

RA Reform: Hedging

January 5, 2021



Together, Building
a Better California



Safety



Earthquake

Know the safest places to drop, cover, and hold, such as under sturdy desks and tables.



Fire

Know your exits, escape routes, and evacuation plan. If safe to do so, use your compliant fire extinguisher. Exit the house and call 911.



Active Shooter

Get out, hide out, take out, and call 911.



Medical Emergency

Know who can perform first aid and CPR. Call 911 if you're alone or share your location with the call leader to send help. If you have an AED, ensure you and others in your household know where it's located and how to use it.



Psychological Safety

- ✓ We care for each other.
- ✓ Look out for one another.
- ✓ Create a safe space for all.
- ✓ Welcome new ideas from everyone.
- ✓ Practice self-care.



Ergonomics

- ✓ Practice *30/30* (every 30 minutes, move & stretch for 30 seconds).
- ✓ Ensure proper ergonomics.



COVID-19

- ✓ Wash hands frequently
- ✓ Wear a mask when required
- ✓ Get vaccinated if you are able to
- ✓ Follow current CAL-OSHA regulations and local county health orders.



Track 3B.2 Background & CPUC Principles

The scope of Track 3B.2, as adopted in the December 11, 2020 Amended Scoping Memo, included 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;
- rolling off of a significant amount of long-term tolling contracts held by utilities;
- and material increases in energy and capacity prices experienced in California over the past years.

Principles as directed by the CPUC in D.21-07-014 issued on July 15, 2021:

1. Balance a Reliable Electrical Grid with Minimizing Costs to Customers
2. Balance Addressing Hourly Energy Sufficiency with Advancing Environmental Goals
3. Balance Granularity in Meeting Hourly Needs with Simplicity and Transactability
4. Implementable in the Near-Term (2024)
5. To be durable and adaptable to a changing electric grid



Hedging Background

D.21-07-014:

“Particularly given the summer 2020 electricity outages and the reliance on import energy to serve California’s load, we find it critical that a future framework include a component that links RA to a resource’s energy bidding behavior so as to increase the cost-effectiveness of RA.” (p.27)

“...the Commission remains concerned that PG&E’s approach, as well as other proposals, lack a means to ensure that RA is linked with energy bidding behavior in order to balance reliability with minimizing costs to customers. Therefore, the Commission directs parties in workshops to discuss and propose a hedging component as part of the final proposed framework, such as PG&E’s hedging proposal, Energy Division’s bid cap proposal, or aspects of the SFPFC concept.” (p38)

Hedging proposals under consideration:

- Variable Cost Hedge: PG&E proposal
- Price Cap Rebate: PG&E proposal
- Bid Cap: ED proposal
- Elements of SFPFC: ED proposal



Hedging Objectives

- PG&E Presentation: Discuss pros and cons of proposals under consideration
- PG&E Presentation: Identify how the existing proposals could be incorporated into the slice-of-day proposals
- Hedging Workshop Broadly: Discuss any new proposals



ED Proposals

- SFPFC: unclear to PG&E how this could be adapted to work with the slice-of-day proposals, but open to stakeholder ideas
- Bid Cap: require a bid cap of the greater of \$300/MWh or the resource-specific default bid for all resources under RA contracts
 - Pros: Simple and easy to understand
 - Cons: Unclear if the requirement can be legally implemented; even if it is legal, there's a significant administrative burden to enforce the approach

Additional enforcement detail: Energy Division staff propose to review bidding by market participants and refer load serving entities for non-RA compliance if the resources do not comply with the resource adequacy requirements per contractual provisions



PG&E Proposals

- PG&E initially submitted a hedging proposal (variable cost hedge) in December 2020 and subsequently submitted an additional proposal in a March 2021 revision (price cap rebate).
- The variable cost hedge proposal would require variable costs to be identified in the RA contract and energy market revenues in excess of the costs to be rebated to the LSE.
- PG&E's revised price cap rebate proposal functions like the variable cost hedge, except that instead of having the rebate trigger based on variable cost, it would be based on a price cap value.
 - When LMPs exceed the price cap trigger, LSEs are credited the difference between the LMP and the price cap.
 - The mechanism assures that energy prices above the price cap amount do no additional harm to consumers and that resources do not directly benefit from energy prices above the price cap.
 - Provides an incentive for generators to participate in the market, as prices above the cap would still need to be rebated regardless of whether the generator was participating in the market or not.
 - The price cap rebate approach could allow for LSEs to individually determine their appetite for risk by allowing each LSE to determine their price cap (subject to broad Commission direction).



Price Cap Rebate – What Price?

- Should LSEs be allowed to determine their own price cap? Or should the Commission direct a specific cap?
- If the Commission determines a single level for all LSEs, what level should the cap be set at?



PG&E Experience w/ Hedging

- PG&E has experimented with hedging approaches in some recent solicitations:
 - Emergency Reliability OIR: 1 executed contract
 - Mid-term Reliability OIR: 1 executed contract
 - Central Procurement Entity Solicitations
- The variable cost hedge terms are outlined in the “Energy Settlement” section of the contracts associated with these solicitations
- PG&E plans to pursue additional contracts of this nature in the future



