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PROJECT NO. 54335

REVIEW OF MARKET REFORM ASSESSMENT PRODUCED BY ENERGY AND ENVIRONMENTAL ECONOMICS, INC. (E3)	§ § § §	PUBLIC UTILITY COMMISSION OF TEXAS

CONSTELLATION ENERGY GENERATION, LLC'S
COMMENTS IN RESPONSE TO STAFF'S QUESTIONS

Constellation Energy Generation, LLC ("Constellation") is the largest producer of carbon-free energy in the country, owning more than 30 GW of total power generation, including generating resources within ERCOT. Constellation also provides wholesale electric supply to utilities, cooperatives and municipalities, and is a power marketer for its own resources as well as providing services on behalf of other entities in ERCOT and in every organized competitive wholesale electric market in the country. Additionally, through its subsidiary, Constellation NewEnergy, Inc., Constellation provides retail electric service to end-use customers in every retail access jurisdiction throughout the U.S.

Constellation has long been an advocate of establishing a mandatory reliability standard in ERCOT, and strongly supports the Commission's immediate adoption of a reliability standard and a reliability service such as the Performance Credit Mechanism ("PCM") to achieve that standard.

I. BACKGROUND AND GENERAL COMMENTS

Constellation appreciates the Commission's continued work, consistent with the mandates of Senate Bill 3 ("SB 3"), in Phase II of the market design proceeding to establish a reliability standard along with a reliability service that achieves that standard on a competitive basis. Although the current energy market worked as intended when it was established, ERCOT's customers and their needs have evolved, and ERCOT's markets must evolve with those dynamics in order to ensure reliability in the future. As described in the E3 Report, the current "boom or

bust" energy market design is simply not capable of incentivizing investment in new generation resources at the quantity needed to achieve an acceptable level of reliability, nor does it encourage the retention of existing generation resources. In addition, ERCOT's conservative operations over the last year, resulting in more frequent Reliability Unit Commitments ("RUCs") and other out-of-market actions have put increased operational pressure on the physical assets themselves, as well as the personnel who run them. The extreme volatility in energy market outcomes combined with the frequent need for out-of-market actions to maintain reliability are visible indications to potential investors and developers that ERCOT is a risky place to own and operate generation resources.

Constellation has been an ardent supporter of the development and articulation of a reliability standard.[1] The underlying design of ERCOT's current energy-only market does not explicitly target a specific level of reliability but rather produces reliability outcomes as an implied output of market design rather than an explicit input. As both the E3 Report and earlier reports on the Market Equilibrium Reserve Margin have demonstrated, the market equilibrium expected level of reliability embedded in the current design falls well short of the 1-in-10 Loss of Load Expectation standard (0.1 LOLE) utilized elsewhere in the country. Even before the E3 Report, the Texas legislature recognized the gap in the ERCOT market resulting from the lack of a defined reliability standard and directed the Commission to establish reliability requirements for ERCOT and ensure that ERCOT procures services on a competitive basis to meet those requirements.[2] A 0.1 LOLE standard is the industry norm and should be adopted by the Commission for use by ERCOT. The Commission also should adopt Expected Unserved Energy ("EUE") as the metric of measurement for the reliability standard, at an equivalent level of reliability to 0.1 LOLE. EUE a more robust metric in adapting to changes in the market's resource

[1] *See* Comments of Exelon Corporation, Project No. 47199 (December 1, 2017); Comments of Exelon Generation Company, LLC, Project 51840 (June 6, 2021); Comments of Exelon Generation Company, LLC, Project No. 52373 (Sept. 30, 2021). Constellation Energy Generation, LLC f/k/a Exelon Generation Company, LLC.
[2] TX Utilities Code 39.159(b) (enacted in SB3).

composition and load shape over time and can reflect the same stringency as 1-in-10 LOLE, as demonstrated in the E3 Report.

The Commission wisely relied not just upon stakeholders with competing interests to analyze potential services to that reliability standard, but engaged independent expert outside consultants, E3 and Astrape for its recommendation. E3 studied not 1 or 2, but 6 different market design options. The analysis evaluated the ability of each proposed design to achieve the reliability standard, the potential effects on the competitive markets, and the relative benefits and challenges of each design. Of the studied market design options, several are capable of achieving the desired level of reliability while retaining the hallmarks of an efficient competitive electric market.

