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PROJECT NO. 52373

REVIEW OF WHOLESALE ELECTRIC MARKET DESIGN	**§** **§**	**PUBLIC UTILITY COMMISSION OF TEXAS**

COMMENTS OF FTI-CL ENERGY

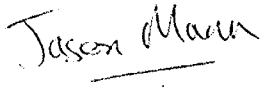
TO THE HONORABLE PUBLIC UTILITY COMMISSION OF TEXAS:

FTI-CL Energy appreciates the opportunity to provide the attached comments in the Commission's review of the Electric Reliability Council of Texas's ("ERCOT") wholesale electric market design. FTI-CL Energy files these comments in response to Commissioner McAdams' November 17, 2021, memorandum proposing the Commission establish a Dispatchable Portfolio Standard (DPS).

FTI-CL Energy was retained by Eolian, L.P. to comment on Commissioner McAdam's DPS proposal, including the likelihood that the proposal will increase reliability and resource adequacy in the ERCOT Region and enable ERCOT to be better prepared for the market transitions that the Region is experiencing similar to other energy markets in the world. In addition, we also contrast Commissioner McAdams' DPS proposal with other proposals the Commission is considering.

We appreciate the opportunity to provide the attached memorandum and look forward to working with the Commission and other stakeholders as it considers these complex issues.

Respectfully submitted,



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Memorandum

TO: **PUCT Commissioners**

FROM: **FTI-CL Energy**

DATE: **December 1, 2021**

RE: **Global energy market perspectives on the DEC proposal in ERCOT**

1. Introduction

FTI-CL Energy comprises energy experts from FTI Consulting and its wholly-owned subsidiary Compass Lexecon, both US-headquartered global expert services firms. FTI-CL Energy offers expertise in energy and environmental policy, competition economics, regulatory economics, market and network modeling, accounting and finance, econometrics and statistics, valuation, arbitration and calculation of damages.

We regularly work with energy regulators, regulated companies and investors around the world on market design, network planning and regulation, investments and associated issues. The global nature of our work means that we have considerable experience in all major competitive energy markets (including the US, Australia and most jurisdictions in Europe), reflecting a wide range of policy and market approaches. We have advised governmental authorities on many occasions on the question of how to ensure *resource adequacy* in the context of competitive energy markets. Broadly speaking, resource adequacy means sufficient investment in energy resources, at the appropriate time and location to match demand, such that supply and demand can be balanced at all times.

Globally, energy markets are in a transition phase. This is driven by a combination of factors, including increasing shares of renewable intermittent resources (notably solar and wind), traditional thermal plants becoming, on average, older (and consequently less reliable), and the introduction of new information-based technology. While there is broad agreement that energy markets need to evolve to meet these challenges (and others), there is no clear consensus on what the optimal design is. A key facet of the debate is the balance between the role of the energy 'spot' market (real-time, or near-real time, matching of demand and supply) and the role of central authorities to contract with sources of energy capacity in advance of real-time to attempt to ensure that energy is available when required.

The ERCOT system is, like many energy markets around the world, facing resource adequacy issues, including those driven by the increasing penetration of intermittent renewable resources. There is increasing recognition that in these circumstances, what is required is not simply additional capacity, but capacity that can complement these intermittent sources by responding rapidly to changes in supply and demand.

However, in many systems, including ERCOT, in light of the energy crisis of February 2021, policymakers are increasingly concerned that existing market designs may not be providing sufficient signals to encourage timely investment in the types of capacity required. Where there is a consensus (as appears to be the case in ERCOT) that additional mechanisms are required to encourage such timely investment, the central question is what type of mechanism is most appropriate – providing sufficient signals without jeopardizing the competitive nature of the market.

In this context, and as markets evolve, we see significant value in regulatory bodies retaining *optionality* for future pathways – for example, by: (i) exercising caution against interventions that are difficult or costly to reverse; (ii) avoiding 'locking in' legacy resources at high-cost levels; and (iii) exercising caution against moving away from the energy spot market too rapidly.

2. Background

Following the issuance of Governor Abbot's set of directives to the Commission on July 6, 2021, Project No. 52373 was opened: Review of Wholesale Electric Market Design (the "Review"). The Review commenced in August 2021 and to date there have been over 250 separate filings made.

