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PROJECT NO. 48539

REVIEW OF THE INCLUSION OF MARGINAL LOSSES IN SECURITY-CONSTRAINED ECONOMIC DISPATCH	§ § §	PUBLIC UTILITY COMMISSION OF TEXAS

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PUBLIC UTILITY COMMISSION
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TEXAS INDUSTRIAL ENERGY CONSUMERS' COMMENTS

I. RESPONSE TO COMMISSION QUESTIONS

1. ***What are the benefits of implementing the use of marginal transmission losses rather than average transmission losses in the Electric Reliability Council of Texas (ERCOT) Security-Constrained Economic Dispatch (SCED) over the long term?***

2. ***Are the benefits identified in response to Question 1 sufficient to justify the near term costs to the market as a whole? Please consider individual stakeholder implementation costs as well as the costs to ERCOT identified in its study.***

The potential benefits of implementing marginal loss pricing do not appear to justify the downside risks or implementation costs. ERCOT's study predicts very low overall production cost savings from implementing marginal loss pricing,[1] and projects that make-whole and start-up costs and RUC commitments could potentially increase.[2] ERCOT also accurately observes that the primary consequence of marginal loss pricing would be "a significant transfer of revenues within the generation fleet—specifically from generators in the West and North Load Zones to generators in the Houston zone."[3] This transfer of revenue does not change wind dispatch at all, but simply reduces LMPs in the West Zone and the North Zone. Lower LMPs in the North and West Zones could adversely impact the economics of important legacy generation, potentially accelerating unit retirements. Because it is very difficult to build new, large-scale generation in the Houston Zone (due to environmental restrictions and other factors independent of LMPs), adopting marginal losses and increasing retirement pressure on units outside of Houston may harm overall resource adequacy.

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[1] Production costs savings range from a loss of $1 million to $13 million in annual savings across the gas price scenarios that were analyzed. ERCOT Marginal Loss Study at 2. Note that production cost savings often do not equate to actual reductions in prices experienced by customers because customers pay prices based on the marginal unit. If the marginal price is unchanged, then reducing fuel costs for non-marginal generators does not provide savings for consumers.

[2] Increases in start-up costs and generator revenue shortfall are multiples of the expected production cost savings. ERCOT Marginal Loss Study at 5-6.

[3] *Id.* at 3.

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Generator siting decisions are driven by a wide range of factors that have little to do with the local energy price, including compliance with environmental regulations and land cost/availability.[4] These factors naturally limit the amount of generation that can be built in dense urban areas—areas that are often critical to the state's economic growth—and are unlikely to be counteracted by higher local pricing. This is why other mechanisms designed to drive generation investment in load pockets by increasing prices (such as congestion pricing) have historically failed to incentivize substantial new local generation. In TIEC's experience, generators will not invest in significant incremental capacity based on localized high prices because they know that enough additional generation will cause those price spreads to collapse.[5] Dr. Patton acknowledged this dynamic at the Commission's workshop in Project No. 47199 in August of 2017.[6] As a result, generators with fleets in urban areas have an economic incentive to limit new generation development to maintain local price spreads, including potentially retiring units to maintain a tight local supply. As TIEC has explained in other contexts, investors consider overall market fundamentals when making investment decisions. Pricing marginal losses will not materially change this calculus, and is likely to cause collateral damage to customers and certain thermal generators.

Critically, pricing marginal losses will not significantly impact dispatch or curb the development of remote wind generation. Wind resources are currently bidding negatively based on federal production tax credits (PTCs), and the pricing impact of marginal losses will not be significant enough to displace wind resources—even with non-wind resources that are much closer to load. As a result, while marginal loss pricing may reduce wind generator revenues, it will not materially curb wind development or cause it to be dispatched less. Instead, as

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[4] *See, e.g., Application of Cross Texas Transmission, LLC to Amend a Certificate of Convenience and Necessity for the Limestone to Gibbons Creek 345-kV Transmission Line in Brazos, Freestone, Grimes, Leon, Limestone, Madison and Robertson Counties*, Docket No. 44649, Proposal for Decision at 31 (Calpine/NRG witness Mr. Collin Cain acknowledged that "[s]iting and permitting issues raise the investment cost threshold in highly populated areas by reducing the number of potential sites for development, limiting the possible technologies that can be employed because of environmental quality issues, and creating a more challenging permitting process" and "the areas with the highest locational prices are those where it is also most difficult to site new projects.")

[5] *See id.* ("As Calpine/NRG witness Collin Cain admitted, a generator that owns multiple generation units in a constrained region would weigh the potential revenues from building a new unit in that area against the revenue *losses* this new supply would cause by reducing LMPs.")