E3 ultimately recommended a Forward Reliability Market ("FRM"), based on objective criteria, but there are subjective factors to be considered that may make the PCM more favorable for the unique ERCOT region. For example, the PCM maintains the current energy-only design principal that favors generation resources being paid for performance as they perform, rather than providing payment in advance that may be clawed back in the event of non-performance. On balance, Constellation believes that the PCM is the superior alternative and should be adopted by the Commission in an order affirming the structure of the PCM service to be adopted by ERCOT, as discussed below.

The Commission should ignore parties that seek to suggest a different construct at this late date, or claim that the costs are too high. Parties have had well over a year to develop frameworks and make recommendations; new suggestions now are stall tactics, at best. Those who claim the cost is too high fail to acknowledge the immediate and long-term costs of maintaining the status quo, or of applying patchwork products that complicate the overall workings of ERCOT and under market efficiency. These critics also fail to recognize the benefits that come with efficient market design – namely keeping and attracting new generation resources

at a reasonable cost. The Commission should look closely at criticisms and ask itself what opponents get out of a continuation of the status quo or a delay for further study and evaluation. Would they receive windfalls for curtailing load during scarcity, avoiding high energy prices that residential customers cannot avoid, and at the same time receive payments that actually provide them greater revenues than if their business was operating? Objections from parties that financially benefit from flaws in the current market design are simply attempts to thwart the Commission's fulfillment of its statutory obligation to achieve reliability so that they can continue to reap benefits from a market design that is failing the state's citizens as a whole.

To be clear, much work lays ahead of the Commission and stakeholders in implementing the PCM. The Commission need not be concerned with critique that the new reliability standard and reliability service will take more than a year to implement. As the Commission's outside consultants have noted, ERCOT currently has sufficient resources to achieve close to the 0.1 LOLE standard.[3] Accordingly, provided that appropriate financial signals are sent to encourage retention of existing generation, implementing a backstop reliability mechanism or another ancillary service product is not needed in the near term. In fact, it would be counter-productive, taking time and other resources away from implementing the framework that will achieve ERCOT's long-term reliability. Moreover, financial markets do not wait for the end date; rather, markets react based on signals that are sent now. Adopting a reliability standard and a service to achieve that standard will send a clear signal to financial markets, existing generators, and developers that the Commission is committed to market reform, and they will react accordingly.

[3] E3 Report, p. 7.

II. REPONSES TO SPECIFIC COMMISSION STAFF QUESTIONS

1. **The E3 report observes that the Performance Credit Mechanism (PCM) has no prior precedent for implementation; does this fact present a significant obstacle to its operation for the ERCOT market?**

No, the fact that the PCM has not been implemented elsewhere does not present a significant obstacle to its operation in the ERCOT market. There will always be a first time for a particular product or a specific market design component. The fact that something is new should not stop the Commission from adopting and implementing vital reforms that are necessary to provide all Texans a reliable electric grid, when the Commission has sufficient confidence in the outcome.

The Commission can have that confidence here for several reasons. First, PCM itself is not a particularly complicated design and does not require modifications to existing ERCOT markets for energy and ancillary services. PCM does not supplant existing markets but, rather, can be implemented with the current markets in a modular manner and operated alongside of them. Second, although the overall PCM package may be new, it is primarily built using familiar components that have been shown to function well in other markets, and have for some time, which allows us to understand how it works before it is put in place. Specifically, the PCM includes the following components that have all been implemented in well-functioning competitive electric markets elsewhere in the country, and which are keys to the success of a market design that promotes reliability:

- Explicit adoption of a specific reliability standard applicable to all load
- Administrative demand curve tied to the reliability standard that compensates resources for reliability services
- Measurement of and payment for actual performance during high-risk periods
- Voluntary forward market to facilitate retail hedging and bilateral contracting

Third, the Commission obtained the expert analysis of E3, a highly competent firm that provided a thorough and thoughtful analysis. E3's expert independent analysis revealed that PCM scored very highly in both quantitative and qualitative categories.

