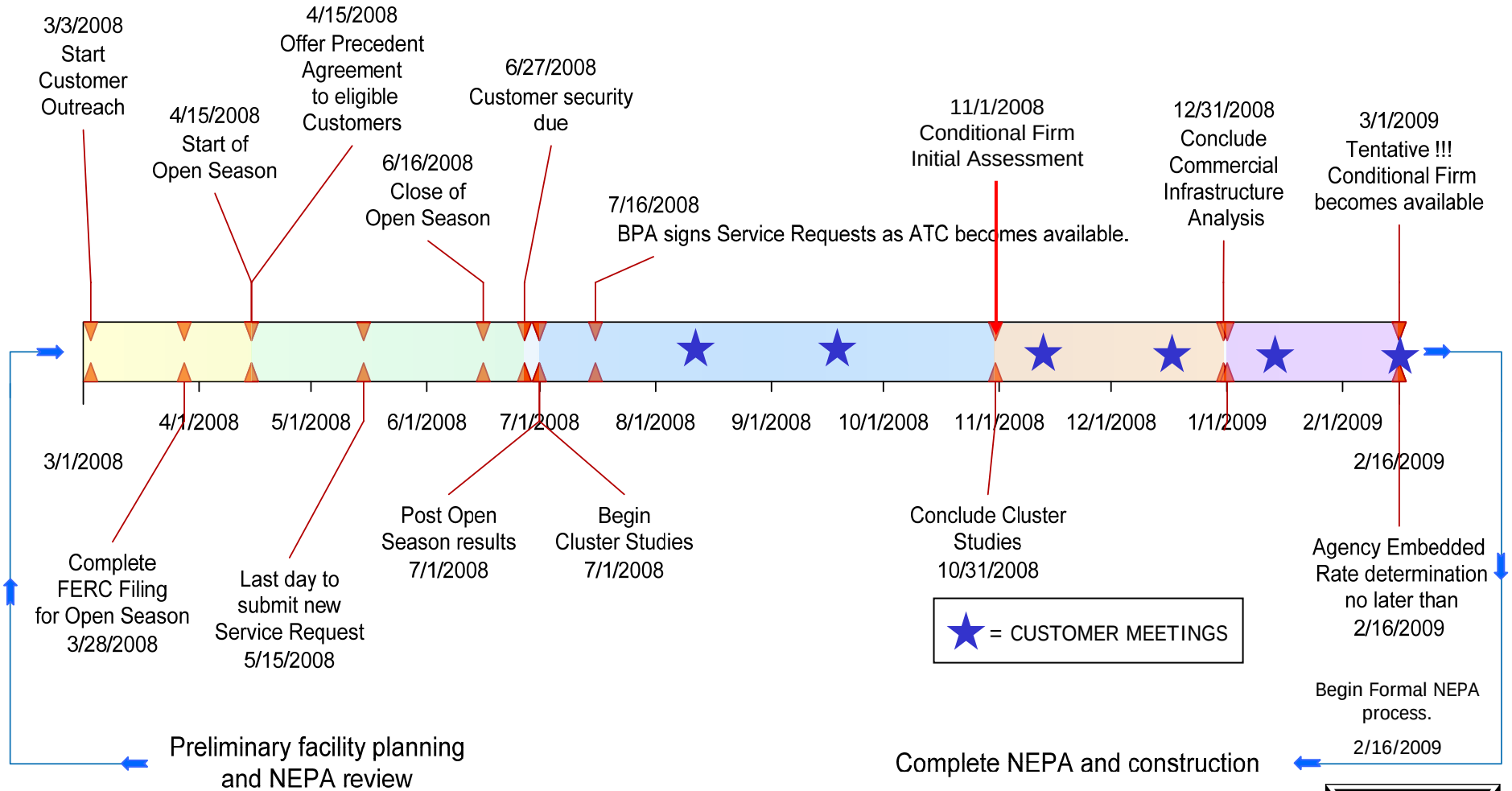
Network Open Season Cluster Study

Posted for discussion at the

Network Open Season Customer Meeting

November 20, 2008

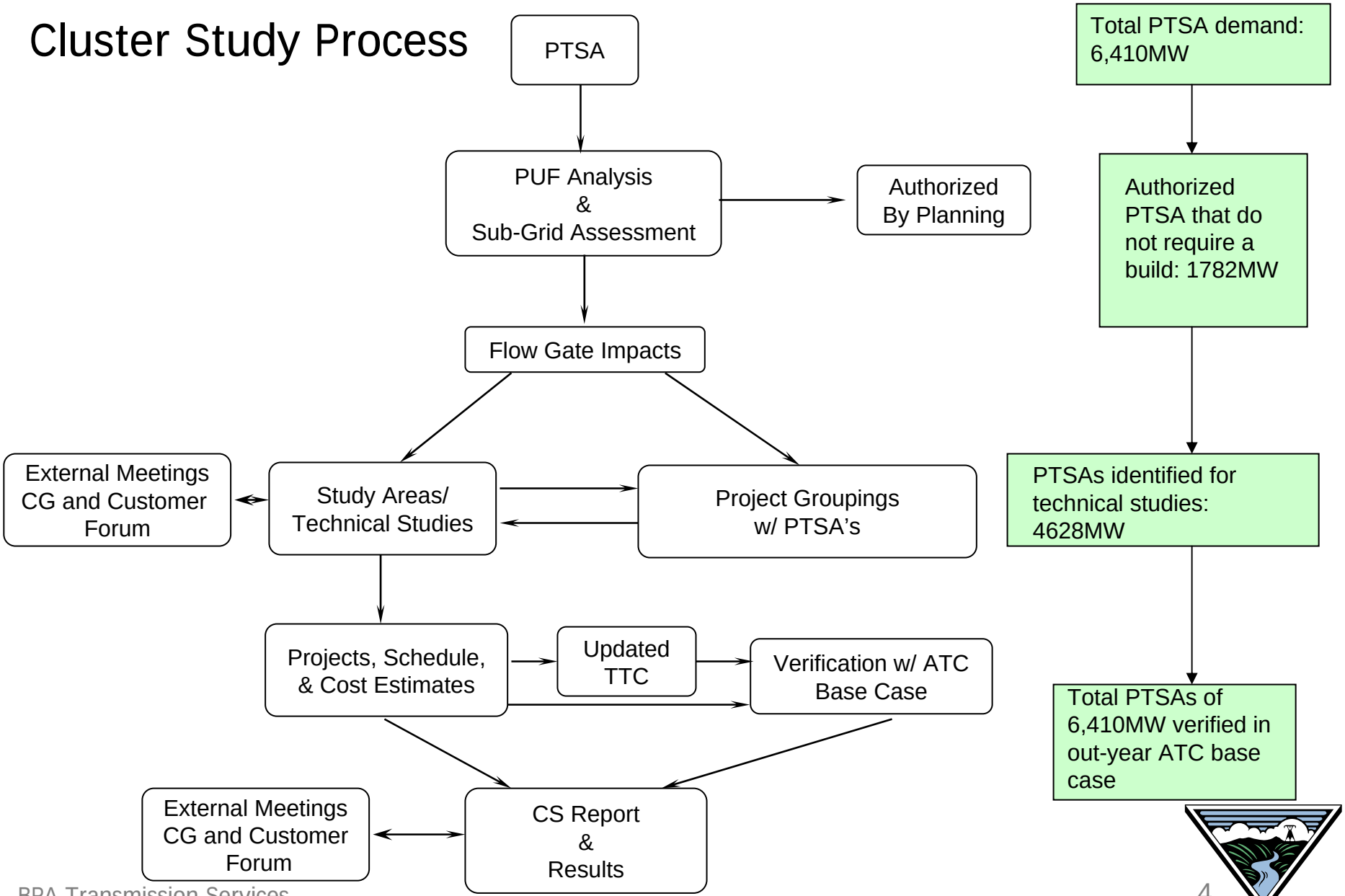
Network Open Season Timeline



Initial NOS Pending Queue Summary

		Non-De Minimus Impacts		
Flowgate	**Starting ATC**	**Req's**	**Imp**	**Beyond ATC**
South of Allston	213 MW	13 Req's	392 MW	249 MW
Cross Cascades North	1,518 MW	111 Req's	1,273 MW	0 MW
Cross Cascades South	2,054 MW	108 Req's	1,420 MW	0 MW
Monroe-Echo Lake	360 MW	3 Req's	126 MW	0 MW
North of Hanford	1,539 MW	24 Req's	573 MW	0 MW
North of John Day	1,375 MW	50 Req's	1,383 MW	61 MW
Paul-Allston	303 MW	12 Req's	343 MW	138 MW
Raver-Paul	411 MW	8 Req's	111 MW	0 MW
West of McNary	345 MW	58 Req's	866 MW	621 MW
West of Slatt	220 MW	73 Req's	1,044 MW	876 MW

Cluster Study Process



Cluster Study Methodology

- Determine which Precedent Transmission Service Agreements (PTSAs) could be met from existing system capability and which PTSAs required system reinforcement
