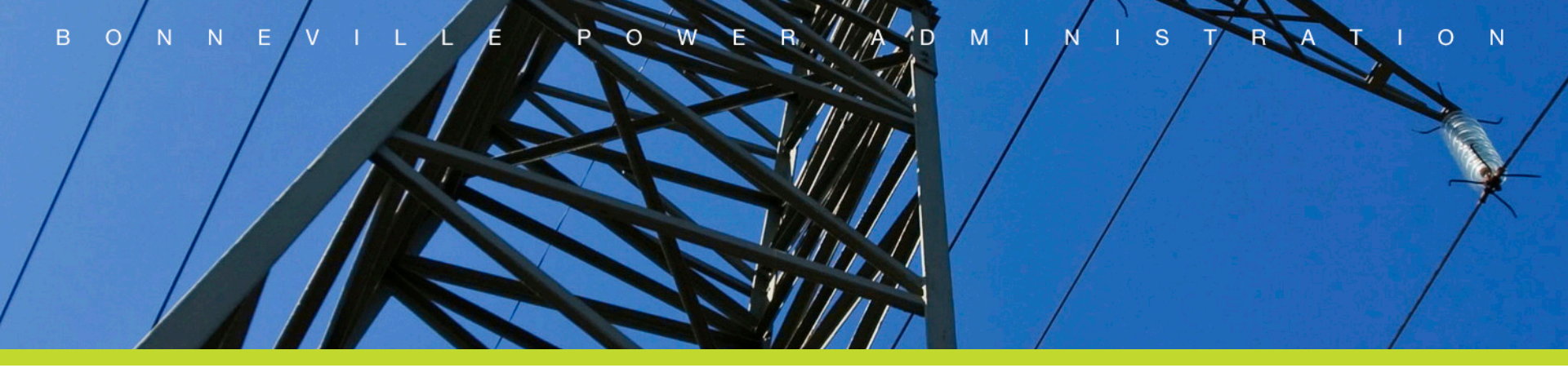


Non-Wires Pilot for South of Allston

December 6th, 2017

Agenda

- Pilot Refresher
- SOA Non-Wires Pilot objectives
- Forecasting Tool
- Preliminary findings for first year of operation with SOA Non-Wires Pilot
- Budget, Usage and Costs
- Expectations for second year of operation with SOA Non-Wires Pilot based on learning to-date

Pilot Refresher

- One of many work streams underway to reduce flows
- BPA acquired two years of incremental and decremental capacity and energy (deployed with day ahead notice) to reduce flows on SOA flowgate during summer peak periods
- Annual transmission budget to fund pilot program is $5M/year.
- Non-wires portfolio chosen is balanced with roughly 200 MW of incremental capacity and 200 MW of decremental capacity
- Pilot runs weekdays only and deployed as a portfolio in four hour blocks, late afternoon through evening, for up to 40 hours per year
- Third-party suppliers were notified of need to dispatch on a pre-schedule day-ahead basis
- An event notice was posted on OASIS for each event

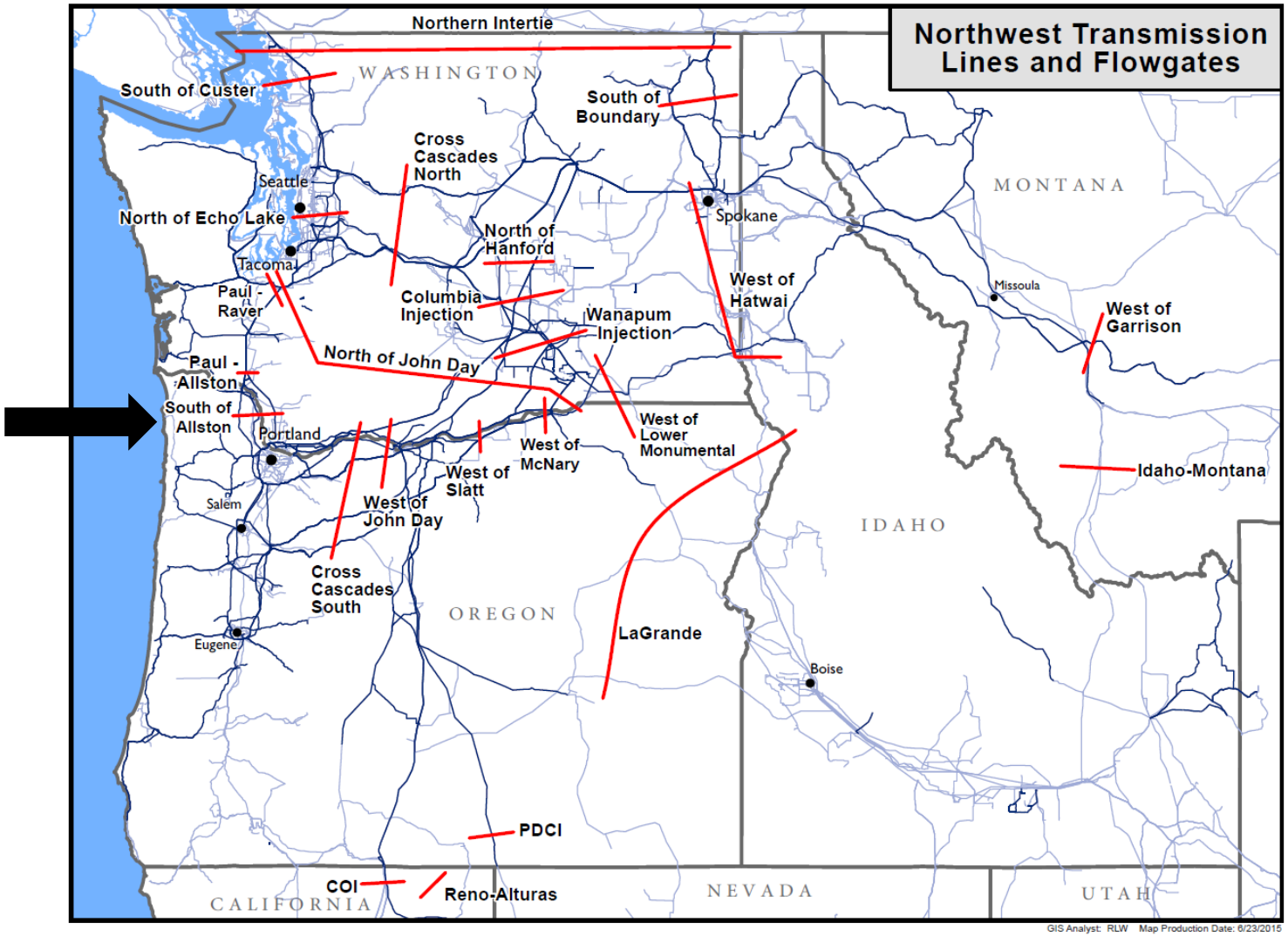
Pilot is designed to reduce flows prior to a contingency on the system

