Item 9: Reliability Must-Run Recommendation Regarding CPS Energy Braunig Units 1-3 - REVISED*

Woody Rickerson
Senior Vice President and Chief Operating Officer

Chad V. Seely
Senior Vice President, General Counsel, and Corporate Secretary

Board of Directors Meeting

ERCOT Public
December 3, 2024

* Updates to estimated costs provided on slides 15-17, 19, 26, and 29 11/27/24

RMR Recommendation on CPS Energy Braunig Units 1–3

- **Purpose**
  - To provide the Board of Directors (Board) with ERCOT's staff recommendation on the Reliability Must-Run (RMR) Agreement of one or more of CPS Energy Braunig Units 1-3
- **Voting Items / Requests**
  - Board action is requested on ERCOT staff's recommendation

Key Takeaways

- Analysis shows that Braunig Units 1-3 are needed for transmission system reliability for the next two years to mitigate risk of system-wide Load shed
- Recommend Board approve an RMR Agreement for Braunig Unit 3 (400 MW)
  - Unit 3 is cost effective and provides greatest reliability benefit
- Recommend Board defer RMR decision on Units 1 and 2 until February 4, 2025 meeting or Special Board Meeting thereafter
  - Allows ERCOT staff to consider CenterPoint Energy Mobile Generation solution as more reliable and effective tool
  - Mobile Generation solution is more flexible and likely to be more reliable than Units 1 and 2
  - If feasible, will move forward with another Request for Proposal (RFP) for Must-Run Alternatives to compete against Mobile Generation solution

Notices of Suspension of Operation (NSOs)

Resource	Summer Max Rating in NSO	Summer Max Rating per CPS Update	Year in Service	Proposed Suspension Date
BRAUNIG_VHB1	217 MW	217 MW	1966	03/31/2025
BRAUNIG_VHB2	230 MW	175 MW	1968	03/31/2025
BRAUNIG_VHB3	412 MW	400 MW	1970	03/02/2025

- CPS Energy provided NSOs of Braunig Units 1-3 on March 13, 2024
- On October 3, 2024, CPS Energy revised the NSO for Braunig Unit 3 to an earlier suspension date of March 2, 2025.
  - If Board approves RMR Service for Braunig Units 3 and 1, earlier date improves odds that both units will be available for Summer 2025 peak demand
- CPS Energy has stated each unit must be inspected and repaired before running after their suspension dates. Inspection must be one-at-a-time; blue-sky estimate is 60 days for each, under the following schedule:

Braunig 3: March 3 – May 2, 2025	Braunig 1: May 3 – July 2, 2025	Braunig 2: July 3 – Sept. 1, 2025

Reliability Analysis Conducted

- ERCOT reliability analysis conducted under Public Utility Commission of Texas (PUCT) Substantive Rule 25.502(e) and Protocols § 3.14.1.2
  - Looked at transmission-system impacts, not resource adequacy
- Analysis completed on April 22, 2024 showed ERCOT System performance deficiencies affected by retirement of the Braunig Units 1-3:
  - Transmission facilities loaded above their normal rating under pre-contingency conditions;
  - Transmission facilities above 110% emergency loading; and
  - Cascading under study contingencies
- When such performance deficiencies are found, ERCOT must begin negotiations for potential Reliability Must-Run (RMR) Service
- Note: The Braunig Units 1-3 are particularly impactful on a transmission line subject to Interconnection Reliability Operating Limits (IROLs)
  - Under NERC Reliability Standards, ERCOT must develop a plan to avoid exceedance of IROLs. Load Shed is included as a last resort, if necessary

Must-Run Alternative Process Conducted

- Performance deficiencies also trigger an open, Request for Proposal (RFP) process seeking lower-cost alternatives (Must-Run Alternatives (MRAs)) in lieu of RMR Service
- Original MRA RFP issued July 25, 2024
  - Revised MRA RFP issued August 21, 2024
  - Proposals due October 7, 2024
- Public outreach included multiple PUC filings, Market Notices, and an ERCOT workshop
- **No qualified proposals were received.** One proposal for an accelerated 200 MW Energy Storage Resource received, but was inconsistent with the RFP requirements

ERCOT Staff Recommendation

- ERCOT staff makes recommendation (including alternatives and cost benefits), and the Board decides whether to enter into an RMR Agreement
- Analysis shows the following:
  - **All 3 Braunig Units are needed to mitigate system-wide load-shed** projected to occur if the units retire. Risk is less severe in 2025 than 2026; and
  - **Contracting for RMR Service from all 3 Braunig Units for 2 years is estimated to cost less than the value of the system-wide Load shed projected to occur if the units retire**
- Recommend that the Board:
  - **Authorize RMR Agreement for Braunig Unit 3,** (the newest, largest, and most cost-effective unit) for RMR Service beginning on March 3, 2025; and
  - **Defer decision on Braunig Units 1 and 2 until February 2025** Board meeting so ERCOT can continue to explore potentially more reliable alternatives to RMR Service from these units

ERCOT RMR Analysis – Identifying the Load-shed Risk

- ERCOT conducted 8,760-hour analyses of 2025 and 2026 each, using its production cost simulation tool to determine when system-wide Load shed was projected to occur if the Braunig units retired
- Assumptions included incorporating updates to the transmission system, in-service generation, and system Load for each year
- More details regarding these updated assumptions are provided on the following slides

Key Takeaway: ERCOT conducted analysis of 2025 and 2026, using information to reflect expectations for 2025 and 2026

ERCOT RMR Analysis – Identifying the Load-shed Risk

Updated assumptions included:

- Transmission Updates
  - Updated ratings of the line subject to the South Texas export IROL (the IROL line) to new Dynamic Ratings
  - Included a switching procedure that can be (and has been) implemented when the IROL line is at risk of overload
- Generation Updates
  - Updated renewable dispatch based on 2022 Weather Year
  - Added new generation meeting Planning Guide § 6.9(1) based on the January 2024 Generator Interconnection Status (GIS) report
  - Outages: A nearby unit was outaged throughout the study years to represent ERCOT System generation outages; Braunig Unit 1 out of service April – June 2025; and Braunig Unit 2 out of service April - August 2025
  - Updated Generation Variable O&M Cost for all Braunig units to $5,000/MWh

ERCOT RMR Analysis – Identifying the Load-shed Risk

- Load Updates: Load levels were based on steady-state analysis levels

Description	2025	2026
Peak Net Load* (GW)	82	85
Peak Net Load at max Post Overload (GW)	74	80
Weather Year Assumption	2013	2013
Coincident Peak Load Demand (without PUN) (GW)	101	106
Peak Load Demand (without PUN) at max Post Overload (GW)	92	100

Historic Data		
Description	**2023**	**2024**
Peak Load Demand (GW)	85.5	85.6
Peak Net Load (GW)	70.7	70.8

*** Peak Net Load = Hourly Load Forecast – Hourly Wind Output – Hourly Solar Output**

Key Takeaway: Load-shed risk is driven by Peak Net Load because that is more correlated with overloads on the IROL line than Peak Load Demand

ERCOT RMR Analysis – Empiric Peak Net Load Trends and Peak Net Load Projections

ERCOT RMR Analysis – Identifying the Load-shed Risk

- For each year, ERCOT studied four scenarios:
  - Scenario 1: All Braunig Units out of service
  - Scenario 2: Braunig_VHB3 in service (Braunig_VHB1 and Braunig_VHB2 out of service)
  - Scenario 3: Braunig_VHB3 + Braunig_VHB1 in service (Braunig_VHB2 out of service)
  - Scenario 4: All Braunig Units 1-3 in service

- To calculate the potential Load-shed value for each hour, for each scenario, where overloads on the IROL line were observed, 215 MW of system-wide Load shed was applied to provide every 5% of relief on the constraint

ERCOT RMR Analysis – Identifying the Load-shed Risk and Costs

Key Takeaways:

