Transmission Customer Forum
NWPP SCED Update

November 18, 2014

BPA Guiding Principles

- BPA continues to meet statutory and regulatory obligations (e.g., preference, reliability).
- Clearly defined roles and responsibilities for continued reliability obligations.
- Overall benefits exceed costs, considering quantitative and qualitative factors.
- Reasonable withdrawal rights.
- Participation is balanced against possibility of increased FERC oversight.

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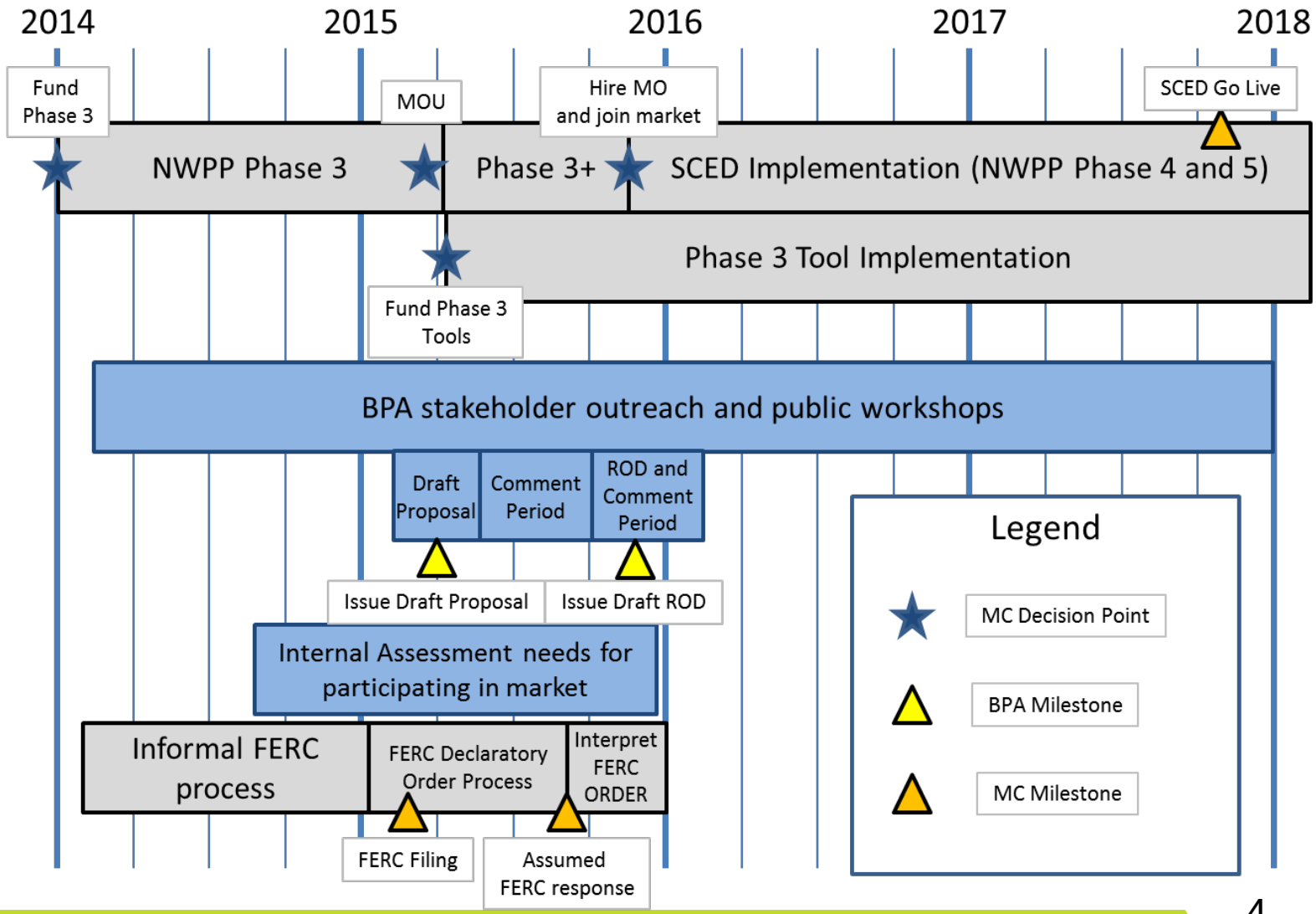
DRAFT BPA and MC Timeline and Decision Sequencing

Date	Activity	Decision/Outcome	Commitment Type
10/14	MO RFP is released	MO RFP cost discovery; identification and selection of MO candidate for 6-month consulting agreement	Continuation, Non-Financial
2/15	File FERC vehicle (i.e. declaratory order)	Ask for FERC feedback on several primary issues: 1) geographic scope, 2) withdrawal rights, 3) voluntary market, 4) Mobile Sierra or equivalent , 5) Market Monitoring , 6) Transmission issues, 7) Limited role of FERC	Continuation, Non-Financial
3/15	MC participants decision re: funding commitment for ongoing development of Phase 3 Tools	Amend work orders. BPA estimated share is ~30% ($500k)	Financial
3/15	NWPP Corporation signs consulting agreement with Desired MO candidate for detailed design (March – Dec 2015 est. term)	BPA financial commitment tbd, estimated share is ~30%	Financial
3/15 – 10/17	**Phased approach to fund internal development of systems/people/process changes required to interface with a SCED and other market tools**	BPA bears 100% of total anticipated cost (~$10-20 million)	Financial
3/15	BPA develops draft proposal prior to March 2015	Not a draft ROD. Anticipated release of draft ROD in Fall 2015 following FERC response.	Continuation, Non-Financial
10/15	Decision to fund SCED administrative corporation to hire and fund MO	BPA's share of total anticipated cost of $30 million (~30%). Informed by MC RFP cost discovery	Financial
10/15	**NWPP MC requires participating BAs to commit to the within-hour energy market. Connects to decisions regarding phased funding to be ready to interface with a SCED**	BPA BA elects to join or not to join the within hour energy market (SCED)	Continuation, Non-Financial
TBD	**BPA decision for power services to offer resources into the within-hour energy market (SCED)**	Power services does or does not offer range of resources to the market for economic dispatch. Depends on internal readiness to interface with SCED	Continuation, Non-Financial

