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PROJECT NO. 54335

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

BASF Corporation’s Comments on PUC Review of Market Reform Assessment
Produced by Energy and Environmental Economics, Inc. (E3)

BASF Corporation (“BASF”) appreciates the opportunity to submit comments in response to the Public Utility Commission of Texas’s (PUCT) request for input on the report compiled by Energy and Environmental Economics, Inc. (E3), entitled *Assessment of Market Reform Options to Enhance Reliability of the ERCOT System*.

BASF is one of the largest petrochemical companies globally by sales and maintains a large footprint in Texas with seven distinct manufacturing sites across the state (including one *Verbund* fully integrated site in Freeport that houses 26 operating plants), multiple R&D sites, and a large office park in Houston’s Energy Corridor. BASF employs approximately 2,000 employees in Texas, with nearly the same number of nested contractors. In Texas alone, we pay over \$20 million annually in property taxes, and the capital replacement value of our Texas assets amounts to the billions of dollars. As a large manufacturer in the state, BASF utilizes a significant amount of electricity, by means of purchasing electricity on the market, generating our own energy through an on-site cogeneration plant, and by way of engagement in numerous power purchase agreements for renewable energy.

First and foremost, BASF recognizes the complex dynamics of the ERCOT grid, particularly considering the ongoing energy transformation, propelled both by the federal administration and by innovative consumers and companies seeking to address the need for a carbon-neutral future. That being said, as a large manufacturer in the state, BASF’s first priority in developing and effectuating an appropriate market design is that ERCOT maintain and ensure a reliable grid in times of extreme weather variations and net load variability scenarios.

BASF’s comments today will begin with providing a structure of our principles in achieving market solutions, followed by an analysis of how and whether the Performance Credit Mechanism (PCM) proposal will function as an overlay to the current energy-only market. We believe this is not the right path for the PUCT to take; and we will therefore provide feedback on the foreseeable pitfalls by this design as well as suggest improvements to the mechanism for it to be more successful. Also included herein will be additional information on how BASF functions as a market participant both in the electricity market and to further energy efficiency through materials innovations.

I. **BASF Principles**

BASF Corporation believes market solutions adopted by the PUCT should achieve the following:

1. Solutions should result in **a reliable grid** – this is our priority.
2. Solutions should be **technology agnostic** and should ensure carbon neutral technologies remain competitive.
3. Solutions should come at a **reasonable cost** to consumers.
4. Solutions should **address real-time reliability operational concerns**.
5. Solutions should continue to foster **innovation and customer choice**.

- a. **BASF's top priority is ensuring ERCOT is reliable.** As a large manufacturer, we depend on a continuous and reliable electricity supply and require a reliable grid to operate. Not only are our facilities sensitive to voltage fluctuations, but an electricity outage at one of our facilities could cost millions in lost productivity and restart costs and could even result in unplanned environmental releases.

BASF consumes a total of 1,000,000 MWh of electrical power. Some of this is self-generated through a combined cycle gas turbine generator. BASF operates its cogeneration unit as a power and steam generation system as part of its optimization strategy called *Verbund*¹. Although BASF operates its plants with energy efficiency in mind, large complex industrial facilities such as those operated by BASF cannot participate in demand-response (D/R) due to significant process safety issues. To illustrate, our Freeport facility, which is one of BASF's fully integrated *Verbund* sites with 26 independent – but interconnected – manufacturing plants, takes between 72 and 120 hours to properly shutdown in emergency conditions. Because of these factors, full participation in D/R is infeasible because of the complexity of the various chemical reactions occurring at the facility.

The Freeport site, however, is able to ramp down production capacity, such as was done at the direction of the Governor and PUCT during Winter Storm Uri to bring stability to the ERCOT grid and provide emergency power to the Brazosport area.

