

PGE Smart Grid Testbed

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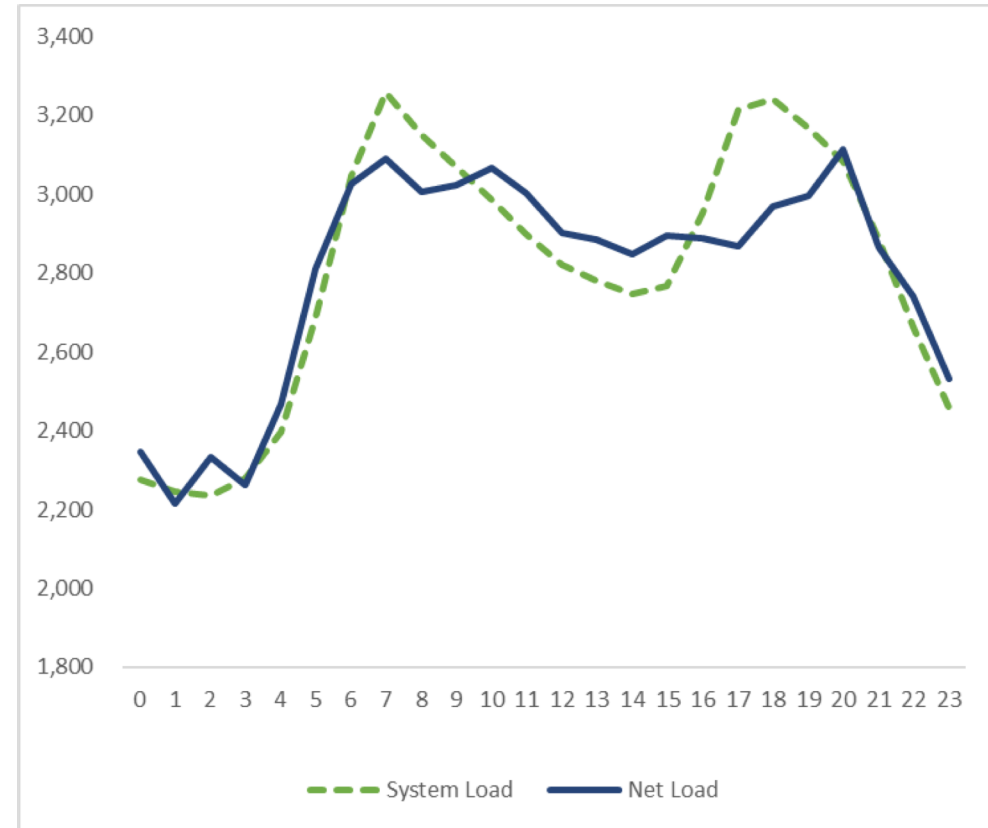
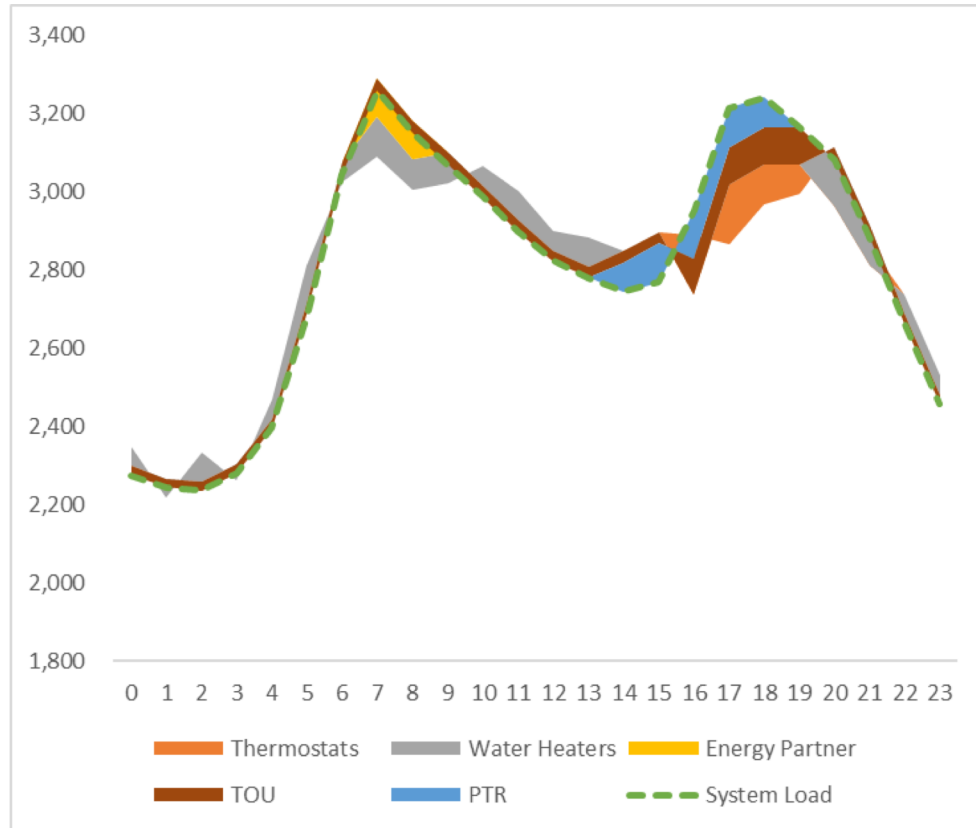
Northwest Energy Coalition, Clean & Affordable Energy Conference