Pilot Objectives

1. Secure a non-wires portfolio to reduce flows on SOA flowgate during summer peak periods
2. Measure and validate post-event data to determine amount of flow reduction
3. Leverage learning to inform future non-wires program design choices

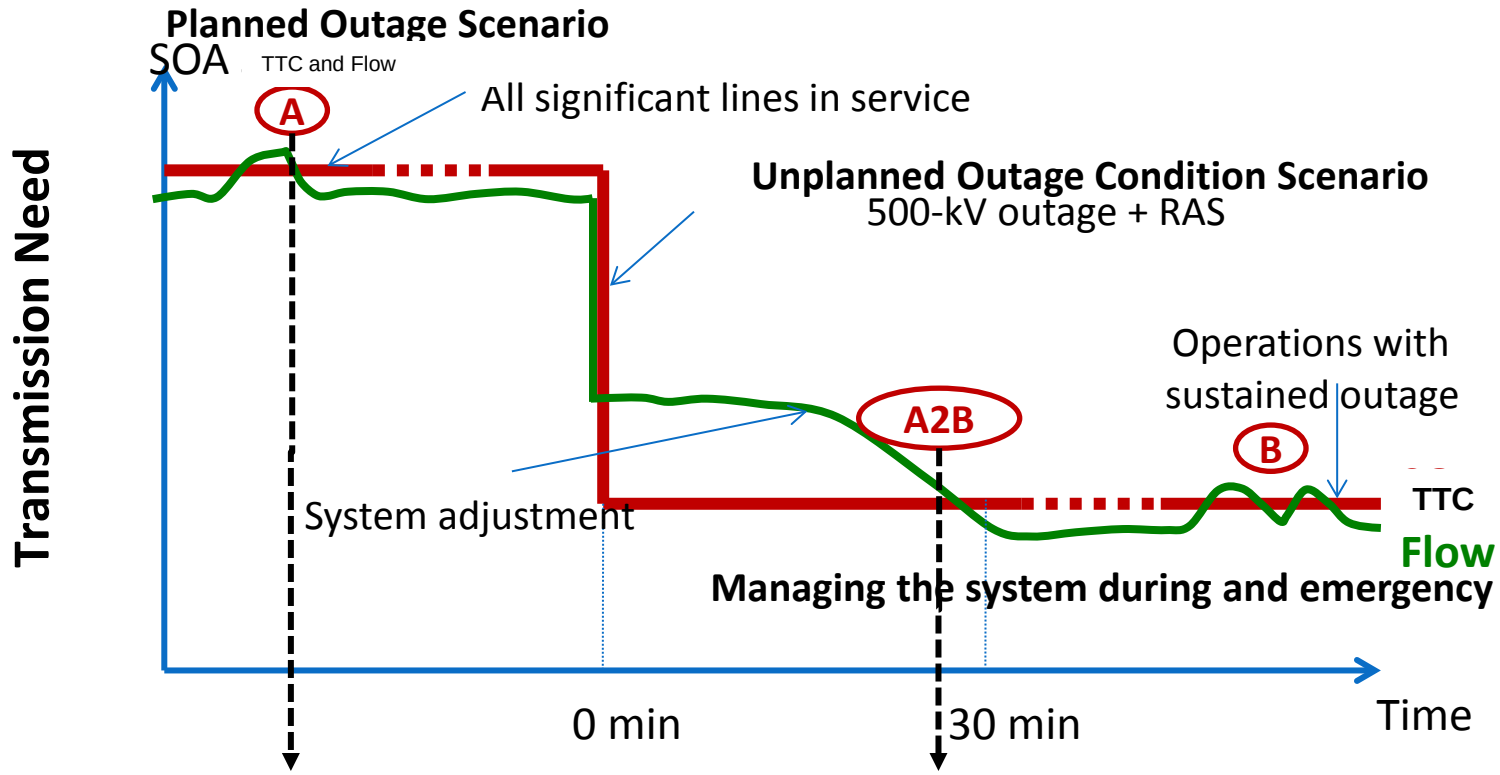
BPA expects to meet all pilot objectives by end of next calendar year