- All three Braunig units **reduce, but do not eliminate**, the Load-shed risk in 2025 and 2026
- The Load-shed risk is markedly higher in 2026

2025					
Scenario	Load-shed Risk (GWh)	Cost of Load Shed ($M)	Incremental Benefit of Unit		
			(GWh)	($M)	Unit Name
1	2.67	93			
2 (+VHB3)	2.37	83	0.30	11	VHB3
3 (+VHB3 + VHB1)	1.98	69	0.39	14	VHB1
4 (+ all 3 units)	1.91	67	0.07	2	VHB2
		Total	**0.76**	**27**	**VHB3 + VHB1 + VHB2**

2026					
Scenario	Load-shed Risk (GWh)	Cost of Load Shed ($M)	Incremental Benefit of Unit		
			(GWh)	($M)	Unit Name
1	33.20	1162			
2 (+VHB3)	30.46	1066	2.74	96	VHB3
3 (+VHB3 + VHB1)	29.80	1043	0.66	23	VHB1
4 (+ all 3 units)	28.85	1010	0.95	33	VHB2
		Total	**4.35**	**152**	**VHB3 + VHB1 + VHB2**

Braunig Units Start Up Counts

- The case results for 2025 showed Braunig Unit 3 started up seven times, Braunig Unit 1 started up four times, and Braunig Unit 2 started up twice when the IROL line was binding or overloading

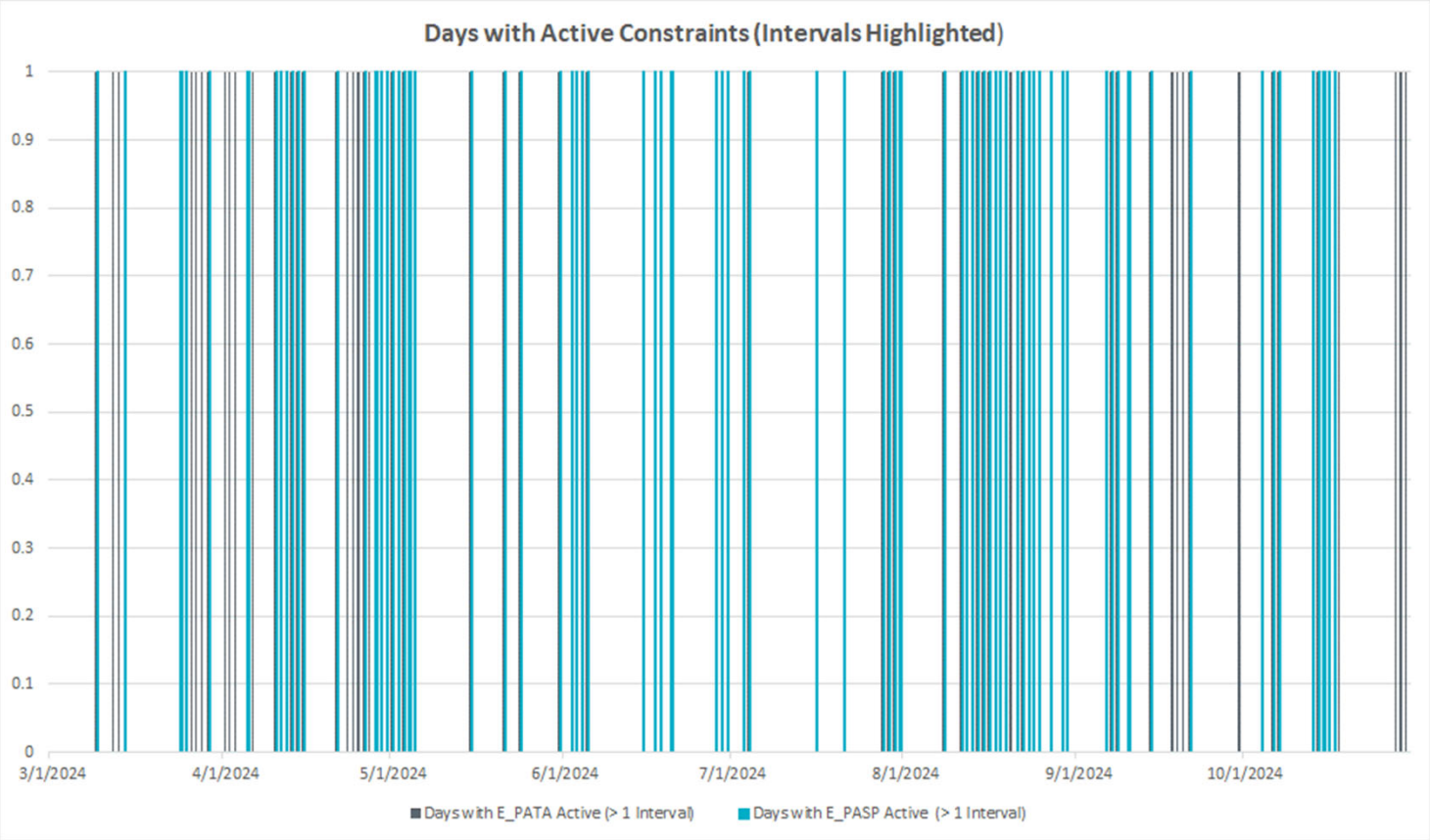
- The case results for 2026 showed Braunig Unit 3 started up 13 to 16 times, Braunig Unit 1 started up 13 times, and Braunig Unit 2 started up 12 times when the IROL line was binding or overloading

2025			
Scenario	VHB3	VHB1	VHB2
1	0	0	0
2 (+VHB3)	7	0	0
3 (+VHB3 + VHB1)	7	4	0
4 (+ all 3 units)	7	4	2

2026			
Scenario	VHB3	VHB1	VHB2
1	0	0	0
2 (+VHB3)	13	0	0
3 (+VHB3 + VHB1)	16	13	0
4 (+ all 3 units)	15	13	12

Key Takeaway: Analysis shows that all three units would start up at least twice in each year. Start ups are projected to be more frequent in 2026