Long-Term View Provides Context for MC and BPA Timelines

Based on Regional SCED Go Live Date of October 2017

Subject to Change



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BPA's Decisions to Move Forward
Phases separate but may not be literally sequential

- **Phase 5**:
  - Developing draft proposal by March 2015. This is not the same as a draft ROD. Anticipate sharing elements of draft proposal with customers in November/December. Draft proposal expected to discuss:
    - Assessment of the SCED Admin Corp Member Agreement or similar agreement.
    - Initial evaluation of key SCED policy and technical issues, and
    - Initial analysis of net cost/benefit and products/services pricing options in a SCED assessment for BPA and its customers.
  - Anticipated that following a public comment period, a final ROD would be issued sometime in Fall 2015. This decision is expected to cover:
    - BPA's decision to sign the SCED Admin Corp agreement to fund and hire a Market Operator.
    - BPA's decision to participate in a SCED.
  - BPA's decision to offer resources to the market may involve a separate ROD further in the future. The timing of this follow-on decision is TBD.

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BPA's Decisions to Move Forward Phases separate but may not be literally sequential (cont'd)

- Phase 4 (Bridge solution for March through likely Dec 2015):
  - BPA anticipates a Phase 4 work order process in early 2015 similar to NWPP MC Phases 1, 2, and 3.
  - Current assumptions are that regional cost and BPA's allocation are somewhat similar to Phase 3.
- Phase 3:
  - Existing work order, expiring March 31, 2015, funds MC Phase 3, including the start-up of the proposed Phase 3 tools, but not ongoing operational support because of the finite term of the WO.
  - BPA expects operational support of the successfully implemented Phase 3 tools to be a follow-on scope of work between counterparties to the Vendor Service Agreement.

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BPA's Draft Proposal

- Draft proposal expected to discuss:
  - Initial evaluation of key SCED policy and technical issues
  - Initial analysis of net cost/benefit assessment for BPA and its customers
  - Initial analysis of BPA's products/services and pricing if a SCED participant
- Will begin sharing preliminary draft proposal information in the next couple of months
- Expect to issue draft proposal sometime next spring
- Once issued, there will be an open comment period

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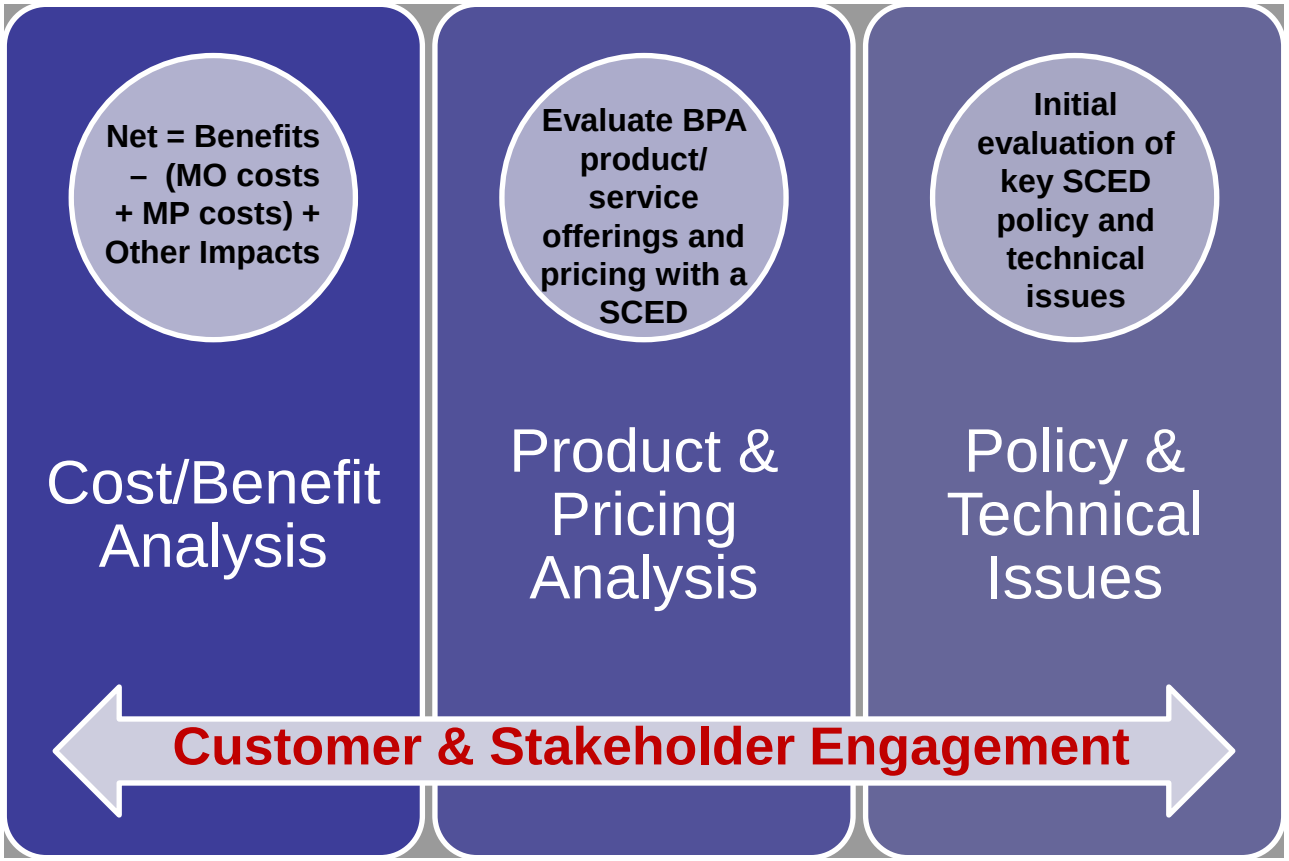
Developing the Draft Proposal