Map of PNW Transmission Paths



Map of flow gates highlighting SOA used by operations to monitor Portland metro area

Scope of SOA Non-Wires Pilot RFO

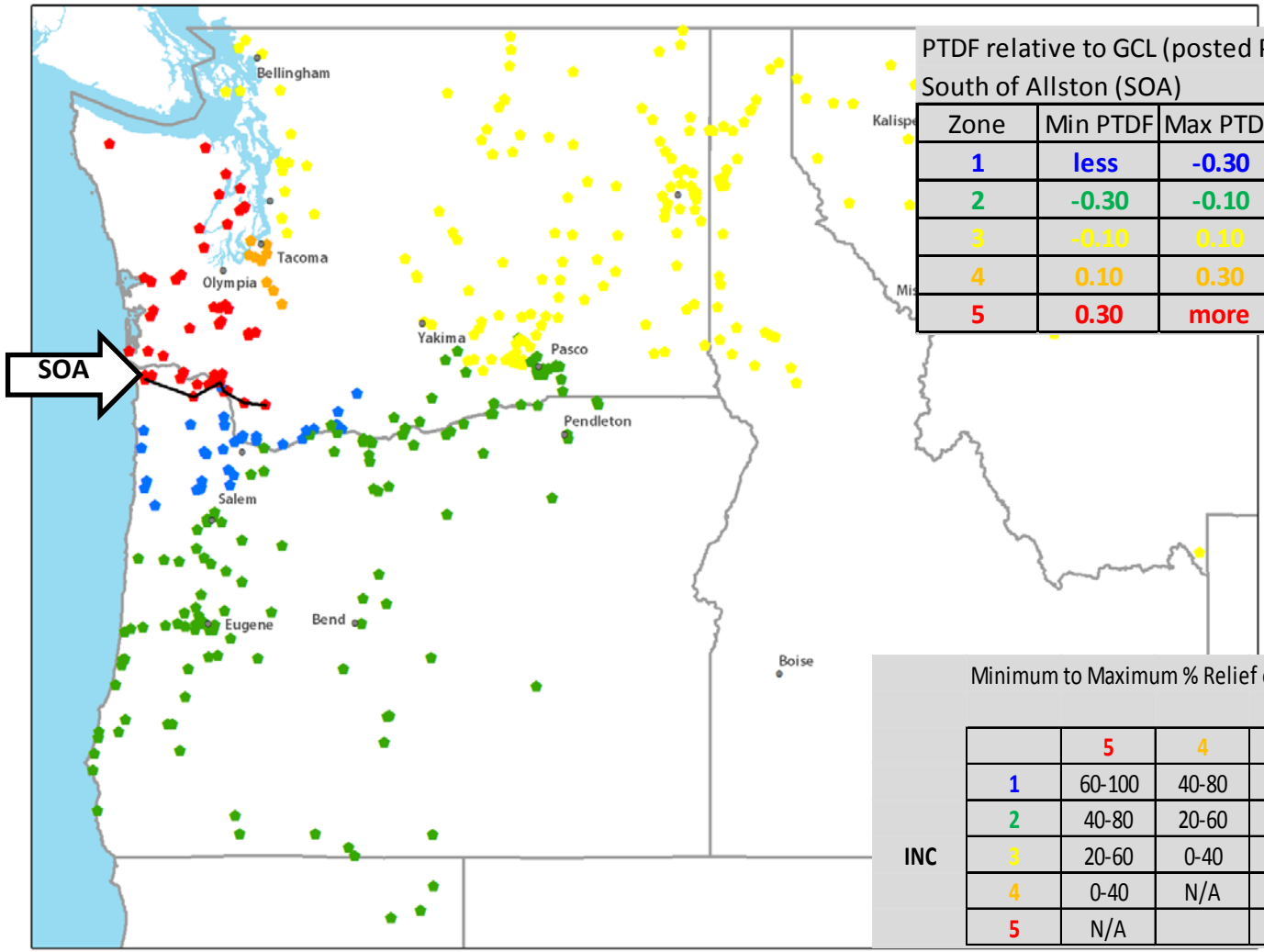


Non-Wires

Non-Outage (A)	Outage (A2B)
Day Ahead Notice Incremental capacity, Decremental capacity, DSM/Demand Response	**Within Hour notice** used to manage the transmission system post contingency. This is outside of the scope of BPA's SOA Pilot**.**

Scope of RFO on "A problem" to mitigate high flow risk (preventative, pre-contingency focus)

Congestion Map



PTDF relative to GCL (posted PTDFs)
South of Allston (SOA)

Zone	Min PTDF	Max PTDF	INC/DEC
1	less	-0.30	Best INC
2	-0.30	-0.10	Good INC
3	-0.10	0.10	Potential INC or DEC
4	0.10	0.30	Good DEC
5	0.30	more	Best DEC

Minimum to Maximum % Relief on SOA by INC and DEC Zone

		DEC				
		5	4	3	2	1
INC	1	60-100	40-80	20-60	0-40	N/A
	2	40-80	20-60	0-40	N/A	
	3	20-60	0-40	N/A		
	4	0-40	N/A			
	5	N/A				

This map was created by BPA for prospective bidders to respond to BPA's RFO seeking non-wires