  - PUF Analysis and Sub-Grid check
- Identify study areas for those PTSAs requiring system reinforcement
  - Perform technical studies to develop plans of service for the study areas
  - Determine TTC w/ reinforcement, cost, schedule and energization date
- Identify PTSAs to a project or group of projects
- Model all PTSAs in an out-year ATC base case and demonstrate that the interconnected transmission system, together with the required reinforcements, would be able to provide the requested service.

Projects/Study Areas

1. West of McNary Generation Integration Projects
2. I-5 Corridor Reinforcement
3. Little Goose Area Reinforcement
4. West of Garrison Remedial Action Scheme (RAS)
5. Harney Area Reinforcement
6. Northern Intertie Reinforcement
7. LaGrande Area Reinforcement

Project Details

- West of McNary Generation Integration Projects
  - Group One:
    - McNary-John Day 500-kV (79 miles)
    - McNary-Ross 345-kV sag upgrade
    - Big Eddy-Ostrander 500-kV sag upgrade
    - John Day-Big Eddy 500 kV No. 2 reconductor
    - 230-kV shunt capacitor addition at Jones Canyon
    - RAS addition at McNary – McNary 500/230 kV transformer outage
  - Group Two:
    - New 500-kV Station (Z)
    - Big Eddy-Station Z 500-kV (28 miles)
- I-5 Corridor Reinforcement
  - New 500-kV Station (Castle Rock)
  - Castle Rock-Troutdale 500-kV (70 miles) or Castle Rock-Pearl 500-kV (90 miles)
- Little Goose Area Reinforcement
  - New 500-kV Station-Lower Monumental 500-KV (40 miles)

Project Details (Cont.)

- West of Garrison RAS
  - RAS addition at Garrison – generation tripping
- Harney Area Reinforcement
  - Harney-Malin 500-kV (179 miles)
- Northern Intertie Reinforcement
  - Monroe-Echo Lake 500 kV No. 2 (33 miles)
- LaGrande Area Reinforcement
  - McNary-LaGrande 230-kV (83 miles)
  - LaGrande-Brownlee 230-kV (79 miles)
  - Note: These are “reference” plans and an alternative would be to participate in Idaho’s Hemmingway-Boardman 500-kV line

