



Baker County Wind Summit



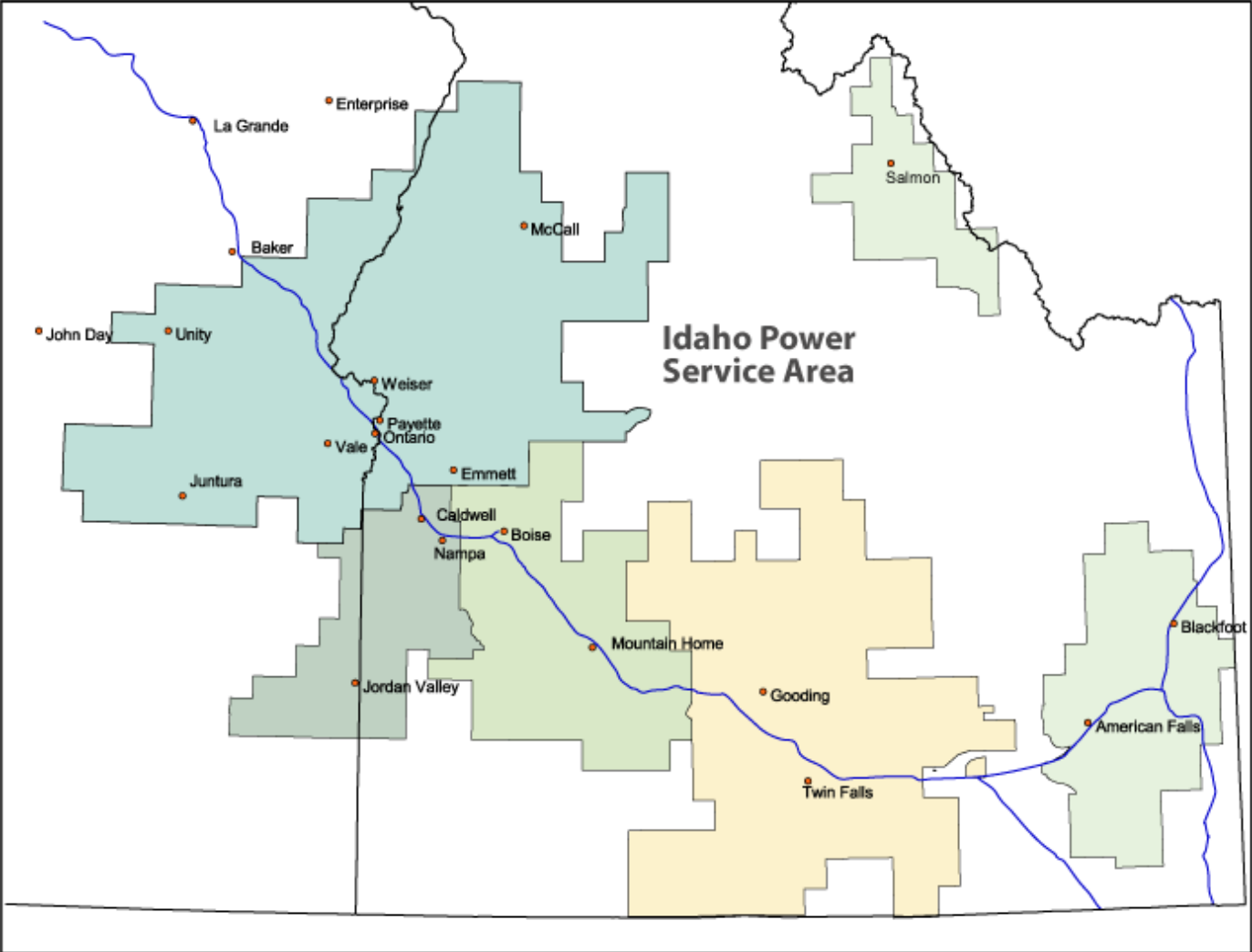
Outline

- Idaho Power Transmission System
- Available Transmission Capacity/Constraints
- Generation Interconnection Process
- Generation Interconnection Queue
- Boardman to Hemingway Transmission Project

