Distributed Energy Resources

Lee Hall

October 2017

Distributed Energy Resources (DER) Team Scope

Demand Response

- Structured DR development at BPA over the past 5 years
- Pilots and Demonstrations

Distributed Generation

- Solar task force, solar interconnection, and site selection.
- Tested end-customer co-gen in two demonstrations.

Energy Storage

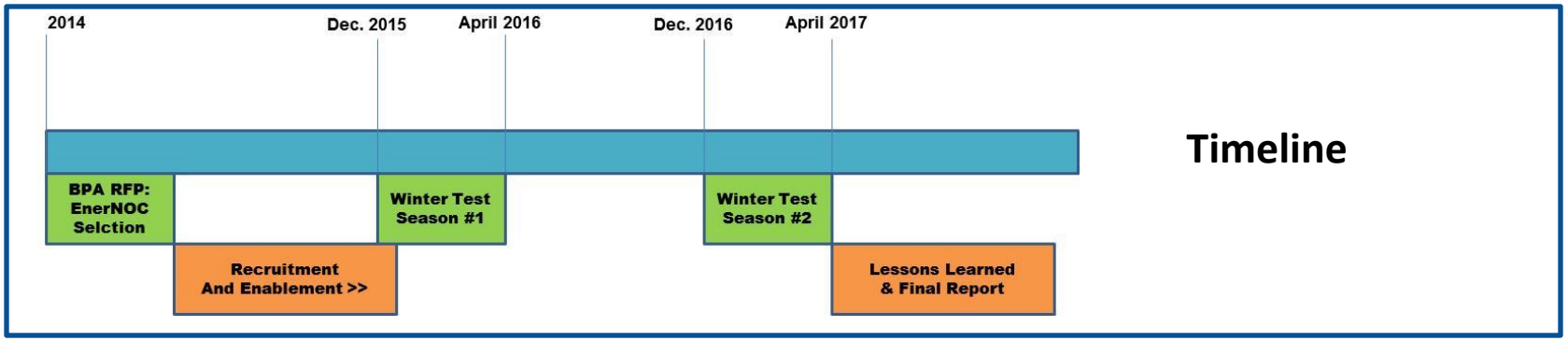
- Emerging nationally as a competitive resource.
- BPA has done successful small scale testing.
- Cross agency battery task force formed to address BPA/customer storage policies and issues.

BPA DR Demonstration Portfolio

Demonstration Overview				Product			
Entity	Status	MW	Timing	Balancing Reserves	Winter Peak Shave	Power Multi-use	Transmission Non-Wires
City of Port Angeles	Complete	30*	2013- 2014	■			
Energy Northwest	Complete	35	2014 - 2016	■			
EnerNOC	Complete	17**	2015 - April 2017		■		
Energy Northwest	Complete	36	Summer 2017			■	
South of Allston - DSM	In Progress	46	2017 - 2018				■
	Total Portfolio	164					

* 30 MW delivered in light load hours. 15 MW delivered in heavy load hours.
** Nippon Paper shut down for the 2017 year in January 2017.

Enernoc Winter DR Demonstration: Timeline and Parameters

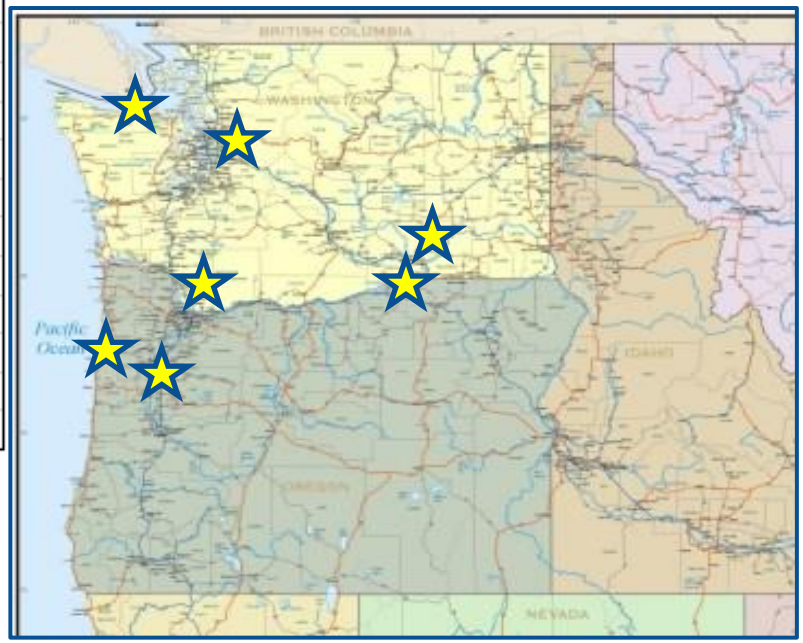


Requirement for Load Participants

Parameter	Requirement
Months available	December 1 – April 30
Product Hours	0700-1000 and 1700-2000 PT
Maximum Duration (hours)	3
Consecutive Days Available	3
Minimum Advance Notice	20 minutes (changed to 60 minutes in Sept 2015)
Maximum Events Per Day	2
Maximum Hours Per Year	120
Recharge Period (hours)	6
Performance Data	One minute interval data available near real time to BPA.
Eligible Asset Types	Demand Response, Battery Storage, and Demand Voltage Reduction.

