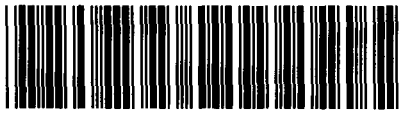

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PROJECT NO. 49125

REVIEW OF ISSUES RELATING TO ELECTRIC VEHICLES	§	**PUBLIC UTILITY COMMISSION**
	§	
	§	**OF TEXAS**

ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.'S
RESPONSES TO PUBLIC NOTICE OF REQUEST FOR COMMENTS

Electric Reliability Council of Texas, Inc. (ERCOT) submits the following responses to certain Public Utility Commission of Texas (Commission) staff requests for comments, as set forth in *Public Notice of Request for Comments–Review of Issues Relating to Electric Vehicles*, as approved at the Commission's December 13, 2019, Open Meeting and as published in the *Texas Register* on December 27, 2019.

I. ERCOT'S RESPONSES TO COMMISSION STAFF REQUESTS FOR COMMENTS

General Data

1. **The Commission requests that parties provide current data sources and projections for the expected deployment of electric vehicles in Texas over the next ten years. If available, the data sources should attribute the projections by vehicle class (i.e., personal, commercial short-haul including fleets and buses, and commercial long-haul electric vehicles).**

ERCOT Response: ERCOT has not produced an official projection or forecast regarding the expected deployment of electric vehicles in Texas over the next 10 years. An official forecast would require proven data about the current level of electric vehicle deployment and a source for the expected growth rate of electric vehicles. Although electric vehicle deployment is accelerating, the data regarding current deployment is still nascent. Moreover, ERCOT is not aware of any generally accepted data source for the expected growth rate of electric vehicles in Texas.[1]

[1] ERCOT is familiar with several forecasts of electric vehicle growth by various organizations, but the data varies significantly among these forecasts. *See e.g.,* https://about.bnef.com/electric-vehicle-outlook/#toc-viewreport.

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ERCOT has reviewed potential impacts of widespread adoption of electric vehicles as part of ERCOT's long-term transmission planning process. ERCOT is required by Texas statute to study the need for increased transmission and generation capacity throughout Texas, and report the results of such study to the legislature biennially.[2] In furtherance of this requirement, ERCOT, in coordination with the Regional Planning Group (RPG), conducts a Long-Term System Assessment (LTSA) by using scenario analysis techniques to assess the potential needs of the ERCOT System up to 20 years into the future. The LTSA report provides an evaluation of the potential needs of ERCOT's extra-high voltage (345-kV) system for a 10- to 15-year planning horizon.[3]

One of the scenarios included in the most recent LTSA (2018)[4] was the Emerging Technology Scenario. The Emerging Technology Scenario assumed a high adoption rate for the electrification of the transportation sector in Texas. The assumed high adoption for electric vehicle deployment was not an official ERCOT forecast; rather, the assumed high adoption rate was developed by ERCOT and RPG to help project the potential needs of the ERCOT System in a 10- to 15-year planning horizon. The Bloomberg New Energy Finance's 2017 Electric Vehicle Outlook (BNEF 2017 Report) was also used in the development of the study assumptions for the Emerging Technology Scenario.[5] The BNEF 2017 Report projects electric vehicle adoption rates for personal vehicles in the United States. ERCOT assumed an 8.9% market share for Texas vehicle registrations to estimate annual new vehicle sales in the ERCOT. ERCOT then used personal vehicle registration data provided by the Texas Department of Transportation (TX DOT) to calculate electric vehicle adoption for personal cars in the ERCOT Region.[6] The BNEF 2017 Report does not project deployment of commercial short- or long-haul vehicles; rather, the projected

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2 *See* Public Utility Regulatory Act, Tex. Util. Code Ann. (PURA) § 39.904(k) (West 2007 & Supp. 2014), and ERCOT Planning Guide, Section 3.1.1.1(1), Regional Planning, Long-Term System Assessment.

3 *See e.g.,* ERCOT's 2018 Long-Term System Assessment for the ERCOT Region (Dec. 21, 2018), available at http://www.ercot.com/content/wcm/lists/144927/2018_LTSA_Report.pdf.