- b. **BASF believes any market solution should be technology agnostic and should ensure carbon neutral technologies remain competitive.** While we understand the legislature's goal of increasing the quantity of dispatchable generation on the ERCOT grid, BASF asserts that this could also come from energy storage products such as fast-ramping batteries connected to renewable generation assets. BASF's global sustainability goals include reducing our carbon footprint by 25% by 2035 (from a 2018 baseline), and to be carbon-neutral by 2050. These goals were adopted in line with the Paris Accord and are consistent with our customers' and shareholders' requests. Again, we agree that reliability is the highest priority, but we caution that a market solution does not need to focus solely on natural gas-based solutions when we can also encourage development of long-term energy storage solutions.

¹ Verbund (<https://www.basf.com/global/en/who-we-are/strategy/verbund.html>)

- c. **BASF believes any enhanced reliability and market solution should come at a reasonable cost.** BASF believes it is appropriate to increase cost to increase reliability; however, we want to ensure any increased cost is commensurate with actual reliability benefits. We have significant concerns with the proposals laid out in the E3 report as each of the three capacity constructs, including the PCM, appear to increase cost to consumers without ensuring increased reliability.

The identified costs proposed are between \$5.7 and \$8 billion, or \$14–\$20/MWh. This would amount to a 25–30% cost increase, based upon an equal distribution to all customers. Such an increase would represent the one of the largest, if not the largest, tax increases, imposed on electricity in ERCOT history, more than tripling the current price for TDSP charges. This is not in the best interest of the Texas consumers, but only serves the interests of the retail entities that retain generation assets. For example, implementation of the PCM at this rate would tax a small commercial facility using 0.5 MW of power between \$64,000 and \$87,600/year. We discuss below how we believe the report’s assumption that the cost will be offset and reduced to \$460 million is inaccurate.

- d. **BASF believes the real problem that should be solved is a real-time operational uncertainty problem, *not an installed capacity problem*.** ERCOT does not have a current or prospective capacity shortage issue. Even the E3 report found that ERCOT does not have a capacity problem, but rather that the issue that needs to be addressed is times of increased operational issues directly related to outages of dispatchable generation or from low variable output from renewable energy resources – or, when both occur. These are unplanned issues that need to be addressed by a flexible, real-time or day-ahead market tool, and more importantly, cannot be addressed by a capacity construct such as the PCM. Although Chairman Lake testified that there were eight events that could have led to emergency conditions, it is notable that these events were *not in fact capacity events*, evidenced by the fact that ERCOT was able to incent additional generation to come online and respond, and therefore showing that there was sufficient capacity installed on the grid.
- e. Finally, BASF believes any market solution should continue to foster **innovation and customer choice**. Innovation is the cornerstone of the Texas economy and helps the state remain a leader across all industries. The electricity industry is no exception.

II. BASF Analysis of the PCM

Overall, BASF finds numerous challenges and pitfalls in the proposed Performance Credit Mechanism (PCM). First off, it is extremely difficult to fully understand how the PCM would functionally work; it is overly complex and continues to be a moving target. We recognize that the PUCT is seeking comment on the details of this proposal and would continue to flesh out how it functions, but as an initial matter, the details continue to shift, and there does not seem to be a consistent understanding on how the mechanism would work. This in and of itself is an argument against its implementation – along with the fact that it is not a proven model and has not been used in any other jurisdiction across the U.S.

- a. **Cost.** The E3 report outlines the cost of the proposal to be what we perceive as inordinately high for the result. The report indicates that all three capacity constructs, including the PCM, would cost at a minimum \$5.7 Billion.² The report also makes what we believe to be a false assumption that this cost would be significantly offset by a decrease in energy costs due to new generation coming online following a separate assumption that 11.6 GW of capacity will retire by 2026. The Independent Market Monitor (IMM) agrees that the report makes unsupported assumptions about retirements, as evidenced by legislative testimony in November. Ultimately, as a conservative business operator, BASF cannot count on this purported cost offset to occur, and therefore takes the strong position that the actual cost of implementing the proposal may well be in the multi-billions of dollars. The \$460 million figure is merely an artificial figure based on what we perceive as inaccurate or overly optimistic assumptions.