The novelty of PCM should come as no surprise because it has been specifically tailored to ERCOT's unique structure and needs. PCM is not a structural modification to any existing ERCOT market, be it energy or ancillary services, and therefore does not result in any fundamental alteration in the way business is conducted or the way ERCOT operates the grid. PCM is a modular add-on to the current market design with which market participants are familiar, which should make the implementation seamless and straight forward.

Because PCM contains familiar components and should be relatively straightforward to implement, ERCOT should have no trouble putting PCM in place and operational by the time that it is needed. As the E3 Report indicated, as of 2022, ERCOT is actually above a 0.1 LOLE reliability standard, but will fall below the 0.1 LOLE in the coming years due to retirements of existing thermal resources driven by insufficient revenues in the current energy market design, coupled with a lack of sufficient offsetting investment in new resources. While establishing the detailed protocols for PCM and fully integrating PCM into the ERCOT systems will take some time, PCM's integration and implementation should be relatively straightforward once the Commission adopts a preferred market design and approves the essential elements of the design.

Just as important, or perhaps more so, the Commission and ERCOT will not need to wait until PCM is implemented and fully operational to incentivize the needed investment of resources in the ERCOT market. So long as the Commission acts now, establishing the reliability standard to be achieved and the basic market design framework, market participants will be provided with a strong signal regarding the future trajectory of the market and begin to take steps that enable the retention of existing resources and investment in new resources in anticipation of PCM implementation. Given that ERCOT does not currently actually face a reliability deficit, the

signal that PCM is coming with high certainty should be sufficient to maintain an acceptable level of reliability during the interim period between Commission action adopting the design and actual implementation.

2. Would the PCM design incentivize generation performance, retention, and market entry consistent with the Legislature's and the Commission's goal to meet demand during times of net peak load and extreme power consumption conditions? Why or why not?

Yes. PCM provides the necessary revenues, at a defined level of reliability, to support the investment in existing and new resources. SB[4] contains several Commission mandates. First, the Commission must establish a reliability standard ("establishes requirements to meet the reliability needs of the power region"). Second, Section 18 provides that the Commission must, consistent with the standard adopted in the first part, right-size and procure on a competitive basis a quantity of resources sufficient to ensure reliability in view of two interrelated factors: extreme weather (both winter and summer) and low non-dispatchable resource production. Third, and finally, the Commission must "ensure that resources…are dispatchable and able to meet continuous operating requirements for the season in which the service is procured.

Meeting the legislative goals of SB 3 is achieved by establishing a reliability standard and implementing a service that meets that objective reliability standard across all seasons of the year. That is precisely what PCM is. As a market participant in every competitive electricity market in the U.S., Constellation has seen in other parts of the country that when a reliability standard is adopted in conjunction with a market design that implements that standard, the market experiences entry and exit of resources that achieves the desired reliability as expressed by the reliability standard. This includes a fairly sustained addition of new gas thermal resources as older resources, primarily coal units, have retired -- all while maintaining the reliability standard each and every year.

[4] (codified at Subchapter D, Chapter 39, Section 159).

