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January 10, 2022

Public Utility Commission of Texas
Chairman Peter Lake
Commissioner Will McAdams
Commissioner Lori Cobos
Commissioner Jimmy Glotfelty
1701 N. Congress Ave.
Austin, Texas 78711

Re: *PUC Project No. 52373, Review of Wholesale Electric Market Design*

Dear Chairman and Commissioners:

Pursuant to Public Utility Commission of Texas (PUCT) instruction at the December 16, 2021 Open Meeting, Electric Reliability Council of Texas, Inc. (ERCOT) provides the following information regarding feasibility and the interactive dynamics surrounding the Phase I market design discussion.

For background, ERCOT provides information on the methodology employed in determining many of the project timelines and resource constraints discussed in the following pages. The various changes discussed in Phase I are at differing phases of implementation. Some items are complete and in operation, such as the new Minimum Contingency Level (MCL) and High System-Wide Offer Cap (HCAP) for the Operating Reserve Demand Curve (ORDC). Others are only in the concept stage—for example, a voltage support compensation program. ERCOT conducted this analysis in a manner that best matches the way ERCOT plans projects. There is some guesswork involved in estimating project timelines because we do not yet have all necessary details; therefore, some caution must be exercised around viewing the estimates as rigid.

The timeline estimates for each market design element are calculated on a stand-alone basis; therefore, the timelines do not necessarily imply expected implementation dates. While ERCOT staff went through exercises to determine an approximate amount of time required to complete each task, ERCOT and its vendors cannot do all the work for each project simultaneously. Thus, each task needs a priority to signal which items are the most important when managing constraints and risks within the portfolio of projects.

In regards to prioritization, for the next 18 months, ERCOT must stay focused on delivery of ERCOT Contingency Reserve Service (ECRS), due to how the ECRS project interacts with the upgrade to the Energy Management System (EMS). If the ECRS project cannot be delivered prior to the EMS upgrade, ECRS will have to wait until after the new EMS system is stabilized. At this point in time, considering the many PUCT initiatives that are already in flight, ERCOT believes that if given top priority ECRS can be delivered before the EMS upgrade. Additionally, ERCOT

believes it could also endeavor to deliver an additional Ancillary Service enhancement in parallel, such as Firm Fuel Product or Backstop Reserve. However, due to the relative size and complexities of these efforts, ERCOT cannot deliver three major projects simultaneously in next 18 months. For example, ECRS, a firm fuel service, and a Backstop Reserve Service cannot be delivered in 18 months. As such, PUCT prioritization of these projects would aid ERCOT in prioritizing one initiative over the other. It is worth noting most efforts outside of ECRS are not as constrained by the EMS upgrade. Consequently, ERCOT recommends ECRS be given top priority among the Phase I elements.

The remainder of this filing will focus on the status and presenting key variables for the Phase I projects. Additionally, this filing identifies areas where the PUCT may wish to provide ERCOT with policy direction to speed up the design process.

In addition to the information provided below, a table summarizing the projects described herein is provided as Attachment A. Further, included as Attachment B is a graphic showing the current expected delivery timeline for a subset of ERCOT's current major projects.

Operating Reserve Demand Curve (ORDC)

Change MCL to 3,000 MW, System-Wide Offer Cap (HCAP) to \$5,000 – These changes were implemented in ERCOT systems effective January 1, 2022. Associated Nodal Protocol Revision Requests (NPRRs) and Other Binding Document Revision Requests (OBDRRs) are expected to be approved at the next regularly scheduled ERCOT Board of Directors (BOD) meeting, which is anticipated to be in March 2022.

De-couple Value of Lost Load (VOLL) and HCAP – Upon PUCT direction (e.g., a Substantive Rule change), ERCOT will file NPRRs and OBDRRs to make the needed changes. The estimated implementation timeline for these changes is 3 to 6 months. Small changes to ERCOT's software systems, estimated as 3 to 6 months of work, would also be required.

Bi-Annual Report on ORDC – ERCOT is prepared to produce this report in the last quarter of every even numbered year, starting with 2022.