Furthermore, a capacity construct is truly a wealth transfer from consumers to generators without any ensured addition of generation. The PCM is functionally a tax for assets that may never be used, which is not technology neutral, and that seeks to stifle innovation and reward parties at the expense of the Texas consumer. The 30%+ tax proposed by the PUCT represents one of the largest, if not the largest, tax increase, imposed on electricity in ERCOT not associated with fuel cost since the nodal market was engaged in 2011.

- b. **Maintenance and Availability Concerns.** The maintenance cycle of natural gas is performed every six years. The cycle is as follows:

Maintenance Activity	Timing	Duration
Semi annual	6 months	5 days
Minor	Every 3 years	23 days
Major	Every 6 years	40 days

Although the above general timeline is a rule of thumb, actual work time for these maintenance activities, often results in substantially greater duration. This causes significant uncertainties in reliability and output due to unknown variations in maintenance timelines. For one, the number of companies that perform this work is limited, and the lack of qualified and available skilled labor limits competition and new entrants. We would note also that maintenance changes over the past three years have been due to a lack of skilled labor for both on-site repairs as well as parts fabrication. Furthermore, due to the focus on 4 CP and the focus for generation facilities to run from June through September, the maintenance calendar has been condensed into 8 months, which was part of the issue with system shortfalls in February 2021, February 2022, and May 2022. Additional natural gas burning

²As pointed out in the Coalition for Dispatchable Reliability Reserve Service's Comments in Project No. 52373: In comparison, the report produced by ICF Resources, LLC – *Assessment of ERCOT Market Structural Changes* – estimates the cost of implementing the Load-Serving Entity Obligation (LSEO) (which is similar to the PCM) would actually be upwards of \$8.5 Billion in the first year and to be in the billions for several years after implementation. Under these total cost analyses, excluding Uri as a typical year, cost for implementing the PCM would be \$14.5/MWh (\$21.63/MWh per ICF) based on the 393B kWh used in 2021 per ERCOT, and average energy cost of \$40.73/MWh (excluding Uri per IMM 2021 state of the market report). Therefore, for the first year of implementation alone of PCM, the increase in cost of energy would be 35.6% based on E3's cost calculation and 53.1% based on ICF's cost calculation.

assets will not necessarily result in enhanced output or reliability; it will only increase the asset base.

- c. **Reliability Unit Commitment (RUC).** The ongoing use of the RUC system is only incentivizing the use of the least cost effective and least reliable assets in the thermal fleet, further decreasing reliability.

Those in favor of maintaining the current RUC configuration are retailers who are vertically integrated with generation assets, often at the detriment of the retail customer. RUC incents running old units instead of doing maintenance or replacing. This continues to reduce system reliability and causes units to not be available when needed or to fail when they are running. It also only incents those with large generation fleets to participate as the marginal units become money making units and do nothing for system reliability as they are only counted on for revenue generation and not reliable operation. If the PCM is merely an overlay to the current market, then the RUC situation would not be fixed; rather, it would remain as the go-to formula until more generation was built.

- d. **Additional Consequences of Implementing the PCM.**

The PCM will result in a concentration of existing generation during the months of July and August, between HE 17 to 19. These times are highly consistent with current 4CP practice. Once the market signal has been received, and the entities targeting PCM compensation have determined to stop supplying outside of those hours, undetermined, second derivative impacts can occur which can create grid instability. Other analysis would indicate that likely PCM times will be heavily concentrated, and independent of the offline generation capacity. The frequency and timing of PCM events will be calculated and effectively predicted by sophisticated parties, and then used to their financial advantage. The PCM will not result in random instances.

The PCM is also subject to administrative malfeasance and negligence, resulting in certain parties being treated more favorably than others. The administrative look back on the previous year does not allow for the market to correct itself and rather it will result in a feedback loop.

Furthermore, strategically misaligned operation of a generation fleet will allow for the opportunity to ‘game’ the system, similar to what Enron did in California, without immediate detection or correction due to retrospective year-end evaluation. This operational action would take some assets offline to the benefit of other operator owned assets and provide PCM credit for operational malfeasance.

Additionally, the retrospective application of market credits will also discourage transparency among generation owners. This long delay in a potential enforcement action will only serve to further undercut faith in the ERCOT market and will create incentives and opportunities for market manipulation and fraud, much akin to the actions undertaken by Enron in the late 1990s/early 2000s.