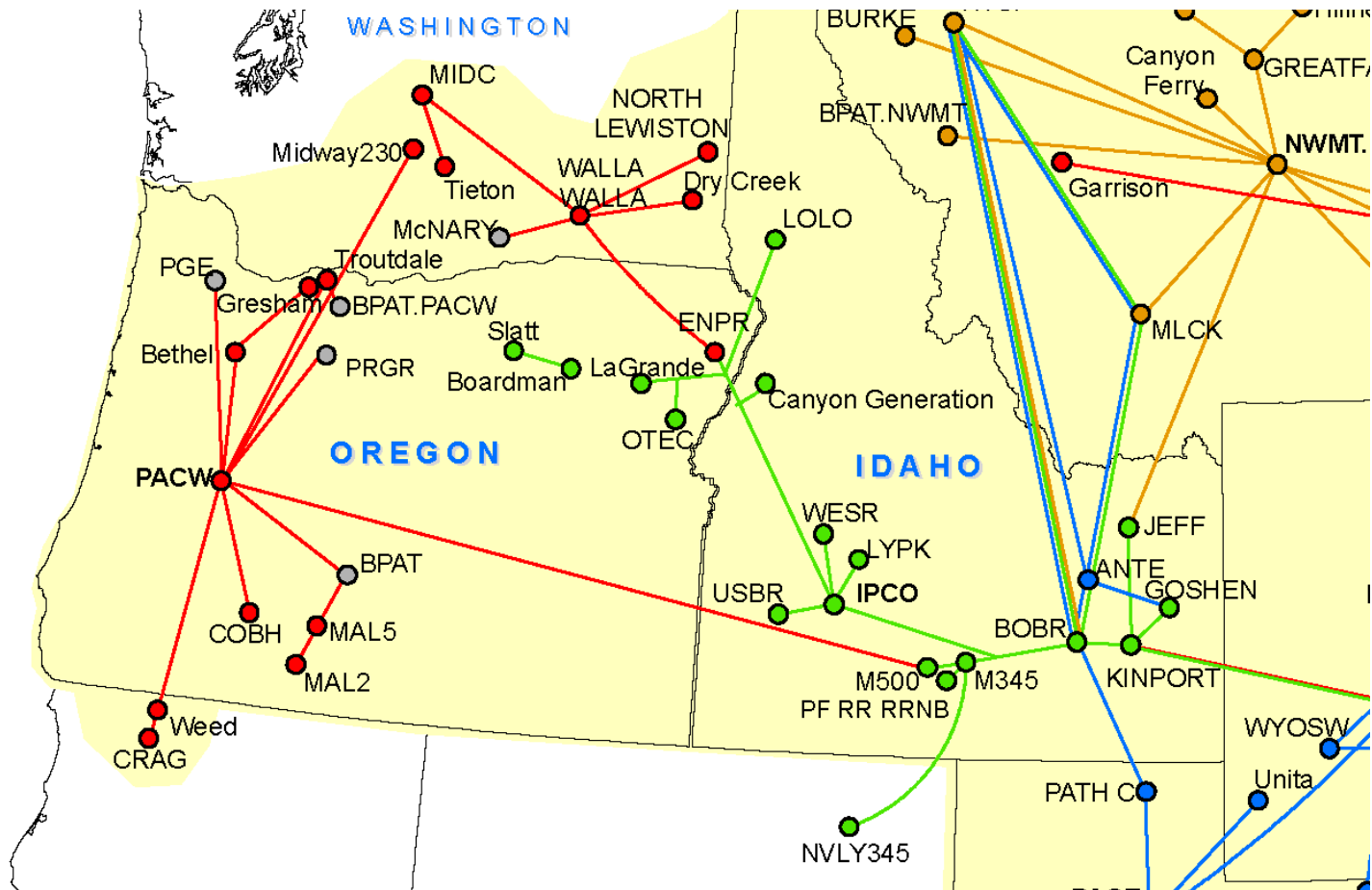
Idaho Power System

- 24,000 Square Miles Service Area
- 982,000 Population of Service Area
- 4,747 Transmission Line Miles
- 3,218 MW Peak Load—(*Summer 2008*)
- Energy Sources
 - 38% Hydro
 - 39% Thermal
 - 28% Purchased Power

