



MEMORANDUM

EUGENE WATER & ELECTRIC BOARD



TO: Commissioners Mital, Simpson, Brown, Helgeson and Manning
FROM: Erin Erben, Power & Strategic Planning Manager
Monica Shovlin, Public Affairs Supervisor
Mark Tuffo, Project Manager
DATE: September 25, 2015
SUBJECT: R&D Pilot Programs Semi-Annual Summary
OBJECTIVE: Information Only

Issue

The purpose of this semi-annual memorandum is to provide updates on research & development (R&D) programs, including load management pilots being undertaken by a cross-departmental team of EWEB staff. This summary includes activities from Q2 and Q3 2015. The next update will be provided in Q2 2016 for activities from Q4 2015 to end of Q1 2016.

Background

Staff continues to research an array of energy efficiency and demand response programs as directed in EWEB's updated IERP and strategic plan. The proposed programs are also intended to better position EWEB to assist customers with bill saving opportunities in the future. Appendix 1 summarizes current status by pilot program.

Discussion

Following are updates on active pilots:

Residential Time-of-Use (R-TOU) / "Power Hours Pricing Study"

The implementation of the Residential Time-of-Use (R-TOU) Rate pilot, also known as the Power Hours Pricing Study, remains the primary focus of EWEB's R&D team. This pilot is the first investigation of the effects of pricing signals within the residential sector and their ability to change customer behavior. The project team has completed customer recruitment and installation of the TOU meters as of June 30, 2015, and the study is officially underway. The team continues to focus on quality assurance, customer service and communication as we approach the change of schedule to winter hours on November 1st.

A total of 451 TOU meters have been installed, including 226 customer-volunteers who were randomly assigned to begin on the Power Hours Pricing plan at the time of meter installation (the "treatment" group); the other 225 customer volunteers will begin on the new pricing plan in summer 2016 (the "control" group) per the "recruit and delay" protocol recommended in the study design commissioned from the Electric Power Research Institute (EPRI). Recruitment incentives have been distributed to customers who signed their research agreements within two business days. Incentives included Unique Eugene gift certificates redeemable at a variety of local merchants, one iPad Air grand prize drawing

and five emergency preparedness kits via a drawing of customers who declined to participate in the study, but agreed to take a short “decliner” survey to help us understand obstacles to participation.

A communications plan is in place to engage those customer-volunteers who are on the pricing plan and encourage them to “shift and save.” Tactics include a closed Facebook Group where customers and EWEB administrators can share tips and tricks to shift and/or reduce electric consumption, as well as a quarterly e-newsletter.

Two half-time Customer Service Analysts are temporarily assigned to provide support for the study. In addition to a dedicated phone line and email address, the CSAs access an in-house database to record customer interactions and address concerns. For example, CSAs can use the database to perform a “Shadow Bill” calculation – a comparison of the cost of their electricity use on the Power Hours Pricing plan versus the standard tiered residential rate – in addressing high bill concerns from customers. CSAs also may point out or remind participants about the Best Bill Guarantee to retain customer-volunteers.

The database also stores interval meter data for load research. Meter Shop technicians continue to download the interval data every 60 days at customers’ homes.

The first evaluation report, focused on the planning phase of the Study will be published in Q4 2015. The team is currently preparing data for summer impact analysis by EPRI and wrapping up analysis of the recruitment process. In addition, team members are documenting lessons learned and applying them to continuously improve processes in real time. Lessons learned from the recruitment process include:

- Need for customer communication to emphasize the importance of direct meter access for EWEB staff, which is heightened by the hands-on process of interval data download;
- The realities of manual meter data management and importance of applying Validation, Estimation and Editing (VEE) rules with tight tolerances (similar to that of an automated Meter Data Management system) when processing energy usage data, while also avoiding excessive error log entries and false errors;
- Need for flexible & adaptable internal processes and procedures – and interdepartmental collaboration – to accommodate customer service and billing control issues in real time (such as customer move-outs on short notice).

