Non-Wires Contingency Planning for Potential I-5 Delay

Transmission Customer Forum 41

Objectives

- Briefly discuss the proposed I-5 Project
- Discuss non-wires measures being assessed for the potential delay of the I-5 Project
- Share status of other agency initiatives for demand response
- Discuss next steps

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What is the I-5 Project?

- The proposed I-5 Corridor Reinforcement Project (I-5 Project) includes construction of a new 500 kV line approximately 79 miles in length to connect two new proposed substations near Castle Rock and Troutdale.
- BPA's analysis indicates the line would need to be energized to avoid the risk of overloads on two critical transmission paths along the I-5 Corridor during summer peak-load conditions.
- Without the project, summer peak load in the region could create conditions in which an outage on the high voltage lines along I-5 could damage the parallel lower voltage lines.
  - This damage could raise the risk of voltage collapse and curtailed power delivery to loads in the Portland, OR and Vancouver, WA areas.
- BPA expects to release the final Environmental Impact Statement in late 2015, followed by a Record of Decision in 2016.
- Planning, permitting, and constructing a transmission project of this size requires considerable lead time.

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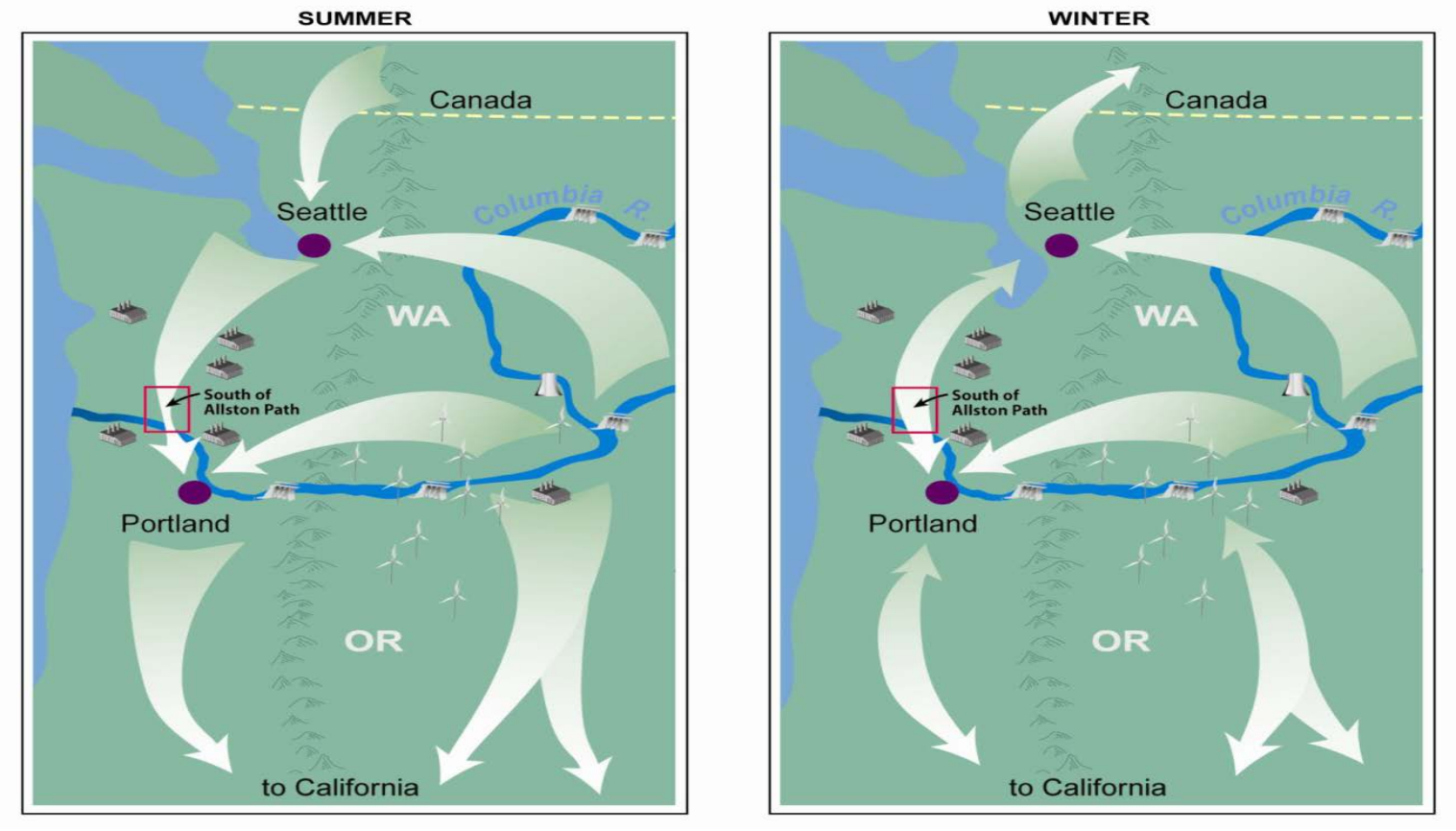
Power Flow Congestion Map

