



Date: April 11, 2023
To: Board of Directors
From: Bob Flexon, Reliability and Markets (R&M) Committee Chair
Subject: Phase 2 Market Design – Bridging Solutions

Issue for the ERCOT Board of Directors

ERCOT Board of Directors Meeting Date: April 18, 2023

Item No.: 10.1

Issue:

Whether the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) should approve ERCOT staff’s proposal to recommend to the Public Utility Commission of Texas (PUCT) certain enhancements to the Operating Reserve Demand Curve (ORDC), as described further herein, as ERCOT’s preferred bridge option until longer-term changes to the wholesale market design can be implemented.

Background/History:

On January 19, 2023, the PUCT issued an [order](#) in PUCT Project No. 53298 that instructs ERCOT “to evaluate bridging options to retain existing assets and build new dispatchable generation until the [Performance Credit Mechanism (PCM)] can be fully implemented.” During the open meeting discussion of that order, the PUCT conveyed its preference that ERCOT recommend a preferred bridge solution approved by the Board.

Following the PUCT’s directive, ERCOT endeavored to develop bridge recommendations that meet the following two basic criteria:

- (1) Advance the ERCOT market to meet the PUCT’s long-term goals with minimal distortions and adverse consequences; and
- (2) Allow quick implementation timelines that do not interfere with a long-term solution.

At the February 27, 2023 R&M Committee meeting, ERCOT staff presented several bridge concepts for consideration, including identification of pros and cons for each of the concepts. Those concepts were also later discussed with ERCOT stakeholders during meetings in March and April.

During the February meeting discussion of those concepts, the R&M Committee expressed interest in focusing ERCOT’s evaluation efforts on mechanisms that could also help reduce the frequency of Reliability Unit Commitments (RUCs) for system capacity.

Accordingly, ERCOT staff has endeavored to identify bridge options that address the three related goals of: (1) retaining existing generation, (2) attracting the construction of new generation, and (3) reducing the frequency of RUCs.

In order to identify and evaluate these and other possible bridge solutions, ERCOT staff held multiple discussions with stakeholders to solicit feedback, including workshops on March 3 and March 15, the regularly scheduled Technical Advisory Committee (TAC) meeting on March 21, and special TAC meetings on March 31 and April 10.

Based on stakeholder feedback received at the workshops and in written comments, ERCOT staff has narrowed its focus to Concept 3, which involves enhancements to the ORDC. The considerations leading to this focus on Concept 3 are further described below and in the presentation attached hereto as **Attachment A**. ERCOT's analysis of Concept 3 evaluated levels of Operating Reserves in the years 2020 and 2022, which were selected in order to compare a year with mild pricing to a year with relatively higher pricing.

- This analysis targets potential On-Line ORDC price adder increases in Operating Reserve ranges that are above emergency levels while avoiding ORDC price adder increases at times of substantial Operating Reserve surpluses, with the objective of enhancing price signals that would have positive effects on:
 - retaining existing assets;
 - incenting new dispatchable generation; and
 - reducing the frequency of RUCs for system capacity.
- Additionally, this ORDC enhancement bridging option would:
 - entail relatively minimal system changes that could be quickly implemented (within the 8 to 12 months targeted for any proposed bridging solution);
 - fit within the existing market framework, from day-ahead through settlement, including credit; and
 - continue to be hedgeable by Market Participants through energy positions.

As a result of this analysis, ERCOT staff's recommendation for a preferred bridge solution is a multi-step floor to On-Line ORDC price adders. At the first step, when Operating Reserve levels are equal to or less than 6,500 megawatts (MW), the price would be \$20 per megawatt hour (MWh). At the second step, when Operating Reserve levels are equal to or less than 7,000 MW and greater than 6,500 MW, the price would

be \$10 per MWh. ERCOT staff's analysis demonstrates that this solution has the following benefits:

1. Aligns with the PUCT's long-term proposal: The back-cast analysis for 2020 and 2022 indicates that, by applying these floors, the total revenue increase would be in the \$500 million range. While the analysis does not account for behavioral changes by Market Participants, this level of increase aligns with the additional average revenue that PCM would provide (as calculated by Energy+Environmental Economics (E3)).
2. Targeted to the right Resources at the right time: The back-cast analysis for 2022 confirms that, when these floors are applied, the increase in revenue would be largely directed to dispatchable Resources. Under this preferred scenario, approximately 80% of the revenue increase would be directed to dispatchable Resources. The floor prices are also having an impact during intervals with the greatest need for increased generator commitment.
3. Helps address RUC: A floor that begins to apply in the 6,500-7,000 MW range provides a self-commitment incentive that is better aligned with conservative operations. Adding multiple steps to the floor incorporates Market Participant feedback, provides for tiering in the strength of the self-commitment signal, and provides some mitigation of risk for Generation Resources that self-commit.