Forecasting Tool

- Internal trigger tool generates daily peak flow forecast on SOA flowgate
  - Indicates when to deploy pilot based on next day's forecasted flow relative to forecasted TTC
- Utilizes historical data from June through September dating back to 2012. Statistical method is ridge regression model. Predictor variables in the model:
  - Portland area Load Forecasts
  - California Load Forecasts
  - Generation forecasts of generators located near the SOA flowgate
  - BPA total wind generation forecasts
  - Lower Columbia river hydro generation forecasts (i.e., BON, TDA, JDA, MCN)
  - Total Transmission Capacity (TTC) from OATI web data

Forecasting tool was used to inform pilot deployments to maximize use of the pilot

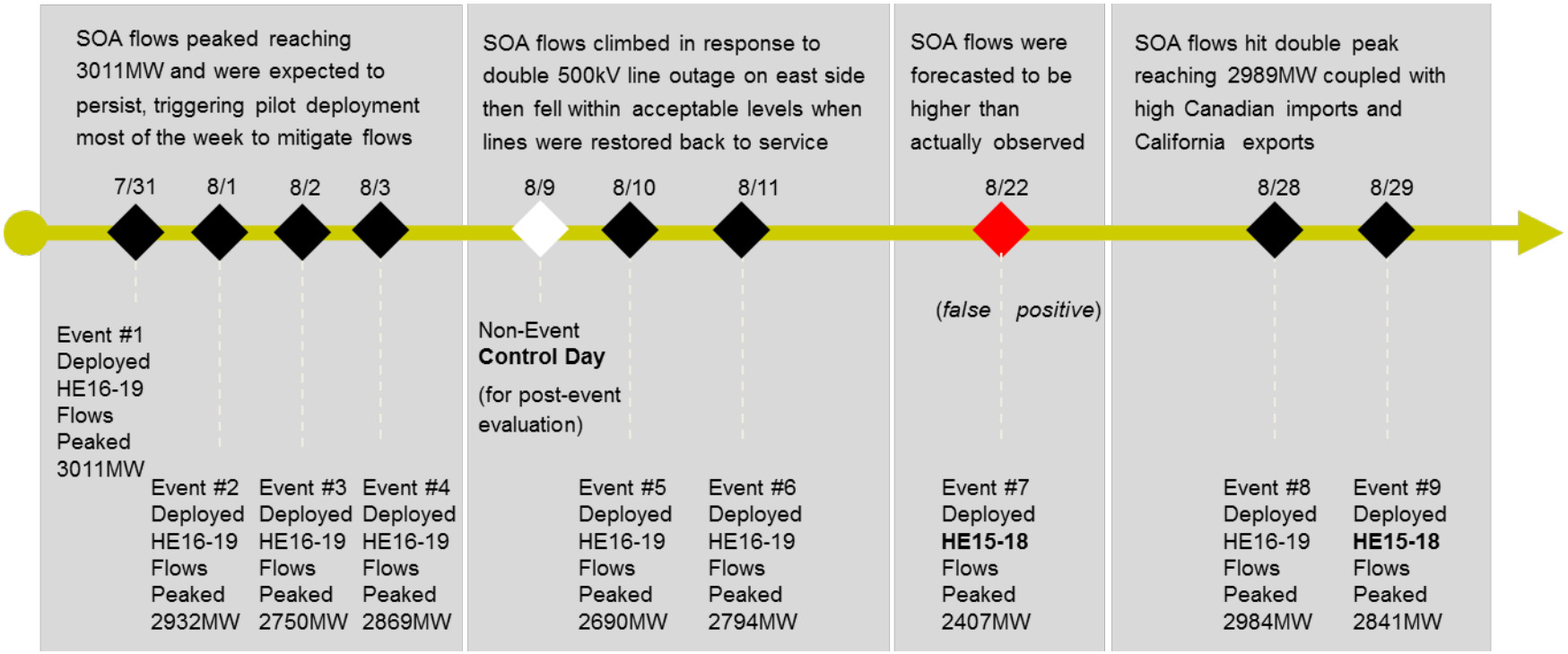
Forecasting Tool

- Forecast is calculated at 04:00 on preschedule day for eight hour window (14:00-22:00)
  - After considering system conditions and outages, BPA decides whether or not to deploy the SOA Non-Wires Pilot
- There were times when the tool forecasted high flows and the pilot was not implemented
- There were other times when the tool did not forecast high flows that did end up materializing

Forecasting is a challenging and evolutionary process that BPA is committed to undertaking

Key Preliminary Findings

- BPA purchased right to deploy 10 events totaling 40 hours (each event deployed in four-hour blocks). No events were deployed in September
- Due to limited time and resources, post-event analysis is currently limited to one control day (8/9) and two event days (8/10, 8/28). Staff working on completing analysis for all pilot event days for comparison across all summer days

