

State of Florida



# Public Service Commission

CAPITAL CIRCLE OFFICE CENTER • 2540 SHUMARD OAK BOULEVARD  
TALLAHASSEE, FLORIDA 32399-0850

**-M-E-M-O-R-A-N-D-U-M-**

**DATE:** May 3, 2012  
**TO:** Ann Cole, Commission Clerk, Office of Commission Clerk  
**FROM:** Mark Futrell, Division of Regulatory Analysis *MYRLT*  
**RE:** Electric Vehicle Charging Station Study

RECEIVED-FPSC  
 12 MAY -7 PM 3:16  
 COMMISSION CLERK

Attached are letters and staff's first data request for the Electric Vehicle Charging Station Study, which is required by Chapter 2112-117, Laws of Florida. Please place these documents in Docket No. 120000-OT, Undocketed Filings for 2012.

Cc: Charlie Murphy (GCL)

DOCUMENT NUMBER DATE

02904 MAY-7 2012

FPSC-COMMISSION CLERK

**Patti Zellner**

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**From:** Patti Zellner  
**Sent:** Tuesday, May 01, 2012 4:19 PM  
**To:** Ann Cole  
**Cc:** Matilda Sanders  
**Subject:** Electric Vehicle Charging Station Study - Data Request #1  
**Attachments:** elec ve study data request #1 merged letters.pdf

**Ann/Matilda,**

**Please see attached Electric Vehicle Charging Station Study - Data Request #1 that was mailed out today.**

**Thank you and best regards,  
Patti Z. ☺  
Division of Regulatory Analysis  
Phone: (850) 413-6208**

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**Patti Zellner**

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**From:** Patti Zellner  
**Sent:** Tuesday, May 01, 2012 4:19 PM  
**To:** Ann Cole  
**Cc:** Matilda Sanders; Benjamin Crawford; Patti Zellner; Mark Futrell  
**Subject:** Electric Vehicle Charging Station Study - Data Request #1  
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**Electric Vehicle Charging Station Data Request**

**Background and Present Situation**

1. How many Plug-in Hybrid Electric Vehicle (PHEV) charging stations are currently located in the utility's service territory?
  - a. How many charging stations are "Public Chargers," e.g. available to the general public?
  - b. Does this include charging available to RV parks, rest areas, and campgrounds?
  - c. How many are in-home, private charging stations?
  - d. How many charging stations are "Private," e.g. not available to the general public, excluding in-home charging?
  - e. 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
2012						
2013						
2014						
2015						
2016						
2017						
2018						
2019						
2020						
2021						

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

Level 3	Charge anytime; charge until full Several plug-in PHEV charges per day 50 kW, 100 amp, ~400V Refueling station concept for PHEVs
Level 4	Charge anytime; charge until full Up to hundreds of charges per day Not currently defined Will use DC Technology

3. Please describe the impact PHEV charging stations had on the utility's load in 2011. 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 2011.

Please provide this information for:

- a. In-home charging stations.
- b. Other private charging stations
- c. Public charging stations.

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

5. Has the utility estimated the number of PHEVs that are expected to be in use in Florida through 2021?

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 2021?

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

If yes, please complete the table below describing the projected number of PHEVs in Utility's service territory through 2021.

	Number of PHEVs
2012	
2013	
2014	
2015	
2016	
2017	
2018	
2019	
2020	
2021	

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

Please describe any load management programs the utility currently offers.

8. Does utility currently plan to offer to its customers programs designed specifically for PHEVs?

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

If no, does utility have plans to offer any programs designed for PHEVs?

9. What type of additional policies and processes does the utility currently have in place to manage the addition of charging facilities to the 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 2021?

- a. What if the figure reaches 5 percent, 10 percent, 25 percent, or 50 percent?
- b. What are the costs of these additional generation assets expected to be?
- c. 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
2012			
2013			
2014			
2015			
2016			
2017			
2018			
2019			
2020			
2021			

13. Is the utility's existing electric generation system adequate to accommodate the PHEV demand based on the estimated number of PHEVs expected to be in use through 2021?

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 2021?

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 2021?

- a. What if the figure reaches 5 percent, 10 percent, 25 percent, or 50 percent?
- b. What will the costs of these distribution improvements be?
- c. Does the utility believe that a Contribution in Aid of Construction would be appropriate?

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

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

- a. 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 the PHEV demand based on the estimated number of PHEVs expected to be in use through 2021?

Please explain.

### **Off-Grid Solar Charging**

23. Provide the location and describe the utility and non-utility off-grid solar PHEV charging stations in operation in the utility's service area.

24. How many utility and non-utility off-grid solar photovoltaic PHEV charging stations are planned to be installed in the utility's service area?

25. How does the production cycle of solar photovoltaic align with the load profile of PHEV charging demand?



26. Explain the extent to which solar photovoltaics can meet the energy requirements of PHEVs?
27. Please estimate the load and number of solar photovoltaic panels needed for Level 1, Level 2, Level 2+, and Level 3 charging stations.

COMMISSIONERS:  
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LISA POLAK EDGAR  
ART GRAHAM  
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JULIE I. BROWN

STATE OF FLORIDA



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TALLAHASSEE, FL 32399-0850

## Public Service Commission

May 1, 2012

Mr. Paul Lewis  
Progress Energy Florida, Inc.  
106 E. College Avenue, Suite 800  
Tallahassee, Florida 32301

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

Dear Mr. Lewis:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

In order to facilitate this study, 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 June 1, 2012. If you have any questions regarding this request, you may contact me at (850) 413-6598 (bcrawfor@psc.state.fl.us). Thank you for your assistance.