Any approved bridge option will subsequently need to be implemented via an Other Binding Document Revision Request (OBDRR) that would be drafted and sponsored by ERCOT staff after PUCT instruction to move forward.

Key Factors Influencing Issue:

- The PUCT directed ERCOT to evaluate bridging options and recommend a preferred solution.
- The bridge should address three related goals: (1) retaining existing generation, (2) incentivizing development of new dispatchable generation, and (3) decreasing the need to RUC.
- The bridge should be suitable for prompt implementation to facilitate development of a long-term market design solution.
- The bridge option to enhance the ORDC using a multi-step floor to On-Line ORDC price adders is preferable because it: (1) aligns with the level of revenue increases targeted by the PCM, (2) achieves the goals of retaining existing generation and incentivizing new dispatchable generation by predominantly directing such revenue to these Resources during times with the greatest need, and (3) reduces RUC by providing incentives for generation to self-commit.
- Following Board and PUCT approval of a bridge solution, ERCOT staff will work with stakeholders to sponsor an OBDRR and implement the necessary software changes.

Conclusion/Recommendation:



ERCOT staff recommends that the Board approve enhancements to the ORDC with a multi-step floor to On-Line ORDC price adders, with multi-step price floors of \$20 per MWh when Operating Reserve levels are equal to or less than 6,500 MW and \$10 per MWh when Operating Reserve levels are equal to or less than 7,000 MW and greater than 6,500 MW, as ERCOT's preferred bridge solution to recommend to the PUCT.



ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.
BOARD OF DIRECTORS RESOLUTION

WHEREAS, by order of the Public Utility Commission of Texas (PUC) issued in PUC Project No. 53298 on January 19, 2023 (Order), Electric Reliability Council of Texas, Inc. (ERCOT) is required to evaluate bridging options to retain existing assets and build new dispatchable generation until longer-term changes to the wholesale market design can be fully implemented, and furthermore recommend a preferred bridge solution;

WHEREAS, the ERCOT Board of Directors (Board) finds that ERCOT staff has evaluated a range of bridge options based on stakeholder feedback and that ERCOT staff has identified an enhancement to the Operating Reserve Demand Curve (ORDC) using a multi-step floor to On-Line ORDC price adders, with multi-step price floors of \$20 per MWh when Operating Reserve levels are equal to or less than 6,500 MW and \$10 per MWh when Operating Reserve levels are equal to or less than 7,000 MW and greater than 6,500 MW, as the option that best meets the goals established in the PUC's Order for a bridge solution;

WHEREAS, the Reliability and Markets (R&M) Committee has considered and recommended that the Board approve the Concept 3 bridge solution recommended by ERCOT staff as the preferred bridge solution to recommend to the PUC; and

WHEREAS, after due consideration of the bridge option alternatives, the Board deems it desirable and in accordance with the PUC's order to select Concept 3, the option recommended by ERCOT staff and the R&M Committee, as the preferred bridge solution to recommend to the PUC;

THEREFORE, BE IT RESOLVED, that ERCOT hereby approves Concept 3, an enhancement to the ORDC using a multi-step floor to On-Line ORDC price adders, with multi-step On-Line ORDC price adder floors of \$20 per MWh when Operating Reserve levels are equal to or less than 6,500 MW and \$10 per MWh when Operating Reserve levels are equal to or less than 7,000 MW and greater than 6,500 MW, as the preferred bridge option for recommendation to the PUC.



CORPORATE SECRETARY'S CERTIFICATE

I, Jonathan M. Levine, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its April 18, 2023 meeting, the Board passed a motion approving the above Resolution by _____.

IN WITNESS WHEREOF, I have hereunto set my hand this ____ day of April, 2023.

Jonathan M. Levine
Assistant Corporate Secretary

Item 4.1: ERCOT Staff Recommendation to Committee

Kenan Ögelman

Vice President, Commercial Operations

Reliability and Markets Committee Meeting

ERCOT Public

April 17, 2023



Purpose of the Recommendation

- On January 19, 2023 the Public Utility Commission of Texas (PUCT) instructed ERCOT to “evaluate bridging options to retain existing assets and build new dispatchable generation until the PCM* can be fully implemented” (*Memorandum attached to Order, Project 53298*)
- Additionally, interest expressed at both the PUCT and the February 2023 Reliability and Markets Committee for mechanisms that could help reduce the frequency of Reliability Unit Commitments (RUCs) for system capacity

*PCM – “[T]he Performance Credit Mechanism (PCM) concept” (*Memorandum attached to Order, PUCT Project 53298*)