In the summer, power use is concentrated in the SW and California, which causes power to primarily flow from north-to-south. The north-to-south capacity available in summer on the South of Allston (SOA) path is about half of the system capacity in winter from east-to-west. This creates a bottleneck during summer peak demand periods.



Source: I-5 Corridor Reinforcement Project Draft EIS November 2012, Chapter 1, Page 5

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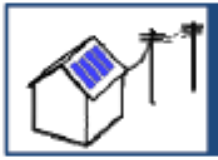
What Are Non-Wires?

	Energy Efficiency	improvements that result in the ability to use less energy to provide end-use customers with the same (or a better) level of service in an economically efficient way
	Demand Response	changes in electric usage by end-use customers from their normal consumption patterns in response to changes in the price of electricity over time or to incentive payments
	Utility-scale Generation	relatively large generators that connect to the grid at the transmission (high voltage) level
	**Distributed Generation**	small generation systems located at a customer site
	Energy Storage	technologies that allow electricity generated at one time to be used at another time
	Smart Grid	technologies that enable a more efficient use of the electric power grid through computer-based remote control and automation

Source: "A Wires Report on Market Resource Alternatives: An Examination of New Technologies in the Electric Transmission Planning Process" by London Economics International. Pg11

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Background on Non-Wires Analysis for I-5

- In 2011, BPA hired Energy and Environmental Economics (E3) to produce a screening study of non-wires alternatives to evaluate whether it would be possible to defer the proposed I-5 Project through a combination of energy efficiency, demand response, and generation redispatch.
- Deferral benefits were identified and BPA has been working toward pursuing a portfolio of non-wire measures to address overloads on the critical transmission lines along the I-5 Corridor.
- In 2013, BPA formed a contingency planning team to study whether these non-wire measures could provide effective relief in the area of the transmission system of most need.
- BPA is studying how redispatch of generation can be paired with cost-effective local demand response, distributed standby generation, and possibly energy efficiency non-wires measures.