Demand Response

Locational Marginal Pricing (LMP) for Load Resources – NPRRs and OBDRRs would be needed to implement this change. ERCOT's recommended path forward is to break this initiative up into several phases, where Controllable Load Resources (CLRs) would receive LMPs first. Additional types of Load Resources (LRs) could be included over time. As a second phase, ERCOT will explore the feasibility of additional application of LMPs to other resources. Estimated implementation of CLRs receiving LMPs would be at least a 24-month project after the approval of associated NPRRs.

Evaluate Customer Aggregations – This initiative is very similar to FERC Order 2222, which has been challenging to implement by other Independent System Operators (ISOs). ERCOT proposes to begin evaluation with a review of what has worked and not worked in other jurisdictions. The crux of the issue is that aggregations that cover large areas are difficult to align with locational dispatch and pricing. If you make the aggregation too large, invariably some of the aggregation is located in a way that acts against other elements of the aggregation's ability to resolve local reliability issues. At times, deploying the aggregation could create new problems. If the aggregation is too small, you lose the benefit of aggregating to get a worthwhile systematic response. The default starting point for the other ISOs is to limit aggregation to resources around a single, nearest transmission element; this is the recommended starting point in the ERCOT footprint as well.

Emergency Response Service (ERS)

Codify PUCT Good Cause Instructions – Implementation occurred with the most recent ERS procurement in November 2021. NPRR1106, Deployment of Emergency Response Service (ERS) Prior to Declaration of Energy Emergency Alert (EEA), was approved December 16, 2021, and became effective upon PUCT approval.

Determine Potential ERS Changes – This project will require ERS tool changes but no core ERCOT system changes, unless ERS settlement is changed. The ERS tool changes would take about six months after the approval of any necessary NPRRs and OBDRRs. Substantive Rule changes would be needed to change the annual ERS expenditure limit. The Commission may also wish to consider other spending or procurement controls around the quantity of ERS.

Seasonal Apportionment – ERCOT currently uses risk factors to assign the \$50 million annual ERS budget across both the procurement periods and within each contract period. It is possible for an expansion or modification of this process that accomplishes the PUCT objectives. For any changes to proceed, ERCOT would need to know the areas of emphasis. To the extent the PUCT plans to amend the ERS Substantive Rule, 16 TAC § 25.507, the opportunity to instruct ERCOT as to any changes in apportionment would be available. Ultimately, codifying the changes requires ERS tool changes that would take approximately six months to implement after the approval of any necessary NPRRs and OBDRRs. Implementation efficiencies are expected from combining ERS changes that require ERS tool changes into a single project effort.

Ancillary Service Enhancements

Fast Frequency Response Service (FFRS) – Delivery of this functionality was originally planned for December 2021; however, implementation was delayed due to risks associated with Market Participant systems not being ready. ERCOT is now planning delivery of FFRS for potentially the last quarter of 2022.

Load Resources participation in Non-Spin Reserve Service (NSRS) – NPRR1093, Load Resource Participation in Non-Spinning Reserve, was approved in October 2021 by the PUCT, and the

project is on-target to be completed for the Summer of 2022. For this enhancement to be beneficial, Market Participant systems will also need to be ready; therefore, ERCOT is enhancing its communication of interface requirements to ensure market readiness. It should be noted that implementation of this project, FFRS, and ECRS all require the same ERCOT resources.