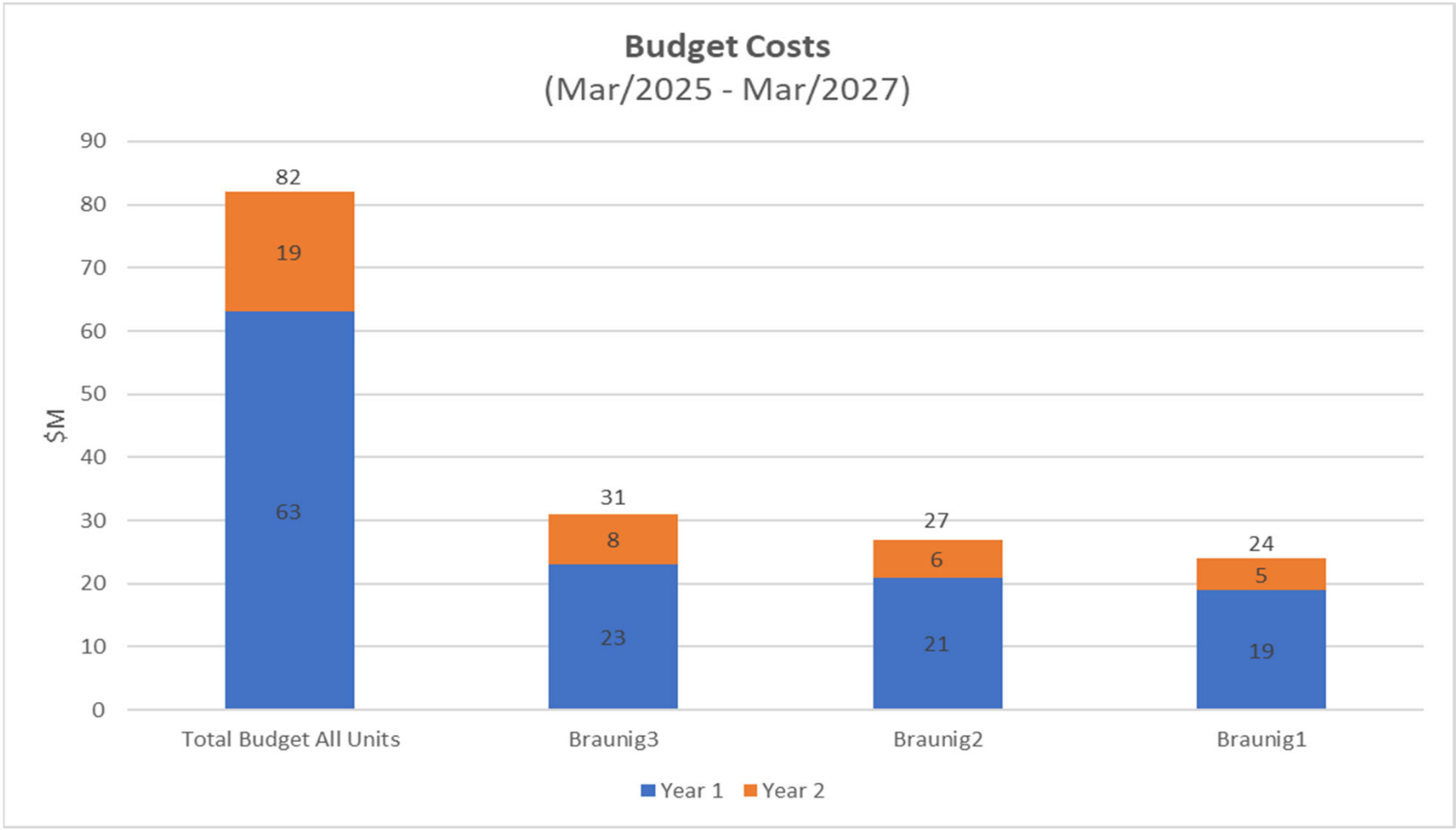
Days on which South Texas Export Generic Transmission Constraints (GTCs) were Binding



- ERCOT begins to control the loading on these GTCs when it reaches 85% of the limit
- This does not indicate that there were insufficient Resources north of the constraint to resolve the loading on those days, but that more expensive generation had to be run to prevent the GTC limit from being exceeded

Key Takeaway: In March-October 2024, ERCOT has had to control the flow on the South Texas Export GTCs for at least one SCED interval on 41% of the days

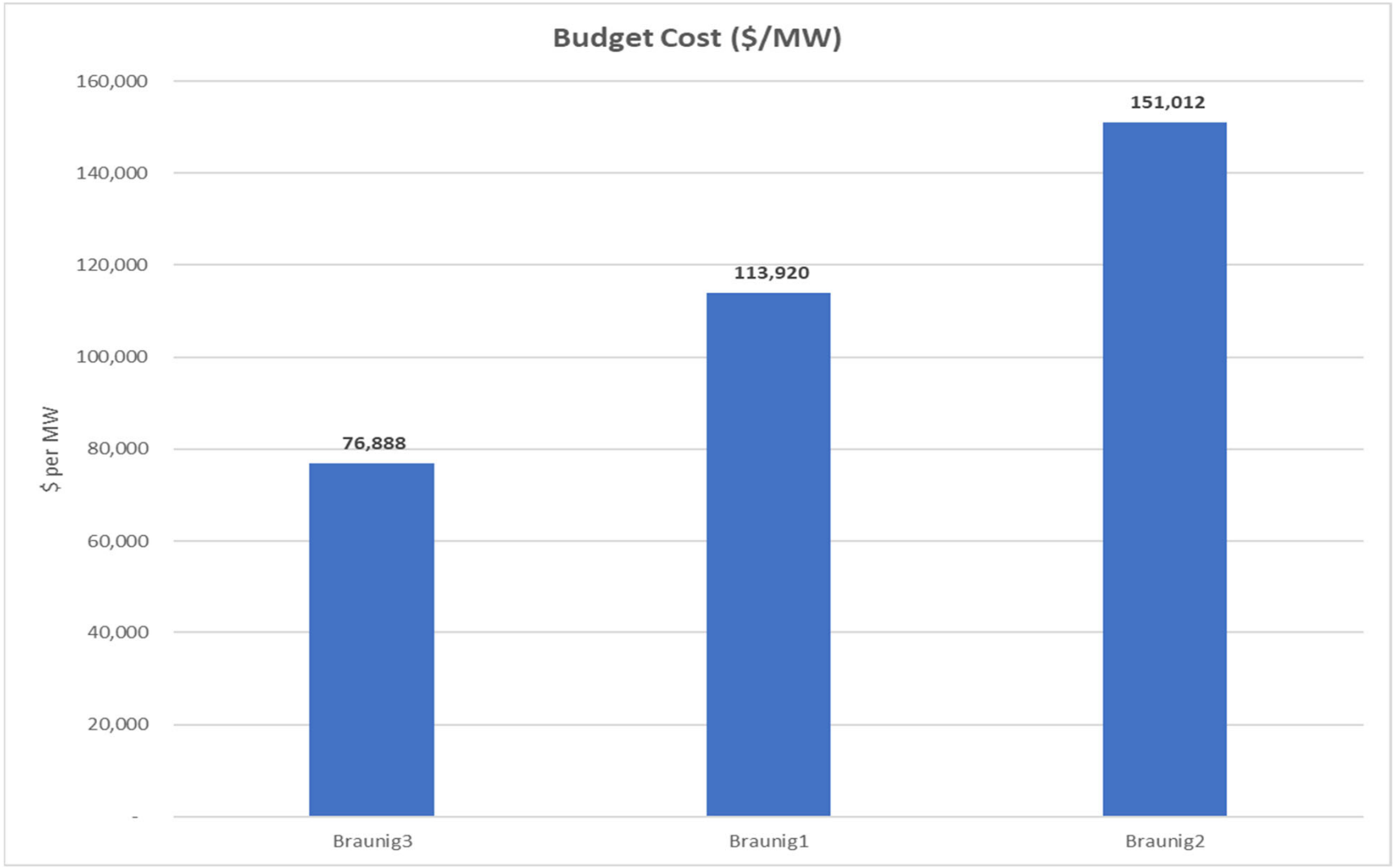
Total Budget Submitted by CPS Energy (by year)