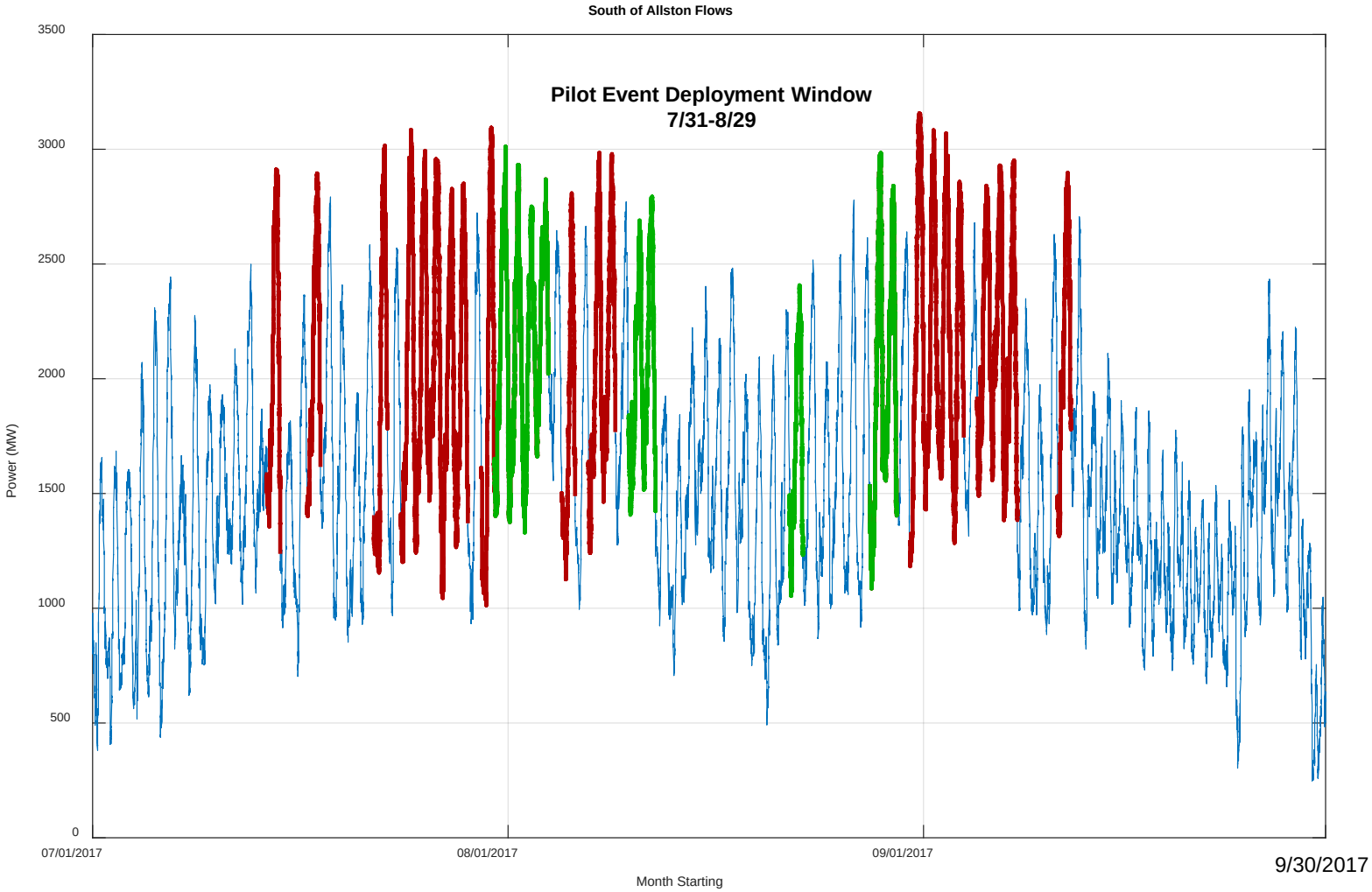


Post-pilot event analysis is still underway to understand impacts of reduced flows from pilot

SOA Pilot High Flow Days

Red = SOA pilot not deployed (actual flows over 2800MW)

Green = SOA pilot deployed



Limited number of hours of events (excludes weekends) also played a role in availability