Enernoc Winter Demo Participants

Participating Location	Serving Utility
Great Western Corp	Central Lincoln Electric
Nippon Paper Industries	City of Port Angeles
Andersen Dairy	Clark Public Utilities
Andersen Plastics	Clark Public Utilities
City of Vancouver Ellsworth Station Booster Pump House 1	Clark Public Utilities
City of Vancouver Water Station 14, 3	Clark Public Utilities
Kizer Farms	Consumers Power Inc
Kenyon Zero Storage Inc	Franklin County PUD
Zen Noh Hay	Franklin County PUD
Alderwood WWTP	Snohomish PUD
City of Edmonds - WWTP	Snohomish PUD
Clearview Pump Station	Snohomish PUD
Evergreen Pump Station	Snohomish PUD
Hardeson Substation Battery	Snohomish PUD
King County Wastewater Treatment Plant - Everett	Snohomish PUD
Water Filtration Plant - Monroe	Snohomish PUD
Cascade Specialties	Umatilla Electric Cooperative
Pacific Ethanol - Boardman	Umatilla Electric Cooperative
Port of Morrow Warehousing	Umatilla Electric Cooperative



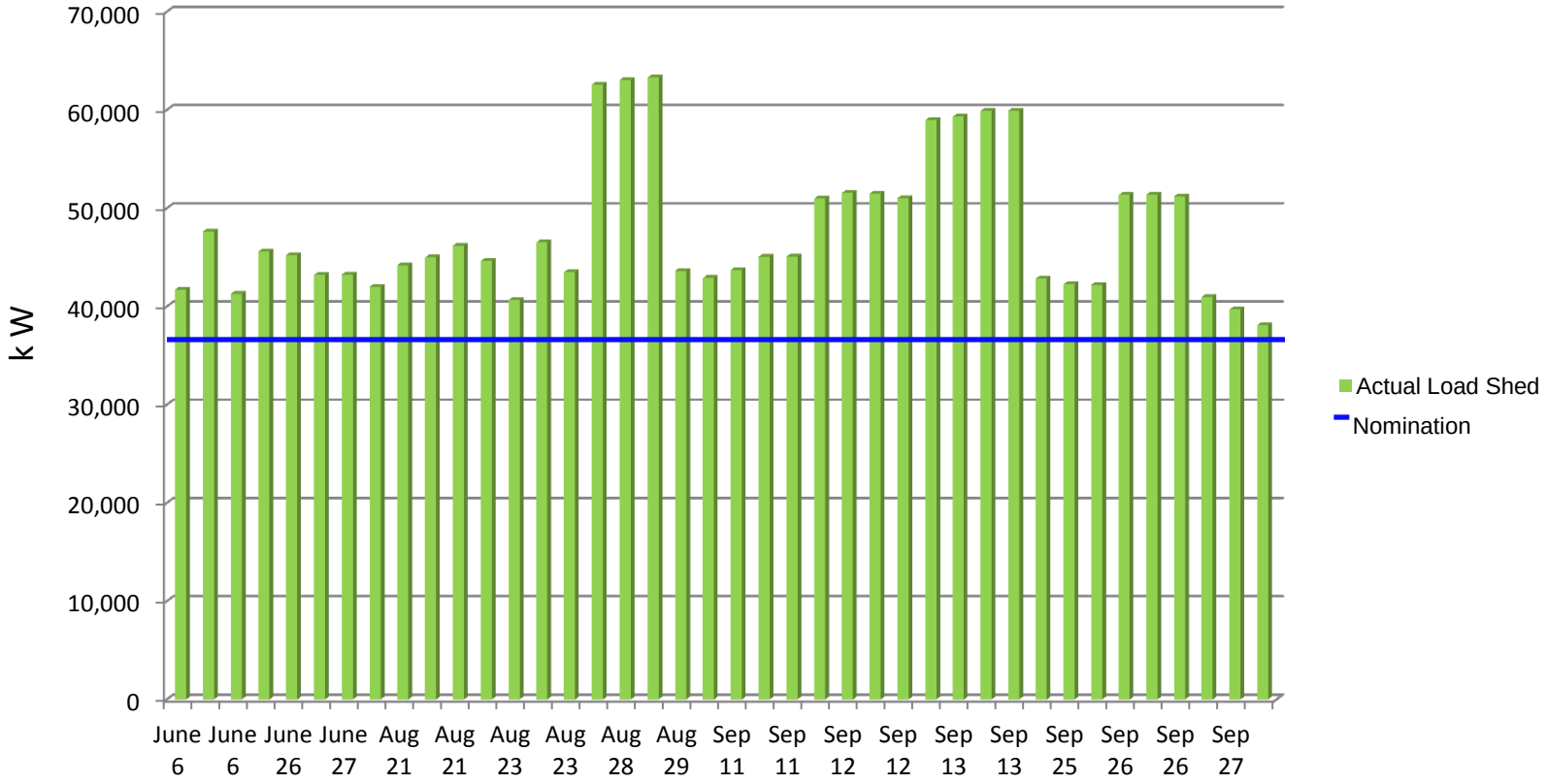
Summer Demonstration Participants

DER	Type	DER Committed Load Reduction (kW)
Cowlitz PUD – NORPAC facility	Load Reduction	27,880
Ferry County PUD	Demand Voltage Reduction	0
City of Richland	Demand Voltage Reduction	1,500
Eugene Water & Electric Board – University of Oregon Steam Plant	Distributed Energy Resource	5,500
Columbia River PUD	Demand Voltage Reduction	500
City of Milton-Freewater	Demand Voltage Reduction	340
City of Milton-Freewater	Direct Load Control Hot Water Heaters	240
	Total Committed Load Reduction (kW)	35,960

