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PROJECT NO. 49125

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

COMMENTS OF ENTERGY TEXAS, INC.

I. Introduction

On December 13, 2019, the staff of the Public Utility Commission of Texas ("PUCT" or "Commission") requested comments on questions in the aforementioned project. Entergy Texas, Inc. ("ETI" or "The Company") provides the responses below as an overview of the general data available to the Company concerning electric vehicles.

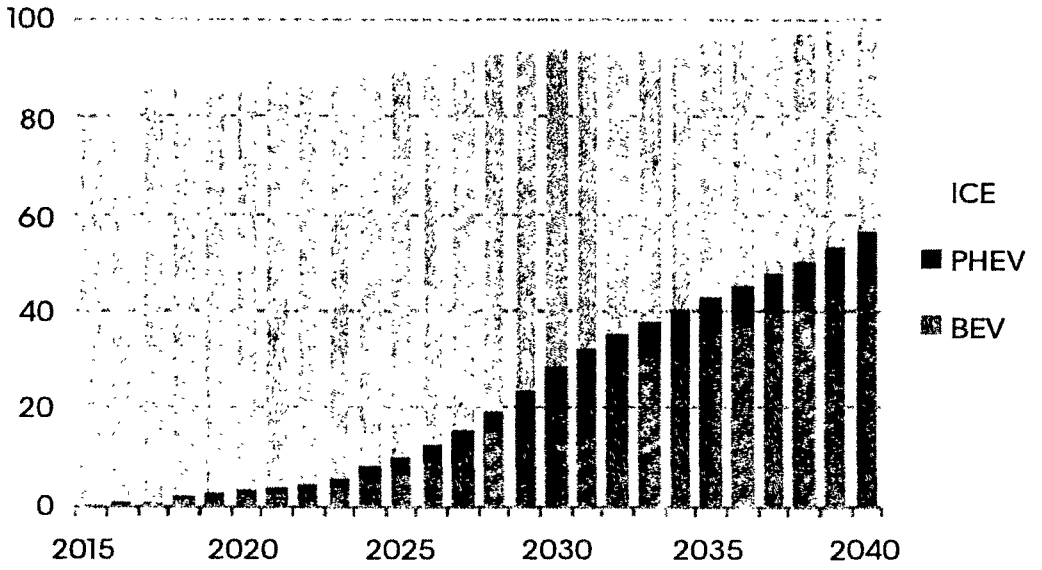
II. General Data

Question 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).

ETI is unaware of any Texas-specific forecasts of electric vehicle ("EV") adoption, although that is not to say that such state-specific long-term forecasts do not exist. There are various EV-related forecasts available in the public domain that cover regions like the U.S., China, and Europe as well as global-wide projections. For example, Bloomberg New Energy Finance ("BNEF") issued an Electric Vehicle Outlook in 2019 that makes various near-term and long-term projections for EV adoption globally.[1]

[1] https://about.bnef.com/electric-vehicle-outlook/#toc-viewreport

Figure 1. Global Long-Term Passenger Vehicle Sales by Drivetrain (Million Vehicles)



Despite rapid expected growth, it is important to consider perspective. Globally, there are more than 1 billion passenger vehicles on the road and less than 0.5% of them are either plug-in hybrid ("PHEV") or battery electric ("BEV"). Based on auto registration data, there were 11,764 EVs sold in Texas in 2018 representing ~0.8% of sales. The Company does not have 2019 information for Texas. Globally, BNEF also forecasts the share of electrified vehicles by type. Per Figure 2, the share of electrified buses is expected to significantly outpace other electrified vehicle types (none of which are expected to represent more than 10% until after 2030). Figure 3 provides a global-wide near-term EV adoption forecast for passenger EV adoption by region between 2015-2023.

Figure 2. EV Share of Global Vehicle Fleet by Segment (Share of Fleet)

