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Public Service Commission

December 13, 2017

Re: Electric Vehicle Charging Station Study – Staff's Data Request #1

In 2012, the Commission was directed to conduct a study on the potential effects of public charging stations and privately owned electric vehicle charging on both energy consumption and the impact on the electric grid in the state. Additionally, the Commission was to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

We are currently updating this study. In order to facilitate this update, we are making a request for information related to electric vehicle charging. This information will be used to inform the Commission's report on the effects ~~of electrical vehicles on the~~ electric grid and energy consumption.

Please submit a response for all questions no later than January 15, 2018. If you have any questions regarding this request, you may contact me at (850) 413-6978 (swhitfie@psc.state.fl.us). Thank you for your assistance.

Sincerely,

Shelby Whitfield
Office of Industry Develpoment and Market Analysis

Florida Public Service Commission
Electric Vehicle Charging Station Data Request
December 13, 2017

Background and Present Situation

1. How many Plug-in Hybrid Electric Vehicle (PHEV) charging stations are currently located in the utility's service territory?

How many charging stations are "Public Chargers," e.g. available to the general public?

Does this include charging available to RV parks, rest areas, and campgrounds?

How many are in-home, private charging stations?

How many charging stations are "Private," e.g. not available to the general public, excluding in-home charging?

How many charging stations are owned by the utility?

2. Please complete the table below describing the projected number of PHEV charging stations that are anticipated to be located in utility's service territory.

Number of Projected PHEV Charging Stations

	Level 1	Level 2	Level 2+	Level 3	Level 4	Total
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Note: PHEV Charging Station Energy Specifications:

Level 1 - 1.1 kW, 15 amp, 110 V (< 15 amps delivered)
Restricted to at home only, overnight full charge
9 pm to 9 am, randomized start, full plug-in PHEV charge

Level 2 - 3.3 kW, 15 amp, 220 V
Restricted to home and work
Charge anytime, charge until full
Effectively two plug-in PHEV charges per day

Level 2+ 6.6 kW, 30 amp, 220V
Unrestricted location; wherever you park
Charge anytime; charge until full
Several plug-in PHEV charges per day

Level 3 50 kW, 100 amp, ~400V
Refueling station concept for PHEVs
Charge anytime; charge until full
Up to hundreds of charges per day

Level 4 Other, please defined

3. Please describe the impact PHEV charging stations had on the utility's load in 2016. Please include contribution to peak demand, a typical hourly profile for load from PHEV charging stations, and a typical hourly profile for the electric system as a whole for comparison purposes, for each month of 2016.

Please provide this information for:

1. In-home charging stations.
2. Other private charging stations
3. Public charging stations.

4. Has the utility estimated the number of PHEVs in Florida at present, both in its service territory and statewide? If so, how many?

5. Has the utility estimated the number of PHEVs that are expected to be in use in Florida through 2025?

If yes, please provide and include source of estimates and how derived.

6. Has the utility estimated the number of PHEVs that are expected to be in use in its service territory through 2025?

If yes, please provide and include source of estimates and how derived.

If yes, please complete the table below showing actual and projected number of PHEVs in your service territory through 2025.

	Number of PHEVs
2016	
2017	
2018	
2019	
2020	
2021	
2022	
2023	
2024	
2025	

7. Explain how load management or rate design tools may mitigate the demand impacts of PHEV charging on peak demand.

8. Does your utility currently have or plan to offer to its customers load management programs or rate designs specifically for PHEVs?

If yes, please describe these programs including participation and peak reduction.

If not currently but plan to,when will plans designed for PHEVs be offered to your customers?

9. What type of additional policies and processes does the utility currently have in place to manage the addition of charging facilities to your system?

10. Based on the utility's experiences, what challenges do PHEVs present to utility and grid operation?

Generation and Transmission

11. What additional generation or transmission assets will the utility require if 1 percent of vehicles in the utility's service area are replaced with PHEVs for each year through 2025?

What if the figure reaches 5 percent, 10 percent, 25 percent, or 50 percent?

What are the costs of these additional generation assets expected to be?

What effect will these additional costs have on the general body of ratepayers?

12. Has the utility adjusted its load forecast to account for additional load from PHEVs?

If yes, please describe the basis for the projected load adjustment and provide resources relied upon for this adjustment.

If yes, please complete the table below summarizing the incremental projected load from PHEVs.

	Summer MW	Winter MW	GWH
2016			
2017			
2018			
2019			
2020			
2021			
2022			
2023			
2024			
2025			

13. Is the utility's existing electric generation system adequate to accommodate PHEV demand based on the estimated number of PHEVs expected to be in use through 2025?

Please explain.

14. Is the utility's existing electric transmission system adequate to accommodate the PHEV demand based on the estimated number of PHEVs expected to be in use through 2025?

Please explain.

15. Has the utility performed any analysis or prepared any studies examining the magnitude and nature of PHEV charging, especially regarding whether different levels (as delineated in question 2) of charging are more or less likely to occur at specific times of day?

If yes, please provide the analysis or study and describe the results.

16. Has the utility performed any analysis or prepared any studies related to the potential impacts of PHEV charging on its transmission system?

If yes, please provide the analysis or study and describe the results.

17. Has the utility performed an analysis or prepared any studies related to the potential impacts of PHEV charging on its generation system?

If yes, please provide the analysis or study and describe the results.

Distribution

18. What improvements will be required for the utility's distribution network if 1 percent of existing vehicles are replaced with PHEVs for each year through 2025?

What if the figure reaches 5 percent, 10 percent, 25 percent, or 50 percent?

What will the costs of these distribution improvements be?

Does the utility believe that a Contribution in Aid of Construction would be appropriate action to off-set the costs of these improvements?

19. To what extent will "clusters" of PHEVs in the same geographic area cause localized distribution problems, especially in residential areas?

Explain how many PHEVs charging simultaneously on a single residential transformer will necessitate upgrades to the utility's distribution network.

Describe the methods to minimize any additional costs for distribution upgrades.

20. What effect will quick-charge stations (Level 3 or above) have on the utility's distribution network?

Will this effect vary in urban, suburban, or rural areas? If so, how?

21. Has the utility performed any analysis or prepared any studies related to the potential impacts of PHEV charging on its distribution system?

If yes, please provide the analysis or study and describe the results.

22. Is the utility's existing electric distribution system adequate to accommodate PHEV demand based on the estimated number of PHEVs expected to be in use on your system through 2025?

Please explain.

23. Are you aware of any required system upgrades where PHEVs have been a contributing factor?

If so, please explain.