

Energy Wise Rewards™



Implementing Direct Load Control: Lessons from the Field

Presented by: Susan Marinelli November 15, 2019

Demand Side Management







Types of Demand Response for Grid/Customer Needs





Policy Drivers of Demand Response Programs

Capacity Deferral	 Delaying investments in new generation capacity to meet reserve requirements 			
Improved Reliability	 Developing curtailment capability to address short- term/emergency supply shortfalls 			
Deferral of T&D Upgrades	• Delaying investment in specific, localized substations and feeders using DR as a demand side resource			
Operational Cost Savings (Economic Dispatch)	 Reduction of system operating costs through fewer starts of peaking units, reduced need for spinning reserve from generators, and economic dispatch of DR resources 			
Integration of Intermittent Renewable Resources	 A possible alternative to new generation or a more economical way to provide ancillary services 			
Regulatory requirements	 Commission rulings to have ESPs fund and operate DR programs or achieve DR curtailment goals 			



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Types of Demand Response Programs

- Dispatchable call or control or bid in advance
 - Wholesale market directed economic programs
 - Wholesale market directed reliability programs
 - Direct Load Control, e.g., automatic appliance shut-off
 - Interruptible Rates, i.e., lower rates for directed reductions
- Non-Dispatchable / Price-Responsive Demand = pre-set
 - Critical Peak Pricing scheduled
 - Peak Time Rebate built into a rate
 - Time-Of-Use Pricing annual scheduled
 - Dynamic Pricing all of the above





Manage Load through multiple types of DR







Demand Response Evolution









Energy Wise Rewards Program Evolution

- 2008: EmPOWER MD
- 2009: Launched the Energy Wise Rewards direct load control program with company-installed one-way (paging) webprogrammable thermostats and outdoor switches
- 2013: Launched critical peak pricing program, Peak Energy Savings Credit
- 2015: Expanded customer choice by offering two-way (Wi-Fi) communicating thermostats
- 2017: Explored a targeted demand response pilot
- 2019: Expanded customer choice to include mass-market smart thermostats and to enroll in DR and Thermostat Optimization
- 2020: Continue to expand smart thermostat options
- 2020+: Evolve with changing communication protocols



Energy Wise Rewards – District of Columbia

- Peak-energy management program
- Choose a device
 - Energy Wise Rewards Wi-Fi or paging programmable thermostat
 - Outdoor switch
- Choose a cycling level 50%, 75%, 100%
- Participate in Peak Savings Days weekdays, 12-8 p.m., June through September
- Receive bill credits based on selected cycling level









Energy Wise Rewards – Maryland

- Choose a device or "bring your own device"
 - Opt for an Energy Wise Rewards device
 - Enroll your ecobee, Honeywell, or Emerson smart thermostat in Energy Wise Rewards* and Thermostat Optimization

*Nest smart thermostat can enroll in Spring 2020

- Receive day-ahead notices via email, phone call, or text to reduce energy use
- Participate in Peak Savings Days weekdays, 12-8 p.m., June through September
 - Take steps to reduce energy use 1.
 - 2. Automatically cycle your central air conditioner through Energy Wise Rewards
- Receive bill credits based on cycling level and amount of energy saved (\$1.25 per kilowatt-hour)







Peak Energy Savings Credit – for Individually Metered Pepco Maryland, and Delmarva Power Maryland and Delaware Customers

- Customers earn a bill credit when they reduce electricity use below their 30-day baseline on Peak Savings Days
- No enrollment needed
- Customers receive a phone call, text, or email the day before a Peak Savings Day with specific hours to save energy
- Delaware customers receive a bill credit of \$1.25 for every kilowatt hour (kWh) reduced below a 30-day baseline
- Maryland customers receive their guaranteed EWR credit plus the amount of the PESC credit that exceeds the EWR credit



Targeted Capabilities

- Topography mapping all active devices to:
 - Substation
 - Circuit



- Called in time of need
 - Construction, Emergencies, Switching
 - June 2017 DC; June 2018 MD; July 2019 DC
- Future consideration to offset infrastructure investments
 - Pilots?



Thermostat Optimization Program (EE)

- A cloud-based add-on offered at no additional cost to the participant that allows eligible smart thermostat(s) to make intelligent adjustments customized to each customer's home.
- The algorithm is designed to save small amounts of energy each day, which can add up to big savings.
- The goal a hands-off approach to saving energy without sacrificing comfort.



