICAN WIND ENERGY ASSOCIATION

CALIFORNIA

Valuing Intermittent Resources and Deliverability in SCE & Cal CCA's "Bottom-Up" Proposal (RA -Track 3b)

November 18, 2020

AWEA AMERICAN WIND ENERGY ASSOCIATION
CALIFORNIA

AWEA-California is a project of the American Wind Energy Association, representing companies that develop, own, and operate utility-scale wind, solar, storage, offshore wind, and transmission assets. AWEA-California is focused on driving immediate and sustained development of new utility-scale renewable energy capacity to propel California toward a carbon-free electric future. In January of 2021, AWEA will merge with a new organization to become the American Clean Power Association.

- Our policy priorities in the RA proceeding include:
  - Create a durable RA structure that provides confidence to buyers, sellers and their lenders as the state undertakes the capacity expansion necessary to meet near-term reliability objectives and longer-term GHG target and capacity expansion needs.
  - Ensuring that capacity is appropriately valued to send the appropriate signals to buyers and sellers alike. Incentivize the provision of energy, capacity and ancillary services from a diverse set of carbon-free technologies in diverse locations.
  - Collaborate with neighboring balancing authority areas to facilitate a more regional market for capacity.

Valuing clean capacity

Issues Identified by CPUC in Assessing Reliability and Environmental Targets

RA Track 3B Scoping Ruling: "address energy attributes and hourly capacity requirements, given the increasing penetration of use-limited resources."

IRP the May 2020 Reference System Plan identifies a need for approx. 25-37 GW of incremental capacity between now and 2030.

RPS SB 100 accelerated the compliance periods and requires 65% of each compliance period to derive from long term contracts

Issues Identified by Buyers and Sellers in marketing Capacity

- NQC
  - LSEs should seek best prices on RECs and RA from a diverse set of resources. Generic ELCC derate factors mute the capacity price signal.
  - Renewables can offer a broader variety of products and services. The ELCC mutes the value of these services.
- Contracting Structures must evolve to value a broader suite of products that can be provided by renewable energy capacity
  - RPS Contracts generally require FCDS and are designed to simply maximize output. Changing this structure to incentivize services can provide headroom.
- Variations in deliverability status should be differentiated and valued

A “Bottom-Up” Approach to RA Planning Will Facilitate A Diverse Array of Capacity Expansion Options

- SCE/CalCCA Track 3b proposal is a thoughtful redesign to account for changes in the makeup of LSEs and technologies.
  - Current structure does not incentivize coordinating RA and RPS investments. By valuing “qualified energy”, the proposal provides an opportunity to optimize RPS and RA procurement needs. This makes ratepayer investments in SB 100 more cost effective.
  - Currently, RPS contracts focus on maximizing production. This structure is resulting in a growing amount of curtailment.
  - The proposal “will obviate the need for a single ELCC value as used today in which an environment of decreasing ELCC values may discourage development of resources that otherwise could benefit reliability.”

Expanding the Definition of Deliverability

- SCE/CalCCA proposal would require all IFOM wind / solar to be fully deliverable and notes that the definition of "full deliverability" status should be reexamined under their proposal.
  - "Restricting the deliverability study to one set of conditions is unlikely to produce an outcome that is consistent with the reliability contribution of all resources to the grid."
- "Deliverability" refers to a generator's ability to deliver its energy to load during different system conditions, including expected congestion caused by other generators' output. CAISO Has Several Deliverability Assessment Methodologies:
  - Full Capacity Deliverability Status
  - Partial Capacity Deliverability Status
  - Energy Only
  - Off-Peak Deliverability Status: EO-OPDS and FCDS-OPDS
- According to the CAISO, "every initial interconnection request in the past two years has requested Full Capacity Deliverability Status."

Off Peak Deliverability Status Cont.