[6] *Project to Assess Price Formation Rules in ERCOT's Energy-Only Market*, Project No. 47199, Open Meeting/Workshop (Aug. 10, 2017).

ERCOT's analysis shows, the primary impact will be to reduce the dispatch of (and revenues received by) thermal generators in rural regions ***outside*** of the Houston area, effectively increasing the risk of additional thermal plant retirements.

Based on these considerations, TIEC urges the Commission to exercise caution in deciding whether to adopt marginal loss pricing in ERCOT. As TIEC has noted in prior comments in Project No. 47199, the Commission should first identify the problem it is trying to solve and then consider a variety of approaches to meet best that objective, rather than considering concepts such as marginal loss pricing in the abstract. For instance, if the Commission's goal is to incentivize generation to site closer to loads, then allocating a portion of transmission interconnection costs to new generation would be a far more effective way to create that incentive ***without*** causing collateral damage to customers or existing thermal units. If the goal is to lower overall market costs, there are much more impactful proposals available—such as real-time co-optimization, which is also being considered. In sum, TIEC believes that the drawbacks of marginal loss pricing outweigh any hypothetical benefits, particularly given that there are likely other alternatives that would satisfy Commission objectives without harming loads or potentially hurting overall resource adequacy.

3. What are the effects on retail customers and the retail market from the implementation of marginal transmission losses?

ERCOT's analysis correctly concludes that on a total revenue basis, pricing marginal losses has very little average impact on retail customers statewide. However, it shifts costs to customers in populated, urban areas of the state such as Houston. Retail electric providers will have to factor in this change when they are hedging and pricing their products, and customers will have to account for it when contracting for power supply. Industrial customers will have to make decisions about the level of economic development to pursue based on anticipated pricing—including the impact of marginal losses in different areas of the state.

The level of harm to customers in urban regions depends in part on how the excess revenues collected under marginal loss pricing will be flowed back to customers. As addressed previously (and in further detail below), TIEC believes that the surplus should be refunded in proportion to customers' contribution to the surplus—*i.e.*, customers who payer higher marginal loss prices will receive a greater share of the refund. Any other alternative refund methods would impose greater harm to customers that will be hit the hardest by marginal loss pricing,

which would make the retail impacts much more significant. Therefore, if the Commission decides to pursue marginal loss pricing, it should ensure that the surplus is allocated to customers in proportion to those impacts.

4. ***The ERCOT study of using marginal transmission losses instead of average transmission losses in SCED simulated one year. How would cumulative, multi-year impacts of using marginal transmission losses be different, if at all?***

TIEC expects that studies over a multiple year period would provide similar results because the fundamental impacts of marginal losses will remain the same—to shift costs to developed, urban areas of the state where it is difficult to build generation, to decrease revenues for thermal generators that are located outside of those regions, and to create additional revenues for legacy generators located within those regions.

5. ***What costs would be incurred by market participants if marginal losses were implemented in the ERCOT market? Please provide an estimate of the costs that would be incurred by your company or companies or customers represented by your organization. Please describe the elements of those costs.***

6. ***How would a decision to use marginal transmission losses affect your company's market systems?***

7. ***How would a decision to use marginal transmission losses affect your company's internal operations?***

As sophisticated energy consumers, TIEC members use a variety of methods and tools to forecast future electricity prices and incorporate this information in their commercial activities, such as contracting for long-term power supplies and making planning decisions. Many TIEC members manufacture products whose pricing is materially driven by the price of power. Air separators are a good example, where power can comprise up to 70% of overall production costs. New pricing features such as marginal losses could require substantial revisions to TIEC members' existing pricing models and forecasting tools, as well as their commercial contracts with other parties.

At this time, it is unclear specifically how marginal loss pricing would be implemented. If the marginal loss factor is a separate adder to the LMP, rather than embedded in it, this could require additional changes to TIEC members' internal systems as it would effectively show up as a new charge category. The impacts will likely be similar to what TIEC members experienced with the implementation of the Operating Reserve Demand Curve (ORDC) or the Reliability

Deployments Price Adder (RDPA), which were additional pricing components not previously reflected in TIEC members' models and forecasting tools. The cost impacts will vary by customer, but generally involve updating internal models and contracts. TIEC members also have internal programs that allocate costs among business functions or factor energy costs into overall product costs, and these would all have to be updated to include marginal loss pricing.

