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May 24, 2012

VIA HAND DELIVERY

Ms. Ann Cole
Division of the Commission Clerk and
Administrative Services
Florida Public Service Commission
Betty Easley Conference Center
2540 Shumard Oak Boulevard, Room 110
Tallahassee, FL 32399-0850

RE: Docket No. 110031-EG; FPL's Annual Report on Residential Service Dynamic Price Response Pilot Rate

Dear Ms. Cole:

Enclosed are an original and five copies of Florida Power & Light Company's ("FPL's) Annual Report on its Residential Service Dynamic Price Response Pilot Rate approved by Order No. PSC-11-0257-TRF-EG.

If you have any questions or concerns please feel free to call me.

Sincerely,

Jessica A. Cano

Enclosure
cc: Keino Young

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APA
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Docket No. 110031-EG
Florida Power & Light Co.
Annual progress report: Residential Service Dynamic Price Response Pilot Project

The Residential Service Dynamic Price Response Pilot Project is part of FPL's Energy Smart Florida ("ESF") In-Home Technology Project ("the Project"). The purpose of the Project is to study the technical feasibility, customer acceptance and energy impacts of emerging smart-grid enabled consumer technologies and dynamic pricing. In part, the Project will help FPL study how smart meter-enabled dynamic pricing combined with real-time energy information and load reduction enablement impact peak load and energy use.

FPL is conducting the Project in fulfillment of its commitment to the U.S. Department of Energy ("DOE"), which is funding FPL's Energy Smart Florida initiative pursuant to the American Recovery and Reinvestment Act("ARRA"), which was awarded on March 30, 2010 (DE – OE0000211).

Since FPL is required to seek Commission approval of any new rates or tariff sheets, it received approval by the FPSC of the dynamic pricing pilot on May 24, 2011. As part of the approval, FPL was ordered to provide an annual report detailing information such as: customer response, attrition, conservation results and cost savings. This annual progress report summarizes pilot activity through April 30, 2012.

Enrollment Results

- Completed solicitation, enrollment and installations by September 1, 2011, as scheduled. Achieved 93% of Project participation goal, including 98% of pilot rate participation goal.
  - Planned participation was up to 500 customers, including 130 on pilot rate
  - Actual initial participation was 464 customers, including 127 on the pilot rate

Table 1: Planned and actual distribution of Project Participants by Technology and Rate

Technology / Rate	In-Home Displays (IHD)	Home Energy Controllers (HEC)	HEC and Smart Appliances
Standard Rate RS-1	Group 1 250 planned 226 actual	Group 2 120 planned 111 actual	N/A
Dynamic Price Response Pilot Rate RSDPR-1	N/A	Group 3 120 planned 117 actual	Group 4 10 planned 10 actual

Participating customers were enrolled in one of four Treatment Groups designed to test the effect of a specific "treatment" or new technology and / or rate:

- Group 1: FPL provided 226 customers with in-home displays ("IHDs") providing real-time energy use information. These customers will remain on the standard RS-1 residential rate;

- Group 2: FPL provided 111 customers with Home Energy Controllers ("HECs") which allow customers to monitor their home's energy usage and cost, as well as monitor the energy use of selected appliances or schedule their operation. These customers will remain on the standard RS-1 residential rate;
- Group 3: FPL provided 117 customers with HECs that notify customers of dynamic price events and enable selected appliances to respond in a programmatic manner to dynamic price signals. These customers will take service pursuant to the Residential Service Dynamic Price Response (RSDPR-1) pilot rate; and
- Group 4: FPL provided 10 customers with HECs as well as one or more Smart Appliances, which can conserve energy and reduce load in innovative ways. These customers will take service pursuant to the RSDPR-1 pilot rate. This group is a qualitative technology demonstration, and is not suitable for quantitative analysis due to its small size.
- Control Group (not shown): The Project uses a Control group of 379 homes for comparison. Control group homes are on FPL's standard rate RS-1, and do not receive any technology.