OPDS is an important policy development. According to the CAISO (May 2020 OPDS Assessment):

- "Concerns remain with the ability of the transmission planning process to identify the upgrades on a timely basis to facilitate generation development, especially local transmission upgrades that depend on the exact point of interconnection of the future generation."
- "The off-peak deliverability methodology was developed to address renewable energy delivery during hours outside of the summer peak load period to ensure some minimal level of protection from otherwise potentially unlimited curtailment." and "identify transmission bottlenecks that would cause excessive renewable curtailment"
- the study assumptions focus on system conditions when system-wide oversupply is unlikely. Interconnection customers that elect to finance the network upgrades identified in the off-peak deliverability assessment (or that do not face such constraints) will receive Off-Peak Deliverability Status (See January 2020 (see Jan. 2020 CAISO Compliance Filing, ER20-732).

In the IRP and the SB 100 process, the Commission and energy agencies studied considerable amounts of energy-only resources and found them to be cost effective, but there is no viable path to contracting Energy-only resources.

CAISO 2020 OPDS Modeling

Figure 1: Normalized CAISO Total Solar Output Duration Curve

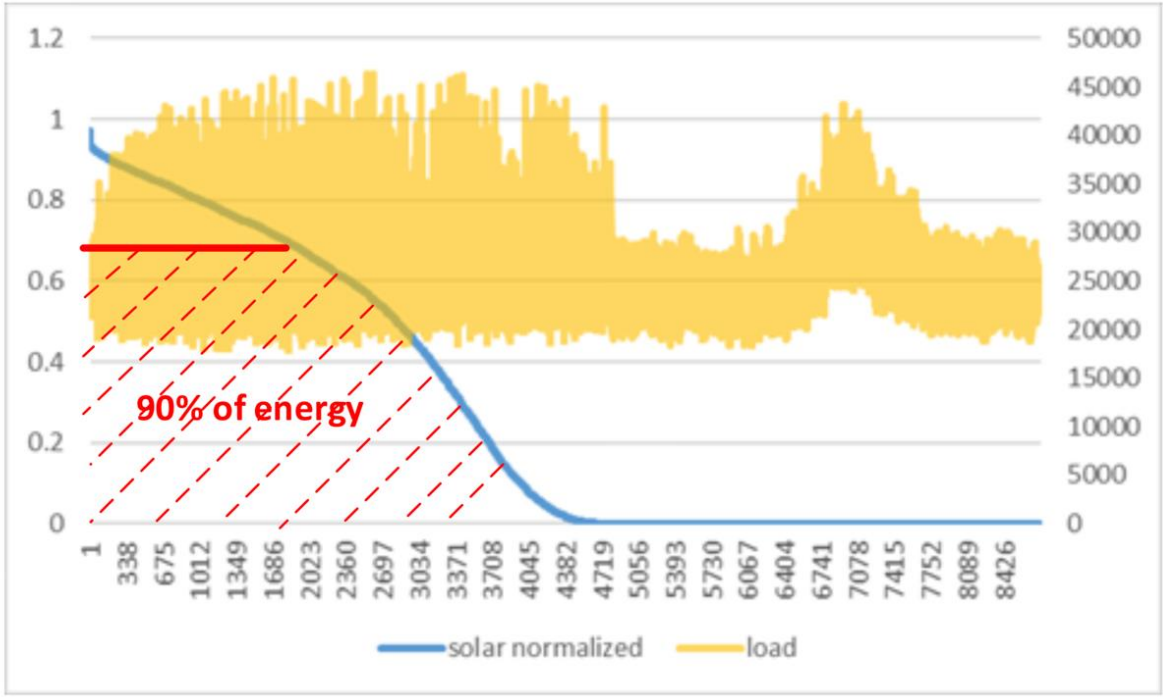
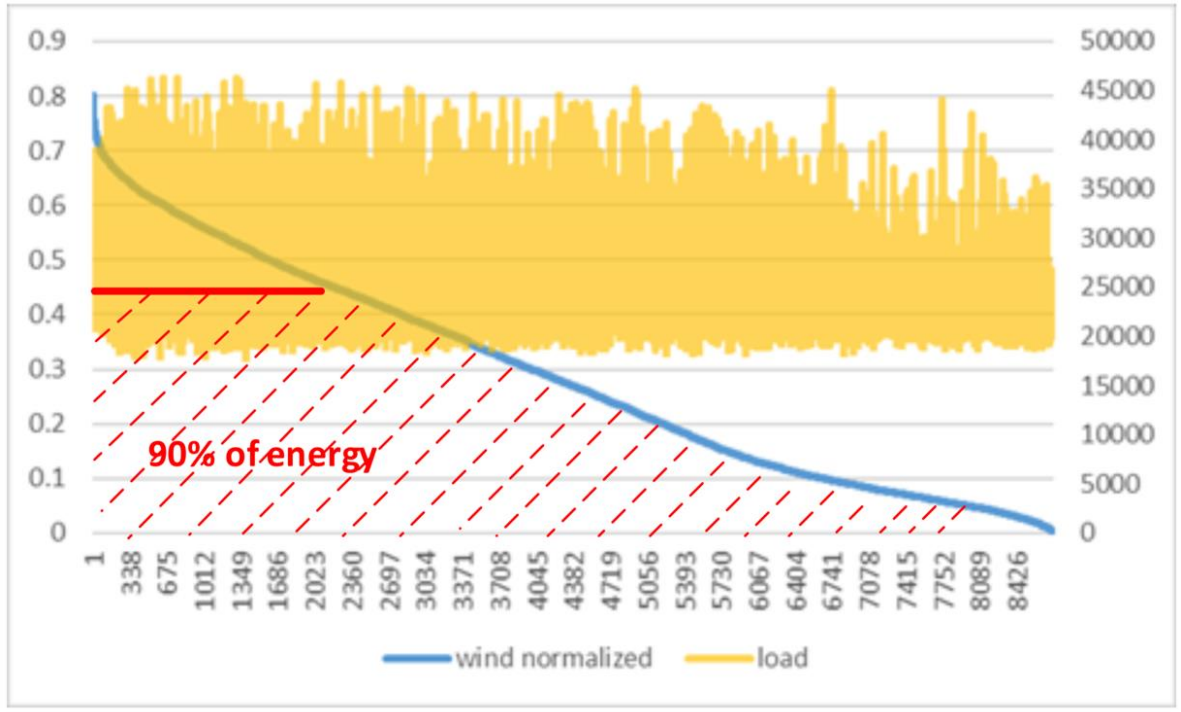