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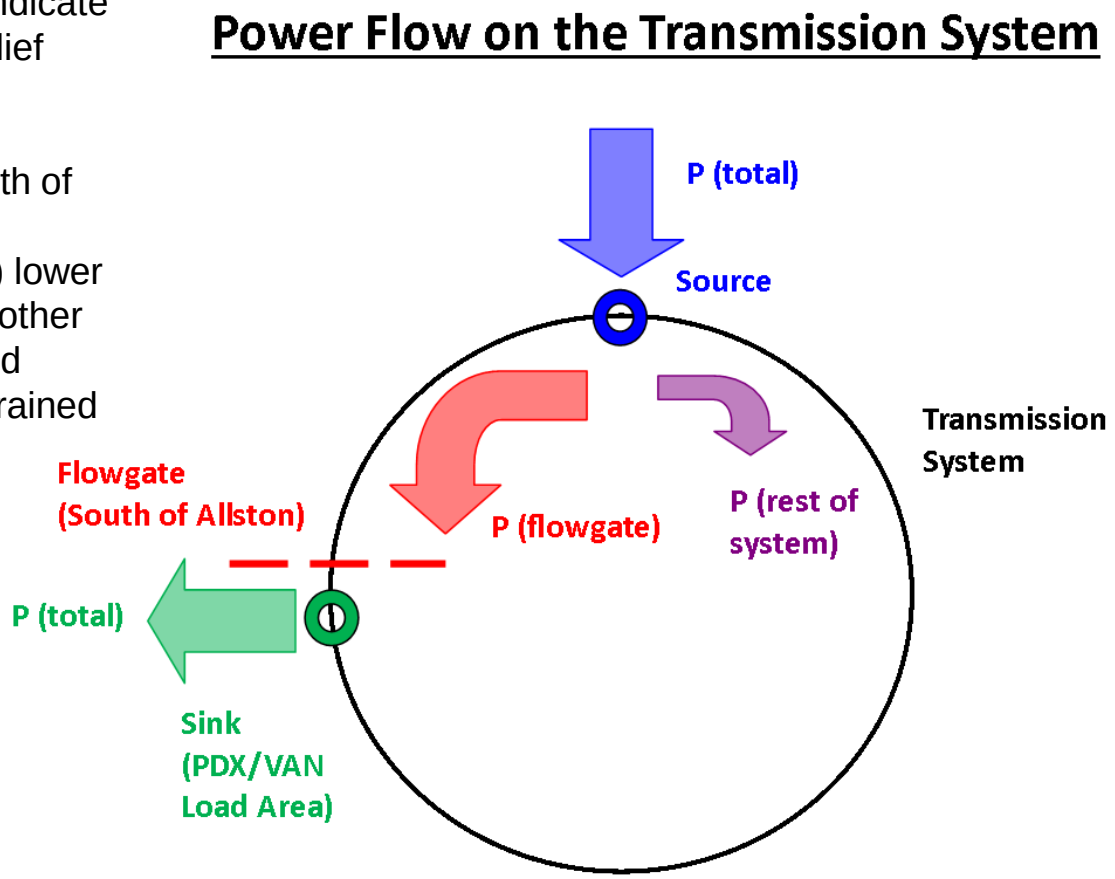
How Does Power Flow?

Study engineers indicate that congestion relief can be obtained if certain generators (located to the north of the constrained transmission path) lower their output and if other generators (located south of the constrained path) ramp up generation.



P (total) = P (flowgate) + P (rest of system)

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What is the Status of Non-Wires?

- BPA executed a two-year contract with an Aggregator of Demand Response in February 2015. This is the first non-wires measure in association with the I-5 Project over the next two summers.
- BPA is exploring how energy efficiency measures can be secured to reduce load in the targeted geographical area with a combination of residential, commercial and industrial programs.
- BPA is assessing distributed standby generation in the greater Portland area available for dispatch within ten minutes notice. Similar to demand response, distributed standby generation would be paired with generation redispatch for effective congestion relief.
- BPA is also exploring another targeted pilot (similar to the reliability redispatch pilot) of how redispatch of federal and non federal generation on opposite sides of the constrained path can provide relief when needed.
- BPA is also evaluating how to minimize the risk of triggering remedial action schemes on the SOA path to reduce power flow and avoid overloading the lines that remain in service if an event occurs.

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Why Are We Pursuing Non-Wires?

- BPA has operational concerns that exist today and continue into the foreseeable future.
- Failure to have a reliable backup plan to mitigate vulnerabilities in BPA's transmission system could lead to reduced power deliveries that compromise the ability of the system to serve loads.
- BPA needs a prudent strategy to mitigate this risk with portfolio of non- wires measures that fit the need, are cost-effective and are proven to be dependable and reliable.
- Our strategy is to start small with low dollar investments that provide high value. This approach allows us to learn how best to develop and apply new products, systems, and processes to a complex need on fewer dollars ahead of critical need.