Program Participation Requirements

Demonstration Period	Notification	Availability	Duration	Frequency	Maximum Hours Dispatched in Demonstration	Qualifying Assets	Quantity
June 1st through September 30th.	30 minutes.	1300-2000 M-F during summer season.	Minimum of 1 hour, up to 4 hours.	Once per day, up to 3 consecutive days.	40 hours. Dispatch of 90% of these hours will be guaranteed for this demonstration.	• Located in BPA's BA • Load Reduction, Batteries, Dispatchable Voltage Reduction (DVR), Distributed Generation (excluding back-up diesel gen).	Up to 50MW.

40 for 40: Stellar Demonstration Performance



BPA's Progression through Demonstrations

2012	2017
Contract Model: Uncertain	Pro forma Contract developed by Long Term Power Planning
Lacked Reliability Data	150+ Events. Very reliable results (95%+).
No Operational Model	Events Being Dispatched by Operations. Tagging in place.
No IT	Two types of control software systems (DRMS) tested.
Small scale pilots (kw)	128 MW of C&I loads tested.
Unformed measurement strategy	M&V protocols in place.
Unclear Acquisition model	Key models tested – Utility, Private and Public Aggregation.

DER Team – What we have accomplished

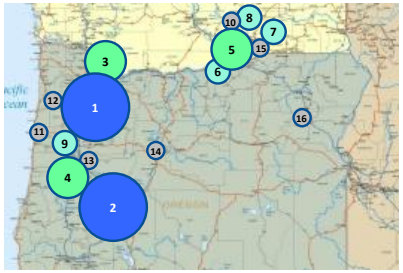
- **In the Country:** Developed strong relationships with Distributed Energy Resources experts across the nation.

- **In the Region:** Facilitated Customer Utility Interest, Education and Networking in the field of Demand Response. Fostered development of DR assets (industrial, commercial, agriculture, municipal, voltage control) working with BPA's customer utilities.

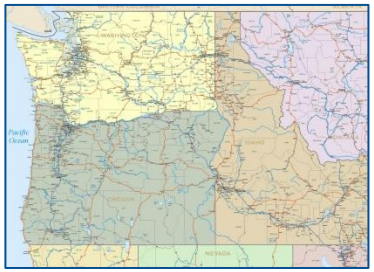
- **In BPA:** Expedited interest, product development and led a strategic "One BPA" focus regarding the risks and opportunities related to Distributed Energy Resources.

- **In the DER Team:** Maintained the flexibility necessary to align our strategic focus with the current and future needs of BPA business lines in a rapidly changing industry. Adapted to changing needs and priorities.

2017 – 2018 Priorities for DER team include Identifying and Assisting the Sourcing of DER as a Cost Effective and Reliable Resource for BPA



Non-Wires. **Continue work with Transmission to build demand side resources in area's where need has been identified, including DR and Storage.**



Regional DER Potential Study. **Thorough study of the costs & potential MW of DER, to support the Power Council and the 7th Plan, and the needs of BPA's Power Resource Program, Transmission Planning organization and the Integrated Demand Side Management Initiative.**

Solar Taskforce & Storage Working Group.
Cross-agency teams with DER team co-leadership to integrate these resources. 2500MW in BPA solar queue. Batteries costs decreasing – expected to compete in future BPA Requests for Offers.

Other Priorities

- National DER **Benchmarking.**
- DER as part of **BPA integrated strategy** - Resource Team, and Integrated Planning Management Team.
- Cross-agency DER **economic valuation** task force.
- **Outreach** – Efficiency Exchange, and Utility cross-share on DER.

What will be available to Utilities – soon!

- **Utility DER Cross Share** – Pasco, Nov 7-8 (hosted by BPA); first results from Regional DER Potential Study + sharing lessons and learning between utilities
- Cross-nation Utility **DER Benchmarking** Results -- December 2017
- **Regional DER Potential Study** Results (Cadmus) – DR and DER potential in BPA Service Territory + Barriers to DR adoption – February 2018
- **DR Demonstration Reports for Enernoc and Energy Northwest**-- December 2017
- Opportunity to participate in **Council's DR Advisory Committee** (DRAC) – which is working on DR recommendations in the Eighth Power Plan. Next meeting is Dec 6, 2017 in Portland or via the Web.

What are utilities considering in DER and how can BPA help?

Lee Hall
503-230-5189
ljhall@bpa.gov