Firm Fuel Product – This project has not started, and material input from the PUCT will aid greatly in the quickest delivery. To understand the definition and primary objective of the new product, ERCOT seeks policy input on six general categories: 1) eligibility/qualification and associated verification; 2) deployment and offer structure; 3) processes for procurement, such as procurement type (e.g., auction vs requests for proposal (RFP)) and procurement/contract length; 4) quantity of procurement, including expenditure limits or cost controls; 5) performance requirements and enforcement; and 6) cost allocation. While an auction may be the better long-term procurement methodology, an RFP would be much faster to implement. Additionally, allocation based on a simple Load Ratio Share (LRS), in line with other existing cost allocation processes in ERCOT, would expedite delivery. Lastly, the more ERCOT could model this after ERS timelines and processes, the quicker this could be delivered. After receiving clarification of these points, ERCOT will draft NPRRs. With current information, ERCOT estimates this to be a 12 to 24 month project, depending on the choices made regarding the items listed above. This project will compete for resources with FFRA and ECRS and will require NPRRs. For the purposes of the most expeditious delivery of this project, ERCOT recommends starting with an RFP with a budget limit and a cost per MW cap. There should be a must offer requirement in the Day-Ahead Market during cold weather events and eligibility should center around the natural gas fleet.

Voltage Support Service – This project has not started. Similar to the Firm Fuel product, any PUCT input to fully understand the definition and primary objective of this new product would be useful, with specific attention to the following issues: 1) eligibility/qualification and associated verification; 2) deployment, if applicable; 3) processes for procurement, if applicable; 4) expenditure limits or cost controls; 5) performance requirements and enforcement; and 6) cost allocation. The FERC rule on this subject and mechanism employed by other ISOs may provide a blueprint for a path forward. After receiving clarification of these points, ERCOT will draft NPRRs. This project will require NPRRs and compete for ERCOT resources with FFRS, ECRS, and potentially the Firm Fuel product.

ERCOT Contingency Reserve Service (ECRS) – NPRRs to implement this project have been approved. Requirements are currently being developed for project delivery in early 2023, which is prior to the major EMS upgrade delivery window mid-2023 through mid-2024. If ECRS is not implemented before the EMS upgrade, there will be a significant delay and cost to re-align ECRS after the EMS upgrade. Therefore, prioritizing ECRS is important to keep it on track. New initiatives, such as Firm Fuel and Backstop Reserve Service, may create risk to ECRS delivery. Since neither of those services have significant dependencies on EMS, granting ERCOT delivery flexibility relative to those services will give ERCOT the best chance of preserving ECRS delivery. Finally, if changes to the methodology for allocating cost of the service are pursued, a separate project phase for those changes would help to mitigate project delivery risk. Changes to cost allocation are not part of the current ECRS project that is underway.

ERCOT thanks the Commission for its consideration of this matter. ERCOT is available to answer any questions the Commission may have and stands ready to take other action as directed by the Commission.

Regards,

/s/ Kenan Ögelman
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ATTACHMENT A