Grid Edge Demonstration Project (in development)

Going forward, the R&D team is interested in focusing the last part of this IERP initiative on microgrid and storage technology, to see where it might make sense as a future investment strategy for EWEB. Currently, EWEB is working to secure grant funding for a Grid Edge Demonstration Project that will test renewable energy storage optimization methods to support community resiliency and disaster recovery of critical facilities including electricity, water and communications. EWEB will act as the lead organization, most likely in partnership with another local entity. The grant is being offered by the Oregon Department of Energy and will be administered by Sandia National Lab.

This project can be viewed strategically as a platform to integrate customer or utility-owed distributed generation while providing multiple value streams such as community resiliency/Disaster recovery¹ and

¹ The Natural Hazard Mitigation Plan and the Vulnerability Assessment that was completed by the Cities of Eugene and Springfield can be found here: <http://www.eugene-or.gov/emergencyplans>.

ancillary grid services. In the event of a disaster (earthquake², flood, fire, etc.), having multiple local stand-alone renewable power supplies is critical for long term (multi-week to multi-month) sustainability. It is anticipated that the Cascadia subduction zone earthquake could result in a loss of BPA intertie and other critical services for weeks to months. EWEB is looking at our ability to harden background generation infrastructure through the use of local, strategically located microgrid solutions.

The basic project elements include: three critical community infrastructure sites, covering key services such as water, power and communications.

Current Draft Plan for Grant Proposal:

Photovoltaics (PV)	<ul style="list-style-type: none"> • 75 kW; Existing PV system installed at the Roosevelt Operations Center (ROC) • 50 kW; New PV system added to support telecommunication and water pumping station site (Blanton Heights)
Energy Storage - Battery	<ul style="list-style-type: none"> • 150 kW / 300 KWh (Li-ion) at ROC for electric utility resiliency • 125 kW/ 250 kWh (Li-ion) at Blanton for water and communications resiliency
Inverter based Interconnection	Building level / 480 V / advanced inverter technology
Software/communication	Control logic and reporting – TBD (Green Energy Corp)

The basic project will explore EWEB’s ability to leverage this infrastructure, whose primary purpose would be disaster recover, by extracting additional value streams once installed, including:

- Storing solar energy from an existing PV system
- Peak shifting – daily shift to reduced monthly demand portion of electric bill
- Demand Response
- Power quality improvements (Volt/Var control)
- Frequency control (Primary frequency response, regulation, load following/ramping, and spinning reserve)
- Resiliency – “Black start” capability
- Disaster Preparedness – able to sustain basic level of self-supplied energy indefinitely
- Grid ancillary services – voltage support, regulation services, peak capacity, demand response.

The planned duration of the project is through December 2017. EWEB is preparing a grant proposal for \$295,000 in ODOE co-funding of the project. Proposals are due in October 2015.

Requested Board Action

No action is required from the Board at this time. For additional questions or comments, please contact Erin Erben at (541)685-7615 or erin.erben@eweb.org.

²Cascadia Earthquake covered by the New Yorker: <http://www.newyorker.com/magazine/2015/07/20/the-really-big-one>

Appendix 1: Active Research & Development Pilot Programs Status

	Residential Time-of-Use ("Power Hours Pricing Study")	Grid Edge Demonstration Project
		
Current Stage	Year one of pilot underway	Under development
Implementation	Recruitment and meter installation are 100% complete. 451 randomly assigned to 226 on TOU pricing plan and 225 to start in about 12 months.	Preparing grant proposals for renewable energy storage optimization project.
Evaluation	First evaluation report, focused on the planning and recruitment phase, to be published in Q4 2015. Also prepping summer usage data for EPRI impact analysis by Q1 2016.	Draft evaluation plan in Q4 2015, if funding secured.
External	Continued ongoing collaboration with EPRI on pilot design and evaluation.	Green Energy Corp and Oregon Department of Energy.
Hypothesis & Findings	Determine how TOU participants can benefit from peak shifting strategies.	Test renewable energy storage optimization including operation and control of PV and battery storage to provide community resiliency/disaster recovery for critical facilities.
Eligible Population and/or Unit Savings	100% of the 78,000 residential customers would be eligible for a residential TOU rate. Unit savings to be determined in Evaluation phase. Participation in the pilot is voluntary.	EWEB customers would benefit from peak shifting, demand response; Customers, occupants/visitors of Eugene, other public service agencies would benefit from resiliency/disaster recovery of critical services.