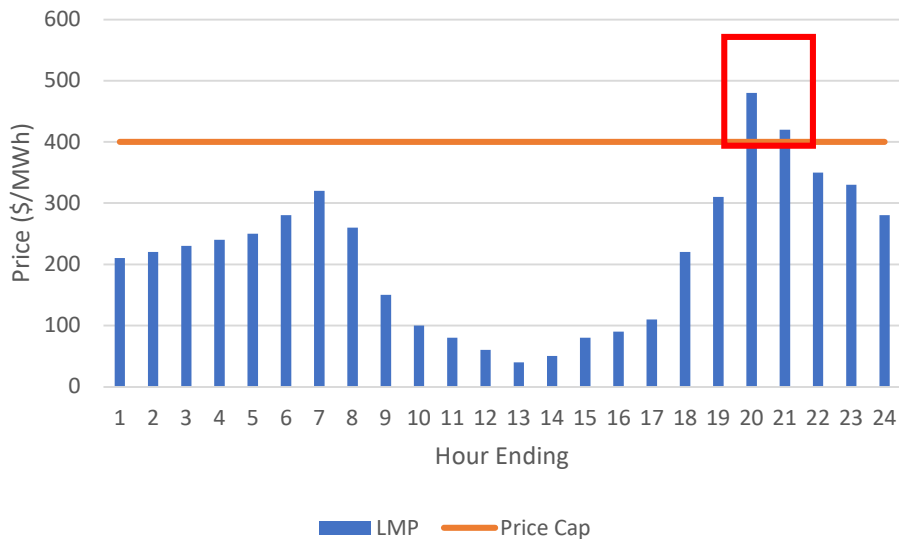
Example: Price Cap Rebate

Overview

- **Concept:** The difference between the LMP prices and the bid cap determine if a rebate is needed and, if so, the amount rebated.
- **Resource Type(s):** Any resource subject to the price cap
- **Calculation:** For each hour, $\text{Max}(\text{Cap Price}, \text{LMP Price}) - \text{Cap Price}$

Example

- Capacity = 10 MW Price Cap = \$400/MWh



HE	Cap Price	LMP	Calculation
20	\$400	\$480	$= (480 - 400) * 10$ $= \$800$
21	\$400	\$420	$= (420 - 400) * 10$ $= \$200$
Total			\$1000



Example: Variable Cost Hedge – Gas Fired

Overview

- **Concept:** The difference between the CAISO index price and the calculated dispatch price of the resource, based on the contractual heat rate, variable O&M, and market fuel prices (including transportation and GHG).
- **Resource Type(s):** Dispatchable gas-fired
- **Example Calculation:** For each hour, $\text{Max}(0, \text{Index Price} - \text{Daily Dispatch Price}) * \text{Capacity}$
 $\text{DDP} = \text{Heat Rate} * (\text{Gas Price} + \text{Gas Transport} + (\text{GHG Price} * \text{GHG Conv})) + \text{VOM}$

Example

- Capacity = 10 MW



HE	Index Price	DDP	Calculation
20	\$47	\$39.42	$= (47 - 39.42) * 10$ $= \mathbf{\$75.80}$
21	\$41	\$39.42	$= (41 - 39.42) * 10$ $= \mathbf{\$15.80}$
Total			\$91.60



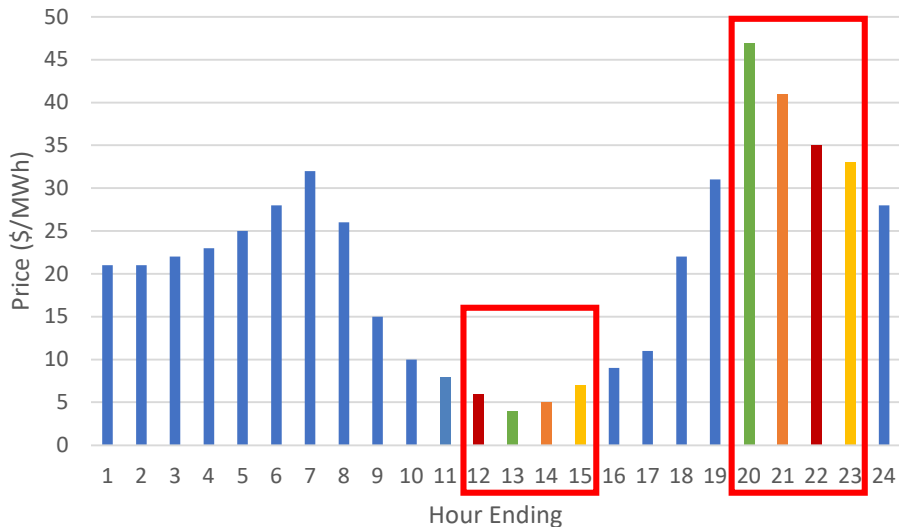
Example: Variable Cost Hedge – Energy Storage

Overview

- **Concept:** The difference between the “k-th” highest priced hours and the “k-th” lowest priced hours of each day, adjusted for the contractual variable O&M and roundtrip efficiency. “k” is equal to the duration of the resource (e.g., 4 hours).
- **Resource Type(s):** Energy Storage
- **Calculation:** For each hour, $[\text{High Price}_k - (\text{Low Price}_k + \text{VOM})] * \text{Capacity}$

Example

- Capacity = 10 MW VOM = \$5/MWh
- Efficiency = 100%* Duration = 4 hours



#	Highest Index Price	Lowest Index Price	Calculation
1	\$47 (HE20)	\$4 (HE13)	$= 47 - (4 + 5) * 10$ = \$380
2	\$41 (HE21)	\$5 (HE14)	$= 41 - (5 + 5) * 10$ = \$310
3	\$35 (HE22)	\$6 (HE12)	$= 35 - (6 + 5) * 10$ = \$240
4	\$33 (HE20)	\$7 (HE15)	$= 33 - (7 + 5) * 10$ = \$210
Total			\$1,140

*Efficiency is set at 100% for simplicity of the example