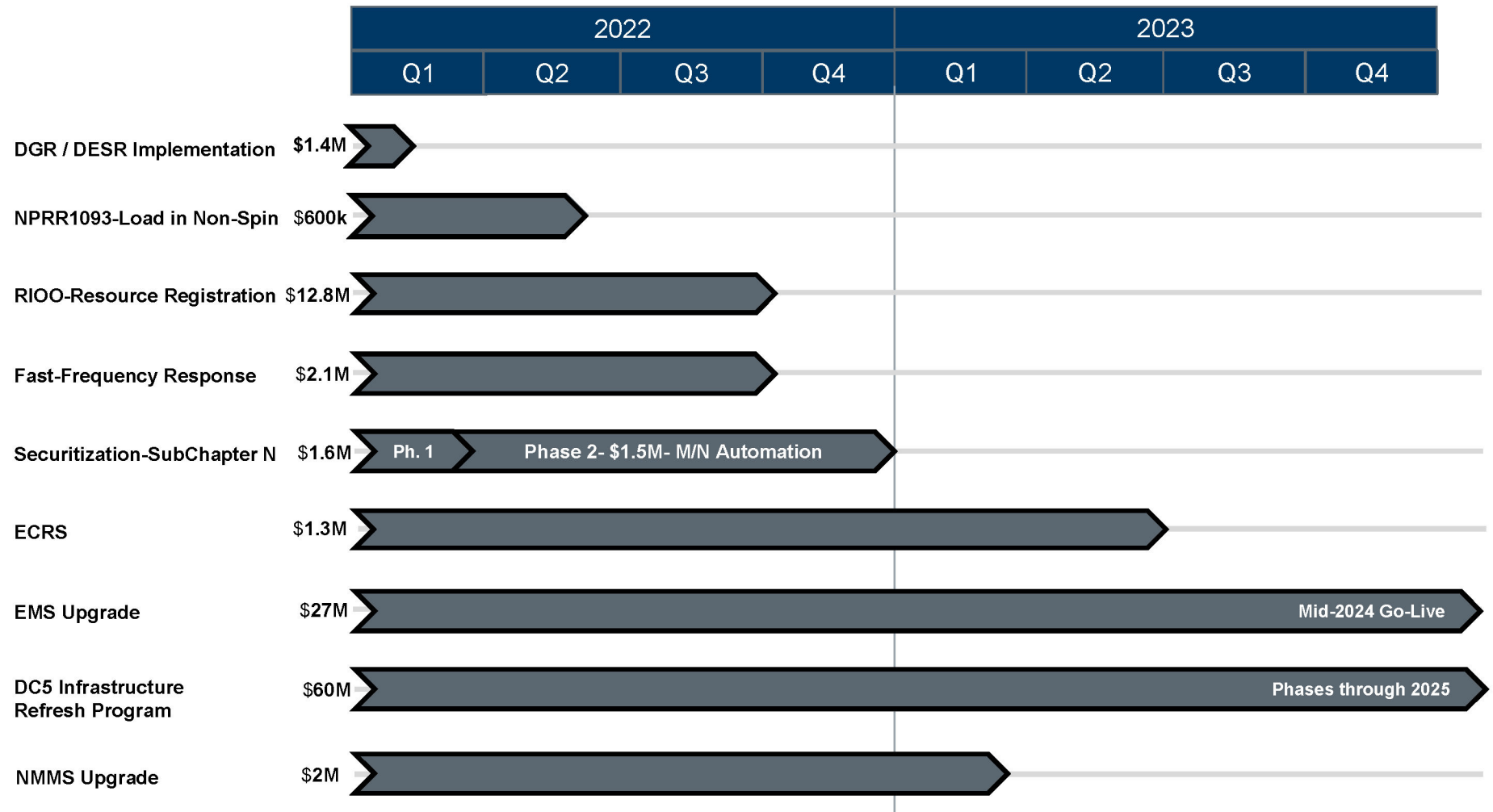
Design Change	Status	Input From PUCT	Required Market Rule Changes	Project Requirements and implementation time	Conflicts or risks to other projects	Additional notes
Operating Reserve Demand Curve						
MCL @ 3,000 and HCAP @ \$5,000	Change is in place as of January 1, 2022	No new input required.	Associated NPRRs and OBDRRs to be approved at the next regularly scheduled BOD meeting -- anticipated to be in March.	No project required. ERCOT has completed design and testing	None	
Decouple VOLL and HCAP and create a new VOLL	Pending Substantive Rule Change	Yes. 1) Changes to Subst. Rule 2) Value for VOLL 3) Date to begin utilizing new VOLL	Yes, NPRRs and OBDRRs	Yes. 3 to 6 month project after ERCOT BOD and PUCT approval of associated rule changes.	Resource competition could slow down NPRRs 1093, 1101, and 939. Impact on FFRA and ECRS.	ERCOT recommends project to start after the design for FFR Advancement Project (FFRA) and ECRS, as well as NPRR 1093, 1101, and 939, is complete
Bi-annual Report	Waiting for PUCT instruction	Yes. 1) Information useful and responsive to the PUCT in the report.	Yes, NPRRs	None. Can be implemented immediately.	None	