In addition, many TIEC members have Option 2 Retail Electric Providers (REPs) who participate in the wholesale markets directly, including the Congestion Revenue Rights (CRR) market. These Option 2 REPs would be impacted in a similar manner as other REPs and would need sufficient notice to factor marginal loss impacts into their hedging behavior.

Due to the number of members and the widely disparate impact on different companies, TIEC is unable to calculate a reliable cost impact of implementing marginal loss pricing, but agrees that it will have internal cost implications for its members that could be material. As such, if the Commission decides to pursue marginal loss pricing, sufficient implementation time would be needed to allow customers to plan for these cost impacts and internal changes.

8. What are the effects on reliability on the ERCOT grid of using marginal transmission losses instead of average transmission losses in SCED?

As discussed above, TIEC believes that pricing marginal losses will most likely harm reliability by accelerating unit retirements in rural areas and making it less economic to build new generation in those regions. For the reasons addressed previously, marginal loss pricing is unlikely to produce significant new generation resources in dense urban areas, nor will it materially change expected development of intermittent generation due to federal subsidies. With respect to transmission reliability, congestion is already priced, and ERCOT has tools to determine when transmission elements are in danger of being overloaded and when new transmission is needed. As a result, TIEC expects that pricing marginal losses will cause an overall net reduction in resource adequacy and system reliability.

9. What effects, if any, would marginal transmission losses have on grid hardening and resilience?

TIEC does not anticipate that marginal loss pricing will materially impact future generation siting decisions within ERCOT. Instead, it will merely shift costs to customers in urban areas and create additional economic challenges for new and existing resources in rural

areas, which could accelerate retirements.[7] This may result in the need for additional transmission and other reliability measures to address grid resilience.

TIEC anticipates that some parties will claim having generation sited closer to load confers a resilience benefit and minimizes transmission, but this presumes additional generation will ***actually be built*** in response to marginal loss pricing. Like other initiatives aimed at increasing prices in certain local areas of the state—rather than focusing on market-wide fundamentals—developers understand that building enough new generation to lower the marginal loss factors in urban regions will cause the pricing to collapse. Therefore, these generators have an economic incentive to build generation ***only up to the point*** that revenues from marginal losses would remain roughly the same. This is no different from the response to congestion pricing, which has been repeatedly borne out through experience. This means that customers in constrained regions will perpetually pay higher energy prices than the rest of the state. Many businesses that are important to the state's economic growth must site in these urban regions due to factors unrelated to electricity cost, such as access to raw materials, infrastructure, transportation, etc. As a result, marginal loss pricing will not result in substantial new generation build, but will (1) create a permanent inequity in the electric prices charged to customers (including manufacturers and other businesses in key economic regions), and (2) create additional economic challenges for thermal generation located outside of these regions, posing additional risks to resource adequacy.

Again, as noted above, if the Commission seeks to incentivize generation development closer to loads, then changing how transmission interconnection and upgrade costs are treated (and allocating a larger portion of those costs to new remotely sited generation) is a far more direct and effective way to address the issue without harming customers or creating additional unit retirement risks.

10. What effects would the use of marginal transmission losses in SCED have on grid reliability in regions of the ERCOT grid where non-synchronous generation is more prevalent?

TIEC understands this question to be referring to areas where intermittent resources are more prevalent. Again, pricing marginal losses will primarily harm thermal generators in the

[7] *See, e.g.*, Project No. 47199, Vistra Energy Initial Comments (Dec. 1, 2018) and Reply Comments (Dec. 22, 2018).

regions outside of Houston, discouraging thermal generation development in those areas and potentially accelerating retirements. If additional thermal generation is needed to support reliability in areas with the heaviest penetration of intermittent resources (such as in far West Texas), marginal loss pricing would impede that development, potentially exacerbating the need for additional transmission or other reliability measures.

11. How would a decision to implement marginal transmission losses affect investment in new generation resources in ERCOT over the next five years, the next 10 years, and in the years beyond 10 years?

12. How would the implementation of marginal transmission losses affect the composition of the generation fleet in ERCOT?

TIEC believes that the primary impact of pricing marginal losses will be to create additional economic challenges for thermal generation located outside the dense urban regions such as Houston. This creates an additional risk that large-scale coal units or older gas units will retire prematurely. It will also make it marginally more difficult to site generation in rural areas, which are currently good places for resource development due to land availability, cost, and fewer environmental limitations.