Sincerely,

/s/ Benjamin Crawford

Benjamin Crawford  
Division of Regulatory Analysis

Enclosure

cc: Office of the General Counsel (Murphy)  
Office of the Commission Clerk (Cole)

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## Public Service Commission

May 1, 2012

Mr. Jim Beasley  
Ausley & McMullen (Tampa Electric Company)  
P.O. Box 391  
Tallahassee, Florida 32302

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

Dear Mr. Beasley:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

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Sincerely,

/s/ Benjamin Crawford

Benjamin Crawford  
Division of Regulatory Analysis

Enclosure

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## Public Service Commission

May 1, 2012

Ms. Susan Ritenour  
Secretary and Treasurer and Regulatory Manager  
Gulf Power Company  
One Energy Place  
Pensacola, Florida 32520

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

Dear Ms. Ritenour:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

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Sincerely,

/s/ Benjamin Crawford

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Division of Regulatory Analysis

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## Public Service Commission

May 1, 2012

Mrs. Michele Jackson  
System Planning Manager  
Assistant General Manager, Power Resources  
Florida Municipal Power Agency  
8553 Commodity Circle  
Orlando, Florida 32819-9002

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

Dear Mrs. Jackson:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

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Sincerely,

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## Public Service Commission

May 1, 2012

Mr. Norman Kamhoot  
Gainesville Regional Utilities  
P.O. Box 147117, Station A136  
Gainesville, Florida 32614

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

Dear Mr. Kamhoot:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

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## Public Service Commission

May 1, 2012

Ms. Mary Guyton Baker  
Electric System Planning  
JEA  
21 W. Church St., Tower 11  
Jacksonville, Florida 32202

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

Dear Ms. Gyton Baker:

Pursuant to the Commission’s authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

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## Public Service Commission

May 1, 2012

Mr. John Guiseppi  
System Planning Section  
Lakeland Electric  
501 E. Lemon St.  
Lakeland, Florida 33801

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

Dear Mr. Guiseppi:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

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Division of Regulatory Analysis

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## Public Service Commission

May 1, 2012

Mr. Brad Kushner  
Black and Veatch (Orlando Utilities Commission)  
11401 Lamar Ave.  
Overland Park, Kansas 66211

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

Dear Mr. Kushner:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

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## Public Service Commission

May 1, 2012

Mrs. Trudy Novak  
Senior Director, Bulk Power & Generation Planning  
Seminole Electric Cooperative  
16313 North Dale Mabry Highway  
Tampa, Florida 33831

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

Dear Mrs. Novak:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

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TALLAHASSEE, FL 32399-0850

## Public Service Commission

May 1, 2012

Mr. Paul Clark  
Planning Engineer  
City of Tallahassee  
400 E. Van Buren Street  
Tallahassee, Florida 32301

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

Dear Mr. Clark:

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TALLAHASSEE, FL 32399-0850

## Public Service Commission

May 1, 2012

Barry Moline  
Florida Municipal Electric Association  
P.O. Box 10114  
Tallahassee, Florida 32302-2114

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

Dear Mr. Moline:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

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Sincerely,

/s/ Benjamin Crawford

Benjamin Crawford  
Division of Regulatory Analysis

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STATE OF FLORIDA



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TALLAHASSEE, FL 32399-0850

## Public Service Commission

May 1, 2012

Bill Willingham  
Florida Electric Cooperatives Association  
2916 Apalachee Parkway  
Tallahassee, Florida 32301

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

Dear Mr. Willingham:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

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## Public Service Commission

May 1, 2012

Cheryl M. Martin  
Florida Public Utilities Company  
1641 Worthington Road, Suite 220  
West Palm Beach, FL 33409-6703

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

Dear Ms. Martin:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

In order to facilitate this study, 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 June 1, 2012. If you have any questions regarding this request, you may contact me at (850) 413-6598 (bcrawfor@psc.state.fl.us). Thank you for your assistance.

Sincerely,

/s/ Benjamin Crawford

Benjamin Crawford  
Division of Regulatory Analysis

Enclosure

cc: Office of the General Counsel (Murphy)  
Office of the Commission Clerk (Cole)

COMMISSIONERS:  
RONALD A. BRISÉ, CHAIRMAN  
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ART GRAHAM  
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JULIE I. BROWN

STATE OF FLORIDA



CAPITAL CIRCLE OFFICE CENTER  
2540 SHUMARD OAK BOULEVARD  
TALLAHASSEE, FL 32399-0850

## Public Service Commission

May 1, 2012

Mr. Ken Hoffman  
Director of Regulatory Relations  
Florida Power & Light  
215 S. Monroe, Suite 810  
Tallahassee, Florida 32301

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

Dear Mr. Hoffman:

Pursuant to the Commission's authority under Section 366.94(4), Florida Statutes, and Chapter 2012-117, Laws of Florida, the Commission is 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 is to report on the feasibility of using off-grid solar photovoltaic power as a source of electricity for the electric vehicle charging stations.

In order to facilitate this study, 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 June 1, 2012. If you have any questions regarding this request, you may contact me at (850) 413-6598 (bcrawfor@psc.state.fl.us). Thank you for your assistance.

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/s/ Benjamin Crawford

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