Design Change	Status	Input From PUCT	Required Market Rule Changes	Project Requirements and implementation time	Conflicts or risks to other projects	Additional notes
Demand Response						
LMPs for LR	Not started	Not necessary but if there are preferred limits or grandfathering	Yes, NPRRs	Extensive implementation timeline. 24 months after approved NPRRs and OBDRRs.	Resource competition could slow down NPRRs 1093, 1101, and 939. Impact on FFRA and ECRS.	ERCOT recommends project to start after the design for FFRA and ECRS as well as NPRR 1093, 1101, and 939 is complete. ERCOT further recommends a phased approach with Controllable Load Resources receiving LMPs first. The feasibility of further LMP application could be evaluated as a separate effort.
Evaluate customer aggregation	Not started. Evaluation could begin very quickly.	Not necessary	Not for evaluation, but follow-on actions would.	Evaluation does not require a project however, follow-on actions would.	None	Similar to FERC order 2222. Full implementation of FERC order 2222 has been challenging in other ISOs.
Emergency Response Service						
Codify PUCT good cause instructions	In flight.	No new input needed	NPRR 1106		N/A	
Determine Potential Changes	Not started	Instruction and rule changes addressing: Budget; Quantity; and Cost controls.	Yes, potential Substantive Rules changes and OBDRR	ERS tool changes - 6 months	None identified	Best if implemented as a joint project with seasonal apportionment.
Seasonal apportionment	ERCOT does currently allocate on risk factors.	PUCT preferences if different than the current factors.	Yes, if wanted in the Substantive Rules and OBDRR	ERS tool changes – 6 months	None seen at this time.	Best if implemented with substantive rule changes.

Design Change	Status	Input From PUCT	Required Market Rule Changes	Project Requirements and implementation time	Conflicts or risks to other projects	Additional notes
Ancillary Service Enhancements						
FFRS	Delivery tentatively last quarter of 2022	None needed.	System design is complete.	Tentative schedule for last quarter of 2022 but dependent on priority and market participant systems being ready.	Competes with resources for other AS enhancements and would need to go-live before or after EMS upgrade window (which is mid-2023 through mid-2024).	Delivery was delayed because market participant systems were not ready.
LRS in NSRS	NPRR 1093 is approved and on target to be completed for summer of 2022	None needed.	System design is complete.	Delivery expected Summer 2022	Competes with resources for other AS enhancements and would need to go-live before or after EMS upgrade window (which is mid-2023 through mid-2024).	Assumes market participant system are ready.
Firm Fuel	Not started	Yes: 1) Eligibility/qualification; 2) deployment, if applicable; 3) procurement processes; 4) quantity of procurement; 5) performance requirements;	Yes, NPRRs.	12–24-month implementation. LRS share allocation and RFP to maintain simplest design to implement.	Competes with resources for other AS enhancements, but potentially no impacts to EMS upgrade work.	While an auction is the better way to procure an RFP would be the quickest to implement. Allocation based on load ratio share also makes implementation easier. Designing this service will compete for resources with FFRA and ECRS.

Design Change	Status	Input From PUCT	Required Market Rule Changes	Project Requirements and implementation time	Conflicts or risks to other projects	Additional notes
		and 6) cost allocation				
Voltage Support	Not started	If PUCT wishes to define the service or use a blueprint from FERC it may. 1) Eligibility/qualification; 2) deployment, if applicable; 3) processes for procurement, if applicable; 4) quantity of procurement; 5) performance requirements; and 6) cost allocation	Yes, NPRRs.	24 months. Depending on priority. Likely after EMS upgrade.	Competes with resources for other AS enhancements.	
ECRS	Early 2023	Currently prioritized to be delivered in early 2023.	Potentially, NPRRs if changes to cost allocation are made	Tentative schedule for early 2023 but dependent on prioritization to maintain schedule and resource allocation.	Competes with resources for other AS enhancements and would need to go-live before or after EMS upgrade window (which is mid-2023 through mid-2024).	<p>Firm Fuel and Back Stop reserve service may create risk to delivery.</p> <p>Changes to cost allocation are not part of the current project underway. If changes to cost allocation were pursued, a separate project phase for those changes would help to mitigate project delivery risk.</p> <p>PUCT prioritization of other functions could miss EMS freeze.</p>

Subset of Major Projects for 2022-2023*



* Note: These projects represent a subset of the ERCOT project portfolio.