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Customer and Stakeholder Engagement

- **Scope of Work:** Develop customer and key stakeholder engagement strategy, prepare customized materials, and conduct customer group and key stakeholder roadshow to discuss SCED impacts, including any changes to daily operations, products/services and pricing options, BPA relationship, etc.

- **Key Topics:** Topics could include products/services and pricing options in a SCED; cost/benefit allocation findings and potential rate impacts; customer choices around market participation; Phase 3 tools, data sharing and RS reporting requirements (depends on readiness of information.)

- **Timing:** Begin customer meetings in the Fall; dependent on readiness to share externally findings from cost/benefit and products/services pricing analysis.

- **Team:**
  - **Sponsors:** Michelle Manary, Peter Cogswell, David Fitzsimmons
  - **Co-leads**: Kevin Farleigh and Rod Aho.
  - **P/T/CAE core team**: Eric Taylor, Eric Carter, Paul Munz, Larry Felton, Kate Patton, Jessica Singh, Mark Symonds, Crystal Ball, Jenny Lowe
  - Coordinate with Nancy Baker, PPC; Therese Hampton, PGP; Aleka Scott, PNGC, and John Saven, NRU for additional support and guidance

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Economic Cost/Benefit Analysis

- **Scope of Work:**
  - Conduct a economic cost/benefit analysis for BPA to participate in a SCED. = Benefits – ((MO costs + MP costs) + Other impacts).
  - Team is looking at Power and Transmission rate projections with and without a SCED. Includes tangible (revised revenue forecasts) and intangible (avoided costs) benefits.

- **Key Inputs:**
  - Benefits Analysis – Extent of tie to Production Cost Model from Phase I?
  - Market Operator Costs.
  - Market Participant Costs (includes the internal assessment).
  - Qualitative Costs and Benefits.

- **Timing:** Preliminary results by December**.** Results will evolve depending on findings from exploration of alternate models for RS and enforcement with a SCED and products/service and pricing analysis in a SCED.

- **Team:** Lead: Peter Stiffler, SME Team: Frank Puyleart, Paul Koski, Eric Federovitch, Tom Coatney, Laura Trolese, Michael Linn, Mark Symonds, Will Rimmer, and Aimee Higby.

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Product/Service Offerings and Pricing with a SCED

- **Scope of Work:** Evaluate BPA product/service offerings and pricing with a SCED.

- **Key questions to address:**
  - What changes if any will be needed to current BPA products in a SCED?
  - Will current products/services meet the standard for resource sufficiency as currently proposed by the MC?
  - What products/services are customers currently using and how might they be impacted by identified changes needed to existing products or new offerings?
  - What new products may be available from BPA to customers under a SCED?

- **Timing:** Team is mobilizing; expect to start work late October.

- **Team:** Sponsor: Michelle Manary; Lead: Daniel Fisher; SME team: Emily Traetow, Theodore Barham, Kevin Mozena, Troy Simpson, Bradley Davison, Milos Bosanac, Deb Malin, and Will Rimmer.

Pre-decisional. For Discussion Purposes Only.

Existing BPA Transmission Initiatives

BPA Transmission Initiative	Potential Impacts of SCED	Further Investigation
Southeast Idaho Load Service (SILS)	No direct impact.	Could SCED support more efficient dispatch to serve load?
Gen Inputs Settlement	No direct impact.	N/A
3rd Party Gen Inputs	Potential for SCED to displace need for 3rd party capacity.	Resource Sufficiency decisions could impact. What are capacity standards and how are they implemented?
Network Open Season	No identified impacts due to long term nature of NOS.	Could SCED delay future needs for upgrades?
NT Redispatch	SCED 5-min dispatches could reduce need.	
Congestion Management	Improved ability to actively manage system constraints, avoid SOL excursions, and more effectively and reliably manage post-curtailment energy resupply.	Expect additional BA and TOP benefits. Work toward quantifying operational benefits.
CAISO EIM	CAISO EIM will operate independently of the SCED.	SCED operation will determine if the two markets can work together.
Order 1000	No direct impact.	N/A
Non-Wires Solutions	Potential to help alleviate some of the congestion problems until a wires solution is found.	Benefits depend on the number of participating plants.