ERCOT Staff Recommendation

Key Takeaways

- ERCOT Staff recommends:
 - ORDC changes for online resources in targeted operating reserve ranges that are above emergency levels, while avoiding ORDC increases at times of substantial operating reserve surpluses. The proposed enhancement of price signals that would have positive effects on:
 - Retaining existing assets
 - Adding new dispatchable generation
 - Reducing the frequency of RUCs for system capacity
- Additionally, these ORDC bridging options would:
 - Have minimal system changes and be quickly implementable (estimated at approximately 4 months)
 - Fit within the existing market framework, from day-ahead through Settlement, including credit
 - Continue to be hedgable by market participants through energy positions

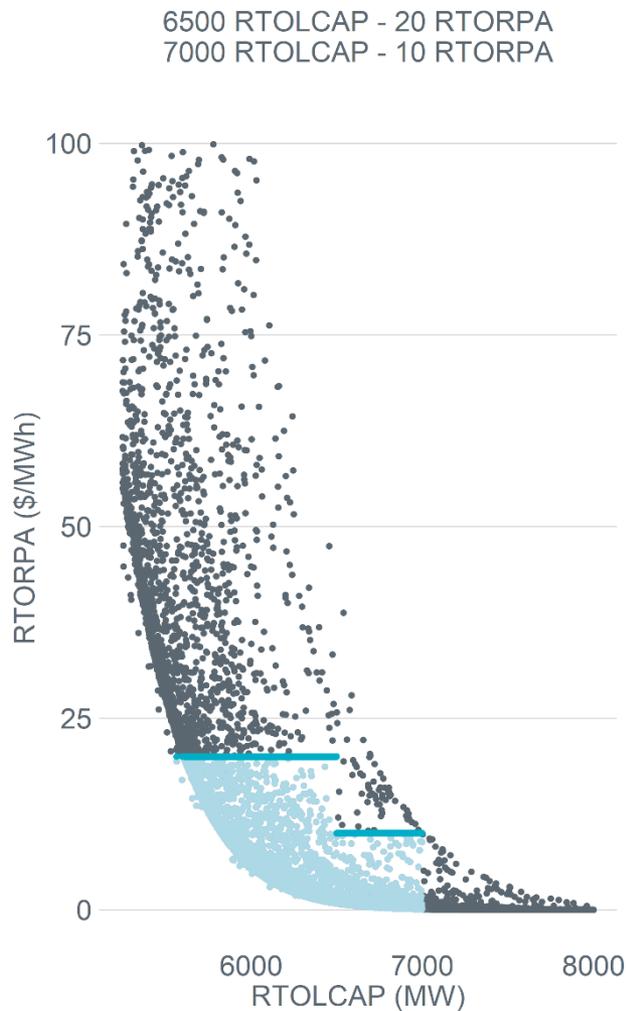
Analysis Summary

- Market wide energy revenue was calculated considering:
 - Generated energy multiplied by total price.
- The revenue for additional capacity that was not dispatched (Market wide headroom) was calculated considering:
 - Available capacity multiplied by the price for reserves
- Changes in revenue were then calculated by creating a floor at varying prices (5,10,15,20,25) when reserves fell below certain thresholds (6500,7000,7500).
- Additionally, we studied adding multi-step floors within the same range of operating reserves
- We executed this analysis for 2020 and 2022. The idea here was to compare a year with mild pricing to a year with higher pricing.

2020 Load Weighted Energy Price	2022 Load Weighted Energy Price
\$25.73/MWh	\$74.93/MWh

- For 2020 we applied the 2022 ORDC parameters for pricing (VOLL = 5000, X = 3000, 2022 seasonal mu & sigma). In order to make the comparisons equivalent.

A Visual Representation of the Recommended Floor in Practice (2020)



Revenue Summary 2020

2020 - baseline energy revenue = \$12.6B , baseline headroom revenue = \$.3B

Floor Level (Online Reserve_Price)	Energy Revenue Increase (\$M)	Headroom Revenue Increase (\$M)	Total Revenue Increase (\$M)
6500_15	186.0	24.2	210.2
6500_20	286.3	37.0	323.3
6500_25	395.7	50.7	446.4
6500_20, 7000_10	440.2	58.7	498.9*
6500_20, 7000_10, 7500_5	524.1	71.5	595.6
7000_15	422.9	57.6	480.5
7000_20	607	82.1	689.1
7000_25	800.6	107.6	908.2
7000_15, 7500_5	506.7	70.5	577.2

* 9% of 2020 intervals adjusted.
Preferred solution. See slide 9.