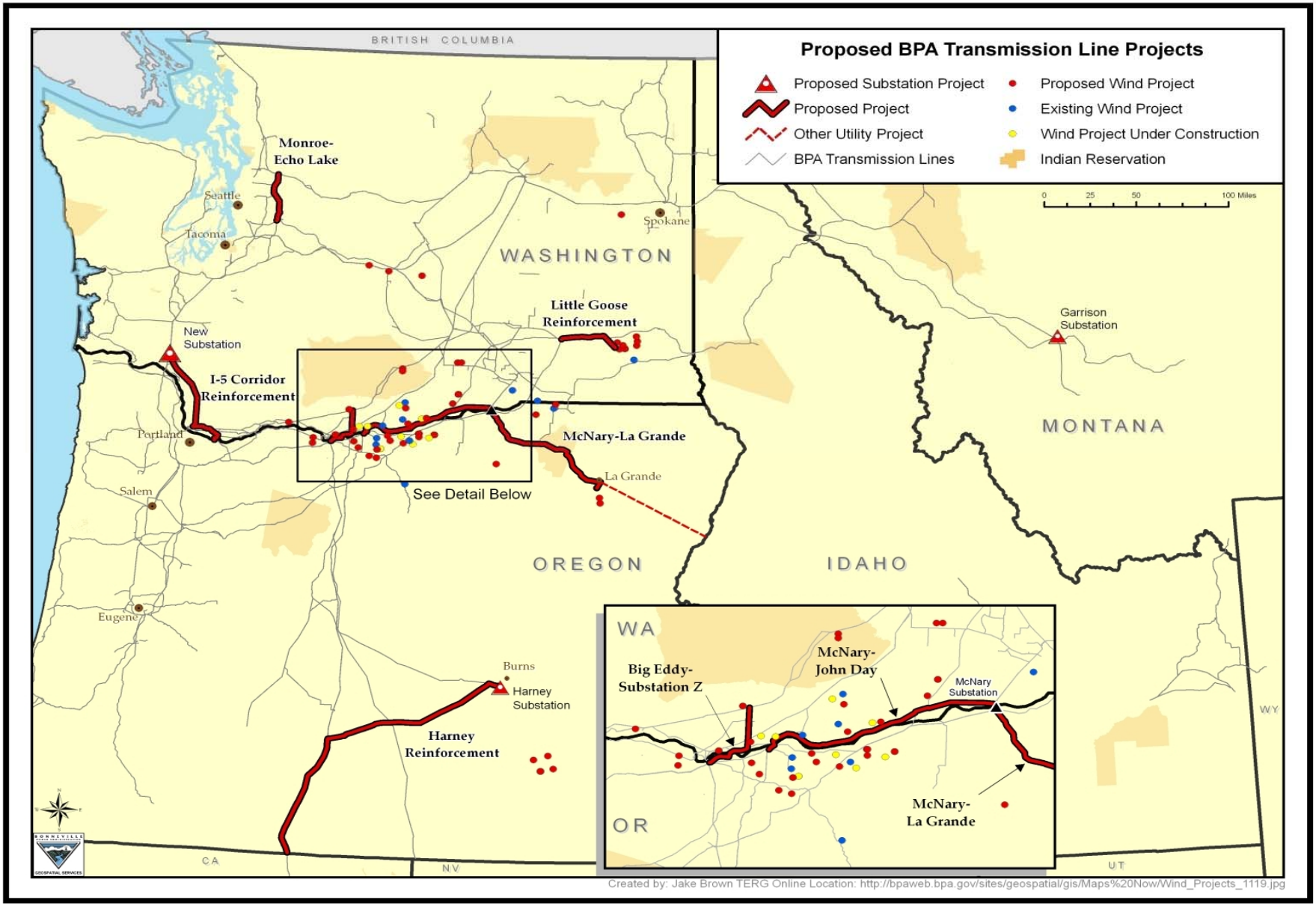
Project Cost and Schedule

Estimated Direct Costs Only (no overheads)

Project-Description	Estimated Total Cost ($k) / Confidence Level	Proposed Energ. Date
McNary-John Day + Other Upgrades	$246,545 / High	Dec-12
Station Z + Big Eddy-Station Z	$115,658 / Medium	Feb-13
I-5 Corridor Reinforcement Total	$341,996 / Medium	Sep-15
Little Goose Area Reinforcement Total	$99,435 / Medium	Sep-13
West of Garrison RAS	$2,300 / Low	Sep-11
Harney Area Reinforcement Total	$359,589 / Low	Sep-14
Northern Intertie Reinforcement Total	$225,301 / Low	Sep-15
LaGrande Area Reinforcement Total	$131,989 / Low	Sep-14
Total	$1,522,813	

Notes:

1. Estimated costs in FY08 dollars.
2. Energization dates assume embedded cost rate determination is made in Feb. 2009.
3. All projects except for Harney, Northern Intertie and LaGrande have high to medium confidence level of project costs.