Note: Values do not include a 10% Incentive Factor nor estimated fuel costs

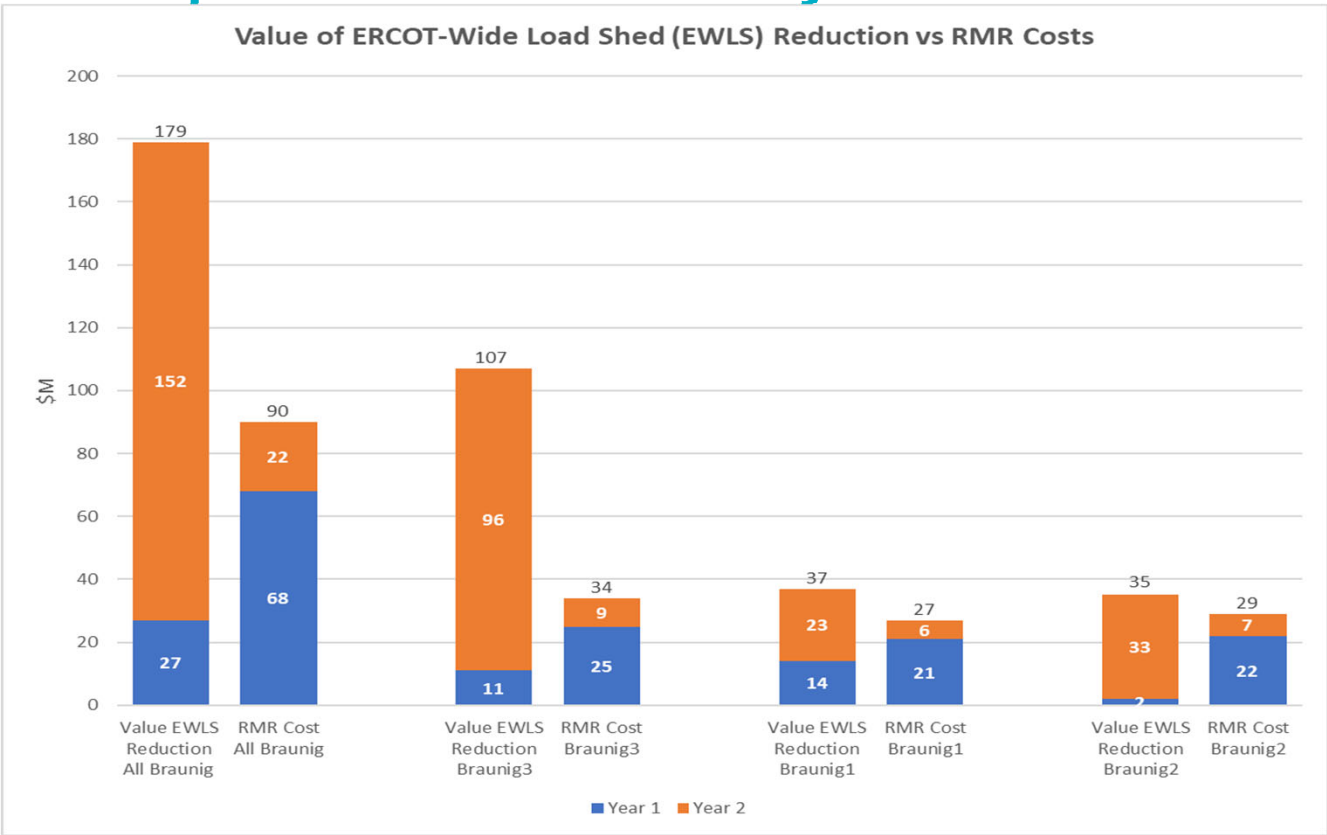
Year 1: March 2025 – March 2026
Year 2: April 2026 – March 2027

Budget Cost ($ per MW) over a 2-year period



Note: Values do not include a 10% Incentive Factor nor estimated fuel costs

Value of Reduced ERCOT-Wide Load Shed (EWLS) (IROL related) Compared to RMR Costs by Resource



Notes:

1) RMR Costs include budget costs, incentive factors, and estimated fuel costs, assuming number of start-ups and generation as estimated in the planning simulation model

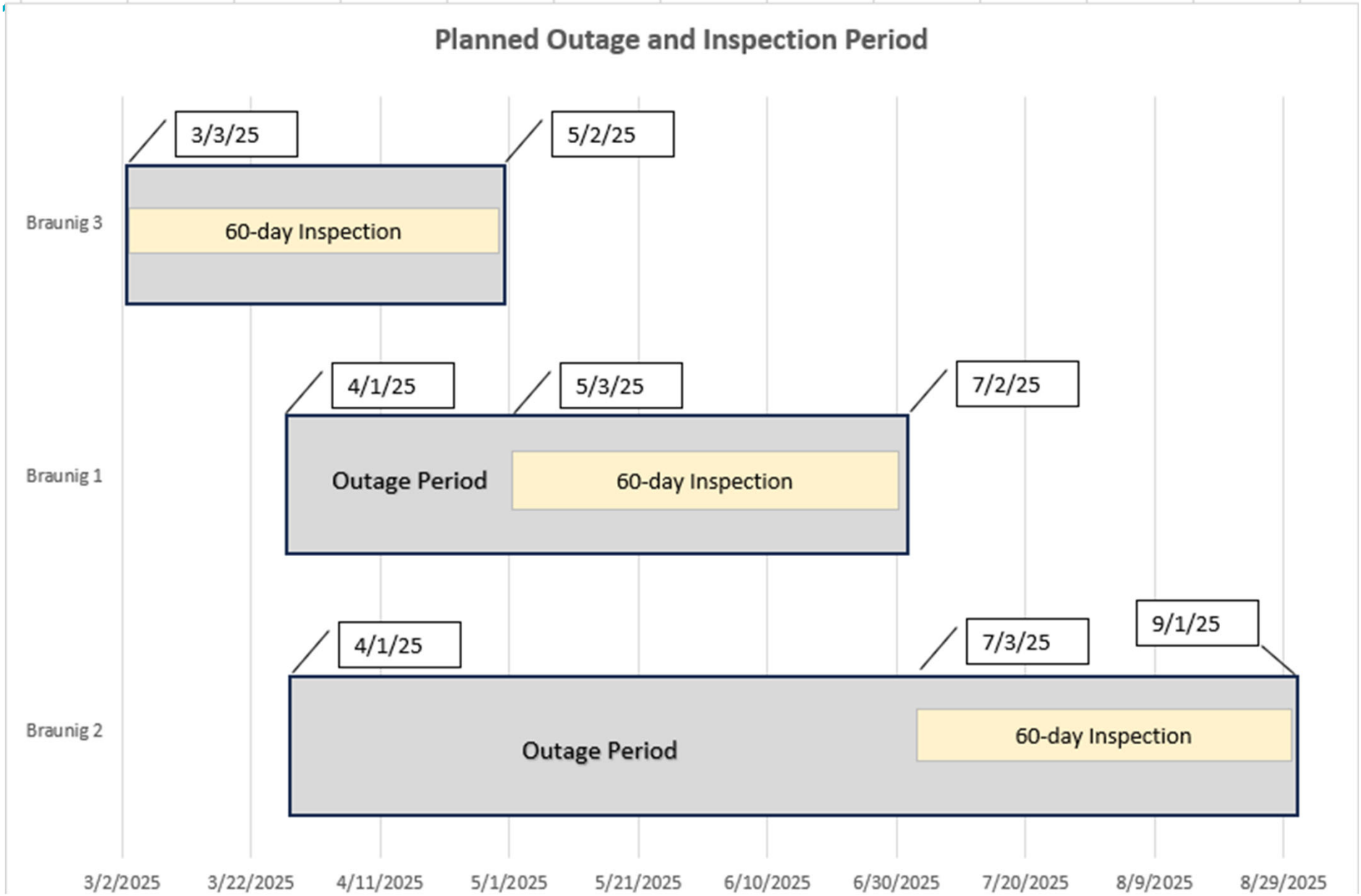
2) Values for reduced ERCOT-wide Load shed are based on a Value of Lost Load (VOLL) of $35,000/MWh

3) The values of the EWLS reduction for Braunig Units 1 and 2 are incremental values