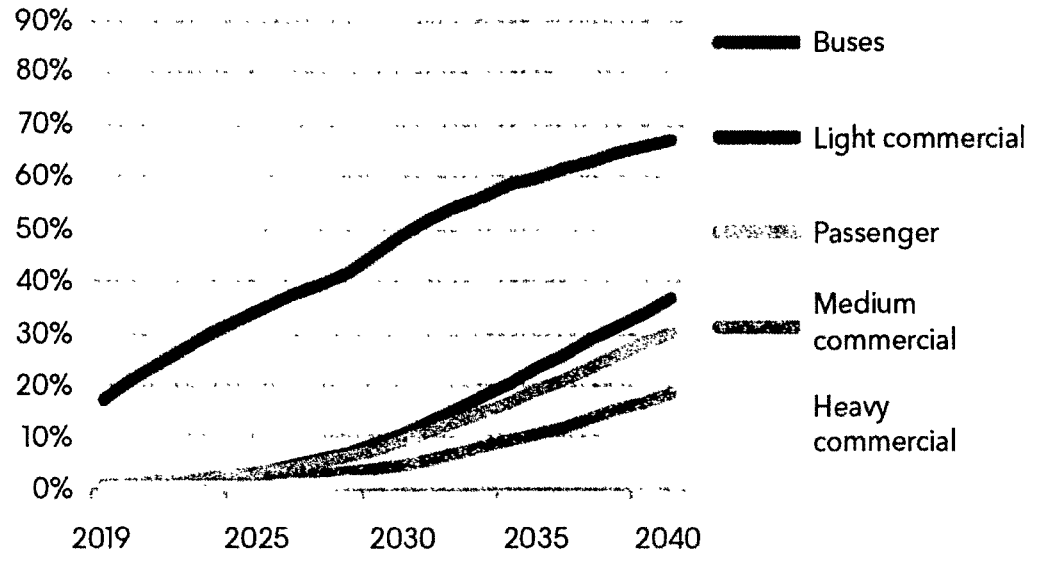
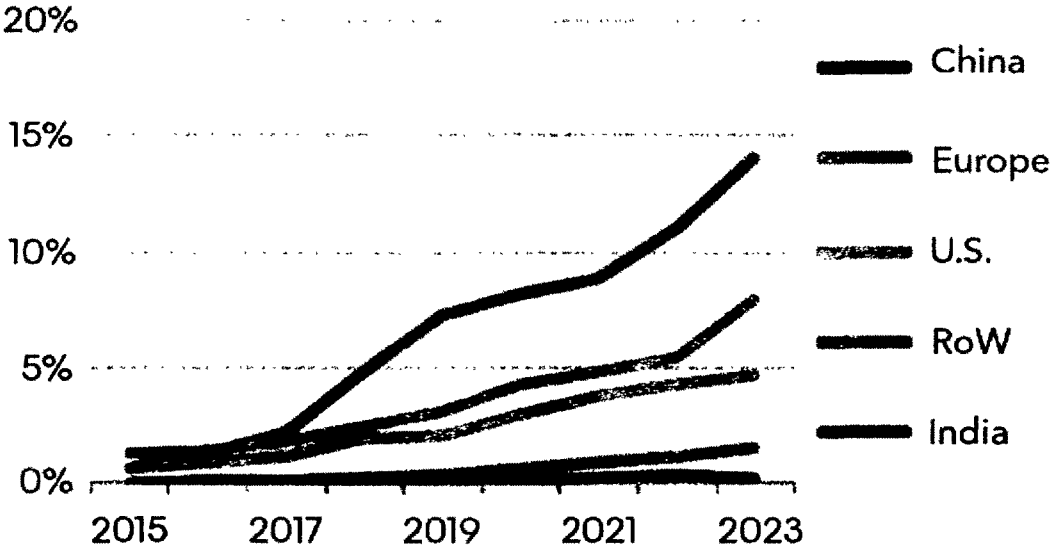


Figure 3. Global Short-Term Passenger EV Adoption by Region (Share of Sales)



The International Energy Administration ("IEA") publishes an annual Global EV Outlook that discusses trends and policies related to electrified transportation and makes various adoption

forecasts.[2] IEA provides two different global long-term forecasts to 2030 representing two different policy scenarios with the second scenario reflecting an accelerated push for adoption.

Figure 4. Global Electric Vehicles in IEA's New Policies Scenario (Million Vehicles)[3]