Pre-decisional. For Discussion Purposes Only.

NWPP MC Phase 3 Tools

- Regional Flow Forecast (RFF)
- Resource Monitoring & Deliverability (RMD)

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RFF Tool

- What Problems We Are Trying to Address?
  - Reduce risk of real-time curtailments
  - Reduce sense of blindness
  - Improve situational awareness

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RFF Tool

- How does the Technology Work?
  - DC Model (Linear Model) – **Phase 3**
    - Attribution of Flows – Cake Layering
    - Interim solution until Enhanced Curtailment Calculator is operational
  - AC Model (Power Flow) – **Post Phase 3**
    - Highly Accurate Flow Forecast
    - To be included post Phase 3

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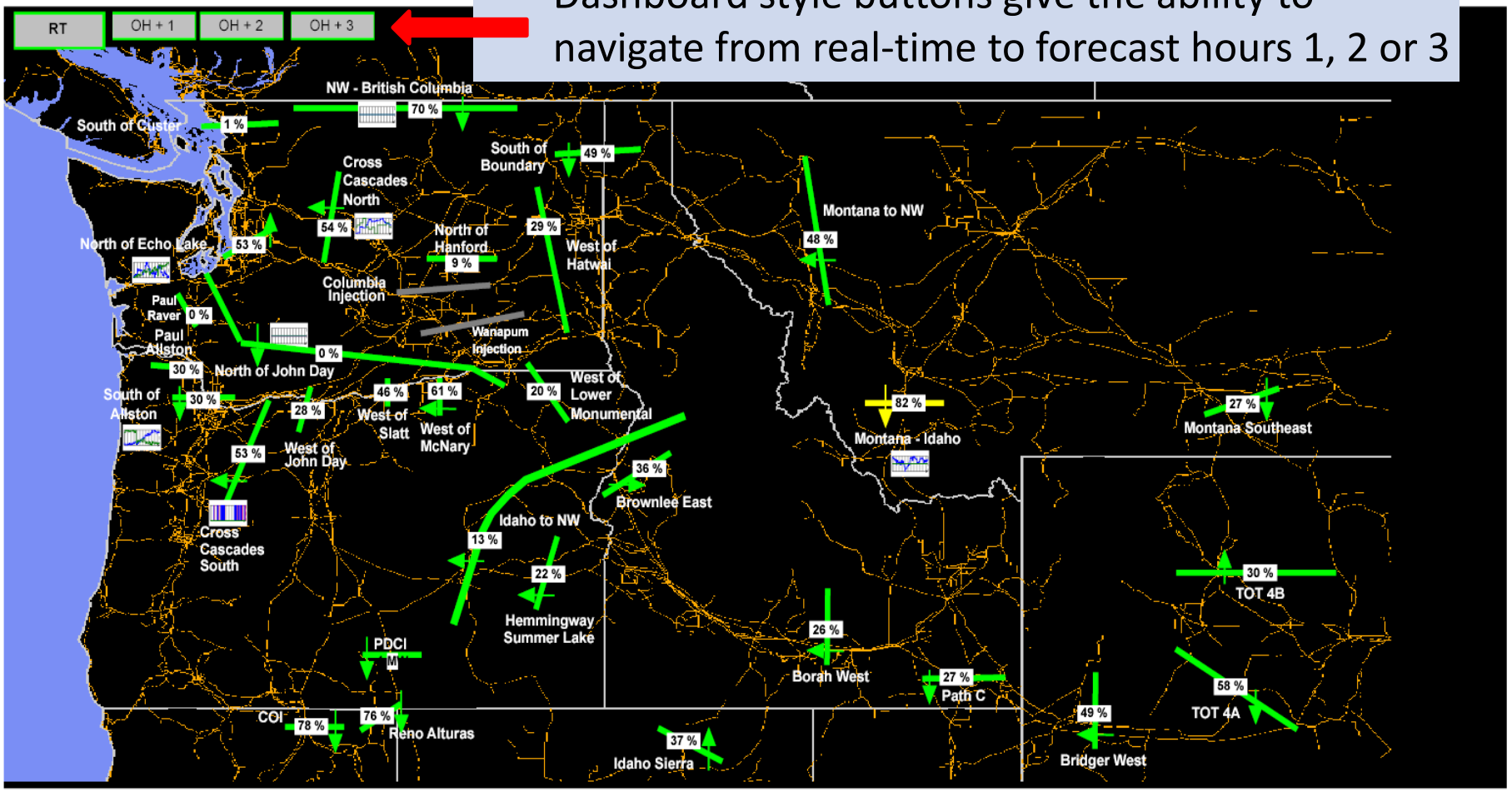
Regional Flow Forecast – Geographic View

Regional FlowForecast

Dashboard style buttons give the ability to navigate from real-time to forecast hours 1, 2 or 3