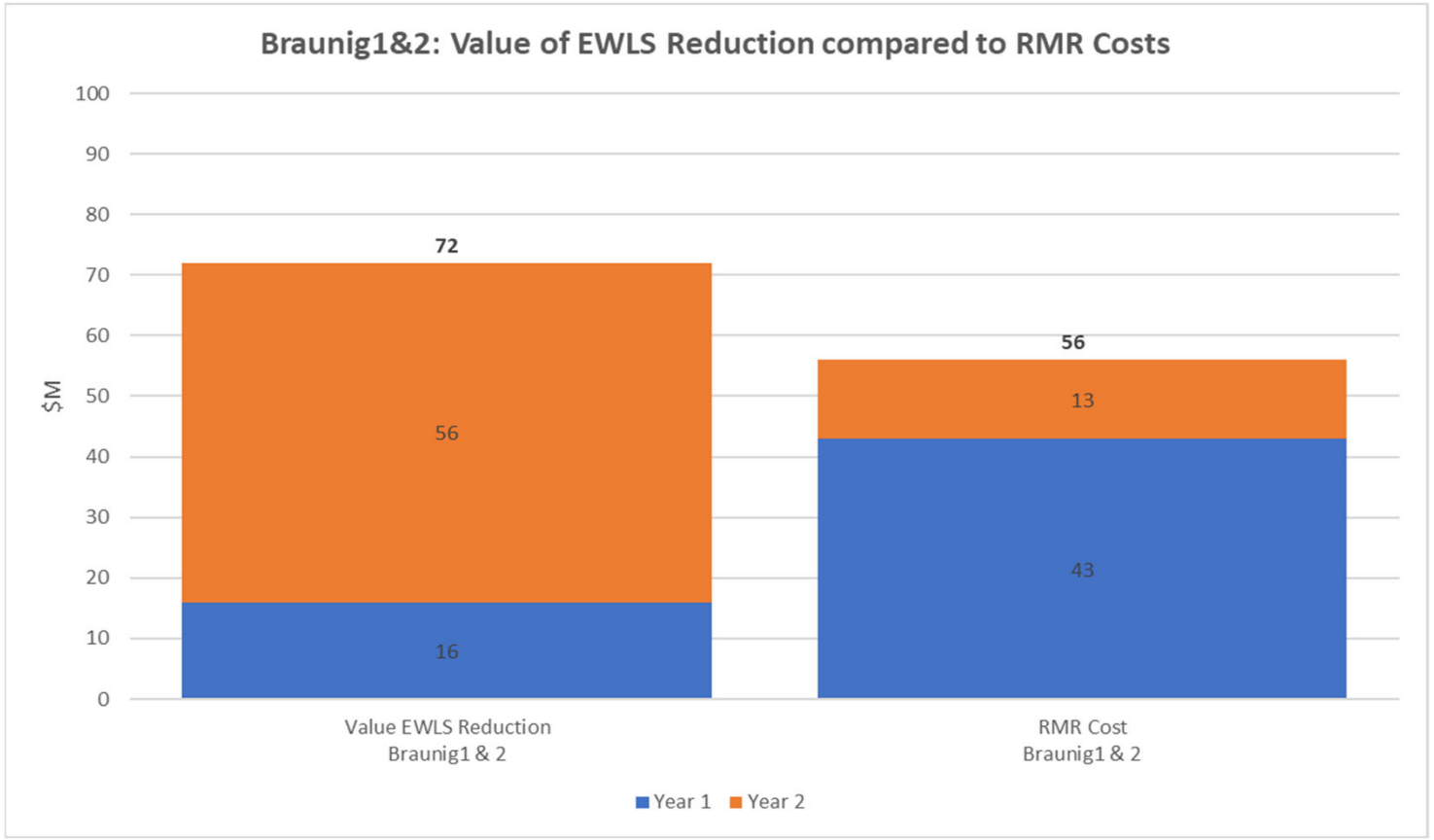
Key Takeaways:

- For each Braunig unit, the two-year RMR costs are lower than the value of the ERCOT-wide Load shed projected to occur if the unit retires
- This graph shows that Year 2 carries the larger risk of ERCOT-wide Load shed while simultaneously there are lower costs for RMR Service
- Braunig Unit 3 provides the best value

Braunig Units 1 - 3 Planned Outages and Inspections



Value of Reduced ERCOT-wide Load Shed (IROL Related) Compared to RMR Costs for Braunig Units 1 & 2



Notes:

1) RMR Costs include budget costs, incentive factor and estimated fuel costs, assuming number of start-ups and generation as estimated in the planning simulation model

2) Values for reduced ERCOT-wide Load shed are based on Value of Lost Load (VOLL) of $35,000/MWh

Key Takeaway: The combined estimated RMR cost of Braunig Units 1 and 2 results in a lower cost than the value of the ERCOT-wide Load shed projected to occur if the units retire. These combined values could represent parameters to compare against other alternatives.

Risks and Other Considerations Regarding RMR Service

- Risks:
  - Additional unforeseen costs associated with the refurbishing of each Braunig unit. CPS Energy's estimated budget for each unit is based on expected work that must be done to ensure safe operations
  - Extended outages associated with discovery of needed additional work
  - Given the age of these units, these Resources may have higher than normal forced outage rates

Risks and Other Considerations Regarding RMR Service

- Risks (continued):
  - Given the age and technology of the Braunig Units 1-3, ERCOT would have to commit these units many hours in advance due to the long lead times required to start and have the units ready to operate at full output
  - Each Braunig unit is susceptible to being a larger single point of failure than a more distributed alternative, such as smaller distributed resources or Demand response
- Additional Reliability Benefit:
  - If under an RMR Agreement, the Braunig Units 1-3 could also be dispatched as a last resort tool for other reliability needs such as ERCOT-wide capacity insufficiency (*e.g.* during winter storms)

Potential Alternatives to RMR Service from Braunig Units 1 and 2

- Defer decision on Braunig Units 1 and 2 until February 2025 Board meeting or Special Board Meeting thereafter
- Exploring CenterPoint Mobile Generation Solution
  - Lower emission, dual-fuel capable power generation turbines
  - Turbines range from 5.7 to 35 MW and can start as short as 10-15 minutes and no minimum downtime
  - Can be relocated into San Antonio area, including in areas with potentially higher shift factors than the Braunig units
  - Newer, more responsive units are at a lower risk of forced outage
  - Provide greater cost certainty than the Braunig units
- If feasible, possible future RFP process seeking MRAs
  - Comparing CenterPoint Mobile Generation Solution against proposed alternatives that would need to provide same or greater reliability benefits at comparable or lower cost

Exit Solutions

- Under Protocols § 3.14.1.4, ERCOT staff is required within 90 days of execution of an RMR Agreement to report to the Board and post on the MIS Secure Area a list of feasible alternatives that may, at a future time, be more cost-effective than the continued renewal of the existing RMR Agreement
- ERCOT staff is already examining potential exit solutions
- A potential exit solution is the acceleration of in-service dates for certain transmission facility upgrades that were part of the San Antonio South Reliability Project II.
  - ERCOT has communicated with responsible Transmission Service Providers (CPS Energy, AEP, and STEC) about accelerating these projects
  - Requests for Proposals are out or forthcoming

Appendix Slides

ERCOT Stipulates* that

a) CPS Energy, the Resource Entity, provided complete and timely NSOs including sworn attestations supporting the claim of pending Generation Resource closures;

b) ERCOT received all of the data necessary to evaluate the need for and provisions of the RMR Agreements, and that information was posted on the MIS Secure Area by ERCOT as it became available to ERCOT;

c) When executed, the signed RMR Agreements will comply with the ERCOT Protocols and be posted on the MIS Secure Area;

d) ERCOT evaluated:

   i. The reasonable alternatives to the RMR Agreements as set forth in Section 3.14.1, Reliability Must Run, and compared the alternatives against the feasibility, cost, and reliability impacts of the signed RMR Agreements;

   ii. The timeframe in which ERCOT expects each unit to be needed for reliability; and

   iii. The specific type and scope of reliability concerns identified for each RMR Unit or MRA as applicable.