December 2, 2019



Shaping Flexible Load

Portfolio Dispatch of Demand Response



PGE Smart Grid Testbed

Program Description



Timeline and Budget

- Order 17-386 (DRRC)
- \$5.9M, 2.5 year Program
- 66% Participation to achieve 3-5 MW

Characteristics and Timeline

- Residential: ~ 19,000 – opt-out PTR
- Business: ~ 2,300 – New Program offerings
- Three Community Relations Managers embedded

Research Objectives

- Identify sustainable DR/DER customer value proposition.
- Accelerate the DR/DER pilot to program cycle.
- Collect data to inform maximum technical DR potential.

Customer Value Propositions



Monetary
Q4 2019



Giving Back
Q1 2020



Carbon
Q3 2020



Giving Back V2
Q4 2020



Community
Q2 2021



Renewables
Q2 2021

	Smart Grid Testbed Phase 1																														
	Q3 - 2019			Q4 - 2019			Q1 - 2020			Q2 - 2020			Q3 - 2020			Q4 - 2020			Q1 - 2021			Q2 - 2021			Q2 - 2021			Q2 - 2021			
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
DR Event Seasons	Summer						Winter						Summer						Winter						Summer						
Customer Value Propositions				Financial			Giving Back						Carbon						Giving Back+						Renewables						
EV Charging/TOU Pilot	500 Customer TOU Incentive Overlay Pilot																														
DER Capacity Value Analysis	SGTB Demo																														
Load Dissaggregation				Demo Phase			Ramp-Up Phase																								
Bring your own Device Pilot	~150 Customer Device *Agnostic Pilot																														
Phase 2 Transition																	Internal Strategy			DRRC Review						OPUC Proposal					

Test Bed Substations

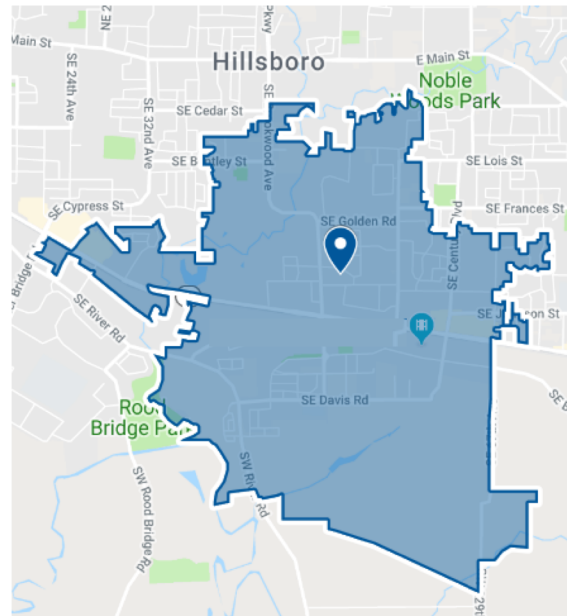
A Representative Sample of Customers



Delaware



Roseway



Island



Building Towards SGTB Phase II

DR/DER Product Roadmap



Existing Products

- Peak-Time Rebate
- Time-of-Day
- Smart Thermostats (Direct Install and BYOT)
- Multifamily Water Heater (Switch/Smart Resistance)
- Electric Avenue

Under Development

- Device agnostic home aggregation pilot
- Electric Vehicle Service Equipment (EVSE)
- Energy Storage (PGE-Owned and BYOD)

Planned Products

- Smart Inverters for Distributed Solar PV
- Distributed Solar plus Storage
- Large Energy Storage (Institutional, Large Industrial, and Substation)