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Tabular View

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File

	WA OR North-South Flowgates	13:15	13:30	13:45	14:00	14:28	14:30	14:45	15:00	15:15	15:30	17:00	18:00
%	Columbia Injection	39%	36%	37%	39%	54%	37%	37%	38%	38%	39%	34%	31%
SOL		1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440
ACT	North of Echo Lake	1,344	1,328	1,380	1,361	1,262	1,386	1,379	1,386	1,387	1,367	1,314	1,269
MARGIN		96	112	60	79	178	54	61	54	53	73	126	171
%	North of Echo Lake	93%	92%	96%	94%	88%	96%	96%	96%	96%	95%	91%	88%
%	North of Hanford	31%	33%	32%	33%	26%	34%	35%	33%	33%	32%	34%	39%
%	North of John Day	16%	18%	20%	17%	9%	19%	21%	19%	17%	17%	24%	32%
%	Paul-Allston	62%	60%	71%	50%	52%	52%	51%	51%	52%	50%	41%	49%
%	Raver-Paul	45%	43%	37%	35%	50%	37%	36%	39%	36%	36%	38%	39%
%	South of Allston	31%	33%	32%	33%	26%	34%	35%	33%	33%	32%	34%	39%
%	South of Boundary	16%	18%	20%	17%	9%	19%	21%	19%	17%	17%	24%	32%
%	South of Custer	62%	60%	71%	50%	52%	52%	51%	51%	52%	50%	41%	49%
%	Wanapum Injection	45%	43%	37%	35%	50%	37%	36%	39%	36%	36%	38%	39%

Up to one hour of history will be displayed, and three hours of forecast data

ID WY Flowgates | Major NW Interties | WA OR East-West Flowgates | WA OR North-South Flowgates | Other NW Flowgates

Ready 90%

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Trend View

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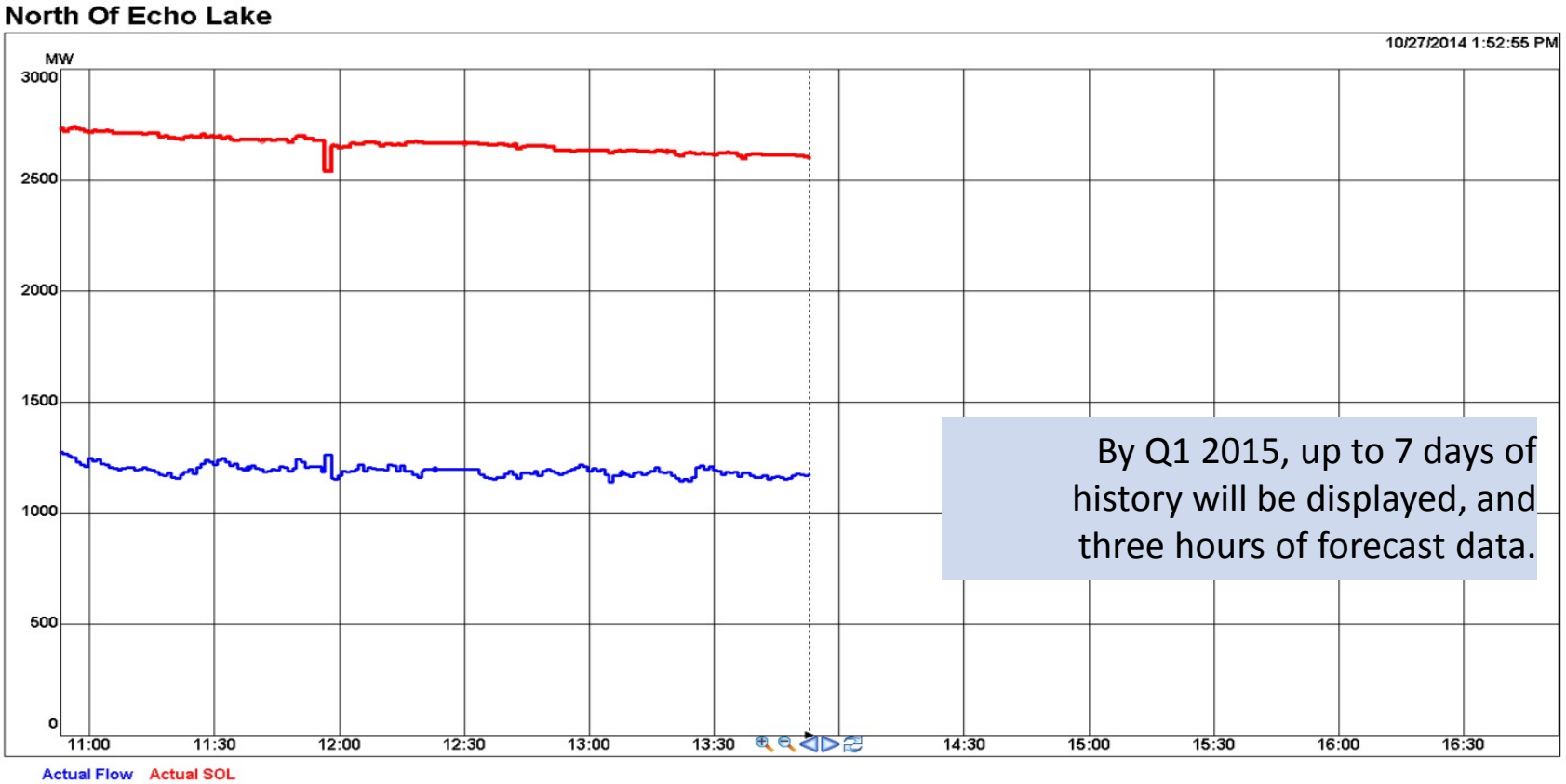

By Q1 2015, up to 7 days of history will be displayed, and three hours of forecast data.