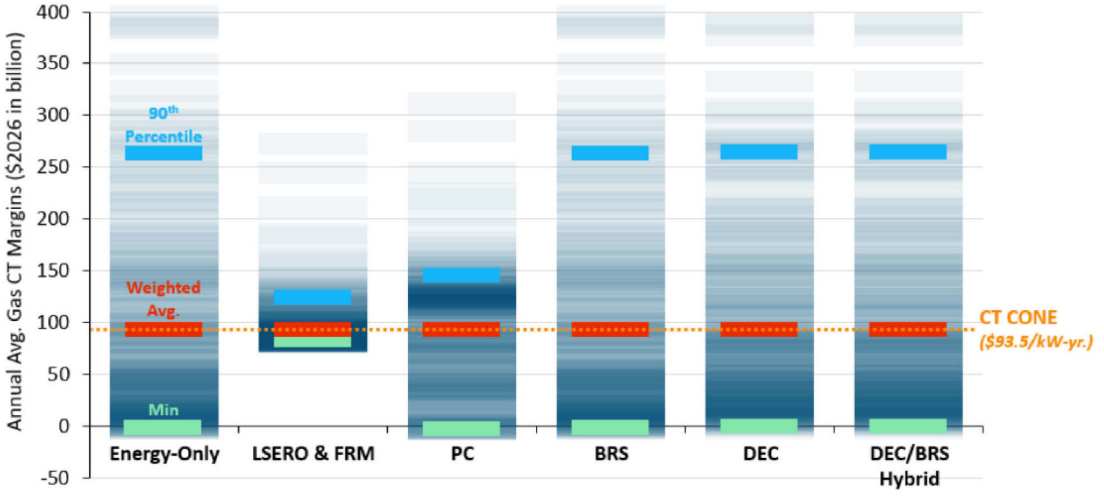
The E3 Report affirms that, if the Commission adopts a 0.1 LOLE reliability standard and adheres to the PCM design parameters, ERCOT will achieve that 0,1 LOLE reliability standard consistently over time. The E3 Report was a fulsome analysis, including robust modeling that assessed a variety of scenarios and several different designs. E3's detailed analysis reveals that the PCM design allows for a well-defined reliability standard. If the reliability standard is set high enough, it will provide sufficiently stable compensation for resources in the amount necessary to initially achieve that standard, and to perform at the necessary level to maintain that standard. For the health of the ERCOT grid, as load increases and grid use evolves, the Commission needs to incentivize performance, retention, and investment of sufficient resources to satisfy the determined reliability standard. The PCM incentivizes investment and performance to consistently achieve a 0.1 LOLE reliability standard.

PCM satisfies SB 3's requirement that the design achieve reliable operations in both the winter and summer by measuring and paying for performance across the highest risk hours of the year, regardless of the season in which those hours fall. If reliability risk in a particular year is concentrated in the summer, resources will primarily be paid for summer performance, and vice versa if the reliability risk is primarily concentrated in the winter. The PCM design requires generators and resources to perform in all seasons when the system is most at risk and naturally concentrates the performance incentives to the periods of the year where performance is most critical to system reliability.

In addition to achieving the desired level of reliability, the adoption and implementation of PCM should reduce consumer costs. In the current energy market design in which generating resources are paid during times of scarcity when availability of resources reaches particular thresholds, there is a tremendous volatility in generator market revenues year over year, and generators cannot predict what revenues they will receive in any given year. PCM reduces the current volatility in generator cash flows, which lowers generator risk and cost of capital and should thus reduce the Cost of New Entry ("CONE"), and ultimately reduce customer costs. The E3 Report assumes total market revenues net of variable cost equal to CONE for all resources under equilibrium conditions, regardless of design. That is based on the

E3 Report assumption that CONE for a Combustion Turbine resource is $93.5 kw-yr for all designs.[5] But figure 30 from the E3 Report (below)[6] shows that market revenue variability is reduced by at least half under both PCM relative to the current market design.

Figure 31. Gas CT Net Margins Variability Across Market Designs[40]



Because of this reduction in variability, the cost of capital for new entrant resources should be reduced, resulting in an overall lower market price under a PCM model addition than under the current energy market design.[7]

As a rough example, if we assume that a 50% decline in revenue variability is consistent with a reduction in Weighted Average Cost of Capital of 1%, this in turn would reduce CONE by about 10%. A 10% reduction in CONE translates into $900 million/yr when applied to the approximately 95 GW of load plus reserves projected by E3 for 2026 under the current energy-only model.[8] This is equivalent to a 4% cost decline relative to the status quo through risk

[5] E3 Report at 32 (Figure 12).
[6] E3 Report at 65 (Figure 31).
[7] This same reduction in CONE would occur under FRM, which would similarly smooth volatility in generator revenues.
[88] E3 Report at 34 (Table 7) and 36 (Table 8). Adding 7.6 GW of total reserves to the 85 to 92 GW range of peak load shown in Table 7.

reduction, which more than offsets the $460 million or 2% cost increase that E3 projects for PCM relative to the current energy market design resulting from procurement of more resources while leaving CONE unchanged.[9] While this example is a rough approximation, it suggests that it is entirely possible that adoption of PCM (or FRM for that matter) could actually result in improved reliability AND lower overall consumer costs than the current energy market design.