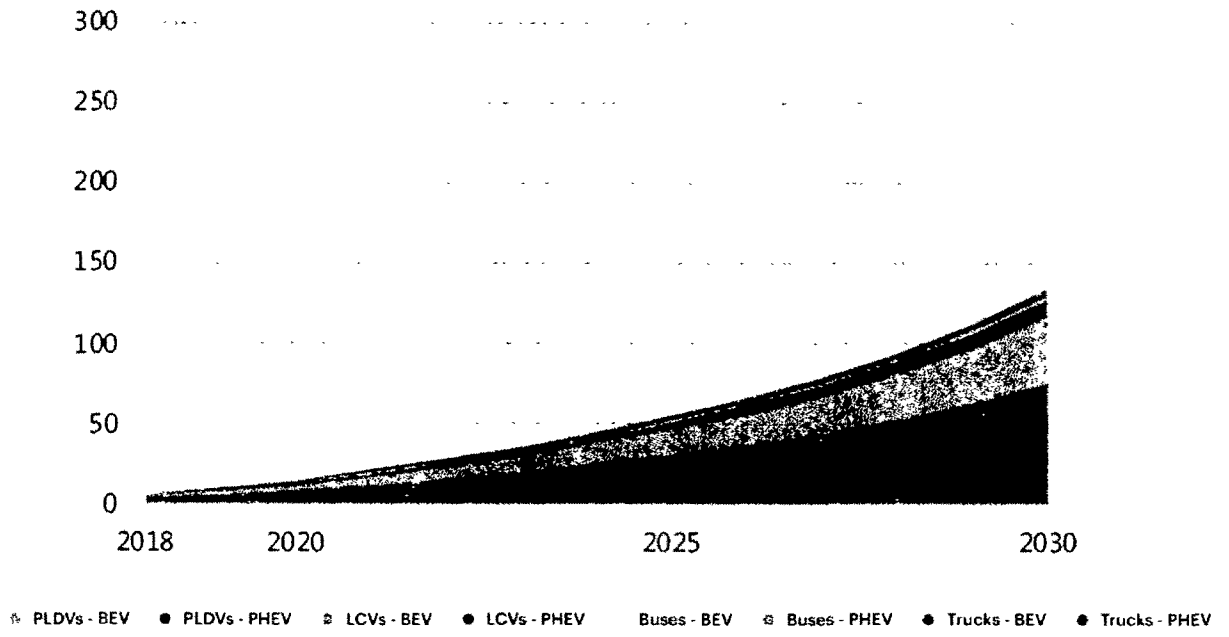
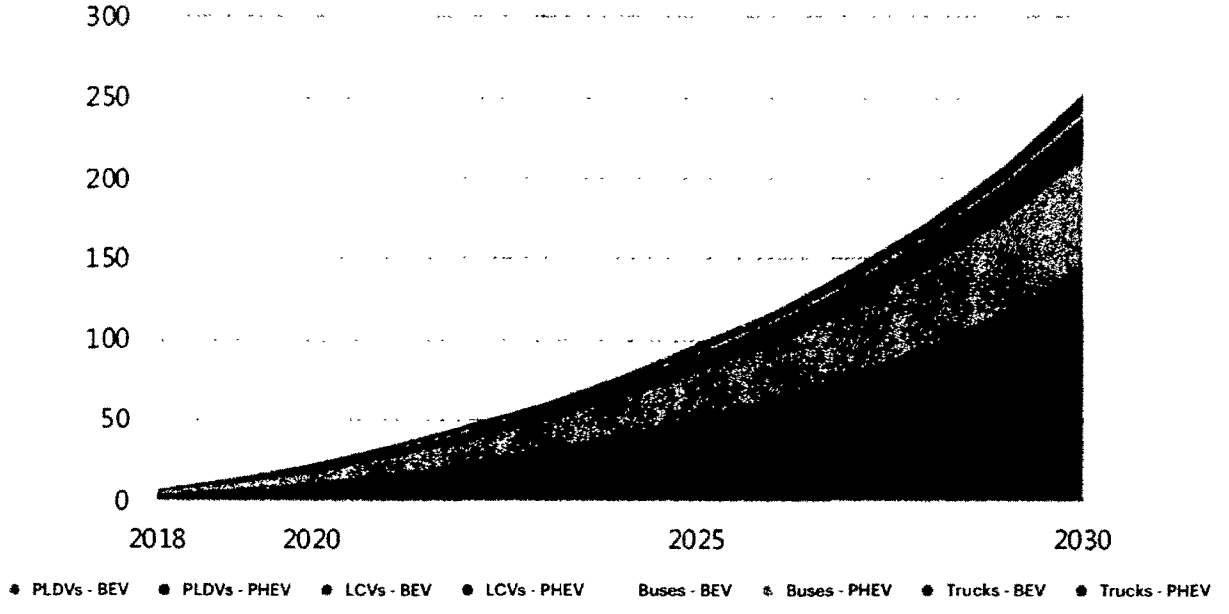


Figure 5. Global Electric Vehicles in IEA's EV 30@30 Scenario (Million Vehicles)