** See Paragraph (1) of ERCOT Protocols Section 3.14.1.3.*

3.14.1.5(3) Evaluation of Alternatives (1 of 2)

Under the Protocols, when recommending to the Board whether to enter into RMR and/or MRA service, ERCOT must consider:

a) The degree to which the option addresses the identified performance deficiency;

- Please refer to slide 12. ERCOT staff studied the projected overloading on the IROL line under four scenarios to identify the reduction in performance deficiencies attributable to returning the Braunig units in the order of cost-effectiveness. Each addition of a Braunig unit showed incremental benefits; altogether, the three Braunig units are estimated to reduce the ERCOT-Wide Load Shed quantity by 0.76 GWh in 2025 and 4.35 GWh in 2026

b) The total expected cost of each option;

- Please refer to slide 17. Including budget costs, incentive factors, and estimated fuel costs, the projected cost of RMR Service is a total of ~$90 million. (Braunig unit 1: ~$27M; Braunig unit 2: ~$29M; and Braunig unit 3: ~$34M)

c) Expected unit performance of the Generation Resource proposed for suspension of operations, including start-up time, minimum run-time, minimum down-time, and historical unit outage data;

- ERCOT's production cost simulation tool considered the Braunig units' reported start-up time, minimum down time, and historical unit outage data

3.14.1.5(3) Evaluation of Alternatives (2 of 2)

d) Operational limitations of proposed MRAs, including start-up times, minimum run-times, ramp periods, and return-to-service times;

- No eligible MRAs were received through the MRA RFP

e) Other operational constraints or operational benefits of the proposed option; and

- Please refer to slides 20 and 21

f) Any other factors which ERCOT determines are relevant to the evaluation, and for which ERCOT can develop quantifiable criteria with which to evaluate all proposed options

- Please refer to slides 20 and 21. Other relevant factors include
  - Potential for high forced outage rates
  - Time and cost of repairs if needed
  - The risk of single points of failure with three, older units as opposed to a fleet of smaller, newer, distributed resources or Demand response

3.14.1.5(4) Evaluation of Alternatives (1 of 2)

Under the Protocols, in evaluating the expected impact to Customers due to the performance deficiency, ERCOT must consider:

(a) Expected amount of Customer Demand affected (MWh);

- Over two years, RMR Service from the three Braunig Units is estimated to reduce the ERCOT-Wide Load Shed quantity by 0.76 GWh in 2025 and 4.35 GWh in 2026

(b) Expected number of hours during which Customers will be affected;

- Over two years, RMR Service from the three Braunig Units is projected to avoid approximately 80 hours of ERCOT-Wide Load Shed related to managing the loading on the IROL line

(c) Number of Customers affected;

- Over two years, RMR Service from the three Braunig Units is estimated to avoid Load Shed that otherwise would affect 4 million customers, assuming
  - 1 MW = 250 customers
  - The outages are rotated every 20 minutes
  - Total load shed is 5,115 MWh
  - Load Shed occurs 16 times over 2 years

3.14.1.5(4) Evaluation of Alternatives (2 of 2)

d) Possible additional Customer impacts due to unforeseen conditions, such as Generation Resource unavailability, transmission circuit Outages, or Load variation due to extreme weather; and

- Outages of each Braunig unit and a proxy for other Generation Resource unavailability was included in scenarios studied using the production cost simulation tool. Any unforeseen transmission circuit outages or increases in Load due to extreme weather could result in additional ERCOT-wide Load Shed avoided by RMR Service from the three Braunig Units, depending on circumstances.

e) Potential economic impact to Customers

- The cost to refurbish the three Braunig Units and operate them is estimated to total $90 million. It is also estimated that they would reduce ERCOT-wide Load Shed (related to managing the IROL line loading) and prevent a negative impact to customers of approximately $179 million over two years.

  (5.11 GWh *$35,000/MWh = approximately $179 million)

Braunig Units Total Start Up Counts and Energy Served

- The total start up count modeled in 2025 for VHB3 was nine times; VBH1 started up six times; and VHB2 started up twice. This includes events when the constraint was not binding

2025						
Scenario	VHB3		VHB1		VHB2	
	Count	GWh	Count	GWh	Count	GWh
1	0	0	0	0	0	0
2 (+VHB3)	9	13.25	0	0	0	0
3 (+VHB3 + VHB1)	9	14.26	6	4.64	0	0
4 (+ all 3 units)	9	14.25	6	4.64	2	1.65

- There were significantly more start ups of each of the Braunig units in 2026 modeling. This includes events when the constraint was not binding.

2026						
Scenario	VHB3		VHB1		VHB2	
	Count	GWh	Count	GWh	Count	GWh
1	0	0	0	0	0	0
2 (+VHB3)	33	69.70	0	0	0	0
3 (+VHB3 + VHB1)	35	68.21	32	36.51	0	0
4 (+ all 3 units)	34	69.34	30	35.13	30	28.91

New Energy Storage Resources (ESRs)

- The 8,760-hour analyses that ERCOT conducted for each year of 2025 and 2026 included new Generation Resources meeting Planning Guide § 6.9(1), based on the January 2024 Generator Interconnection Status (GIS) report. The analyses take into consideration the reported commercial operations dates
- Those new Generation Resources included 31 new ESRs (28 added throughout 2025 and 3 more added throughout 2026)
- The table below summarizes the new ESRs, differentiated by how they affect loading on the IROL line

Year	ESRs that Help Relieve Loading when Providing Power			ESRs that Contribute to Loading when Providing Power		
	Total Count of New ESRs	Total Nameplate Capacity (MW)	Average Weighted Capacity (Nameplate Capacity x Shift Factor)	Total Count of New ESRs	Total Nameplate Capacity (MW)	Average Weighted Capacity (Nameplate Capacity x Shift Factor)
2025	17	2320.65	-125.29	11	2133.47	111.26
2026	18	2523.30	-138.34	13	2613.01	148.32

Date:	November 27, 2024
To:	Board of Directors
From:	Woody Rickerson, Senior Vice President and Chief Operating Officer Chad V. Seely, Senior Vice President, General Counsel, and Corporate Secretary
Subject:	REVISED - ERCOT Staff Recommendation Regarding ERCOT Board Approval of Reliability Must-Run (RMR) and Must-Run Alternative (MRA) Agreements related to CPS Energy Braunig Resources

Issue for the ERCOT Board of Directors

ERCOT Board of Directors Meeting Date: December 3, 2024
Item No.: 9

Issue: Whether the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) should accept the recommendation of ERCOT staff to approve a Reliability Must-Run (RMR) Agreement with CPS Energy for the provision of RMR Service from V.H. Braunig unit 3 (BRAUNIG_VHB3) from March 3, 2025 through March 2, 2027.

Background/History:
On March 13, 2024, CPS Energy provided ERCOT notices of proposed indefinite suspensions (NSOs) of CPS Energy's V.H. Braunig units 1, 2, and 3. (Hereinafter, these units collectively will be referred to as "the Braunig units or Braunig Resources.") CPS Energy has proposed suspension dates of March 31, 2025 for Braunig units 1 and 2 and March 3, 2025 for Braunig unit 3. CPS Energy has stated each of the Braunig units must be inspected and repaired before it may operate after its proposed suspension date. Inspections and repairs must be one-at-a-time with best-case estimates of 60 days each for the inspection and repair of each unit.

CPS Energy's NSO submissions regarding the Braunig units prompted an initial ERCOT reliability analysis under Public Utility Commission of Texas (PUCT) Substantive Rule, 16 Texas Administrative Code (T.A.C.) § 25.502(e), and ERCOT Protocols § 3.14.1.2. As required under the Protocols, the reliability analysis looked at transmission-system impacts, not resource adequacy. The reliability analysis was completed on April 22, 2024. ERCOT's analysis identified ERCOT System performance deficiencies that are materially impacted by the retirement of the Braunig Resources. In summary, without the Braunig Resources, there were:

- Transmission Facilities loaded above their Normal Rating under pre-contingency conditions for which the Braunig Resources had an unloading Shift Factor of more than 2% and an unloading impact of more than 5%;
- Transmission Facilities that were above 110% emergency loading for which the Braunig Resources had an unloading Shift Factor of more than 2% and an unloading impact of more than 5%; and

- cascading under studied conditions identified in paragraph (3)(c)(ii) of ERCOT Protocols §3.14.1.2.

Therefore, the Braunig units are needed to support ERCOT System reliability. ERCOT posted the report on this reliability analysis to ERCOT's Market Information System (MIS) Secure Area on April 22, 2024.

The Braunig units are particularly impactful on certain 345-kV transmission lines that are subject to the South Texas Export Interconnection Reliability Operating Limits (IROLs). The Braunig units have an approximate Shift Factor of negative 7% to negative 8.5% on the transmission lines subject to the South Texas Export IROLs, providing reductions to loading on those transmission lines when the Braunig units provide power on the ERCOT System. Under NERC Reliability Standards, ERCOT must develop a plan to avoid the exceedance of IROLs. ERCOT's plan includes Load shedding, if necessary.