Criticism of the PCM that it would result in a double payment to generation resources is simply wrong. The performance credits paid through PCM do not represent a double payment for reliability alongside the ORDC adder, for two reasons. First, the price of performance credits under PCM are, via the operation of the demand curve, based on Net CONE, which deducts expected energy and ancillary services revenue, including any revenues from the operation of the ORDC adder, from the gross Cost of New Entry. Thus, to the extent that ORDC adder revenues are expected to increase for any reason, Net CONE and the performance credits price will be reduced by the same amount, avoiding double payment. Second, more generally the ORDC adder and performance credits are payments for different services. The ORDC adder is intended to be a granular award for production during specific 5-minute intervals when the system experiences an actual physical shortfall or near-shortfall in operating reserves. The PCM, by contrast, is intended to be a more predictable compensation stream for availability over a defined longer period measured in a specific fixed number of hours. They are thus different services intended to fill different needs and the mechanism by which they are determined explicitly avoids double counting.

3. **What is the appropriate reliability standard to achieve the goals stated in Question 2? Is 1-in-10 loss of load expectation (LOLE) a reasonable standard to set, or should another standard be used, such as expected unserved energy (EUE). If recommending a different standard, at what level should the standard be set (e.g., how many MWh of EUE per year)?**

[9] E3 Report at 5-6.

The initial question posed above asks about both the stringency of the standard (e.g., 1-in-10 LOLE vs. 1-in-5, etc.) as well as the appropriate metric for standard measurement itself (LOLE vs. EUE). 1-in-10 (or 0.1) LOLE is the recognized industry-standard reliability target throughout the country and is therefore a reasonable standard to implement in ERCOT as well. Constellation supports a standard that is equivalent in stringency to 1-in-10 LOLE.

While 1-in-10 LOLE is the industry standard, there are certain benefits to using Expected Unserved Energy ("EUE") as the metric for standard measurement in that EUE is more precise because it captures duration and the severity of events, which LOLE does not. Thus, while a severe event that lasted days would be reflected under LOLE as a single event, the EUE calculation would consider and include the extended duration and severity of the event. EUE is therefore a more robust metric in adapting to changes in the market's resource composition and load shape over time, which could drive changes in the expected length and severity of reliability events separate from their frequency. Constellation recommends that the Commission adopt EUE as the metric of measurement for the reliability standard while maintaining an equivalent level of stringency as 1-in-10 LOLE. Table 18 of the E3 report (below)[10] indicates that a reliability standard of 1-in-10 LOLE and 1,632 MWh of EUE are equivalent in stringency for the 2026 test year modeled by E3 and thus adopting an EUE-based standard at this level would provide equivalent reliability to a standard expressed as 1-in-10 LOLE while allowing for more accurate measurement of reliability risk over time.

Table 18. Detailed Reliability Results by Market Design Reform Proposal in Equilibrium

Reliability Metrics	Energy-Only	LSERO & FRM	PCM	BRS	DEC	DEC/BRS Hybrid
LOLE *(days/year)*	1.25	0.10	0.10	0.10	2.03	0.10
LOLH *(hours/year)*	3.8	0.4	0.4	0.4	5.6	0.4
EUE *(MWh/year)*	14,093	1,632	1,632	1,632	19,053	1,638

[10] E3 Report at 53 (Table 18).

4. **The E3 report examines 30 hours of highest reliability risk over a year. Is 30 the appropriate number of hours for this purpose? Should the reliability risk focus on a different measure?**

Constellation recommends that the PCM examine the 45 hours of highest reliability risk. As E3 indicated, there is a broad range of acceptable number of hours to evaluate – from as little as 10 hours to as high as 100 hours.[11] The key to the number of hours should be capturing the reliability risk throughout the year, as described in response to Question 5, below. Winter scarcity events tend to be consecutive, based on severe, sustained weather conditions. It is not difficult to envision a single winter weather event that lasts for 30 hours. In contrast, scarcity events during the summer and shoulder seasons occur for a greater number of reasons – heat wave, cloud cover, lack of wind, lack of resource availability due to planned maintenance outages, etc., and are typically for a limited number of consecutive hours. If a 30-hour time frame is selected, it is possible that a sustained winter event could account for all 30 hours early in the operating year which could blunt performance incentives during the summer and shoulder periods which, though of shorter duration, are integral to the health of the overall grid. Using 45 hours instead of 30 hours would help ensure reliability throughout the year even if there is an event early in the year that lasted 30 hours.