Figure 2: Normalized CAISO Total Wind Output Duration Curve



See CAISO Off-Peak Deliverabilty Assessment Methodology (March, 2020), pp 2-3, available here: https://www.caiso.com/Documents/Off-PeakDeliverabilityAssessmentMethodology.pdf

AWEA-CA Proposal to Revise FCDS in CalCCA/SCE Proposal

- Consider what should be netted vs. what should count as capacity to meet the LSE's peak load. Dispatchable resources, including hybrids, should not be netted.
- Re-evaluate how resources are netted and create an RA value stream for OPDS that incentivizes cost-effective transmission planning. Netting should only occur during deliverability hours. Allow netting of energy-only off peak deliverability status
- Evaluate how "head-room" and the provision of ancillary services can be incentivized through new contracting structures under the SCE/CalCCA proposal

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Q&A/Discussion

Presentation 4: Green Power Institute (GPI) Proposal

Dr. Gregg Morris, Director, GPI

3:30-3:45 p.m.

Another Stretch Break :)

Please be back at 4 p.m.

Image Source: iamthinks.blogspot.com

Presentation 5: California Energy Storage Alliance (CESA) MCC Bucket Proposal

Jin Noh, Senior Policy Manager, CESA
Sergio Dueñas, Senior Regulatory Consultant, CESA

4-4:20 p.m.

CESA
CALIFORNIA ENERGY STORAGE ALLIANCE

RA Track 3B Workshop: CESA's Track 3B Proposal

November 18, 2020

Jin Noh
Senior Policy Manager
jnoh@storagealliance.org

Agenda

- RA Track 3B Scoping Issues & Context
- Purpose of CESA's Track 3B Proposal
- Summary of CESA's Track 3B Proposal
- Potential Benefits of CESA's Track 3B Proposal
- Potential Limits and Q&A