At this juncture of the Review, our understanding is that the Commission is seeking to encourage the development of new dispatchable resources in the region, following Governor Abbott's initial directive to "[s]*treamline incentives within the ERCOT market to foster the development and maintenance of adequate and reliable sources of power*"[1]. Concurrently, ERCOT has issued a study[2] indicating that, as more renewables enter the system, the system is expected to experience more ramping needs, which in turn indicates that significantly more flexible resources will be required soon.

In this context, flexibility essentially refers to resources that can produce output on demand (i.e., are dispatchable) and can 'ramp' rapidly (i.e., can reach a state of maximum output rapidly after being turned on, and vice versa when turned off). We note additionally that the concept of 'flexibility' is itself evolving, and increasingly encompassing other characteristics like inertia.[3]

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1 Letter from Governor Greg Abbott to the Commission, July 6, 2021.

2 "Impact of Growth in Wind and Solar on Net Load" issued on October 25, 2021.

3 In very broad terms, this is the store of kinetic energy in the rotating mass of machines and motors connected to the system. This aids with overall system stability at very short timescales.

More generally, resource adequacy methodologies are evolving from the simple historical approach of ensuring a sufficient capacity margin to more sophisticated approaches taking into account the impact of various types of potentially high impact events, and identifying the evolving system needs in terms both of firm and flexible energy.

Given the identification of the current (and, more importantly, future) need for a specific type of capacity, this raises the question as to how to incentivize investment in such capacity. Within the Review, there are multiple proposals for market design reforms that are at varying stages of consideration - some mutually exclusive, and some mutually complementary.

We have been asked by Eolian, L.P. to specifically comment on the LSE Obligation and the DEC proposals, and the relative appropriateness of each for meeting the evolving system needs in the ERCOT region. Recognizing the LSE Obligation and the DEC proposal are both proposals that would require more detailed scrutiny and design work to implement (and that the proposals are detailed in other filings), we outline the key distinguishing features of each as we understand them below.

The LSE Obligation proposal

The LSE Obligation is premised on ERCOT/PUCT specifying a desired reliability standard and then seeking to ensure that sufficient resources are procured to meet the specified standard. Each Load Serving Entity ("LSE") would be required to procure a sufficient quantity of resources to meet its share of total system-wide reliability requirement. The requirement could be satisfied through LSEs either owning resources or contracting with resources – and such contracts could be bilaterally traded with other LSEs.

A key feature of the LSE Obligation is that LSEs would be required to procure general capacity – i.e., capacity potential expressed in MW. The LSE Obligation is in many respects similar to a decentralized general capacity market, such as that used in California and France.

The DEC proposal

Commissioner McAdams has proposed a "Dispatchable Energy Credit" (DEC) system.[4] In the DEC system, LSEs would be obliged to procure a certain volume of Dispatchable Energy Credits, representing capacity that meets specific performance standards.

The specific performance standards would be targeted towards contributing flexibility to the ERCOT system. Commissioner McAdams stated in his Commissioner Memorandum that "*we need that new generation to be flexible*" and he has suggested the following performance standards as an example:

[4] The DEC is proposed by Commissioner McAdams in filing #250. The DEC proposal is supported by Eolian, L.P., an investor in electricity assets.

> *"…PUC could require qualifying DEC generation to be facilities able to ramp to full nameplate capacity within 5 minutes or less and have a net facility specification heat rate less than or equal to 8,000 Btu/kWh, or a battery that can discharge for at least 2 hours"*

Relative to the LSE Obligation, the key distinguishing feature of the DEC proposal is that it is targeted (that is, targeting capacity that can meet certain performance standards and in particular with regard to ramping capability).

3. Targeted vs. non-targeted mechanisms for meeting system needs

As discussed above, one of the key differences between the LSE Obligation proposal and the DEC proposal is that the latter is a targeted market mechanism designed to meet system needs dynamically.