Service Area

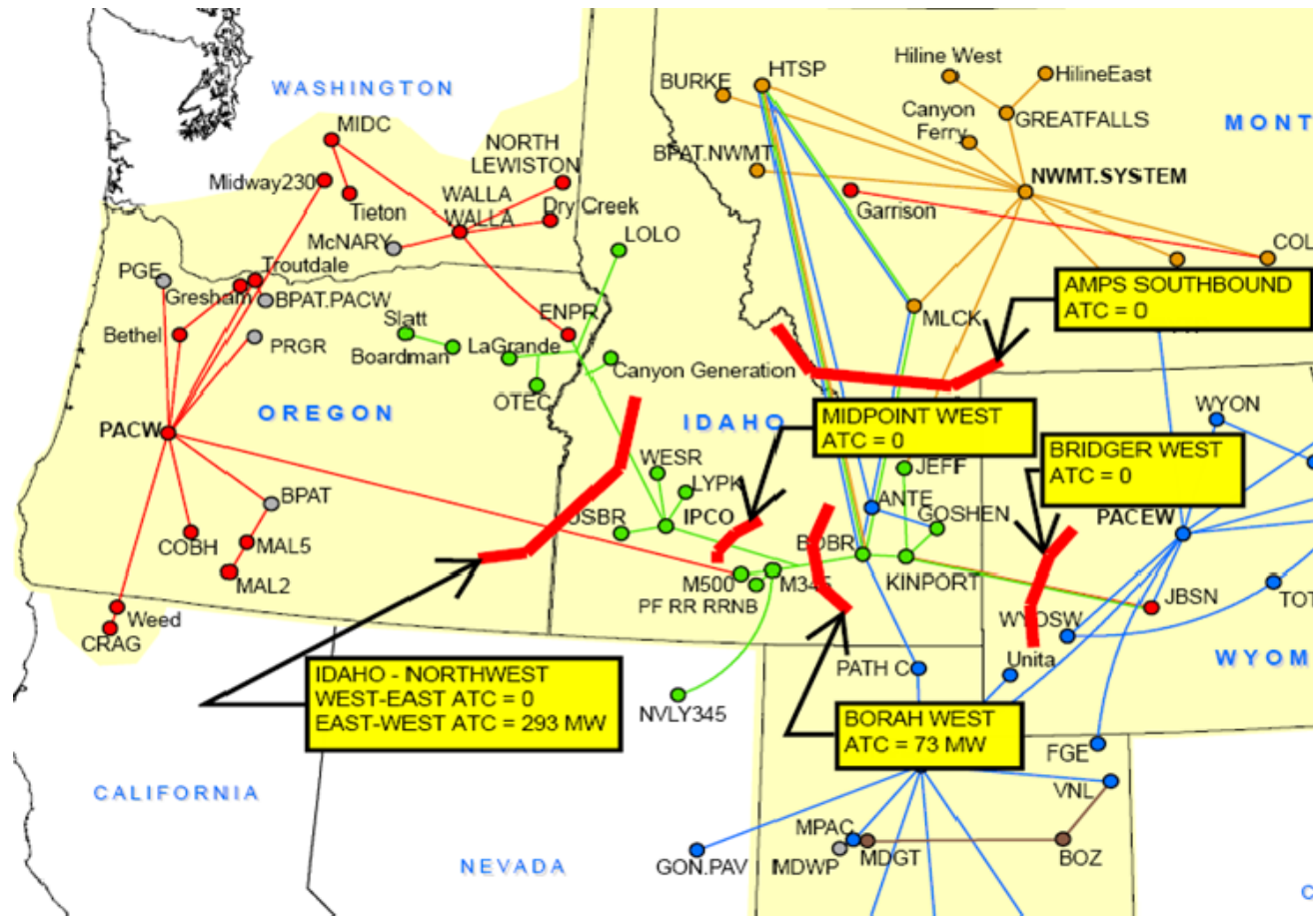


Idaho Power Transmission Paths

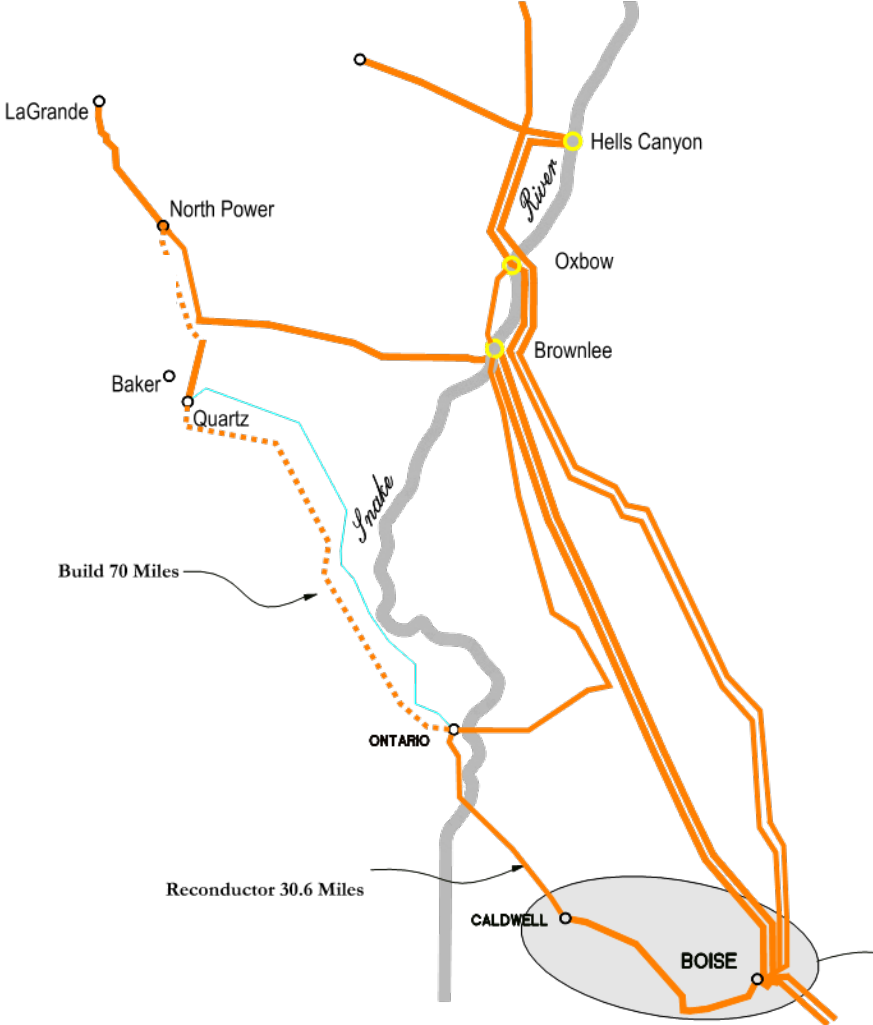


Transmission System

- All transmission paths to other utilities constrained



Oregon/Idaho Detail



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Generation Interconnection Process