Virtual Energy Assessments through Device Data





Energy Wise Rewards Customer Incentives

Location	Cycling Option	Installation Credit per device	Annual Reward Credit per device	Total Rewards First 12 Months per device	
	50%	\$40	Works with	\$40	
Residential	75%	\$60	Peak Energy Saving Credit:	\$60	
Delaware	100%	\$80	\$1.25 per kilowatt-hour of electricity reduced	\$80	
	50%	\$30	\$30 (\$6 monthly)	\$60	
	75%	\$45	\$45 (\$9 monthly)	\$90	
Residential	100%	\$60	\$60 (\$12 monthly)	\$120	
DC					
Residential	50%	\$40	\$40 (\$8 monthly)	\$80	
Residential	75%	\$60	\$60 (\$12 monthly)	\$120	
Maryland	100%	\$80	\$80 (\$16 monthly)	\$160	
BYOD	50%	N/A	\$40 (8 monthly) \$40		
Maryland					
Small Commercial	50%	\$80	\$80 (\$16 monthly)	\$160	
Maryland					
Residential	50%	\$50	N/A	\$50	
NJ				pmp	

Energy Wise Rewards Program Results



of goal achieved, with 38,869 active

devices participating in the Energy Wise Rewards Program

141

active devices participating in the Bring Your Own Device (BYOD) Program

or 140 active devices participating in the Residential BYOD DLC Program also participated in the TOP Program

2,961

active devices participating in the Small Commercial Demand Response Program



Energy Wise Rewards Program Results



Stars of Dynamic Efficiency Award 2019



The Alliance to Save Energy presented Pepco Holdings with the Stars of Dynamic Efficiency Award 2019

Pepco and Delmarva Power received the award for demand-side management programs that leverage smart thermostats to help customers save energy during periods of peak energy usage.

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EV Charging as a Demand Response Tool



Baltimore Avenue Connected Communities: Smart Roundtable

Presented by: Jason Tucker, P.E. November 15, 2019



Plug-In Vehicle Adoption is Expected to Significantly Increase Across PHI's Service Territory

- Maryland and New Jersey are both Zero-Emission Vehicle (ZEV) States in PHI's service territory
 - 330,000 ZEV by 2025 (NJ)
 - 300,000 ZEV by 2025 (MD)
- Considerations of EV Charging Grid Impacts
 - Vehicle charging will increase residential electricity consumption (kW-h) by at least 1/3 for each vehicle¹



Co-location/clustering of EV chargers could have a significant grid impact if not managed effectively



PHI is Implementing a Comprehensive Plug-In Vehicle Infrastructure Program in Maryland (EVSmart)

- Pepco and Delmarva Power are Implementing a Comprehensive Plug-in Vehicle (PIV) Infrastructure in Program
- Residential
 - 1,000 Rebates for L2 EVSE's
 - 137 Discounted Installations for L2 EVSE's (Managed Charging Program)
- Non-Residential
 - 250 Discounted Installations for L2 EVSE's
- Public
 - 350 Utility Owned and Operated L2 and DCFC





Pepco's Previous EV Charging Demand Response Program in Maryland

- Pepco Piloted a Residential Charging Demand Response Program in 2014/2015
- Most customers charged at night when rates were lower
- Seven (7) DR Events over the course of the pilot
 - 7 events; 3 chargers in-use
 - 1 customer opted out of event

Pepco's Pilot provided evidence that passive incentives (i.e. TOU rates) and active managed charging events can have an impact on customer behavior

PHI Pilot Demand Response Events

Table 7-1

Summary of the demand response events.

Date	Time	Number of meter that received the DR event signal	Number of people charging during the event	Number Opted Out	Number of customers with reduced load
8/27/2014	2:00 p.m6:00 p.m.	9	2	1	1
9/2/2014	2:00 p.m6:00 p.m.	9			
7/21/2015	2:00 p.m6:00 p.m.	8			
8/3/2015	2:00 p.m6:00 p.m.	8	1		1
8/17/2015	2:00 p.m6:00 p.m.	9			
9/9/2015	2:00 p.m6:00 p.m.	10			
9/25/2015	2:00 p.m3:00 p.m.	11			



The EVSmart Program will Provide Additional Insight Into Customer EV Charging Behaviors

- Pepco's EVSmart Program is addressing PIV charging load in two ways
 - Passive
 - Development of rate structures to encourage off peak PIV charging
 - EV Only TOU Rate
 - Active
 - 137 Residential customers enrolled in "managed charging" program as condition of discounted installation incentive
- Utilizing "smart" charger to initiative events to reduce system demand
 - Reduce output of charger by 50%





Managed Charging in Practice – Multiple Customers on Same Transformer Adopt EV's

Neighborhood Energy Use w/o Managed Charging



If left unmanaged, EV charging in clusters could negatively impact Pepco's distribution equipment during peak load hours



Managed Charging Programs Can Help Reduce the Peak Load and Shift Load to Off-Peak Times



Managed Charging Programs allow Pepco to spread the EV charging load over a longer period and reduce system peaks



Thank you, and keep in touch!

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