4 *Id.*

5 *See* BNEF 2017 Report (Jul. 2017), available at https://data.bloomberglp.com/bnef/sites/14/2017/07/BNEF_EVO_2017_ExecutiveSummary.pdf.

6 *See* TX DOT Statewide Flowband Planning Maps - 2016, available at https://www.txdot.gov/inside-txdot/division/transportation-planning/maps/statewide-2016.html.

number of commercial short-haul and long-haul vehicles included in the 2018 LTSA were assumed numbers designed to stress the ERCOT System. ERCOT reviewed commercial short-haul and long-haul information provided by TX DOT for the limited purpose of determining the feasibility of the assumed values.[7]

In May 2019, RPG initiated the process to develop scenarios for the 2020 LTSA. ERCOT will release the 2020 LTSA in December 2020. An assumed deployment rate of electric vehicles in Texas will be included in the Current Trends Scenario and the High Battery Energy Storage Scenario. ERCOT intends to use the BNEF 2018 Report as the primary source for the assumed vehicle adoption rate for personal vehicles.[8] ERCOT has not finalized scenario assumptions for commercial short-haul or long-haul vehicles as part of the 2020 LTSA. Notably, and with respect to the 2020 LTSA, the assumed high adoption rate for the electrification of the transportation sector in Texas, for all vehicle categories, will not be an official ERCOT forecast of electric vehicle growth.

2. **Please provide any current data sources and information on the expected amount of new load attributable to electric vehicles over the next 10 years. If available, the data sources should attribute this load by vehicle class (i.e., personal, commercial short-haul including fleets and buses, and commercial long-haul electric vehicles).**

ERCOT Response: ERCOT has not produced an official projection or forecast regarding the expected amount of new load attributable to electric vehicles over the next 10 years. As discussed in ERCOT's response to Staff Request No. 1, before ERCOT can produce an official load forecast regarding electric vehicles, additional data is needed regarding: (a) current deployment of electric vehicles; (b) anticipated growth rate for deployment of electric vehicles; and (c) historical information regarding the load profile for electric vehicle charging stations.

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[7] *See e.g.,* TX DOT's Texas Truck Flowband Map, available at http://ftp.dot.state.tx.us/pub/txdot-info/tpp/traffic_counts/flowband/2017-truck.pdf.

[8] *See* BNEF 2018 Report, available at https://bnef.turtl.co/story/evo2018/page/2?src=wir.

As also discussed in ERCOT's response to Staff Request No. 1, ERCOT and stakeholders reviewed the potential impact of widespread adoption of electric vehicles in the Emerging Technology Scenario of the 2018 LTSA. ERCOT prepared a load forecast for the Emerging Technology Scenario using transportation electrification assumptions, as set by ERCOT and stakeholders in RPG. The load forecast for electric vehicles was based on assumed daily electrical consumption. ERCOT assumed that most personal vehicles would charge overnight, and commercial short- and long-haul electric vehicles would charge around noon and overnight. The total peak charging demand based upon these assumptions was estimated to be over 18,500 MW at midnight, and approximately 5,000 to 6,000 MW for Hours Ending 16:00 – 18:00.[9]

The Current Trends Scenario and the High Battery Energy Storage Scenario in the 2020 LTSA will include an assumed deployment rate of electric vehicles. ERCOT will model the effect of assumed electric vehicle deployment rate on load in the ERCOT Region. For the 2020 LTSA, ERCOT will modify the assumptions regarding miles driven for personal vehicles—i.e., ERCOT will use actual miles driven per day data for personal vehicles, as measured by TX DOT, and use those consumption values to calculate the electrical load for personal vehicles. The impact of these new assumptions on ERCOT's prediction of hourly charging load for personal vehicles in 2035 was discussed at RPG in May 2019.[10] ERCOT has not finalized assumptions regarding electrical load for commercial short- or long-haul electric vehicles for the 2020 LTSA.

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[9] *See* 2018 LTSA at 11; *See also* NYISO report: Alternate Route: Electrifying the Transportation Sector – Potential Impacts of Plug-In Hybrid Electric Vehicles on New York State's Electricity System (Jun. 2009), available at http://s3.amazonaws.com/zanran_storage/www.nyiso.com/ContentPages/19214547.pdf; and NREL report: Cost and Emissions Associated with Plug-In Hybrid Electric Vehicle Charging in the Xcel Energy Colorado Service Territory (May 2007), available at https://www.nrel.gov/docs/fy07osti/41410.pdf.