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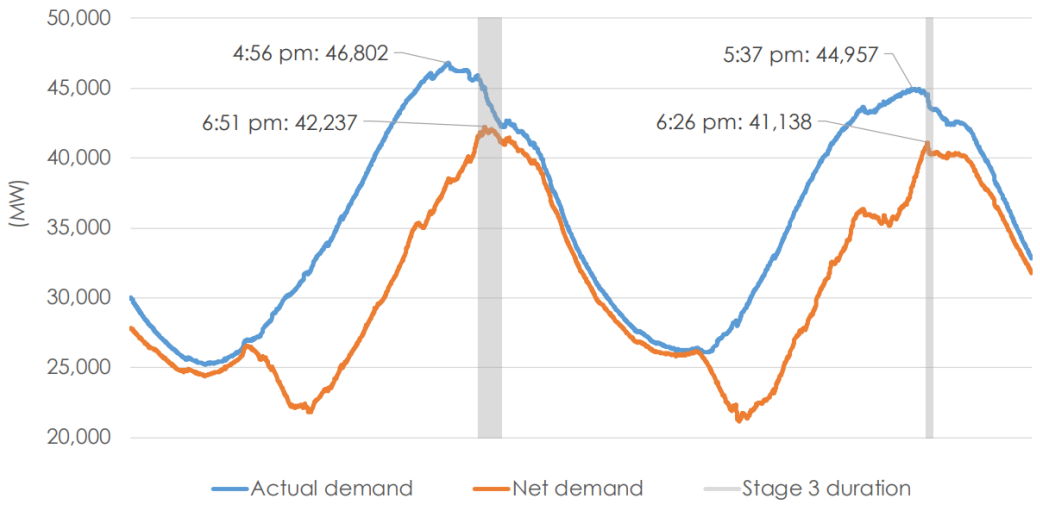
RA Track 3B Scoping Issues & Context

- **According to the Scoping Memo (at 4-5), Track 3B is focused on:**
  - Examination of the broader RA capacity structure to address *energy attributes* and *hourly capacity requirements*, given the increasing penetration and reliance on use-limited and preferred resources, among other things
- **The Preliminary Root Cause Analysis Report highlighted the limits of the current RA construct around peak demand:**
  - "Today, the single critical period of peak demand is giving way to multiple critical periods during the day including the net demand peak, which is the peak of load net of solar and wind generation resources." (at 47)

Figure 4.3: Demand and Net Demand for August 14 and 15



Source: Preliminary Root Cause Analysis Report at 49

RA Track 3B Scoping Issues & Context

- **Maximum Cumulative Capacity (MCC) buckets were established to set four resource categories and indicate the maximum amount of capacity LSEs could rely on various use-limited resources:**
  - The current MCC paradigm calculates MCC percentages following the Mirant formula based on the average load duration curve across the summer months
- **Using updated 2016-2018 load duration curves, D.20-06-031 adopted a new definition of "availability" and updated the percentages:**
  - D.20-06-031 adopted staff's Option 4b proposal to "prevent over-reliance on [use-limited] resources to meet reliability needs and minimize LSEs leaning on other LSEs' portfolios" (at 55)

ADOPTED MCC BUCKETS

Category	Availability	Maximum Cumulative Capacity for Bucket and Buckets Above
DR	Varies by contract or tariff provisions, but must be available Monday – Friday, 4 consecutive hours between 4 PM and 9 PM, and at least 24 hours per month from May - September	8.3%
1	Monday – Friday, 4 consecutive hours between 4 PM and 9 PM, and at least 40 hours per month from May – September	16.0%
2	Every Monday – Friday, 8 consecutive hours that include 4 PM – 9 PM	22.2%
3	Every Monday – Saturday, 16 consecutive hours that include 4 PM – 9 PM	34.8%
4	Every day of the month. Dispatchable resources must be available all 24 hours.	100% (at least 56.1% available all 24 hours)

Purpose of CESA's Track 3B Proposal

- **Currently, the MCC buckets:**
  - Limit market transformation by establishing hard caps on specific technologies
  - Place undue emphasis on the continuous operation of RA resources
  - Increase the likelihood of continued reliance on fossil-fueled resources months
- **This proposal focuses on reframing the MCC paradigm to set the "ingredients" that:**
  - Consider energy requirements and characteristics and focus on the periods with actual reliability risks (*i.e.*, ramping periods, hours identified by the RA Enhancements Initiative)
  - More flexibly enable different types of preferred, energy storage, and hybrid resources to makeup an LSE's portfolio and meet the multi-hour capacity needs
  - Reasonably balance or maintain bilateral transactability and contract financeability with more complex technical or portfolio-based constraints
  - Provide more immediate reforms leveraging existing RA constructs to support continued preferred/storage resource development while developing more significant RA reforms