5. **Over what period should the hours of highest reliability risk be determined? A year, a season, a month, or some other interval? At what point in time should that determination be made?**

The hours of highest reliability risk should be determined on an annual basis. Utilizing a simple annual design, consistent with what the E3 Report proposes, is straightforward and relatively simple to implement. Determining reliability risk on anything shorter than an annual

[11] E3 statements, PUCT Technical Presentation on Market Design (December 2, 2022).

period is likely to result in reduced reliability and higher costs, while also being more complex and likely requiring greater administrative intervention.

The basic principle of PCM is that a resource that performs 100% of the time during assessments should be paid performance credits that add up to Net CONE over the course of the year if the market as a whole is at the reliability standard.[12] This is achieved by paying the resource the performance credit price, which is calibrated via the demand curve to clear at approximately Net CONE divided by the number of performance assessment hours, each time that the resource performs during an assessment hour, with assessment hours defined as the top 30 (or 45 as Constellation recommends) hours with lowest operating reserves, regardless of season. A seasonal design would split the performance assessment hours into separate pools – for example a summer and winter pool. If there is a 50/50 split between only summer and winter, and 30 hours overall (using E3's proposed number of hours), we would have 15 summer hours and 15 winter hours. A resource would still be paid the same performance credit price when it performs, regardless of season.

The problem with that approach is that reliability risk is not distributed evenly between the seasons each year, and ex-ante it is also very difficult to predict where in the year the actual reliability risk will fall. In most years, the reliability risk hours are primarily concentrated in the summer. Under a seasonal design in such a typical year, a given generator would really only have 50% of its PCM payments at risk during hours where reliability risk is high while the other 50% (from winter) would get paid for performance in hours where there is little reliability risk. This approach on average will thus overcompensate for winter reliability and undercompensate for summer reliability, distorting investment incentives and likely leading to lower overall reliability. An annual PCM approach, by contrast, naturally targets the hours of highest reliability risk, regardless of where

[12] Because of variability in performance credit supply and the operation of the demand curve total PCM payments will vary somewhat from Net CONE on a year-to-year basis.

they may fall, and thus accurately targets performance incentives to the actual times of the year when performance is most critical.

A seasonal construct focused only on the summer and winter also fails to take into account reliability risks outside of summer and winter. While reliability risks during shoulder months are typically lower than summer and winter, reliability risk remains during the shoulder months as well. This is evidenced by the number of ERCOT alert notices issued in the Spring of 2021.[13]

6. **Would a voluntary forward market for generation offers and a mandatory residual settlement process for Load Serving Entity procurement provide additional generation revenue sufficient to incentivize resource availability in a way that improves reliability?**

Yes. If the Commission adopts the PCM, clearly articulating the central features that appropriately compensates for reliability risks, the market will digest that information and send signals that will incentivize generation. If a market design construct is clearly communicated and is capable of being hedged, market participants will weigh the design elements and respond accordingly. Like virtually all significant market design changes the market will need to adjust and understand to the new rules before bilateral contracting proliferates.

7. **Does a centrally cleared market through ERCOT sufficiently mitigate the risk of market power abuse? Should additional tools be considered?**

A centrally cleared market will provide transparency for Load Serving Entities, and will enable the ERCOT Independent Market Monitor to review transactions for potential market power abuse. Notably, the E3 Report assessed the risk of market power for the PCM as "low."[14]

[13] In 2021, OCNs were issued for operating days January 11, February 11 – February 15 (moved to EEA, with return to normal February 19), March 15, April 8, April 11, April 12, April 13, April 14, June 14, June 15, and June 16. Market Notice Archives (ercot.com).
[14] E3 Report at 76.

8. **If the commission adopts a market design with a multi-year implementation timeline, is there a need for a short-term "bridge" product or service, like the Backstop Reliability Service (BRS), to maintain system reliability equivalent to a 1-in-10 LOLE or another reliability standard? If so, what product or service should be considered?**

No, there is no need for a bridge product. If the Commission issues an order now with sufficient clarity, generators and financial markets will react by incorporating the pendency of PCM into investment and retirement decisions. The anticipated implementation of PCM will incentivize both retention and building of generation, with developers responding to the certainty of the Commission order and to those financial signals to build generation so it is in place when needed.