List of Flowgates

Major NW Interties

WECC Path #	Path/Flowgate	Real-time Updates	Forecast Data
Path 3	NW - British Columbia	Phase 3	Future
Path 65	Pacific DC Intertie (PDCI)	Phase 3	Future
Path 66	California-Oregon AC Intertie (COI)	Phase 3	Future
Path 76	Alturas Project (Reno Alturas)	Phase 3	Future
Path 8	Montana to NW	Phase 3	Phase 3
Path 14	Idaho to NW	Phase 3	Future
Path 18	Montana - Idaho	Phase 3	Future
Path 16	Idaho - Sierra	Phase 3	Future
Path 80	Montana Southeast	Phase 3	Future
Path 75	Hemingway – Summer Lake	Phase 3	Future

Pre-decisional. For Discussion Purposes Only.

List of Flowgates

WA/OR North-South Flowgates

WECC Path #	Path/Flowgate	Real-time Updates	Forecast Data
	South of Boundary	Phase 3	Future
	South of Custer	Phase 3	Future
	North of Echo Lake	Phase 3	Phase 3
	North of Hanford	Phase 3	Phase 3
	Columbia Injection	Phase 3	Phase 3
	Wanapum Injection	Phase 3	Phase 3
Path 73	North of John Day	Phase 3	Phase 3
	Raver-Paul	Phase 3	Phase 3
	Paul-Allston	Phase 3	Phase 3
Path 71	South of Allston	Phase 3	Phase 3

Pre-decisional. For Discussion Purposes Only.

List of Flowgates

WA/OR East-West Flowgates

WECC Path #	Path/Flowgate	Real-time Updates	Forecast Data
Path 4	Cross Cascades North	Phase 3	Phase 3
Path 5	Cross Cascades South	Phase 3	Phase 3
	West of John Day	Phase 3	Phase 3
	West of Slatt	Phase 3	Phase 3
	West of McNary	Phase 3	Phase 3
	West of Lower Monumental	Phase 3	Phase 3
Path 6	West of Hatwai	Phase 3	Phase 3

ID/WY Flowgates

WECC Path #	Path/Flowgate	Real-time Updates	Forecast Data
Path 17	Borah West	Phase 3	Future
Path 19	Bridger West	Phase 3	Future
Path 55	Brownlee East	Phase 3	Future
Path 20	Path C	Phase 3	Future
Path 37	Tot 4A	Phase 3	Future
Path 38	Tot 4B	Phase 3	Future

Pre-decisional. For Discussion Purposes Only.

Benefits of the RFF Tool

Reliable Flow Forecasts would help:

- Manage real-time work load
- Resolve potential congestion prior to operating hour
- Avoid real-time schedule curtailments
- Reduce uncertainty
- Reduce the sense of blindness
- Clarify what the best generation resources to commit

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Assumptions Behind RFF Display Sharing

- Displays will comply with SOC requirements
- Displays will not present CEII information
- Displays will not reveal commercially sensitive information or conflict with confidentiality agreements
- Sharing displays won't impose OASIS issues
  - e.g. OASIS Transmission Posting requirements
- EC to authorize displays shared with merchant functions
    - Unanimous EC vote required

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RMD Tool

- The Technology
  - Two Key Processes
    - Phase 3 – Resource Sufficiency Test
      - A Capacity Accounting process
      - Downloadable excel report 10 minutes before the hour
      - Used as data input for RS Policy decisions
    - Post Phase 3 – Deliverability Test
      - Refine Resource Sufficiency test to conform with RS Policy
      - Develop/Implement Deliverability Test Algorithm
  - RMD Monitors and Test each BA
    - Runs every 5 minutes with a two Hour Look ahead

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The RMD Tool - Overall

- What Problems Are We Trying to Address?
  - Equity among BAs in providing capacity operating flexibility
  - Provide advance warning of congestion
  - Improve the quality of near real-time data
  - Reveal transaction miscommunications and mismatches
  - Avoid duplication of generation accounting
  - Improve visibility and provide early warning to RS issues

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- Objective for Phase 3
  - Provide BAs advisory, early visibility and warning regarding their BA's Resource Sufficiency, looking ahead 2 hours
- Current Status – On Track
  - RS Formula and Display specifications complete
    - Based on BAL 002 WECC standard modified 3% rule
    - Configurable Design allows changes as RS Policy refines
  - Peak finalizing design and starting build process

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RMD – RS Regional View (Limited Use)

Resource Sufficiency - Regional View											
Balancing Authority	Obligations (MW)				Resources (MW)				Sufficiency (MW)		
	Total Load	Total Exports	Total Reserves	Adjusted Obligations	Total Generation	Total Imports	Demand Response	Adjusted Resources	Current Hr	Hour 1	Hour 2
Avista Corp	1700	100	54	1854	1900	0	0	1900	46	46	46
BANC	450	0	14	464	500	0	0	500	37	37	37
BC Hydro	11000	460	344	11804	12000	0	0	12000	196	196	196
BPA	6050	225	188	6463	6500	0	0	6500	37	37	37
Chelan Co PUD	300	50	11	361	400	0	0	400	40	40	40
Grant Co PUD	660	225	27	912	910	0	0	910	-2	-2	-2
Idaho Power	3400	100	105	3605	3650	0	0	3650	45	45	45
NaturEner Wind	10	600	18	628	1050	200	0	1250	622	622	622
NorthWestern Energy	15	225	7	247	250	0	0	250	3	3	3
PacifiCorp West	4000	500	135	4635	4500	200	0	4700	65	65	65
PacifiCorp East	8500	500	270	9270	6700	2700	0	9400	130	130	130
Portland General Electric	3860	225	123	4208	3000	1220	0	4220	12	12	12
Puget Sound Energy	3900	335	127	4362	4500	50	0	4550	188	188	188
Seattle City Light	2000	0	60	2060	350	1760	0	2110	50	50	50
Tacoma Power	620	0	19	639	180	460	0	640	1	1	1
Turlock Irrigation District	533	0	16	549	200	350	0	550	1	1	1
WAPA	1575	0	47	1622	700	950	0	1650	28	28	28
Total Region	**48573**	**3545**	**1564**	**53682**	**47290**	**7890**	**0**	**55180**	**1498**	**1498**	**1498**