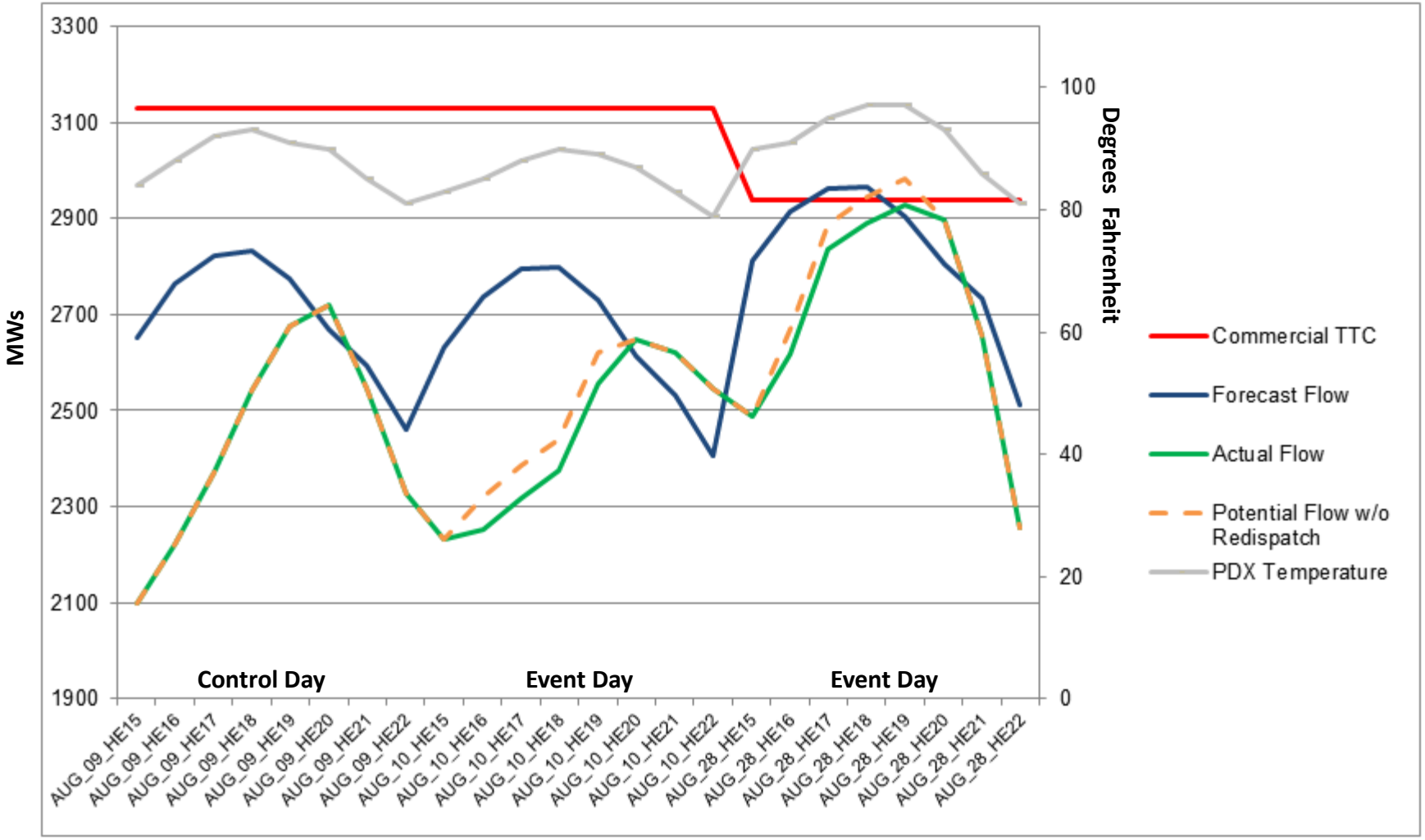
Reduced SOA Flows

- Preliminary analysis of flows yields roughly a 0-50% reduction from initial assumption of 115 MW
- Continued reduced flow analysis is underway

	SOA Pilot days with 200 MW redispatch			SOA Pilot days with 155 MW redispatch		
	Max	Avg	Min	Max	Avg	Min
Best Case: Shift factor based, outage informed relief	-119.4	-117.7	-116.7	-86.9	-86.1	-84.9
Worst Case: Revised shift factor accounting for re-supply of INC	-67.5	-64.0	-61.1	-56.4	-49.5	-45.8

While flows did not reduce as much as expected, net effect is lower flows attributable to the pilot

SOA Pilot Reduced Flows



SOA summer peak flows were lower with pilot than without it!