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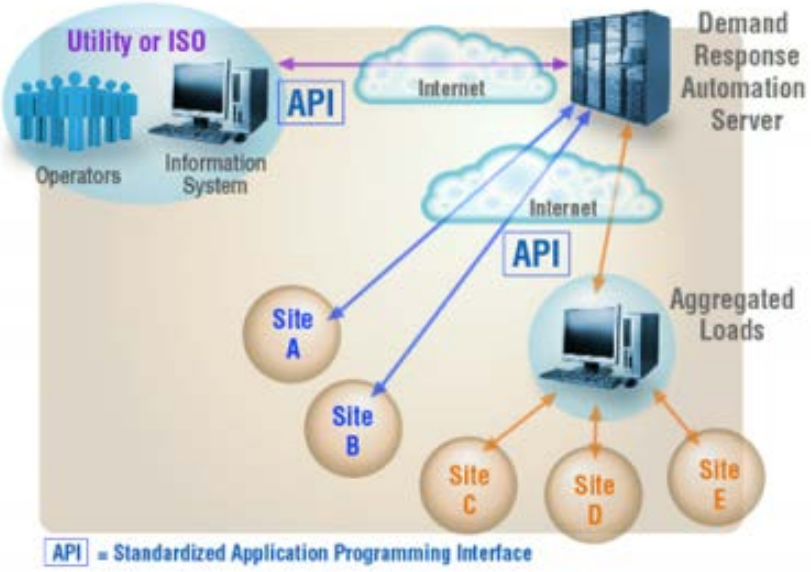
What Systems Are Needed For DR?

BPA is testing a Demand Response Management System (DRMS) software that lives on a server or in the cloud and communicates with multiple demand response sites or programs via internet or cellular. This software will enable BPA to:

- Connect to multiple DR loads served by utilities, direct service loads, and/or aggregators
- View current load of available DR assets
- Automate the dispatch of DR events
- Notify DR participants of an event and/or other programmatic message
- Monitor, measure, and validate load movement
- And more: advanced systems offer DR optimization algorithms and settlement functionality