Data displayed is fictitious

Pre-decisional. For Discussion Purposes Only.

RMD – RS BA View (Limited Use)

Resource Sufficiency - BA View											
Balancing Authority	Obligations (MW)				Resources (MW)				Sufficiency (MW)		
	Total Load	Total Exports	Total Reserves	Adjusted Obligations	Total Generation	Total Imports	Demand Response	Adjusted Resources	Current Hr	Hour 1	Hour 2
Grant Co PUD	660	225	27	912	910	0	0	910	-2	-2	-2
Total Region	**48573**	**3545**	**1564**	**53682**	**47290**	**7890**	**0**	**55180**	**1498**	**1498**	**1498**

Data displayed is fictitious. You will only see your individual BA's detail.

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RMD – RS BA View Detail Navigation

Resource Sufficiency - BA View											
Balancing Authority	Obligations (MW)				Resources (MW)				Sufficiency (MW)		
	Total Load	Total Exports	Total Reserves	Adjusted Obligations	Total Generation	Total Imports	Demand Response	Adjusted Resources	Current Hr	Hour 1	Hour 2
Grant Co PUD	660	225	27	912	910	0	0	910	-2	-2	-2
Total Region	**48573**	**3545**	**1564**	**53682**	**47290**	**7890**	**0**	**55180**	**1498**	**1498**	**1498**

BA: BA-NAME 31-OCT-2014 14:30
RESOURCE SUFFICIENCY - DETAIL VIEW

Obligations (Demand)	Current Operating Hour			Operating Hour +1			Operating Hour +2		
		Approved e-Tags	Approved & Pending e-Tags		Approved e-Tags	Approved & Pending e-Tags		Approved e-Tags	Approved & Pending e-Tags
Area Load Forecast		1200	1200		1200	1200		1200	1200
Exports - Non-recallable		50	50		50	50		50	50
Exports - VER		30	30		30	30		30	30
Contingency Reserves		78	78		78	78		74	74
Balancing Reserves		300	300		300	300		300	300
Regulating Reserves (L_{10})		17	17		17	17		17	17
VER - Reserves		68	68		68	68		68	68
Other (BA Adjusted Value)		-10	-10		-5	-5		0	0
Total Obligations		**1732**	**1732**		**1737**	**1737**		**1738**	**1738**
Resources (Supply)	**Forecasted (MWh/Hr)**	**Resource Capacity (MW)**		**Forecasted (MWh/hr)**	**Resource Capacity (MW)**		**Forecasted (MWh/hr)**	**Resource Capacity (MW)**	
Biomass	20	20	20	20	20	20	20	20	20
Coal	300	300	300	300	300	300	300	300	300
Fossil	450	450	450	450	425	425	320	320	320
Geothermal	500	500	500	500	500	500	500	500	500
Hydro	20	20	20	20	20	20	20	20	20
Natural Gas	30	30	30	30	30	30	30	30	30
Nuclear	20	20	20	20	20	20	20	20	20
Oil	50	50	50	50	50	50	50	50	50
Pump Storage	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0
Imports - Firm	150	150	150	150	100	150	150	100	150
Imports - VER (Adjusted)	300	225	225	300	225	225	300	225	225
Imports - Recallable	45	0	0	45	0	0	45	0	0
Pump (Load)	0	0	0	0	0	0	0	0	0
Demand Response	0	0	0	0	0	0	0	0	0
Other (BA Adjusted Value)	0	10	10	0	5	5	0	0	0
Total Resources	**1885**	**1775**	**1775**	**1885**	**1695**	**1745**	**1755**	**1585**	**1635**
Resource Sufficiency (MW) (Must be > 0)		**43**	**43**		**-42**	**8**		**-153**	**-103**

Pre-decisional. For Discussion Purposes Only.