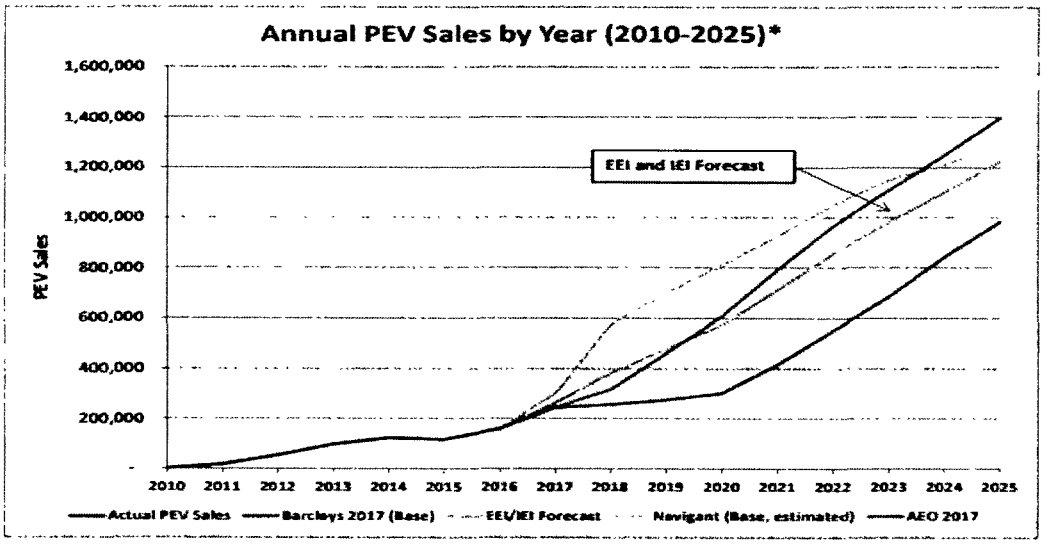


[2] https://www.iea.org/reports/global-ev-outlook-2019

[3] PLDVs = passenger light-duty vehicles; LCVs = light-commercial vehicles; BEV = battery electric vehicle; PHEV = plug-in hybrid vehicle.

Figure 6 provides the long-term U.S. forecast from EEI/IEI showing annual PEV sales forecast compared to selected forecasts. [4]

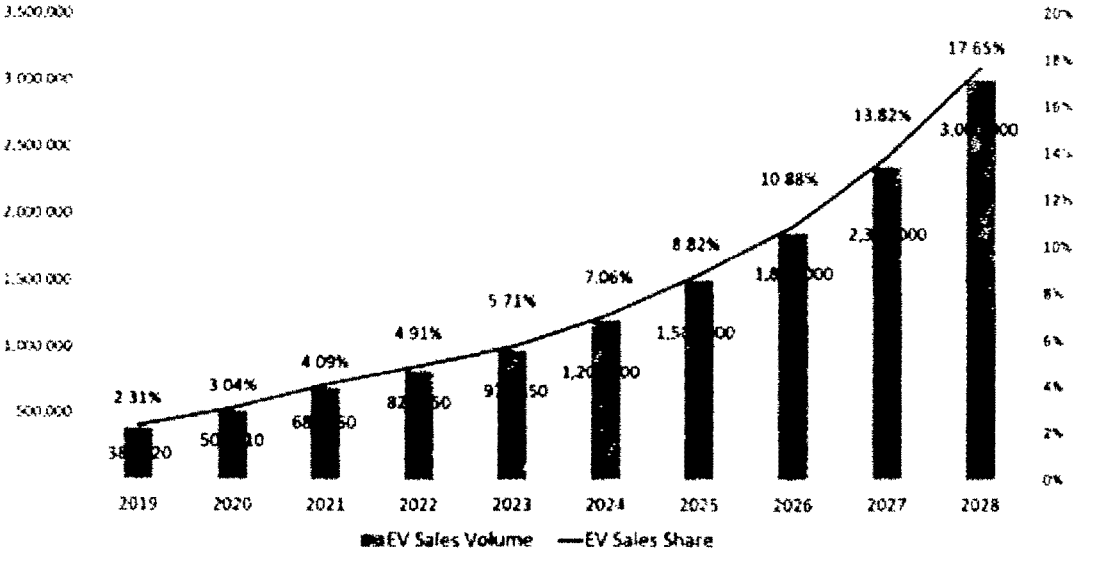
Figure 6. EEI/IEI Annual PEV Sales Forecast Compared to Selected Forecasts (2010-2025)



*Includes battery electric vehicles and plug-in hybrid electric vehicles

Figure 7 illustrates a long-term U.S. forecast available at EVAdoption.com.[5]

Figure 7. U.S. Electric Vehicle Sales Forecast (2019-2028)



[4]https://www.edisonfoundation.net/iei/publications/Documents/IEI_EEI%20PEV%20Sales%20and%20Infrastructure%20thru%202025_FINAL%20(2).pdf

[5] https://evadoption.com/ev-sales/ev-sales-forecasts/

Question 2. Please provide any current data sources and information on the expected amount of new load attributable to electric vehicles over the next ten 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).