- Application
- Feasibility Study
 - Is it feasible to connect to the generator?
 - Identify required equipment and provide a ballpark estimate
 - Identify required upgrades to the local system with estimate and determine if there is system capacity or if a system impact study is required.
- System Impact Study
 - Quantify system capacity limitations
 - Identify system improvements required and provide a ballpark estimate
- Facility Study
 - Develop construction cost estimates for all associated projects (Station, Distribution Lines, Transmission Lines)

Acceptability Criteria

- Less than or equal to 100% of continuous rating of equipment is acceptable.
- Voltages, under normal operating conditions, are to be maintained within plus or minus 5% (0.05 per unit) of nominal.
- Voltage flicker during starting, stopping or operation of the generator is limited to 5% as measured at the point of interconnection.
- Idaho Power's Reliability Criteria for System Planning was used to determine proper transmission system operation.

System Impact Study

- Determine “Impact” of project on the system for numerous operating scenario's (N-1 criteria)
 - Transformer and Line Loading / Thermal Limits
 - Load Flow Impacts
 - Dynamic Stability Study
 - Shunt Reactors?; Reconductor?; Additional System Transformation?; or other modifications required for project's
- Ball park cost estimate for system modifications

Transmission Costs

Transmission Description	Cost/mile
500 kV – double circuit	\$2,500,000
500 kV – single circuit	\$1,500,000
345 kV – double circuit	\$2,000,000
345 kV – single circuit	\$1,000,000
230 kV – double circuit	\$1,700,000
230 kV – single circuit	\$900,000
138 kV – double circuit	\$1,000,000
138 kV – single circuit	\$700,000

Station Costs

Substation Description	Cost
500 kV – no transformation	\$50,000,000
500 kV – 1500 MW transformation	\$100,000,000
345 kV – no transformation	\$40,000,000
345 kV – 1000 MW transformation	\$75,000,000
230 kV – no transformation	\$35,000,000
230 kV – 500 MW transformation	\$50,000,000
138 kV – no transformation	\$1,000,000
138 kV – 30 MW transformation	\$3,500,000

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Oregon Queue

Interconnection		Location	In Service	Generator Information		
Queue #	App. Date	County	Projected	Type	Fuel Type	Capacity (MW)
233	3/6/2008	Baker	1/1/2010	PURPA	Wind	3
235	3/17/2008	Union	10/15/2012	NR/ER	Wind	150
251	4/21/2008	Baker	10/15/2012	NR/ER	Wind	215
272	1/26/2009	Malheur	8/31/2009	PURPA	Solar	10
276	2/26/2009	Malheur	3/1/2010	PURPA	Solar	10
277	3/9/2009	Baker	6/30/2010	PURPA	Wind	10
278	3/9/2009	Baker	6/30/2010	PURPA	Wind	10
279	3/9/2009	Baker	6/30/2010	PURPA	Wind	10
280	3/9/2009	Baker	6/30/2010	PURPA	Wind	10
281	3/9/2009	Baker	6/30/2010	PURPA	Wind	10
282	3/9/2009	Baker	6/30/2010	PURPA	Wind	10