Before discussing these differences in detail, it is worth reviewing he reasons why additional mechanisms are often implemented in competitive energy markets. The key reasons are typically:

i. In some circumstances, the socially optimal or desirable level of an investment would not be reached, if left to market pricing alone. This occurs when there are positive or negative externalities associated with a product that are not reflected in the market price. An example of this in the US is the sulphur dioxide cap-and-trade program ("SOx"), where the negative impacts of such emissions did not generally fall on the producers of those emissions. To correct this negative externality, a pricing mechanism was introduced which effectively unbundled the negative emissions aspect from the industrial process which caused the emissions.

ii. Establishing a mechanism provides some guarantee of the provision of appropriate resource. Relying on market signals alone means exposing the system (and in turn, consumers) to the risk that resource investment may come too little, or too late (and, in doing so, potentially forcing policymakers to adopt more interventionist methods later in time to remedy the situation).

iii. Establishing a mechanism means that revenues are less volatile, which lowers the risk premium for investment, which (i) enhances the financeability of new resources, allowing more new generation than might otherwise be the case; and (ii) lowers the required returns for investment, leading to lower consumer prices.

However, set against these positive factors are several negative factors– such as the potential for anti-competitive issues, the deleterious effects on the signaling properties of the wholesale energy 'spot' market, or the potential for any mechanism to effectively result in consumers overpaying for resource adequacy. We will not discuss these in detail here, but these negative factors mean that any mechanism introduced needs to be carefully calibrated and suitable for the circumstances of the system.

Building on this, it is useful to introduce the concept of unbundling of the different system needs. Power resources provide many different types of services, which are all needed in a power system, including capacity (maximum potential MW production), energy (actual MWh production), flexibility (the ability to increase output rapidly), as well as a host of other services that are often grouped as 'ancillary' services.[5]

In recent years, market design has trended towards unbundling of these different services. This means that specific services are identified and remunerated separately. Unbundling and remunerating adequately each of these services has advantages in that it both:

i. increases the efficiency of the market, including through more specific price signals; and

ii. encourages delivery of the services most valuable to the system in real time.

Unbundling also provides an avenue for applying different procurement approaches for different types of services. In particular, rather than simply procuring capacity, and assuming that the resulting resource mix can produce the other services, authorities have identified specific services that are not being produced in sufficient quantities and procuring them explicitly. If a key future system need is flexibility[6], a targeted mechanism to ensure such flexibility is in principle likely to be more efficient overall than a general capacity mechanism such as that represented by the LSE Obligation proposal. In this regard, ERCOT potentially has an opportunity to leapfrog the experiences of many jurisdictions that adopted general capacity mechanisms and proceed with targeted support to address actual system needs.

A final, but important point on unbundling is that it clarifies where and how different types of resources compete with one another. This is one reason why a MW of new DEC resources will not automatically displace the same amount of capacity of existing resources – a small increase in DEC-compliant, flexible resources will address situations such as: (i) intra-hour pricing volatility, which we understand to be increasing in the system, and (ii) shortfalls that current generation cannot meet due to technological limitations. In other words, DEC-compliant capacity does not directly compete with the general capacity that the LSE Obligation proposal would largely support.

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5 An example of another type of service is 'inertia'. In very broad terms, this is the store of kinetic energy in the rotating mass of machines and motors connected to the system. This aids with overall system stability at very short timescales.

6 We also note another identified system need is for better resilience against the kind of multi-day disruption experienced in Texas in February 2021. Our memo does not discuss this need in detail, but it appears to us that the Strategic Reliability Service proposed by Commissioner Cobos (Filing #253) (focusing on supporting generation that is weatherized and with fuel supplies to run for multiple days) may be complementary to the DEC proposal.

Targeted mechanisms minimize regulatory intervention, and can be transitory in nature

To allow the competitive market to produce optimal outcomes (e.g. resource adequacy and reliability at lowest cost to consumers), a well-functioning electricity market should aim for proportionate intervention. This means that markets are, in the first instance, relied on to deliver efficient outcomes, with regulatory interventions imposed when there is a specific need and the intervention calibrated to meet that specific need.

With a general and market-wide mechanism (such as the LSE Obligation proposal), there is more potential for the mechanism to weaken the spot energy market and lead to continued reliance on the mechanism.[7] In other words, the relevance of the spot market to drive investments will diminish (as project finance will be more reliant on long-term revenues promised through the mechanism).