As stated previously, TIEC does not believe that pricing marginal losses will lead to significant additional generation development in dense urban regions due to siting and environmental constraints, as well as rent-seeking behavior by generators seeking to maintain localized high prices. Nor does TIEC believe that pricing marginal losses will materially change wind dispatch because the marginal loss factors are unlikely to offset the subsidies provided by the federal government. This is true even after the federal production tax credits expire because wind continues to be a zero-fuel-cost resource. Future wind development will be reduced as the PTC expires regardless of marginal loss pricing, which has only a slight incremental impact. As a result, TIEC does not believe that pricing marginal losses will materially reduce wind output or encourage new thermal generation relative to the status quo. Rather, it increases the likelihood of legacy unit retirements in rural regions and makes it less economic for developers to replace those retiring units, in addition to imposing perpetual price increases in important economic areas of the state.

13. Assuming the Commission decided to go forward with implementation of marginal transmission losses, what are the key issues related to determining the appropriate treatment and allocation of the marginal transmission loss surplus revenues?

If the Commission chooses to move forward with marginal loss pricing, which TIEC does not support, the "over-collection" of marginal loss revenues should be refunded to customers on the same basis that the charges were originally collected. This will ensure that customers who contributed most to the surplus receive their proportional share of the refund and mitigate the harm to customers in urban areas and economic growth centers.

As the Commission is aware, under marginal loss pricing, line losses would be collected on a ***marginal cost*** basis, but generators would be paid based on ***actual*** losses.[8] This means the revenue collected will always exceed what is actually necessary to make generators whole for losses, and customers will always be owed a refund. Customers with a higher marginal loss factors in their prices will necessarily contribute more toward this over-collection, and the refund mechanism should appropriately reflect that. Furthermore, the recovery of all transmission cost on a postage stamp basis already favors customers outside urban areas and hurts customers inside urban areas.[9] To effectively allocate transmission losses on a non-postage stamp basis doubly harms customers in urban areas. As a result, TIEC recommends that excess revenues collected under marginal loss pricing be refunded to customers in proportion to the actual revenues that were paid in.

14. Does the ERCOT analysis of the benefits of including marginal transmission losses in SCED accurately measure such benefits? Are potential costs to the market or to market participants adequately accounted for?

ERCOT's study provides estimates of production costs, and directional estimates of impacts on generators and customers in various zones. However, it does not include an estimate or any analysis of the actual financial impact to customers. Customers' prices are based on

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[8] Jim Lazar and Xavier Baldwin, "Valuing the Contribution of Energy Efficiency to Avoided Marginal Line Losses and Reserve Requirements," Regulatory Assistance Project Online Journal, at 4 (Aug. 2011) (available at: www.raponline.org/wp-content/uploads/2016/05/rap-lazar-eeandlinelosses-2011-08-17.pdf) ("Because the average losses increase with the square of the load, the marginal line losses at any point are significantly higher than the average losses at that same point on the load curve."); *see also* Hogan, William W. and Pope, Susan, "Priorities for the Evolution of an Energy-Only Electricity Market Design in ERCOT" (2017) at 41-43.

[9] Prior to the passage of SB 7, both Reliant Energy HL&P and City Public Service Board of San Antonio (CPS) challenged the postage stamp recovery of transmission costs and won on appeal. It was challenged because the actual cost of building transmission to serve urban regions is lower on a per kW basis (due to density) than the average cost of building transmission to serve less dense rural areas. *Public Utility Comm'n of Tex. v. City Pub. Serv. Bd. of San Antonio*, 53 S.W.3d 310 (Tex. 2001).

marginal LMPs (clearing prices), and not generators' average production (fuel) costs. Production costs may decrease overall, but if clearing prices remain the same then those savings do not flow to customers but to non-marginal generators. As a result, production cost impacts do not reliably indicate how consumers will be affected.

15. What ERCOT operational changes would need to be made that are not considered in ERCOT's studies?

Not addressed.

16. Would the use of marginal transmission losses in SCED change the ERCOT transmission planning process and transmission build-out?

In theory, if generation were sited closer to load then transmission costs would be lower. Again, however, TIEC does not believe that marginal loss pricing will incentivize substantial new generation in urban regions due to the much larger impacts of other economic and practical considerations. As such, TIEC does not believe that marginal loss pricing will substantially reduce transmission costs.

If marginal loss pricing is implemented, however, it is imperative for the Commission to adopt an economic planning test that would allow transmission to be built when it would effectively pay for itself by relieving transmission congestion. The same customers who are being penalized by congestion in areas such as Houston will be penalized by marginal loss pricing. From an equity standpoint, if marginal loss pricing is pursued, then these customers should have access to transmission that relieves high congestion costs in load pockets. Customers should not be penalized multiple times for being located in a geographically constrained, dense region of the state. Further, adopting an economic transmission test that measures costs to customers would mitigate the harmful impacts of marginal loss pricing on generators in rural areas, as they would be able to economically compete to serve more load in population centers. As a result, if marginal loss pricing is pursued then the Commission should create a test that allows transmission to be built when the congestion costs savings for customers would pay for the cost of the line over a reasonable period of time.