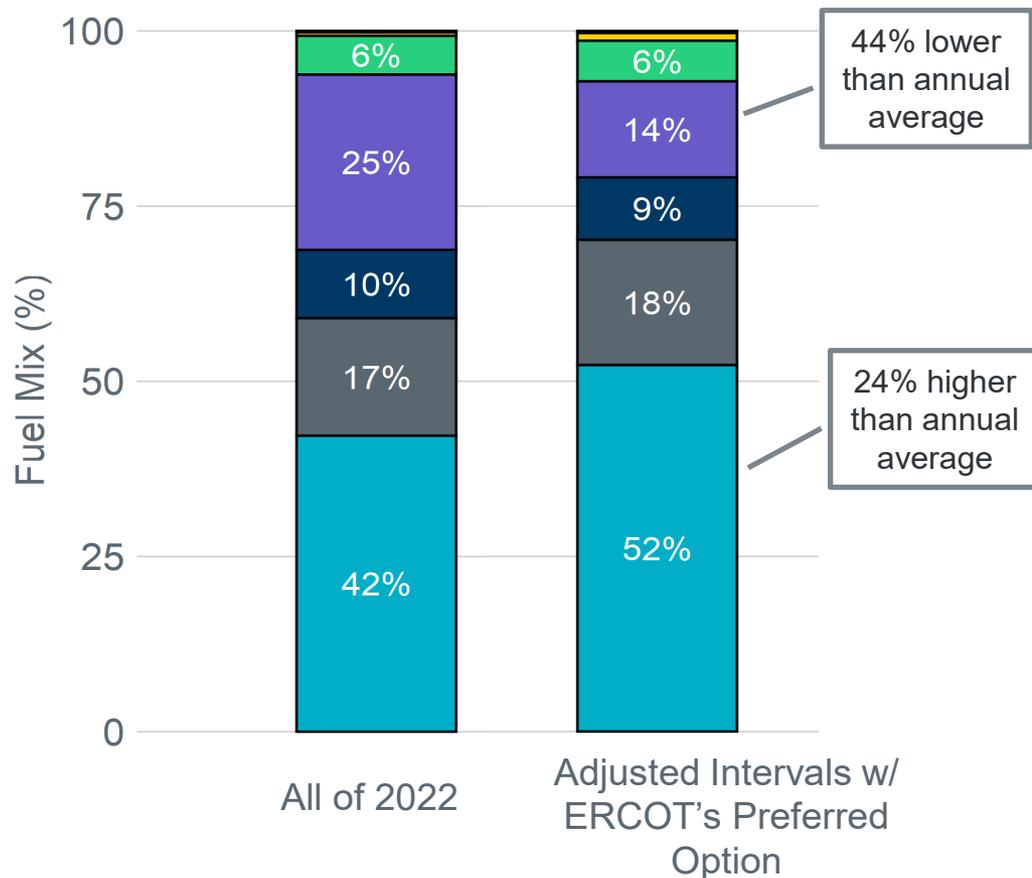
Revenue Summary 2022

2022 - baseline energy revenue = \$32.1B , baseline headroom revenue = \$.3B

Floor Level (Online Reserve_Price)	Energy Revenue Increase (\$M)	Headroom Revenue Increase (\$M)	Total Revenue Increase (\$M)
6500_15	182.1	21.3	203.4
6500_20	274.3	31.8	306.1
6500_25	373.1	42.9	416.0
6500_20, 7000_10	438.0	52.8	490.8*
6500_20, 7000_10, 7500_5	533.7	65.9	599.6
7000_15	433.6	53.5	487.1
7000_20	613.9	75.1	689.0
7000_25	800.9	97.4	898.3
7000_15, 7500_5	529.3	66.6	595.9

* 7.9% of 2022 intervals adjusted.
Preferred solution. See slide 9.

2022 Average Fuel Mix During Intervals Impacted by Studied and Proposed Price Floors



Estimated distribution of additional revenue for 2022 due to ORDC price adder floors

Resource Type	Revenue (\$M)
Natural Gas	261.6
Coal and Lignite	87.9
Nuclear	44.0
Energy Storage	1.0
Hydro	0.3
Wind	67.1
Solar	28.5
Other	0.5



Preferred Solution

Multi-step floor - 6500MW @ \$20/MWh & 7000MW @ \$10MWh

1. Aligns with PCM: The back-cast analysis for 2020 and 2022 indicates that by applying these floors the total revenue increase would be in the \$500M range. While we recognize the analysis does not account for behavioral changes, this level of increase aligns with the additional average revenue PCM would provide (as calculated by E3).
2. Targeted to the right resources at the right time: The back-cast analysis for 2022 confirms that when applying these floors the increase in revenue would be largely directed to dispatchable resources. In the preferred scenario 80% of the revenue increase would be directed to dispatchable resources. The floor prices are also having impact when ERCOT is seeing the greatest need for increased generator commitment.
3. Helps address RUC: Applying a floor that kicks in initially in the 6500-7000MW range provides a self-commitment incentive better aligned with conservative operations. Adding multiple steps to the floor incorporates feedback provided by market participants, provides for tiering in the strength of the self-commitment signal, and provides some mitigation of risk for generators that self-commit.