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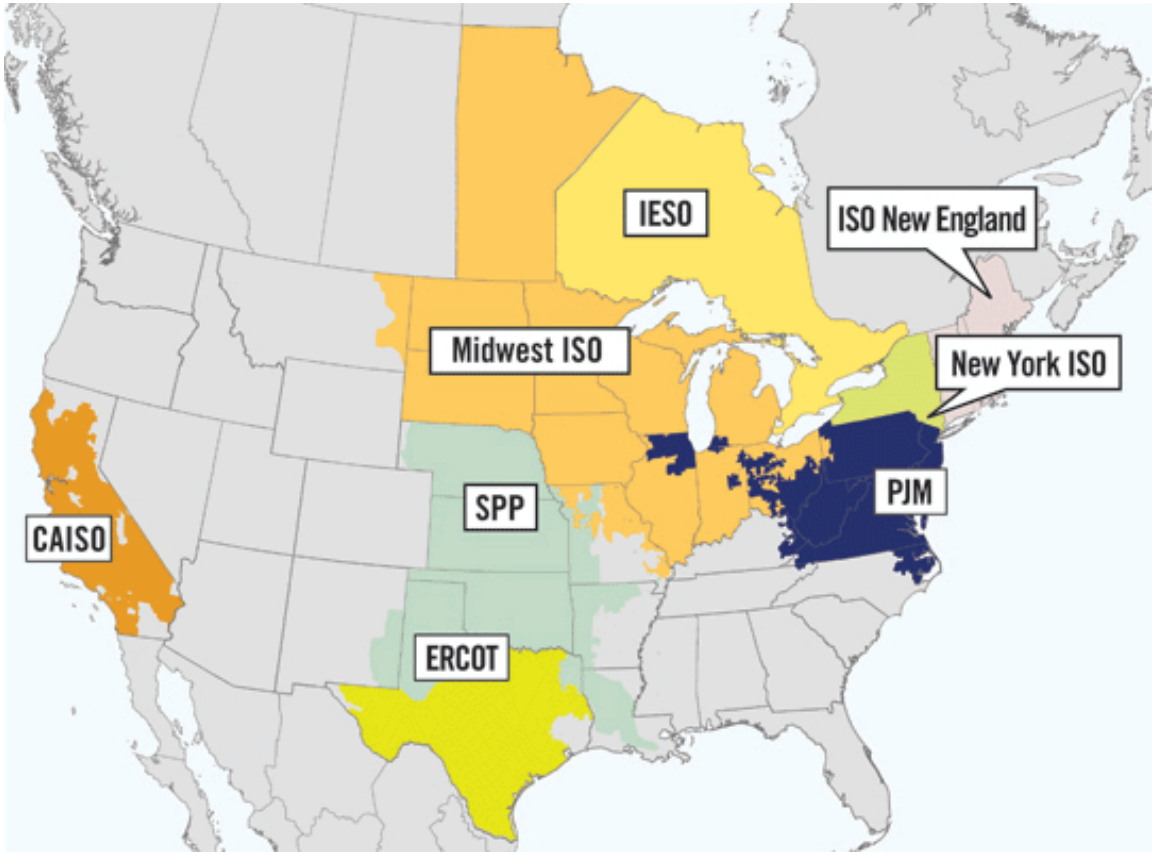
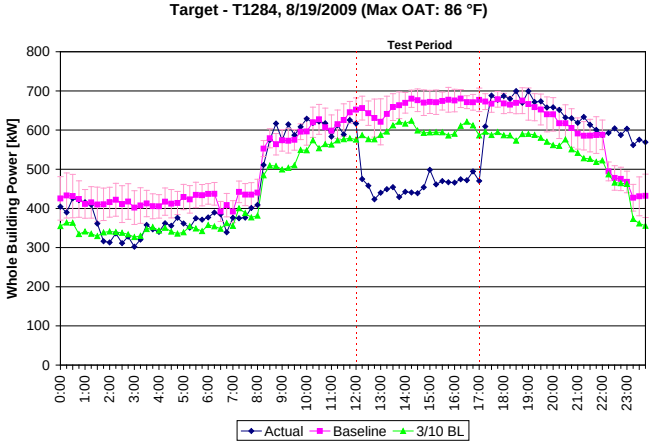
Demand Response Across The U.S.





DR programs across U.S. are approaching 10% of peak!

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In 2013-14 BPA Began the Larger Scale DR Demonstration Process

Entity	Size	Funder	Product Tested
City of Port Angeles	**30 MW**	**Technology Innovation**	✓ **Imbalance Capacity**
Energy Northwest	**35 MW**	**Power and Transmission**	✓ **Imbalance Capacity**
EnerNOC	**13 -25 MW**	**Power and Transmission**	✓ **Winter Peak Shave** ✓ **Summer Congestion (South of Allston)**

Why? The need to test all aspects to bring demand resources into BPA operations including systems and measurement, deployment, assess customer reception, test reliability, scheduling process, accounting & payment and to prepare the organization for a new discipline.

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Next Steps

- BPA is prioritizing “Integrated Demand Side Management” as a high priority area of strategic focus for the agency.
- BPA may explore a Request for Proposal (RFP) to secure additional non- wire measures.
- BPA will go through an Integrated Program Review (IPR) for the upcoming FY18-19 Rate Case to establish a budget to fund non-wires development and demonstration ahead of operational need.
- BPA is benchmarking other DR programs to identify best practices and seek opportunities to save costs and keep rates as low as possible.

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More Information

- Contact your Account Executive or:

Sarah Arison
I-5 Non-Wires Project Manager
skarison@bpa.gov
360-619-6781

John Wellschlager
Acting Manager, Smart Grid & Demand Response
jdwellschlager@bpa.gov
503-230-5944

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