The PCM will look to hours that are covered by the current 4CP structure, and additionally be addressed during the future deployment of solar assets in 2023 – 2024; the PCM concept

is not necessary, and furthermore will not incent investment in natural gas generation assets in the fleet.

The distribution of tokens as part of the PCM has the potential to lend itself to an illiquid secondary market. Small scale generators will have no need for the tokens and will look to monetize them. This will lead to a market that will keep the small generators small and just allow the large generators to continue increasing their generation fleet lending more.

The PCM will likely trigger change in law clauses in several contracts for both renewable and conventional assets. These changes will further delay any installation of physical assets within Texas, as contracting parties will not be able to predict the future actions that are engaged, considered, or enacted by the PUCT. Additionally, the uncertainty will substantially increase prices, further putting the economic growth in Texas at risk.

III. BASF as a Market Participant

As previously mentioned, BASF utilizes 1,000,000 MWh of electricity annually in the ERCOT market. We promote an all-of-the-above approach to our energy portfolio, procure electricity from multiple sources, including on the real time markets, and utilize the Freeport site's resident combined cycle natural gas cogeneration unit and power purchase agreements of renewable energy resources. We continuously look for new and innovative approaches to decarbonize scope 1, 2, and 3 emissions, including from electricity sources, and in line with our global sustainability goals.

Additionally, as part of our global circularity goals³, we engage in various aspects of the value chain to reduce carbon emissions and increase energy efficiency. Some examples of products BASF manufactures include high-performance building and construction materials, such as innovative polyurethanes and engineering plastics to create insulation products that make buildings more durable and energy efficient, and high-quality materials for surface solutions that help our customers succeed with ambitious architecture and infrastructure projects and contribute to a sustainable future. Another example is our diverse styrene-based product portfolio and sustainable solutions for construction projects, including Neopor® – an enhancement of the insulation classic Styropor®, which makes an important contribution to the reduction of CO2 emissions over the long application period of more than 50 years.

These are only a few examples of the large portfolio of products BASF produces. We continue to engage in various industries to promote a low carbon future and are committed to making an impact in all sectors of the economy, with the energy transformation being only one. The chemistry industry is a leader in driving materials innovation to propel the efficiency revolution.

³ Circular Economy at BASF (<https://www.basf.com/global/en/who-we-are/sustainability/we-drive-sustainable-solutions/circular-economy.html>)

IV. BASF Recommended Path Forward

a. Preferred Path: Multi-Layered Approach

i. *Reject a Capacity Construct that Is Inconsistent with Legislative Intent*

- BASF does not support the overlay of any of the proposed capacity market constructs over our current energy only market. A construct such as the PCM would have detrimental effects on the functionality of the market, would significantly increase price on consumers without providing a commensurate increase in reliability to the grid.
- We further believe implementing such a construct is inconsistent with legislative intent. First, BASF asserts that adoption of this type of market mechanism is not an ancillary or reliability service as the agency is directed to procure in Section 18 of Senate Bill 3 (directing the PUCT to “procure *ancillary or reliability services* on a competitive basis to ensure appropriate reliability during extreme heat and extreme cold weather conditions and during times of low non-dispatchable power production.”). Furthermore, BASF also posits that the legislature rejected a capacity market when it considered, but chose not to pass, H.B. 4378⁴, nor were those provisions incorporated in the S.B. 3 omnibus Winter Storm Uri response legislation. In our opinion, this is a clear indication that this approach has not been sanctioned by the legislature and would be outside the purview of the PUCT’s authority under this legislation.

ii. *Adopt an Uncertainty Reliability Ancillary Service, as Proposed by IMM and Fleshed out by Consumer Coalition*

- As an alternative solution, BASF supports the adoption and implementation of the ***Dispatchable Reliability Reserve Service*** (“DRRS”) as proposed and laid out by the Coalition for Dispatchable Reliability Reserve Service in Project No. 52373. This proposal is based off the uncertainty product originally put forward by the Independent Market Monitor (IMM) and would accomplish the goals of the PUCT in addressing real-time operational reliability needs by incentivizing dispatchable generation to come online through a day-ahead market procurement in a more cost-effective manner than the PCM. BASF believes this tool, in conjunction with the two additional services outlined below, would address the reliability needs of the ERCOT grid in a sufficient manner.