When performance deficiencies are found in a reliability analysis conducted under ERCOT Protocols § 3.14.1.2, ERCOT must begin negotiations for potential Reliability Must-Run (RMR) Service. ERCOT conducted such negotiations.

The finding of performance deficiencies also triggered a process wherein ERCOT conducted an open Request for Proposal (RFP) process seeking lower-cost alternatives (Must-Run Alternatives, *i.e.* MRAs) in lieu of RMR Service.

ERCOT issued the original MRA RFP on July 25, 2024, followed by a revised MRA RFP on August 21, 2024, with proposals due by October 7, 2024. Public outreach included multiple PUC filings, Market Notices, and an ERCOT workshop.

No qualified MRA proposals were received.

Key Factors Influencing Issue:

Details of ERCOT's RMR Analysis

To form a recommendation for the ERCOT Board on whether RMR Service from one or more of the Braunig units is a cost-effective solution to remedy identified performance deficiencies, ERCOT staff conducted an 8,760-hour analysis of 2025 and 2026 using a security constrained economic dispatch unit-commitment model of the ERCOT grid. The analysis determined what portion of an ERCOT-wide Load shed, due to overloading of a 345-kV transmission line in the South Texas Export IROL ("the IROL line"), would be attributed to the retirement of one or more of the Braunig units. Study assumptions incorporated updates to the transmission system, in-service generation, and system load for each year.

Transmission updates include:

- Updated ratings of the IROL line to new Dynamic Ratings and

- A switching procedure that has been implemented on occasion when the IROL line is at risk of overload.

Generation updates include:
- Updated renewable dispatch based on a 2022 weather year;
- Adding new generation meeting Planning Guide § 6.9(1) based on a Generator Interconnection Status (GIS) report;
- Placing a nearby Generation Resource with an impact on loading on the IROL line on outage throughout both study years to represent ERCOT System generation outages;
- Placing Braunig unit 1 on outage April – June 2025, and Braunig unit 2 on outage April – August 2025 to reflect the projected outage, inspection, and repair schedules for the Braunig units; and
- Updating Generation Variable O&M Cost for each of the Braunig units to $5000/MWh.

System Load updates include:
- Modeling the 2013 weather year, a weather year in the middle of the range of recent weather years; and
- Using 2025 and 2026 projected Load amounts based on steady-state analysis levels.

For each year, ERCOT studied four scenarios:
- Scenario 1: All of the Braunig units retired;
- Scenario 2: Braunig unit 3 providing RMR Service (Braunig unit 1 and Braunig unit 2 retired);
- Scenario 3: Braunig unit 3 and Braunig unit 1 providing RMR Service (Braunig unit 2 retired); and
- Scenario 4: All of the Braunig units providing RMR Service.

To calculate the potential Load-shed value for each hour, for each scenario, where overloads on the IROL line were observed, 215 MW of ERCOT-wide Load shed was applied to provide 5% relief on the constraint.

The results for 2025 showed that, in the scenarios studied, Braunig Unit 3 started up seven times, Braunig Unit 1 started up four times, and Braunig Unit 2 started up twice when the IROL line was binding or overloading. The results for 2026 showed Braunig Unit 3 started up 13 to 16 times, Braunig Unit 1 started up 13 times, and Braunig Unit 2 started up 12 times when the IROL line was binding or overloading.

Regarding the economic and reliability benefits of RMR Service from the Braunig units, in the scenarios studied:
- the provision of RMR Service solely by Braunig Unit 3 (Scenario 2) in 2025 resulted in a total reduction of 0.30 gigawatt hours (GWh) of ERCOT-wide

Load shed, and a resulting approximate reduction of $11 million in the cost of Lost shed;
- the provision of RMR Service solely by Braunig Unit 3 (Scenario 2) in 2026 resulted in a total reduction of 2.74 gigawatt hours (GWh) of ERCOT-wide Load shed, and a resulting approximate reduction of $96 million in the cost of Load shed;
- the addition of RMR Service by Braunig Unit 1 (Scenario 3) in 2025 resulted in an incremental reduction of an additional 0.39 gigawatt hours (GWh) of ERCOT-wide Load shed, and a resulting approximate incremental reduction of $14 million in the cost of Lost shed;
- the addition of RMR Service by Braunig Unit 1 (Scenario 3) in 2026 resulted in an incremental reduction of an additional 0.66 gigawatt hours (GWh) of ERCOT-wide Load shed, and a resulting approximate incremental reduction of $23 million in the cost of Load shed;
- the addition of RMR Service by Braunig Unit 3 (Scenario 4) in 2025 resulted in an incremental reduction of an additional 0.07 gigawatt hours (GWh) of ERCOT-wide Load shed, and a resulting approximate incremental reduction of $2 million in the cost of Load shed; and
- the addition of RMR Service by Braunig Unit 3 (Scenario 4) in 2026 resulted in an incremental reduction of an additional 0.95 gigawatt hours (GWh) of ERCOT-wide Load shed, and a resulting approximate incremental reduction of $33 million in the cost of Load shed.

All three Braunig units reduce, but do not eliminate, the Load-shed risk in 2025 and 2026. The Load-shed risk is markedly higher in 2026.

Details of ERCOT's RMR Financial Analysis

In accordance with Protocols Section 3.14.1.2, CPS Energy provided cost estimates for each Braunig unit. These cost estimates were used for negotiations with CPS Energy on potential RMR Agreements and for analysis conducted by ERCOT staff to form recommendations to the Board on whether to enter into RMR Service for each of the Braunig units. Cost estimates include inspection and routine repair costs (both Capital and non-Capital Expenditures); operations and maintenance expense; fuel expense, if deployed; and incentive factor payments that apply to all Eligible Costs except Capital Expenditures and fuel expense.

For each of the Braunig Resources, ERCOT provides a revised initial estimate of approximate costs of RMR Service as follows:

- Braunig Unit 1: $21 million (2025) + $6 million (2026) = $27 million;
- Braunig Unit 2: $22 million (2025) + $7 million (2026) = $29 million; and
- Braunig Unit 3: $25 million (2025) + $9 million (2026) = $34 million.

However, ERCOT cautions that there is substantial uncertainty regarding what would be the final, actual costs of RMR Service from any of the Braunig units. CPS Energy has stated that each of the Braunig units is at the end of its service life. Significant repair or maintenance work has not been conducted to extend the life of the Braunig units past their proposed retirement dates. Perhaps most significantly, during and after the initial inspections and repairs contemplated, additional, unanticipated costs may be incurred in the provision of RMR Service. Moreover, the estimates of the costs of RMR Service necessarily contain assumptions about the operation of the units that is unlikely to materialize exactly as assumed. For example, the cost estimates include assumptions regarding how often and at what levels each of the Braunig units would be dispatched when the IROL line constraint is binding or overloaded. Such assumptions affect, among other things, assumed fuel costs.

ERCOT evaluated the incremental value of reduced ERCOT-wide Load shed (EWLS) compared to the estimated RMR costs for the Braunig units. RMR costs include budget costs, incentive factor payments, and estimated fuel costs, assuming the number of start-ups and generation shown in the planning simulation model. Values for reduced EWLS are based on a Value of Lost Load (VOLL) of $35,000/MWh.

For each Braunig unit, the two-year costs of RMR Service are lower than the value of the ERCOT-wide Load shed projected to occur if the unit retires. Year 2 (2026) carries the larger risk of Load shed while simultaneously there are lower costs for RMR Service. Braunig Unit 3 provides the best result.