Proposed BPA Transmission Line Projects
Proposed Substation Project
Proposed Project
Other Utility Project
BPA Transmission Lines
Proposed Wind Project
Existing Wind Project
Wind Project Under Construction
Indian Reservation
0 25 50 100 Miles
BRITISH COLUMBIA
WASHINGTON
OREGON
IDAHO
MONTANA
CA
NV
UT
WY
Monroe-Echo Lake
Seattle
Tacoma
Spokane
Little Goose Reinforcement
New Substation
I-5 Corridor Reinforcement
Portland
Salem
Eugene
McNary-La Grande
La Grande
See Detail Below
Garrison Substation
Burns
Harney Substation
Harney Reinforcement
WA
OR
Big Eddy-Substation Z
McNary-John Day
McNary Substation
McNary-La Grande
Created by: Jake Brown TERG Online Location: http://bpaweb.bpa.gov/sites/geospatial/gis/Maps%20Now/Wind_Projects_1119.jpg

PTSA Grouping

Grouping	PTSA's	Demand
Authorize -- Pre NOS	4 PTSA's	55 MW
Authorize†	43 PTSA's	1,727 MW
West of McNary Generation Integration Projects	45 PTSA's	2,023 MW
I-5 Corridor Reinforcement	2 PTSA's	150 MW
Little Goose Area Reinforcement	5 PTSA's	200 MW
West of McNary & West of Garrison RAS±	1 PTSA's	91 MW
Harney Area Reinforcement	28 PTSA's	775 MW
Northern Intertie Reinforcement	2 PTSA's	100 MW
West of McNary & LAGR Area Reinforcements‡	2 PTSA's	54 MW
West of McNary & I-5 Corridor Reinforcements	6 PTSA's	495 MW
West of McNary & Little Goose Area Reinforcements	13 PTSA's	640 MW
West of McNary & I-5 & Little Goose Area Reinforcements	2 PTSA's	100 MW
NOS -- TSR Groupings	153 PTSA's	6,410 MW

† Includes one PTSA split into two partial TSR's

± Includes one PTSA with a partial TSR (parent PTSA in West of McNary)

‡ Includes one PTSA with a partial TSR (parent PTSA in West of McNary)

ATC Analysis with Proposed Projects

- 2014 ATC summer and winter base cases – modeled 6,410 MW of PTSAs
- ATC base case showed that with the facilities identified, BPA can provide long-term transmission service for all 153 PTSAs with an associated demand of 6,410 MW

2014 ATC Case Flows

			Aug. 2014 Start	Aug. 2014 Final	Jan. 2014 Start	Jan. 2014 Final
Flowgate	**Existing TTC†**	**Projected TTC‡**	**Flow MW**	**Flow MW**	**Flow MW**	**Flow MW**
SOUTH OF ALLSTON	2,870	3,980	2,659	3,118	1,165	1,762
CROSS CASCADES NORTH	10,450	9,900	4,371	4,254	8,676	8,675
CROSS CASCADES SOUTH	8,500	7,700	5,263	4,871	6,954	6,674
MONROE-ECHO LAKE	1,500	1,500	1,074	1,152	-284	-179
NORTH OF HANFORD	4,100	4,100	2,137	1,772	-610	-307
NORTH OF JOHN DAY	7,800	8,400	5,753	5,867	2,739	4,812
PAUL TO ALLSTON	2,250	2,990	1,723	1,379	484	774
RAVER TO PAUL	1,625	1,625	940	979	541	662
WEST OF MCNARY	2,870	4,500	2,184	2,512	1,954	3,063
WEST OF SLATT	4,100	5,500	3,598	4,610	2,659	4,488

† Based upon existing flow gate definitions

‡ Final TTC's will be dependent upon the actual implementation of those plans of service that proceed to construction

Next Steps

- Finalize NOS Cluster Study Report
- Present results of NOS Cluster Study at Columbia Grid - 12/11
- Support Marketing with the CIFP analysis as we go through various scenarios for developing the final portfolio of projects
- Continue to develop plan of service (POS), project requirements diagram (PRD), cost estimate, schedule, funding request, business case, etc.