[10] *See* RPG Meeting, Key Documents (May 14, 2019), available at http://www.ercot.com/calendar/2019/5/14/165285-RPG.

Grid Impacts

6. **The Commission requests that parties provide a detailed explanation on the following items:**

   b. **The anticipated impact of electric vehicle charging stations on the transmission system in the next ten years; and**

   c. **The anticipated impact of electric vehicle charging stations on long-term system planning at the regional transmission organization level, given a widespread adoption scenario.**

ERCOT Response:

b. ERCOT has not produced an official projection or forecast regarding the anticipated impact of the electric vehicle charging stations on the ERCOT System for the next 10 years due to lack of data, as discussed in ERCOT responses to Staff Request Nos. 1 and 2. The growth of electric vehicles is considered an uncertainty in ERCOT's 2019 Long-Term Hourly Demand and Energy Forecast (LTHDEF).[11] Although the growth of electric vehicles has been accelerating, the total number of electric vehicles represents a small percentage of the new vehicle market in Texas. The 2019 LTHDEF assumed that electric vehicle consumption would remain at the level observed for January 2013 – August 2018—i.e., the forecast does not accommodate acceleration in the adoption of electric vehicles. As additional information becomes available regarding the growth of electric vehicles, ERCOT will develop load forecasts and transmission planning models to quantify the anticipated impact of electric vehicle charging stations on the ERCOT System.

c. As discussed in these responses, in the Emerging Technology Scenario of the 2018 LTSA, ERCOT analyzed the potential impact of electric vehicle charging stations on long-term system planning given widespread adoption of electric vehicles, and

[11] *See* ERCOT's 2019 Long-Term Load Forecast reports, available at http://www.ercot.com/gridinfo/load/forecast/2019.

created a load forecast that included an assumed accelerated electric vehicle adoption rate. ERCOT also conducted resource and transmission expansion for the Emerging Technology Scenario, which was used to estimate the types and amounts of new generation resources to be added, as well as those to be retired. Generally, when compared to the Current Trends Scenario, the Emerging Technology Scenario identified more gas generation in the eastern part of the ERCOT Region and less solar and wind generation in the western part of the ERCOT Region.

Transmission expansion analysis in the 2018 LTSA involved evaluating potential need for the ERCOT System under different load and generation assumptions, as developed during the load forecasting and generation expansion analysis stages.[12] With respect to the 2020 LTSA, ERCOT conducted a transmission expansion analysis for the Emerging Technology Scenario and presented the results to the RPG in May 2019.[13] This analysis resulted in less of a need to export generation from the western part of the ERCOT Region due to less solar and wind generation when compared to the Current Trends Scenario.

ERCOT will continue to study the potential impact to the ERCOT System with the assumption of widespread adoption of electric vehicles as part of the Current Trends Scenario and the High Battery Energy Storage Scenario, and will incorporate its findings in the 2020 LTSA.

7. What is the overall anticipated impact of electric vehicle charging in the next ten years in terms of energy and peak demand? What changes, if any, should be made to energy and peak demand forecasts to incorporate this impact?

ERCOT Response: ERCOT has not produced an official projection or forecast regarding the anticipated impact of electric vehicle charging in the next 10 years in terms of energy and peak demand due to the lack of available data, as noted in ERCOT's response to Staff Request Nos. 1 and 2. However, as described above, in the 2018 LTSA, ERCOT

[12] *See* 2018 LTSA at Appendix 1.

[13] *See* RPG Meeting, Key Documents (May 14, 2019), available at http://www.ercot.com/calendar/2019/5/14/165285-RPG.

produced a load forecast for the Emerging Technology Scenario, which showed a significant change in the load profile. The significant change in the load profile suggests that electric vehicle adoption and vehicle charging patterns should continue to be monitored in upcoming years.

II. CONCLUSION

ERCOT appreciates the Commission's consideration of these responses and would be pleased to provide any additional information the Commission may request.

Respectfully submitted,

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