The U.S. Department of Transportation's Federal Highway Administration projects that U.S. drivers average 13,476 miles per year.[6] The Company is not aware of Texas-specific average miles driven per year data. Depending on the EV model, efficiency, weight, driving habits, city versus highway driving, etc., the average range is 2-4 miles/kWh.[7] Assuming the mid-point average of 3 miles/kWh, an average U.S. driver would use 4,492 kWh of electricity per year. Please see the Company's response to Question 1 regarding near- and long-term adoption forecasts.

Charging demand (kW) and resulting electric load on the grid depends on whether the driver is using a Level 1 charger (standard 110V outlet), a Level 2 charger (220V; up to ~7 kW), or a Level 3 direct current ("DC") fast charger (50 to 300+ kW). At present, the majority of EV charging occurs with Level 1 and Level 2 chargers predominantly at home or at a business with equipment that is behind the customer's electric meter. As such, apart from several DC fast charging stations that are directly served and metered, the Company currently has no real visibility into usage patterns for Level 1 and Level 2 EV charging that occurs behind-the-meter.

Question 3. Please identify any anticipated load "hot spots" in the state for electric vehicle charging. Please specify whether these hot spots are expected to result from personal, commercial short-haul, or commercial long-haul electric vehicle deployment and charging.

At present, the Company has not identified any EV charging "hot spots" in its service territory that could necessitate infrastructure upgrades, such as increasing transformer capacity. To the extent new applications for electrified transportation emerge such as return-to-base fleet

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[6] https://www.fhwa.dot.gov/ohim/onh00/bar8.htm

[7] https://afdc.energy.gov/fuels/electricity_charging_home.html; https://avt.inl.gov/sites/default/files/pdf/fsev/costs.pdf

operations or interstate trucking, there could be instances where existing infrastructure cannot accommodate such loads without upgrades. But such a situation would not be any different than the Company upgrading infrastructure as needed to serve any new electric load.

Question 4. Describe the observed or anticipated load profiles and impacts of various types of electric vehicle charging stations (e.g., residential Level 1, Level 2, and Level 3 DC Fast charging) and the class of the vehicle charging (i.e., personal, commercial short-haul including fleets and buses, and commercial long-haul electric vehicles).

Please see the Company's response to Question 2. As noted in the response, the Company now has a small number of DC fast charging stations in its service territory that are directly served and metered. However, there is limited data available given that several locations have only recently begun operations.

Question 5. What, if any, emerging vehicle charging technologies are anticipated to be commercially available in the next ten years that could impact electricity markets in Texas?

The Company is not aware of any emerging vehicle charging technologies, but would note that BNEF, IEA, and others are forecasting increased electrification of commercial fleet operations, mass transit buses, school buses, and potentially long-haul interstate trucking.

III. Grid Impacts

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

a. The anticipated impacts of electric vehicle charging, including residential and commercial charging stations on the distribution system in the next ten years;

Please see the Company's response to Question 3. At this point given modest EV adoption growth and near-term forecasts, the Company is not anticipating any adverse or unmanageable distribution grid impacts.

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

As is the case with the distribution grid, the Company is not anticipating any adverse or unmanageable transmission grid impacts.

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.

The Company has begun to consider increased EV adoption in its long-term resource planning efforts, however it does not anticipate any material impact on long-term planning and interaction with the MISO regional transmission organization.

Question 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?

Please see the Company's response to Question 3.

Question 8. What are the capabilities of electric vehicle related technologies, such as vehicle-to-grid, to participate in wholesale electricity markets?

The Company is aware of several existing and proposed utility vehicle-to-grid ("V2G") pilot projects in the U.S. and in Europe; however, such applications could be considered more research & development than commercialization. The Company is not actively considering any V2G projects at this time and will continue to monitor these activities.

Question 9. Please explain any preferred or best practice facilities siting and design standards for commercial electric vehicle charging stations and why such standards are recommended.

The Company is not aware of any industry best practices relative to siting or design standards for commercial EV charging stations.

IV. Conclusion

ETI appreciates the opportunity to provide comments for the PUCT's consideration in this project. The Company looks forward to further participation as this matter progresses.

Dated: February 3, 2020

Respectfully Submitted,

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