As the E3 Report indicates, there is no imminent reliability issue unless large numbers of existing generators retire, which as discussed above should not happen if the Commission sends the market a clear signal by acting swiftly to adopt a 0.1 LOLE reliability standard and directing ERCOT to implement the standard via an appropriate design such as PCM.[15] Consequently, there is no need to spend time and resources for a bridge product that is not required to meet ERCOT's expected reliability needs. Furthermore, spending time and resources for a bridge product can only serve to distract from the implementation of PCM and leave the market wondering about the true end-state of the Texas market design.

9. **If implementing a short-term design as a "bridge" delays the ultimate solution, should it be considered? Is there an alternative to a bridge solution that could be implemented immediately, using existing products, such as a long-term commitment to buy the additional 5,630 MW of Ancillary services necessary to achieve the 1-in-10 LOLE reliability standard?**

[15] E3 Report at 46 (indicating that with known additions and retirements per the ERCOT Capacity Demand and Reserves Report the system achieves a reliability level of 0.02 LOLW by 2026 absent any additional retirements of thermal resources).

As indicated in response to Question 8, above, the E3 Report suggests that a bridge product is not needed and diverting resources from implementation of a long-term reliability solution would be counter-productive.

10. What is the impact of the PCM on consumer costs?

The PCM will provide reliability benefits that far exceed any costs, while at the same time decreasing the volatility of electricity costs and providing predictability to load serving entities, customers and generators, one of the expected results being to offset and potentially exceed the customer costs for PCM. The E3 Report shows an increase in net system-wide costs of approximately $460 million per year, which represents approximately 2% increase in system generation costs.[16] These costs are driven by paying for an increased amount of resources needed to provide ERCOT the means to reliably and efficiently operate the grid on a continuous basis to meet the needs of consumers. Incentivizing the needed generation drives a ten-fold decrease in LOLE, from a base case of 1.25 events every year under the status quo, to 0.1 events per year or 1 event every 10 years.[17] In and of itself, an investment of 2% to achieve a tenfold increase in reliability is a relative bargain, but the benefits do not end there.

The PCM benefits all stakeholders by reducing volatility and providing predictability. Under the current energy market design, electricity costs can be difficult to predict and can vary widely from year to year. This volatility is a result of two things. First, generator revenues are concentrated in periods in which scarcity events are occurring. Whether there will be an event, how long an event may last, and what the marginal price might be during that time are all unknowable. Due to the unpredictability of scarcity events, generators cannot count on any revenues in any particular year. This revenue uncertainty by extension translates into the forward

[16] E3 Report at 5-6.
[17] E3 Report at 66 (Figure 32).

energy markets, failing to send accurate price signals necessary to incentivize new thermal generation. The PCM reduces that volatility, as performance will be assessed during the same specified number of hours each year.

Second, given reliability concerns, ERCOT is engaging in frequent out-of-market actions such as RUC'ing units, which adds to the overall market costs during those times as well as potentially increasing generator bids in order to recover the additional maintenance and other costs created by the stress being placed on the generating resources. The PCM will incentivize new generation, which should reduce the need for RUC'ing and other ERCOT out-of-market actions as there will be more capacity available to the grid. The greater predictability afforded by PCM will allow load serving entities to better hedge for the needs of their customers, which would ultimately translate into reduced costs for consumers.

Additionally, as discussed previously in response to Question 2, decreased volatility in market revenues under the PCM should drive a decrease in the Cost of New Entry (CONE). A reduction in CONE would be expected to result in a decline in customer costs which would partially or possibly even fully offset the customer cost increase calculated by E3.

11. What is the fastest and most efficient manner to build a "bridge" product or service, such as the BRS, in order to start sending market signals for investment in new and dispatchable generation, while a multi-year market design is implemented by ERCOT? Please provide specific steps.

As indicated in response to Question 8, above, the E3 Report suggests that a bridge product is not needed and diverting resources from implementation of a long-term reliability solution would be counter-productive.