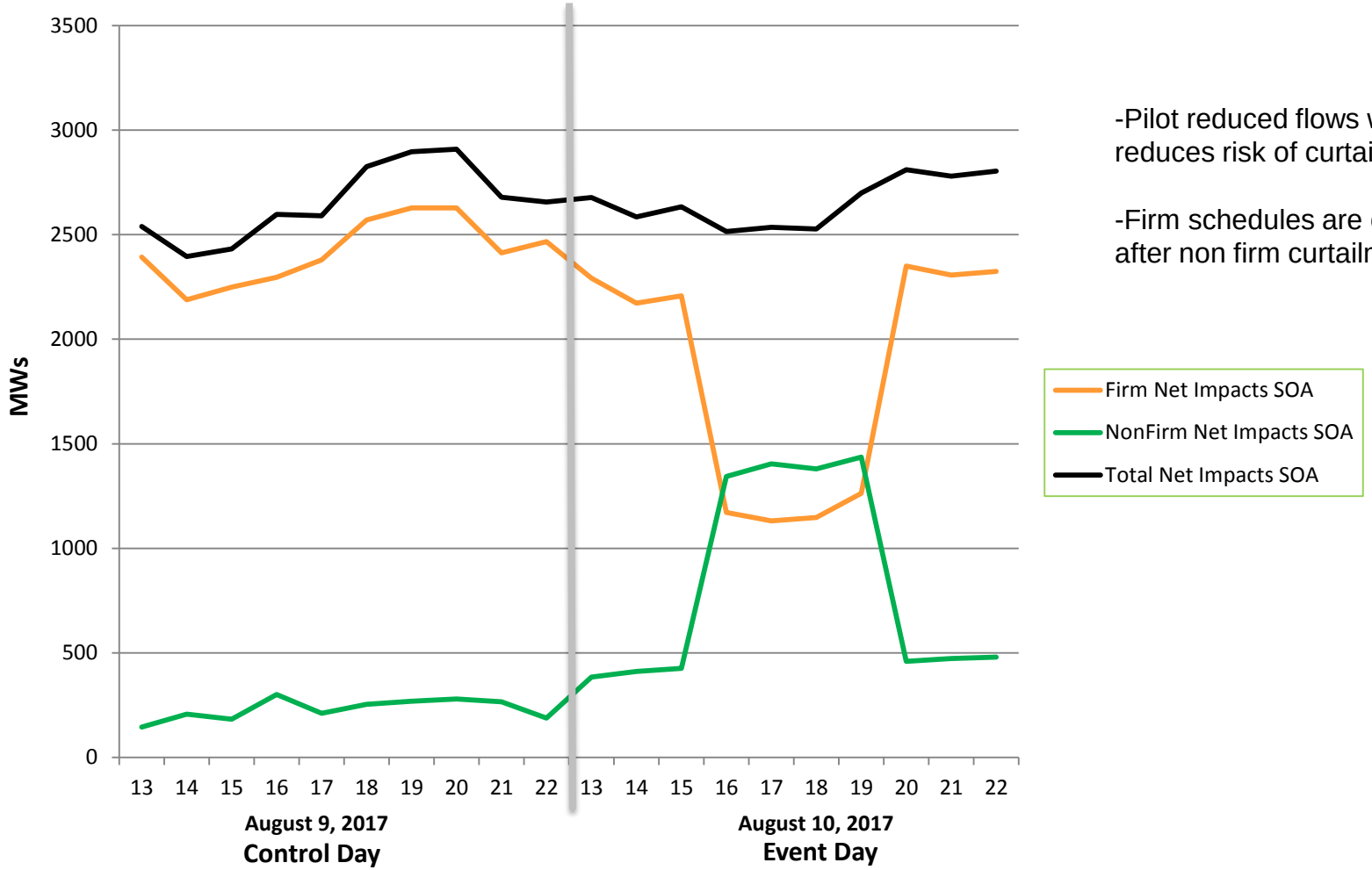
Key Preliminary Findings

Still working on post-event analysis to complete evaluation

- Overall, N-S flows on SOA were lower during pilot event periods than without pilot, indicating pilot was useful at providing flow reduction relief during summer peak periods
- 3rd party resources deployment was successful (e.g., notice, event duration)
- Contract provisions matter in terms of 3rd party resource availability and frequency of deployment
- Appeared to reduce curtailment risk to firm transmission holders
- No curtailment to firm or non-firm schedules during pilot deployments
- Learned a lot about internal implementation that is being leveraged to improve implementation efficiency for next summer operation

Preliminary pilot results are positive and provide a lot of insight into future program design!

BPAT Average Net Hourly Scheduled Impacts South of Allston Redispatch Pilot 2017

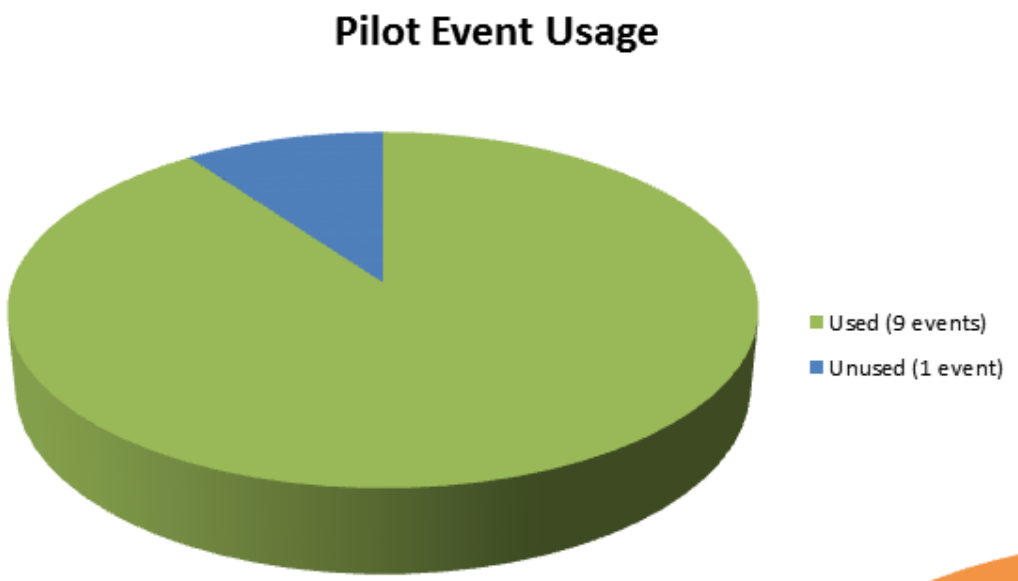


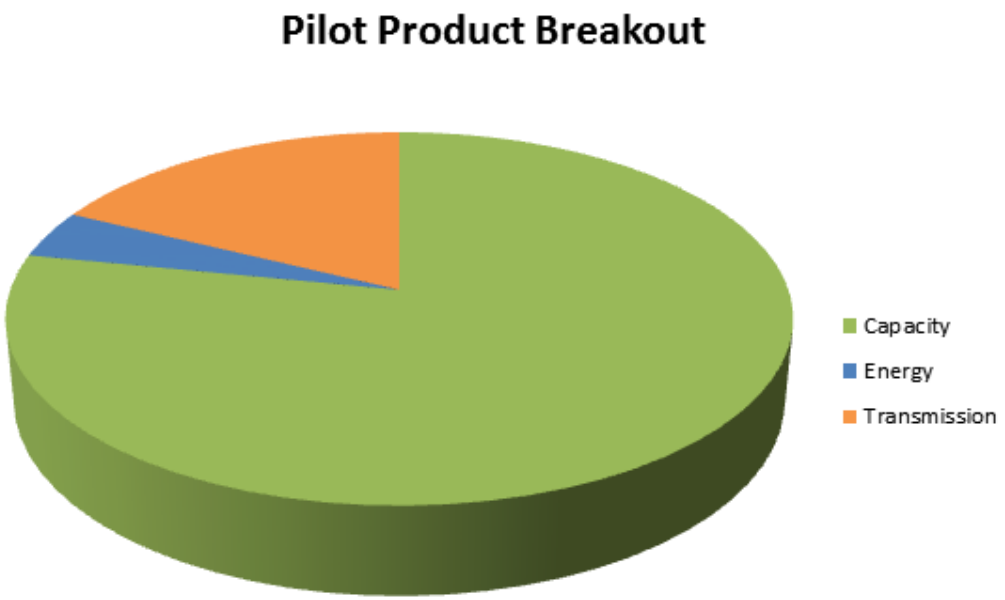
-Pilot reduced flows which reduces risk of curtailment