iii. *Allow ECRS to Move Forward*

- The ERCOT Contingency Reserve Service (ECRS) can be used in a complementary fashion with the DRRS and BASF is supportive of the PUCT’s development and efforts to implement this service.

iv. *Adopt Backstop Reliability Service*

- BASF is also supportive of the continued development and implementation of the Backstop Reliability Service as an additional tool for the PUCT and ERCOT to deploy.

⁴ H.B. 4378 (Rep. Paddie), Tex. Leg. R.S. 87th (2021).

b. **However, if the PUCT Moves Forward in Adopting the PCM, we would like to see the following changes to ensure a better result:**

1. The PCM should be a daily settlement with a performance target and/or specific target for dispatchable generation, as well as an expiration.

- Generation and load will have a daily operational focus
- Daily settlement removes the need for a demand curve and allows for easy implementation
- This resembles LCRA's post-real-time settlement solution and creates a smoother annual revenue profile that underwrites new investment.

Program can have a [5 year] sunset once a targeted amount of new dispatchable generation has been added to the system.

2. PCM should target the daily peak net load hour directly, not through a backward calculation of lowest reserve margin hours

- Reserve margins can be gamed/manipulated by participants with large fleets and their outage schedules
- A difficult day with multiple unit forced outages (like May 13, 2022) could result in 4 hours of extremely low reserve margins, meaning that one day of current PCM structure could be worth a billion dollars

3. PCM must value flexibility and ramping and define allocation of PCM revenue based on policy objectives. For example, incentivize new dispatchable generation & provide some revenue for incumbents

- Units (of any type) that ramp quickly to meet system load during the peak net load hour should be rewarded for the attribute of balancing during the high-risk hour. ERCOT and the IMM have identified this 'Operational Flexibility' as a current and growing concern.

Respectfully,



Brad Morrison
SVP, Freeport Site General Manager
BASF Corporation
602 Copper Road
Freeport, TX 77541

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EXECUTIVE SUMMARY OF BASF CORPORATION'S COMMENTS

- I. BASF Corporation believes market solutions adopted by the PUCT should achieve the following:
 - 1. Solutions should result in **a reliable grid** – this is our priority.
 - 2. Solutions should be **technology agnostic** and should ensure carbon neutral technologies remain competitive.
 - 3. Solutions should come at a **reasonable cost** to consumers.
 - 4. Solutions should **address real-time reliability operational concerns**.
 - 5. Solutions should continue to foster **innovation and customer choice**.

- II. BASF has serious concerns with the functionality and potential impacts of the Performance Credit Mechanism (PCM), including high cost for no commensurate assurance in enhanced reliability to the ERCOT grid, continued concerns with maintenance and reliability of generation assets, the potential lack of curbing the use of Reliability Unit Commitments (RUCs), and various other adverse impacts to the market.

- III. BASF is not only a market participant within ERCOT, but we are also committed to developing innovative solutions to enhance energy efficiency, such as the manufacture of products that lead to lower-energy demand and a low-carbon future.

- IV. BASF recommends the following path forward:
 - a. Preferred Option:
 - i. Reject a Capacity Construct that Is Inconsistent with Legislative Intent
 - ii. Adopt an Uncertainty Reliability Ancillary Service, as Proposed by IMM and Fleshed out by Consumer Coalition
 - iii. Allow ECRS to Move Forward
 - iv. Adopt BRS
 - b. If PUCT moves forward with implementing PCM, we recommend the following changes:
 - i. The PCM should be a daily settlement with a performance target and/or specific target for dispatchable generation, as well as an expiration.
 - ii. PCM should target the daily peak net load hour directly, not through a backward calculation of lowest reserve margin hours
 - iii. PCM must value flexibility and ramping and define allocation of PCM revenue based on policy objectives