12. In what ways could the Dispatchable Energy Credit design be modified through quantity and resource eligibility requirements, e.g., new technology such as small modular nuclear reactors, in such a way that it incentivizes new and dispatchable generation?

As the E3 Report indicates, Dispatchable Energy Credits ("DECs") do not solve ERCOT's future reliability needs and, in fact, would distort market signals. Under the DEC framework, some of the lowest cost generation resources needed for capacity would not be incentivized to be built.[18] Instead, the types of resources that would be incentivized by a DEC product would be encouraged to bid below their costs in order to be dispatched, before resources with lower overall marginal costs, which artificially suppresses prices.[19] The end result would be the opposite from what is needed – incentivizing the development and installation of new steel in the ground to serve ERCOT's growing needs in both the short term and in the long term.

III. CONCLUSION

Constellation appreciates the opportunity to provide comments on the E3 Report and the Commission's Phase II market design implementation. Constellation urges the Commission to immediately, and without delay, set a reliability standard and direct implementation of the PCM to achieve that reliability standard. The PCM is a competitive reliability service that contains qualification and performance requirements that will ensure appropriate reliability during all operating conditions, including extreme heat and extreme cold weather conditions and during times of low non-dispatchable power production as required by SB 3.

[18] E3 Report at 28.
[19] *Id.*

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Respectfully submitted,

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PROJECT NO. 54335

REVIEW OF MARKET REFORM ASSESSMENT PRODUCED BY ENERGY AND ENVIRONMENTAL ECONOMICS, INC. (E3)	§ § §	**PUBLIC UTILITY COMMISSION OF TEXAS**

CONSTELLATION ENERGY GENERATION, LLC's COMMENTS IN RESPONSE TO STAFF'S QUESTIONS

Executive Summary

Constellation Energy Generation, LLC ("Constellation") appreciates the care that the Public Utility Commission of Texas ("Commission") has taken in evaluating various recommendations to improve reliability. Based on the time needed to make investment and retirement decisions and to build generation resources, it is essential that the Commission take decisive action now so that needed generation resources will begin commercial operations in time to meet ERCOT's needs and, in the interim, viable existing resources do not unnecessarily retire. After receiving feedback for over a year and engaging with expert consultants Energy and Environmental Economics ("E3") and Astrape Consulting, now is the time for the Commission to take action to adopt and implement a market design that achieves the reliability objectives in Senate Bill 3. E3's independent expert report was thorough, well-reasoned, and provides clear guide posts for the Commission to Act. Having an independent consultant with no stake in the outcome ensured that options were evaluated on an apples-to-apples basis, analyzing the benefits and challenges of each design on the market as a whole, and not limited to a particular group of stakeholders.

Constellation recommends that the Commission direct ERCOT to implement the Performance Credit Mechanism ("PCM"). Consistent with the E3 Report, the Commission should affirm the following key features of the PCM:

- Explicit adoption of a specific reliability standard applicable to all load, measured by Expected Unserved Energy ("EUE") at an equivalent level of reliability to the 1-in-10 Loss of Load Expectation standard (0.1 LOLE)
- An administrative demand curve tied to the reliability standard that compensates resources for reliability services
- Measurement of and payment for actual performance during high-risk periods
- A robust forward market, which enables retail hedging and bilateral contracting

These characteristics, and an annual structure for performance assessment hours as proposed by E3, including at least 45 assessment hours to ensure that reliability is incentivized and achieved in both "shoulder months" and during the summer and winter seasons, will most appropriately value and achieve a level of reliability at 0.1 LOLE. The PCM will send the market signals needed to attract new investment when needed, while retaining the current generation resources that contribute to reliability, which will enable ERCOT to operate the grid reliably and more efficiently, both of which ultimately benefits customers.

Constellation recommends the Commission immediately adopt a reliability standard and the PCM as the competitively-procured service to be implemented by ERCOT to achieve that level of reliability, consistent with the requirements of Senate Bill 3. While there are many design issues that will need to be developed by the stakeholders over time, clarity from the Commission on the structure of the PCM service will provide the certainty needed for ERCOT to implement the service and for investors, resource owners and developers, and consumers to respond. Conversely, failure to approve the core features described above will result in stakeholder gridlock and little progress toward the market design necessary for a reliable electric grid.