-Firm schedules are curtailed after non firm curtailments

The pilot appears to have reduced curtailment risk to firm transmission holders

Usage and Costs





9 out of 10 events used, capacity represents majority of total pilot costs

Next Summer

The pilot is under contract for two years

BPA will continue its current practices to compare findings from last summer to next summer

BPA is also working on plans to:

1. Explore ways to make OASIS notification of pilot events and suspension of firm transmission more apparent
   - Closer to the start of next summer, BPA will hold a workshop to review customer access to pilot event dates and times
2. Identify potential areas to update forecasting tool BPA uses to trigger when to deploy events

For comparison purposes, second year of pilot will be similar to first year of operation

Next Steps

Complete post-event analysis for pilot program

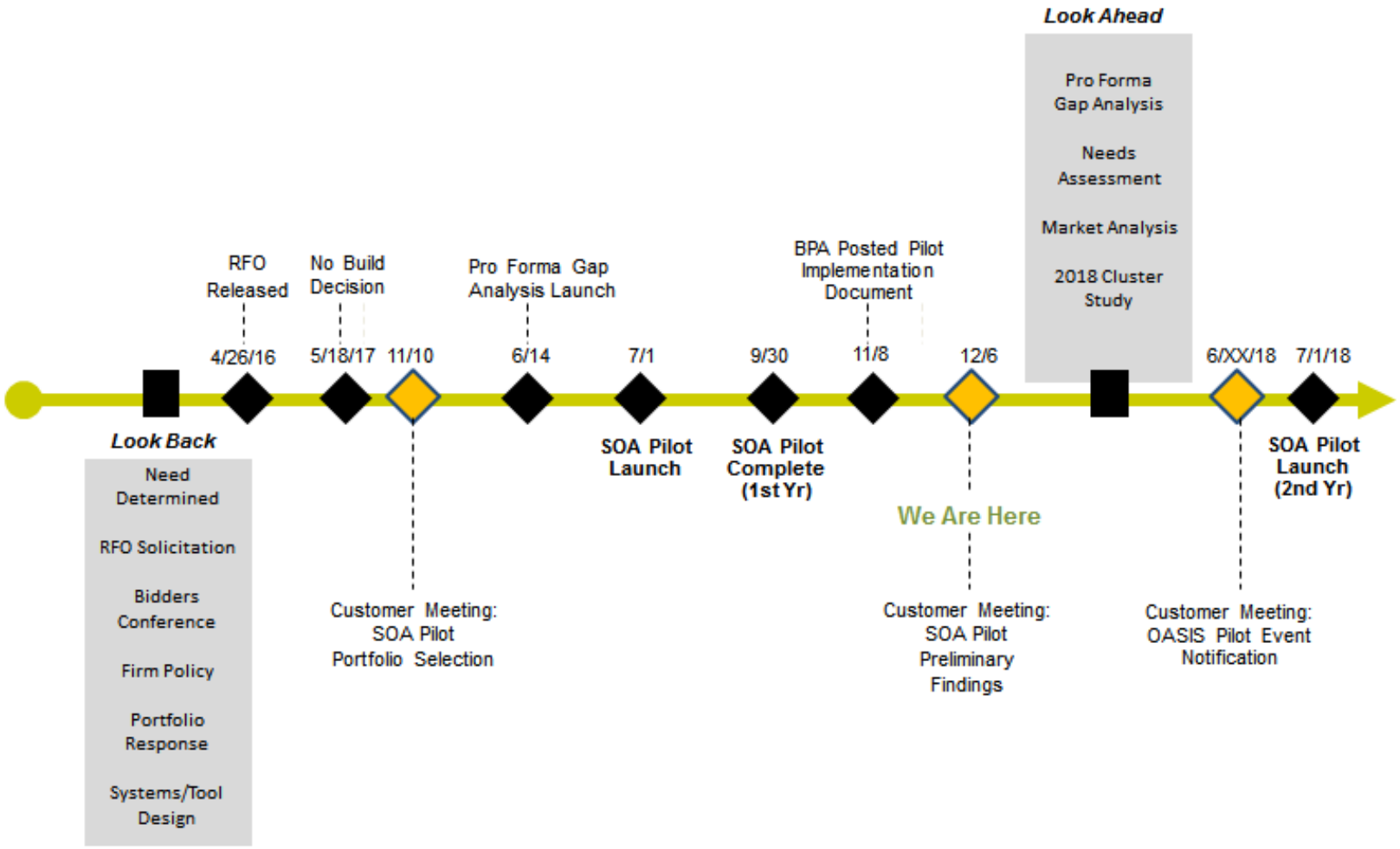
Propose annual non-wires transmission budget in upcoming IPR

Determine how new non-wires planning cluster study for commercial need integrates with RFO

More information on BPA's FY17-18 SOA Non-Wires Pilot at: https://www.bpa.gov/transmission/CustomerInvolvement/Non-Wire-SOA/Pages/default.aspx

Leverage learning and begin position for future development and expansion of non-wires

Next Steps - Timeline



Pilot continues to inform future for non-wires program design to meet evolving agency needs