Customer Response

- Customers were solicited by direct mail, with follow up by outbound phone call and in some cases reminder post cards and email. For Group 3, two direct mail appeals were required. Customer response to solicitation varied by technology group, with response rates declining with the increasing complexity of the offer.
    - A total of 600 customers responded to solicitation, an overall response rate of 4.5%
        - Group 1, In-home display on RS-1: 7.9%
        - Group 2, Home energy controller on RS-1: 3.8%
        - Group 3, Home energy controllers on pilot rate: 1.8% after one mailing, which increased to a total of 2.9% after a second mailing
- From the 600 customers who responded to solicitation, 464 were successfully installed
    - 570 / 95% of respondents met participation qualifications
    - 480 / 85% of qualified respondents elected to enroll
    - 464 / 96% of enrolled respondents were successfully installed
    - The first ten customers to respond to, and qualify for, the pilot rate were also offered one or more smart appliances. All ten accepted, and 33 smart appliances were installed.

Attrition

- A total of 17 participants (3.7%) have dropped out. Participants who drop out are not replaced. Details of attrition, by Group, follow:

    - Group 1: In-home displays on RS-1
        - While in-home display users do not need to contact FPL to drop out, as the device can simply be unplugged, two of 226 (0.9%) did contact FPL to drop out; one could not keep the display connected to the meter, and the other moved. Periodic communications tests of connectivity between the in-home displays and the FPL smart meter indicate that as of April 2012, approximately half of in-home displays may no longer be in use. The next survey, to be conducted in May 2012, will ask users for their main reason for discontinuing use of the display.

- Group 2: Home Energy Controllers on RS-1
  - Nine of 111 (8.1%) have dropped out. Reasons include:
    - 4 were not satisfied with the technology
    - 1 installed a new air conditioner, and used the thermostat which came with the new system
    - 1 was evicted from their home
    - 1 felt their home was not as cool with the home energy controller
    - 1 removed the home energy controller's thermostat when it stopped working
    - 1 moved

- Group 3: Home Energy Controllers on pilot rate RSDPR-1
  - Six of 117 (5.1%) have dropped out. Reasons include:
    - 2 dropped out before being converted to the RSDPR-1 rate, as spouses did not like the home energy controller
    - 1 dropped out as a result of dynamic pricing event 4, held 1/4/12, citing that he used space heaters (which are not controlled by the pilot technology) and was not aware of the event until after it had passed
    - 1 moved out
    - 1 removed the home energy controller's thermostat when their air conditioner stopped working
    - 1 rented their home out

- Group 4: Home Energy Controllers and Smart Appliances on pilot rate RSDPR-1
  - Zero of 10 (0%) have dropped out

Preliminary Conservation and Cost Savings Results

Methodology

- Control and Treatment group pre-treatment load profiles, demographic and appliance stock characteristics were compared to identify any pre-existing differences. After controlling for pre-existing differences and normalizing for weather, each Treatment group is compared to the Control group using a differences-in-differences regression model which identifies energy usage change and load shifting due to the treatments.

Preliminary Energy and Demand Impacts

- Interim energy usage analysis shows no statistically significant energy conservation (i.e. kWh reduction) for Groups 1, 2 or 3, excluding RSDPR-1 critical peak price (CPP) event days for Group 3. It can be stated with 95% statistical confidence that no difference in energy use exists for Groups 1, 2 or 3 when compared to the Control group for the treatment period February 2011 – January 2012.
  - Group 1, In-home displays on RS-1: decrease of 0.7% (not significant)
  - Group 2, Home energy controller on RS-1: increase of 1.5% (not significant)
  - Group 3, Home energy controllers on pilot rate: decrease of 4.7% (not significant)

- Conducted 6 CPP events, with the most recent on April 17, 2012.
  - Interim analysis of Group 3's demand (i.e. kW) reduction during CPP events includes five events:

- Two September events from 3 to 7pm reduced load an average of 15.4%
- One October event from 10am to 2pm reduced load by 12.4%
- Two winter events (January, February) from 6 to 9am reduced load an average of 35%

- Group 4, Home energy controllers and Smart Appliances on the pilot rate, is a qualitative technology demonstration, and not suitable for quantitative analysis due to its small size. In-depth, qualitative interviews with participants in this Group provided detailed observations which are discussed in the next section.

Preliminary Cost Savings from Dynamic Rate RSDPR-1 Compared to RS-1

- After an average of eight bills on RSDPR-1:
  - Excluding any changes in kWh usage, 90% of RSDPR-1 pilot rate participants are saving money relative to what they would have paid on FPL's standard rate, RS-1.
  - Impacts on bill amounts range from savings of 5.5% to losses of 1%.
    - Average of all participants is a savings of 2.1%.
    - Among the 90% who are saving, the average pilot to date total savings is $39.98
    - Among the 10% who are not saving, the average pilot to date total increase is $2.58
    - RSDPR-1 is designed to be revenue neutral for an average customer over 12 months of participation. We note that non-savers have below average kWh consumption (836 kWh per month vs. 1,571 for savers) and have been on RSDPR-1 for slightly less time (7.7 billing periods vs. 7.9 for savers).
  - In April, pilot rate participants were notified by letter of their pilot-to-date savings or loss. Those with losses were also provided with strategies for achieving savings during the remaining pilot period.