Summary of CESA's Track 3B Proposal

- **To reframe the MCC framework, this proposal would:**
  - Reform the MCC structure to have MCC Categories 2 and 3 include non-consecutive availability requirements that capture both the morning ramp (5-9 AM) and the 4-9 pm period
  - Consider solar and wind (VERs) that currently provide RA as RA-reducing resources
- **The specific availability requirements could be adjusted, and percentages recalculated, but the core premise is to more flexibly account for and accommodate operations**

Category	Availability (CESA's Proposed Modifications as Highlighted)
DR	Varies by contract or tariff provisions, but must be available Monday – Friday, 2 consecutive hours via test or dispatch between 4 PM and 9 PM from May – September
1	Monday – Friday, 4 consecutive hours between 4 PM and 9 PM, and at least 40 hours per month from May – September
2	Every Monday – Friday, 8 consecutive hours that include 4 PM – 9 PM or Every Monday – Friday, 8 non-consecutive hours that include 5 AM – 9 PM and 4 PM – 9 PM
3	Every Monday – Friday, 16 consecutive hours that include 4 PM – 9 PM or Every Monday- Friday, 16 non-consecutive hours that include 5 AM – 9 PM and 4 PM – 9 PM
4	Every day of the month.

Summary of CESA's Track 3B Proposal

- **The availability assessment hours (AAH) can be used to incentivize and ensure resources qualifying for a specific MCC category perform in accordance with the category's availability requirements:**
  - This proposal would also require the Commission to revisit their "physical availability" definition to one focused on market availability of capacity to times of need
- **Storage capacity counting will be done in accordance with their qualifications in the various MCC bucket categories**
- **With a focus on net load duration curves, hybrid and co-located storage would also no longer be automatically Category 4 but would fit within the appropriate bucket**
- **The modifications to the DR bucket would also set minimum requirements for DR to qualify but also enable other forms of DR that can provide more energy (*e.g.*, 4-hour storage-backed DR) to qualify for the appropriate bucket, not be "lumped" into DR bucket**

Potential Benefits of CESA's Track 3B Proposal

- **Near-term applicability:**
  - Existing RA structures are leveraged in the near term, providing a bridge between the status quo and more fundamental revisions to it (*e.g.*, SCE/CalCCA NQE proposal)
  - Transactability and financeability of RA contracts are maintained with discrete MCC category requirements while enabling energy delivery through CAISO market participation
- **Alignment with recent ISO findings regarding system reliability needs:**
  - Continuous operation of resources is not required, but a "block stacking" or portfolio of assets which is better equipped to address the evolution of reliability needs (*e.g.*, portfolio of four-hour storage assets could address greater than four-hour capacity need)
- **Flexible incorporation of energy storage and their intended operations:**
  - Storage assets need not be categorized immediately according to their 'nameplate' duration, they can be modeled as fulfilling different needs given the available categories (*e.g.*, cycling twice a day, derating capacity to fulfill longer energy needs)

Potential Benefits of CESA's Track 3B Proposal

- **Aligns incentives to procure for diverse resources:**
  - Conditions are created for LSEs to procure storage resources with durations in excess of 4 hours, if they are deemed economic
  - Rather than setting discrete 'n-hour' rules for storage capacity, storage resources can be counted for full capacity for the duration provided in line with MCC buckets (*e.g.*, 8-hour, 10-MW storage can count for 10 MW QC if they meet Category 3 minimum requirements)
- **Ensures the continued development of renewable generation:**
  - Restrictions on VERs in Category 4 are eliminated, reducing the risk for under-procurement in light of the IRP – so long as dispatchable RA resources are procured and operated in line with MCC category requirements
- **Potentially enables multiple-use applications (MUAs):**
  - By reflecting the minimum requirements of the specific MCC category, it can enable storage/DER MUAs that enable the provision of other services in other hours