The two main disadvantages to a market-wide mechanism are:

i. It moves the system far away from relying on efficient price signals to drive efficient levels of investment.

ii. In practice, it becomes extremely challenging to reverse the policy, as it becomes embedded in the system. In Europe, many capacity markets are non-targeted, broadly encompassing capacity in terms of MW in a similar way to the LSE Obligation proposal. European capacity markets were originally intended to be temporary arrangements, but have now become firmly embedded in expectations.

Following on from this, we can now contrast with the DEC proposal. As noted above, given the inadequacy of the current resource mix, there appears to be a need for urgent and significant new build of a specific type. As a targeted mechanism, the DEC proposal would be at less risk of becoming embedded in the market in a static way, and could, over time be meshed with other evolutions in market design.

A corollary of the above is that the DEC proposal, by virtue of it being targeted and somewhat transitory, preserves optionality to the PUCT, in a way that the LSE Obligation proposal (as a more general, market-wide mechanism) is less likely to.

In relation to the above points, we see some parallels with the tender for Fast Frequency Response ("FFR") in the British market, where an urgent market requirement was met via a central procurement of an unbundled service which provided investable signals – but, over time, the procurement mechanism evolved to be part of a large suite of market design reforms.

[7] The mechanism gives some revenues to all capacity providers, so all resources can bid a lower price in the wholesale market, which then depresses spot prices.

A targeted mechanism avoids spending consumer money on the 'wrong' kind of capacity

Our understanding is that, under the LSE Obligation proposal, all qualifying capacity would be remunerated. This effectively bundles the provision of flexibility (i.e. dispatchable, fast-ramping capacity) with more general resource adequacy (i.e., qualifying capacity of any type).

By design, the LSE Obligation proposal would therefore remunerate all resources, even those which do not contribute to the flexibility needs of the system. As an example, the mechanism would remunerate older thermal resources which cannot in general provide fast-ramping capabilities. A non-targeted mechanism is logically more costly to consumers overall than a targeted mechanism, for little to no benefit as far as system flexibility needs are concerned.

The DEC proposal, by contrast, would specifically seek to ensure that system flexibility needs are met, at a lower cost (and the cost would be capped and known in advance). [8]

An important final consideration, relevant to consumer costs, is that there is a relatively high level of vertical integration in the ERCOT system, with gentailers owning resources. In a decentralized mechanism such as the LSE Obligation, there is more scope for the exercise of market power, which limits competition and raises prices in the market.

A targeted mechanism, specifying capacity characteristics, can allow for innovation

As noted above, the concept of 'targeting' refers to targeting capacity that can meet certain performance standards. Prospective providers of any service providing capacity which meets these standards should be treated equally insofar as regulatory, technical and economic differences permit.

A mechanism that appropriately targets system needs – as long as it is not overly specific – allows for a range of technologies to be deployed, which increases system resilience, as well as innovation and competition to meet evolving system needs. Overall, this assists in delivering services required at lowest cost to consumers.

4. Future Market Considerations

The PUCT is currently weighing options for the market redesign process. Of the proposals currently being considered in the Review, FTI-CL believes that implementation of the DEC proposal, coupled with other targeted proposals that the PUCT is considering, would greatly benefit ERCOT's system, more so than the LSE Obligation proposal.

[8] The DEC proposal includes specific volume requirements and an Alternative Compliance Payment ("ACP") penalty mechanism, which constrains the overall cost that an LSE would pay.

If the DEC framework is chosen, there is tremendous opportunity to design and fine tune this market mechanism, given its targeted nature, so that it meets specific needs of the system, when those needs arise, creating a better outcome during severe weather/reliability events such as Winter Storm Uri, and other times when there is an imbalance of supply and demand, such as when large system resources may be on forced or unforced outages.

Crucially, as ERCOT continues to integrate renewable intermittent resources onto its system, see traditional thermal plants age and become less reliable, and integrate new information-based technology into its system, it will be critical to create opportunities to spur investment in new highly flexible generation. To encourage market participants to build the type of resources that meet the current and future needs of the ERCOT system, the PUCT must choose a pathway that is targeted to real, and evolving system needs.