Customer Surveys Performed

- All Project participants were surveyed at enrollment to collect comparative socio-demographic and appliance stock information.
- Control Group homes were solicited to complete the same survey of socio-demographic and appliance stock characteristics which Project participants complete at enrollment. Survey results assist in identifying any pre-existing difference between Control and Participant groups. 100 Control Group homeowners completed the survey.
- Upon completion of installation, Project participants were given an opportunity to report their satisfaction with the enrollment and installation process, and 96% rated their satisfaction with Overall Quality of Installation as an 8, 9 or 10 on a scale of 10.
- Non-pilot rate participants were surveyed twice, in July and November 2011.
- Pilot rate participants were surveyed after three CPP events, in November 2011.
- The majority of smart appliance participants on the pilot rate were also interviewed in-depth, in their homes, in November 2011.

Preliminary Findings from Customer Surveys

- Interest in in-home displays declines over time as some users refer to the display less frequently and others unplug the device altogether.
- 80% of Home Energy Controller users report programming their new thermostat to match their schedule, doubling their self-reported pre-pilot thermostat programming rate.

Thermostat programming was neither encouraged nor discouraged in the pilot.

- Pilot rate participants were surveyed in November, after three CPP events: 69% of participants report noticing at least one CPP event. Of those noticing events:
    - 88% report not feeling inconvenienced by the events
    - 33% report lowering (overriding) their thermostat during at least one event
- Qualitative findings from in-depth, in-home interviews with Group 4 revealed that:
    - A dedicated display which makes real-time information available at a glance creates awareness and gives participants a feeling of control and empowerment, i.e. creates an option to act, but not an obligation.
    - The most-used display is the digital cost of current usage, as dollars displayed in digits requires no visual or conceptual interpretation. The concept of electrical demand, expressed in kW, is too abstract.
    - When participants glance at a high number, some act, but most changes are minor, like turning lights off. Only a few act consistently.
    - Color displays are helpful in conveying price tiers.
    - About half of smart appliance users notice CPP events, and none report they needed to over-ride appliances during events.

Other Preliminary Observations

- Home Area Networking is developmental. Technology and products used in the Program are first generation. The communication protocol used, Smart Energy Protocol 1.0, is non-specific and subject to variation in implementation making interoperability between products difficult to achieve. Extensive testing and refinement was required to enable in-home technologies to communicate with specific smart meters and with other in-home network components.
- In-home energy display installation and customer orientation takes less than 30 minutes.
- Home energy controller installation is complex, can take several hours and requires installers to possess diverse technical skills: the power wiring skill of an electrician, the control wiring skill of an air conditioning technician, the wireless networking skills of an information technology technician.
- Successful installation also requires customer education. Installers provided customers with an orientation in use of their new technology, including an information kit and refrigerator magnet displaying a toll-free support phone number. Pilot rate participants also received a personal orientation from an FPL employee to explain the pilot rate and what to expect during CPP events.
- Home energy controllers are maintenance intensive. Since deployment was completed, technical service site visits have been made to an average of 5.8% of homes monthly. The majority of site visits are to restore wireless network connections either between in-home components or to the smart meter.

Remaining Activities

- Data collection will continue through 8/31/12
- Additional CPP events and customer surveys will be performed
- Analysis will be performed, and a final report submitted April 30, 2013

Program Expenditures

The Project and dynamic pricing pilot are part of FPL's Energy Smart Florida smart grid initiative, and are fully funded by a U.S. Department of Energy (DOE) grant, pursuant to the American Recovery and Reinvestment Act (ARRA) which was awarded on March 30, 2010 (DE – OE0000211). FPL's $200 million award was the maximum allowed by DOE under ARRA. Up to $3.1 million of the $200 million award is budgeted for the In-home technology program and dynamic pricing pilot.

Acknowledgement & Disclaimer
This material is based upon work supported by the Department of Energy under Award Number DE-OE0000211.