As noted previously, TIEC also recommends revisiting the treatment of generation transmission interconnection costs instead of adopting marginal losses as a more effective way to address generation siting.

17. Assuming that the implementation of marginal transmission losses results in the location of generation closer to load, what advantages and disadvantages would there be during an emergency event or a market restart to having generation located closer to load?

For the reasons explained previously, TIEC does not believe that marginal loss pricing will cause any significant increase in generation siting in urban areas due to countervailing economic factors (such as federal tax incentives) and other external factors (siting and environmental restrictions). In theory, if generation is sited closer to load then generation could potentially be restarted more easily and quicker due to a reduction in the associated transmission that would need to be re-energized. However, this is primarily a factor only during a system-wide blackout, which TIEC believes is extremely unlikely, and only if marginal loss pricing did, in fact, cause new generation to be developed in densely populated areas. TIEC does not believe this type of hypothetical benefit is a rational basis for pursuing marginal loss pricing.

18. What effects, if any, would the implementation of marginal transmission losses have on the Congestion Revenue Rights (CRR) market?

19. How should the Commission direct ERCOT to implement marginal transmission losses in a way that mitigates any deleterious effects on the CRR market?

Marginal loss pricing can actually exacerbate congestion by creating greater price spreads between load and generation, particularly for generators that are located more remotely from loads. This can impact the value of CRRs and related trading and hedging activities. As a result, implementing marginal losses would need to be coordinated with the timing of ERCOT's CRR auction process in a manner that would give sufficient notice to market participants seeking to hedge. Currently, CRRs are sold forward for 36 months, so any rule change that significantly affects LMPs should be timed to not cause a loss to existing CRR holders.

20. Does your assessment of the incorporation of marginal transmission losses change based on the timeline of implementation?

No. TIEC believes that pricing marginal losses will negatively impact ERCOT resource adequacy overall and penalize customers in critical economic regions of the state regardless of when it is implemented. Marginal loss pricing makes the economics for generation in rural areas more challenging, which makes it harder to develop new resources in these areas (where generation siting is easier due to a host of factors) and increases the risk of additional thermal retirements. Marginal loss pricing could also perpetually penalize customers in constrained

regions of the state who are already subject to congestion costs and limited generation development, harming economically significant areas like Houston.

If a major market design change such as marginal loss pricing is pursued, providing at least three years of market notice is preferable given the timing of CRR forward auctions and the term of many wholesale and retail contracts. However, additional notice does not change TIEC's view that marginal losses should not be implemented in this market.

21. What are the effects of implementing both real time co-optimization (RTC) and marginal transmission losses on reliability and price formation?

As TIEC explains in its comments in Project No. 48540, real-time co-optimization is likely to reduce overall generator revenues in ERCOT, although it may produce greater revenues for generators with certain operational characteristics (i.e., ramping capability) relative to the status quo. Marginal loss pricing will impact different generators differently depending on where they are located. Implementing both marginal losses and real-time co-optimization could accelerate the retirement of older units in rural areas by reducing overall market prices along with creating additional economic impediments for rural generation in particular. Implementing both at the same time might also make it more difficult for market participants to adjust their internal systems due to the numerous changes being implemented at once.

22. Are there any synergies that may result from contemporaneous adoption of both RTC and marginal transmission losses?

TIEC expects that implementing market changes and modifying both ERCOT and stakeholder systems a single time could be more cost-effective than implementing two sets of major market changes at different times. However, it is also possible that the more complex change will lead to a longer lead time, potentially cost overruns, and more errors and false starts. In any case, TIEC maintains that marginal loss pricing should not be pursued, regardless of how it is implemented from a practical standpoint.

23. What are the effects on retail customers and the retail market from the implementation of both RTC and marginal transmission losses?

Both of these potential market changes are substantial and will impact pricing expectations and hedging activities, among other items. While there may be "synergies" to be achieved in modifying ERCOT and stakeholder systems one time rather than two, layering

marginal losses on top of real-time co-optimization will make it more complex and difficult for the retail market to rationalize and process these market changes.

II. CONCLUSION

TIEC appreciates the opportunity to provide these comments and looks forward to discussing these issues further at the upcoming workshop.

Respectfully submitted,

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