Potential Limits of CESA's Track 3B Proposal

- **Areas for workshop feedback:**
  - **Transition considerations:** The transition from VERs as RA supplying based on ELCC values versus RA reducing could have material impacts for near-term procurement needs, and whether/how RA value should be impacted when MCC percentages are updated to reflect new net load curves
  - **Interactions with the "4-hour" rule:** Even if this framework creates the incentives to procure resources with durations in excess of 4-hours (if economic), this incentive could be minimal if these resources do not get a value "premium"
  - **Application to Local RA:** Applying this framework to Local RA would require identifying area-specific percentages and times of need, which could potentially over-complicate the current process
  - **Transactability:** If applied to both System and Local RA, this proposal would create differentiated percentages and availability requirements, potentially limiting (or eliminating) transactability
  - **Others?**

Questions?

CESA
CALIFORNIA ENERGY STORAGE ALLIANCE

Thank you!

Jin Noh

jnoh@storagealliance.org

Presentation 6: OhmConnect CEDMC Leap MCC Bucket Proposal

Maria Belenky, Senior Market Analyst, OhmConnect

4:20-4:30 p.m.

MCC DR Bucket: Proposed Revision

RA Track 3.B Workshop | November 18, 2020

Principal Concerns with 8.3% DR Bucket Cap

The cap is <8.3%, prejudices third-parties, and counters the recommendations of the *Root Cause Analysis*

1. Effective cap is *lower* than 8.3%

- Growth potential true at system level, but cap is implemented per LSE
- If some LSEs do not to procure DR, "headroom" is lost
- Observed LSEs hitting cap this procurement cycle — ***with just 2 major market players***

2. Cap uniquely prejudices third-part DR

- Vast majority of DR (~75%) is IOU DR programs
- IOU DR is a must-take resource that is allocated first to LSEs (=fills bucket first)
- This represents preferential treatment and contrary to D.16-09-056:
  - *"DR shall be market-driven […] with a preference for services provided by third-parties through performance-based contracts at competitively determined prices."*

Principal Concerns with 8.3% DR Bucket Cap

The cap is <8.3%, prejudices third-parties, and counters the recommendations of the *Root Cause Analysis*

3. Cap raises unnecessary barriers to deployment of additional DR

- If DRPs cannot sell capacity already-approved for 2021 when willing buyers exist — & in market with very few players:
  - No incentive to develop additional resources & encourage new market participants
  - Available DR capacity providing RA next summer may not even match existing levels

CPUC & CEC should "expedite the regulatory and procurement processes to develop additional resources that can be online by 2021 … This will most likely focus on "demand side" resources such as demand response…"

-- **Root Cause Analysis**

Proposals

Proposals are not mutually exclusive

1. Apply the 8.3% cap at the System level only

- To implement, uncap DR procurement at the LSE level until total approved DR MW reach the 8.3% threshold
- Volume of DR counting toward RA is public information, is currently <8.3% of peak need → no reliability concerns
- Help truly realize 100% growth potential envisioned in D.10-06-031

2. Cap third-party procurement only

- IOU DR programs should not preempt third-party DR in filling the MCC bucket
- LSEs do not directly procure IOU DR & cannot control whether/how much is in their portfolio
- Proposal: Count only directly-procured third-party DR toward bucket cap

Proposals

Proposals are not mutually exclusive

> *"We anticipate further exploration of whether specific DR programs with appropriate, homogeneous operating characteristics should be included in Bucket 1 before the DR bucket constrains development of these resources."*
> **-- D.20-06-031**

3. Allow BTM resources to count toward Bucket 1

- Little reason that a resource able to meet operation characteristics of a bucket should not count toward it
- No particular benefit to waiting on this matter
- **At best:** Encourages better/more available models of DR
- **At least:** Frees up headroom in DR bucket for truly use-limited resources

Questions?

California Public Utilities Commission

Thank you for attending day 1 of Track 3B workshops.
Feedback welcome.
Day 2 workshop: Monday, 11/23, 9:30-4p.m.

Hosts contact:
Jaime Gannon – jaimerose.gannon@cpuc.ca.gov
Linnan Cao - linnan.cao@cpuc.ca.gov