The estimated cost of RMR Service from Braunig Unit 3 for two years (subject to the *caveats* regarding the uncertainty of this cost estimate discussed above) totals approximately $34 million dollars. The two-year value of EWLS that was avoided in the scenarios studied due to provision of RMR Service by Braunig Unit 3 totals approximately $107 million.

The combined estimated cost of RMR Service from Braunig Units 1 and 2 for two years (again, subject to the *caveats* regarding the uncertainty of this cost estimate discussed above) totals approximately $56 million. The two-year value of EWLS that was incrementally avoided in the scenarios studied due to provision of RMR Service by Braunig Units 1 and 2 totaled approximately $72 million.

If Braunig Units 1 and 2 were contracted to provide RMR Service, under the planned inspection schedule, inspection of Braunig Unit 1 would be unlikely to begin before May 3, 2025 and inspection of Braunig Unit 2 would be unlikely to begin before July 3, 2025. Therefore, ERCOT staff recommends that the Board defer its decisions on whether to enter into RMR Agreements regarding Braunig Units 1 and 2 until ERCOT staff further explores other options to address the reliability risk posed by the potential retirement of these units. Specifically, ERCOT has been in early conversations with CenterPoint Energy, Inc.; Life Cycle Power; Arroyo Investors; and CPS Energy to explore the technical, financial, and regulatory feasibility of securing the provision of

service from mobile generation that could be placed at CPS Energy substations with shift factors that are comparable to or better at providing relief on the IROL line than the location of the Braunig Units 1 and 2. Such mobile generation might be able to provide a comparable amount of capacity as Braunig Units 1 and 2, but could not provide sufficient capacity to also replace Braunig Unit 3.

The mobile generation that might act as a substitute to the provision of RMR Service by Braunig Units 1 and 2 have additional reliability benefits relative to such RMR Service. Those benefits include faster ramping times with as little as no minimum downtime, lower risk of forced outage, greater cost certainty, lower single-point-of-failure risk, and more operational flexibility.

If service from the mobile generation appears feasible and cost effective, ERCOT is considering conducting a request for proposal (RFP) process wherein competitive offers to provide service in lieu of the mobile generators would be sought. ERCOT anticipates providing additional information to the Board at its February 2025 meeting.

Conclusion/Recommendation:

ERCOT staff recommends that the Board approve a Reliability Must-Run (RMR) Agreement with CPS Energy for the provision of RMR Service from V.H. Braunig Unit 3 (BRAUNIG_VHB3) from March 3, 2025 through March 2, 2027.

In presenting this recommendation, ERCOT staff stipulates, under paragraph (1) of ERCOT Protocols Section 3.14.1.3 that:

- CPS Energy provided complete and timely NSOs including sworn attestations supporting the claim of pending Generation Resource closures;
- ERCOT received all of the data necessary to evaluate the need for and provisions of the RMR Agreements, and that information was posted on the MIS Secure Area by ERCOT as it became available to ERCOT;
- When executed, the signed RMR Agreements will comply with the ERCOT Protocols and be posted on the MIS Secure Area; and
- ERCOT staff's evaluation included the reasonable alternatives to the RMR Agreements as set forth in Section 3.14.1, Reliability Must Run, and compared the alternatives against the feasibility, cost, and reliability impacts of the signed RMR Agreements; the timeframe in which ERCOT expects each of the Braunig units to be needed for reliability; and the specific type and scope of reliability concerns identified for each of the Braunig units, as applicable.

Furthermore, ERCOT staff considered all factors required in ERCOT Protocols Sections 3.14.1.5, including, but not necessarily limited to, the following:

Analysis shows that all three of the Braunig units are needed to mitigate ERCOT-wide Load shed projected to occur if the units retire. The risk is less severe in 2025 than it is in 2026.

Braunig Unit 3 is the newest, largest, and most cost-effective unit for RMR Service. Analysis also shows that contracting for RMR Service from Braunig Unit 3 for two years is estimated to cost less than the value of the EWLS projected to occur if the unit retired. In the studied scenarios, the provision of RMR Service by Braunig Unit 3 (Scenario 2) in 2025 and 2026 resulted in a total reduction of 3.04 GWh of EWLS, and a resulting approximate reduction of $107 million in the cost of EWLS. The initial estimated cost of RMR Service by Braunig Unit 3 for two years totals approximately $34 million.

Additional information regarding the factors considered, including more information about the cost-benefit evaluation, impacts on customers, operational constraints, and risks is being provided in a presentation to the Board.

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

WHEREAS, on March 13, 2024, CPS Energy provided ERCOT notice of the proposed indefinite suspension (NSO) of CPS Energy's V.H. Braunig unit 3 (BRAUNIG_VHB3) after March 31, 2025, and on October 3, 2024, CPS Energy revised its NSO so the proposed indefinite suspension is now earlier, on March 2, 2025;

WHEREAS, ERCOT conducted a reliability analysis required under Public Utility Commission of Texas (PUCT) Substantive Rule, 16 Texas Administrative Code § 25.502(e) and Protocols § 3.14.1.2 that showed ERCOT System performance deficiencies affected by suspension of Braunig unit 3 and other CPS Energy units proposed for indefinite suspension:

WHEREAS, the operation of Braunig unit 3 impacts certain 345-kV transmission lines that are subject to the South Texas Export Interconnection Reliability Operating Limits (IROLs), providing reductions to loading on those transmission lines when Braunig unit 3 provides power on the ERCOT System;

WHEREAS, under federal reliability requirements, ERCOT must develop a plan to avoid the exceedance of IROLs. ERCOT's plan includes Load shedding, if necessary;

WHEREAS, ERCOT conducted a process seeking Must-Run Alternative Service as a lower-cost alternative to RMR Service and no qualified Must-Run Alternatives were identified by ERCOT;

WHEREAS, ERCOT conducted an 8,760-hour analysis of 2025 and 2026 using a security constrained economic dispatch unit-commitment model of the ERCOT grid. The analysis determined what portion of an ERCOT-wide Load shed, due to overloading of a 345-kV transmission line in the South Texas Export Interconnection Reliability Operating Limits, would be attributed to the retirement of one or more of the Braunig units. Study assumptions incorporated updates to the transmission system, in-service generation, and system load for each year;

WHEREAS, ERCOT analysis showed that, under the studied scenarios, the provision of RMR Service solely by Braunig unit 3 (Scenario 2) in 2025 resulted in a total reduction of 0.30 gigawatt hours (GWh) of ERCOT-wide Load shed, and a resulting approximate reduction of $11 million in the cost of Load shed; and the provision of RMR Service solely by Braunig unit 3 (Scenario 2) in 2026 resulted in a total reduction of 2.74 GWh of ERCOT-wide Load shed, and a resulting approximate reduction of $96 million in the cost of Load shed;

WHEREAS, an initial estimate of costs of RMR Service from Braunig unit 3 for two years totals approximately $34 million; however, this cost estimate is subject to uncertainty;

WHEREAS, ERCOT stipulates that the requirements under paragraph (1) of Protocols Section 3.14.1.3 and the requirements under Protocols Section 3.14.1.5 have been satisfied; and

WHEREAS, ERCOT recommends, after due consideration of the alternatives, that the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) authorize and approve ERCOT entering into an RMR Agreement with CPS Energy for the provision of RMR Service from V.H. Braunig unit 3 (BRAUNIG_VHB3) from March 3, 2025 through March 2, 2027.

THEREFORE, BE IT RESOLVED, that ERCOT is hereby authorized and approved to enter into an RMR Agreement with CPS Energy for the provision of RMR Service from V.H. Braunig unit 3 (BRAUNIG_VHB3) from March 3, 2025 through March 2, 2027.

CORPORATE SECRETARY'S CERTIFICATE

I, Chad V. Seely, Corporate Secretary of ERCOT, do hereby certify that, at its _____ meeting, the Board passed a motion approving the above Resolution by _____.

IN WITNESS WHEREOF, I have hereunto set my hand this ___ day of _____, 2024.

_____
Chad V. Seely
Corporate Secretary