BA: BA-NAME 31-OCT-2014 14:30
RESOURCE SUFFICIENCY - DETAIL VIEW

Obligations (Demand)	Current Operating Hour			Operating Hour +1			Operating Hour +2		
		Approved e-Tags	Approved & Pending e-Tags		Approved e-Tags	Approved & Pending e-Tags		Approved e-Tags	Approved & Pending e-Tags
Area Load Forecast		1200	1200		1200	1200		1200	1200
Exports - Non-recallable		50	50		50	50		50	50
Exports - VER		30	30		30	30		30	30
Contingency Reserves		78	78		78	78		74	74
Balancing Reserves		300	300		300	300		300	300
Regulating Reserves (L_{10})		17	17		17	17		17	17
VER - Reserves		68	68		68	68		68	68
Other (BA Adjusted Value)		-10	-10		-5	-5		0	0
Total Obligations		**1732**	**1732**		**1737**	**1737**		**1738**	**1738**
Resources (Supply)	**Forecasted (MWh/Hr)**	**Resource Capacity (MW)**		**Forecasted (MWh/hr)**	**Resource Capacity (MW)**		**Forecasted (MWh/hr)**	**Resource Capacity (MW)**	
Biomass	20	20	20	20	20	20	20	20	20
Coal	300	300	300	300	300	300	300	300	300
Fossil	450	450	450	450	425	425	320	320	320
Geothermal	500	500	500	500	500	500	500	500	500
Hydro	20	20	20	20	20	20	20	20	20
Natural Gas	30	30	30	30	30	30	30	30	30
Nuclear	20	20	20	20	20	20	20	20	20
Oil	50	50	50	50	50	50	50	50	50
Pump Storage	0	0	0	0	0	0	0	0	0
Wind	0	0	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0	0	0
Imports - Firm	150	150	150	150	100	150	150	100	150
Imports - VER (Adjusted)	300	225	225	300	225	225	300	225	225
Imports - Recallable	45	0	0	45	0	0	45	0	0
Pump (Load)	0	0	0	0	0	0	0	0	0
Demand Response	0	0	0	0	0	0	0	0	0
Other (BA Adjusted Value)	0	10	10	0	5	5	0	0	0
Total Resources	**1885**	**1775**	**1775**	**1885**	**1695**	**1745**	**1755**	**1585**	**1635**
Resource Sufficiency (MW) (Must be > 0)		**43**	**43**		**-42**	**8**		**-153**	**-103**

Pre-decisional. For Discussion Purposes Only.

RMD – Supply and Demand Trend View

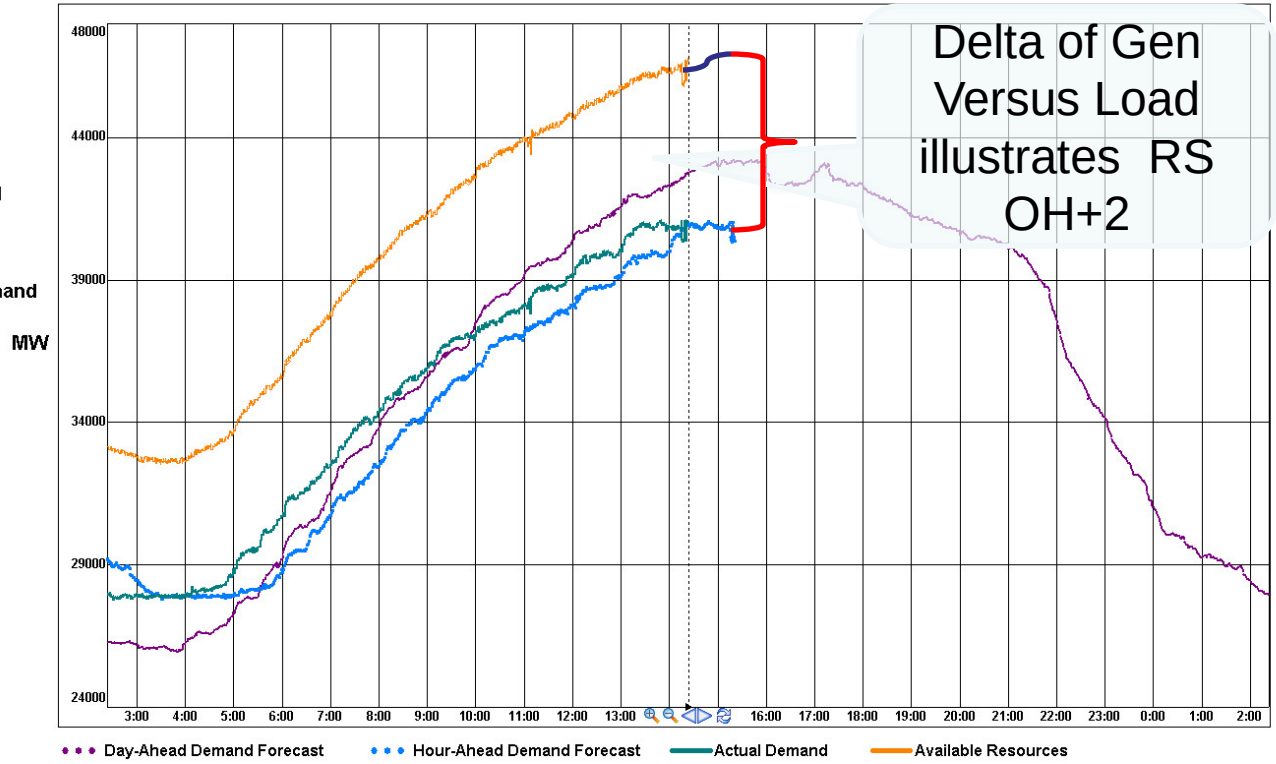
Supply and Demand
Current system demand plotted against forescast demand and available rescources.

Current System Demand
(Actual demand at this point in time)
41030.2 MW

Today's Peak Demand
(Highest point thus far today)
41108.7 MW

Today's Forecast Peak Demand
(Highest point expected today)
46754.8 MW

Tomorrow's Forecast Peak Demand
(Does not appear on graph)
42722.0



Delta of Gen Versus Load illustrates RS OH+2

Pre-decisional. For Discussion Purposes Only.