Western Idaho Queue

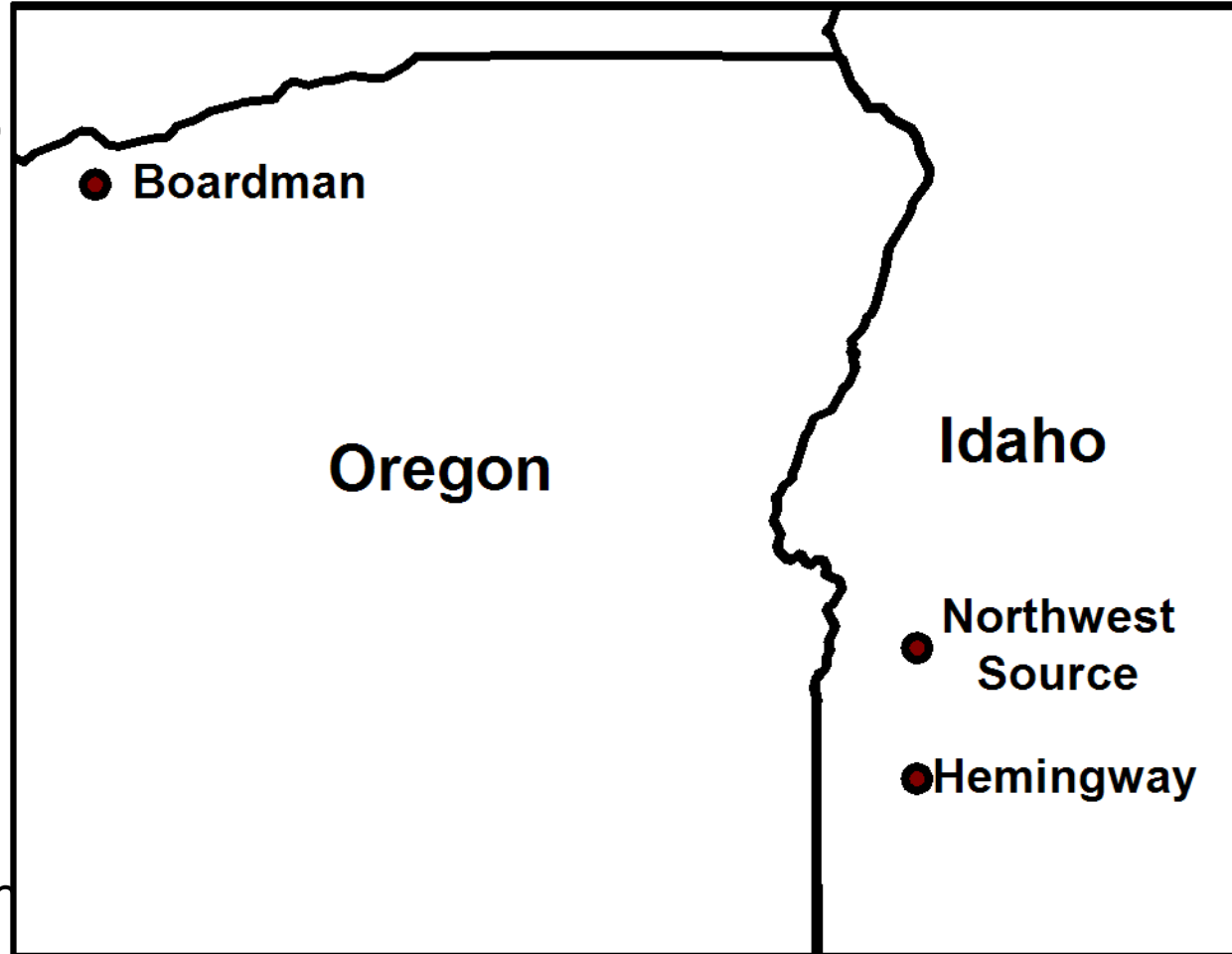
Interconnection		Location	In Service	Generator Information		
Queue #	App. Date	County	Projected	Type	Fuel Type	Capacity (MW)
236	4/1/2008	Canyon	9/1/2008	PURPA	Biomass	3.5
239	4/11/2008	Payette	4/1/2012	NR	CCCT	325
256	6/11/2008	Ada	12/31/2009	ER	Hydro	18
262	6/30/2008	Payette	4/1/2012	NR/ER	CCCT	306
264	8/18/2008	Gem	6/1/2012	NR	CT	340
271	11/20/2008	Canyon	9/30/2009	PURPA	Biomass	1.5
274	2/11/2009	Owyhee	11/30/2009	PURPA	Solar	10
284	3/11/2009	Ada	3/1/2010	NR	Biogas	1
285	3/16/2009	Gem	3/1/2010	PURPA	Geothermal	3.5



Boardman Hemingway 500 kV Transmission Line

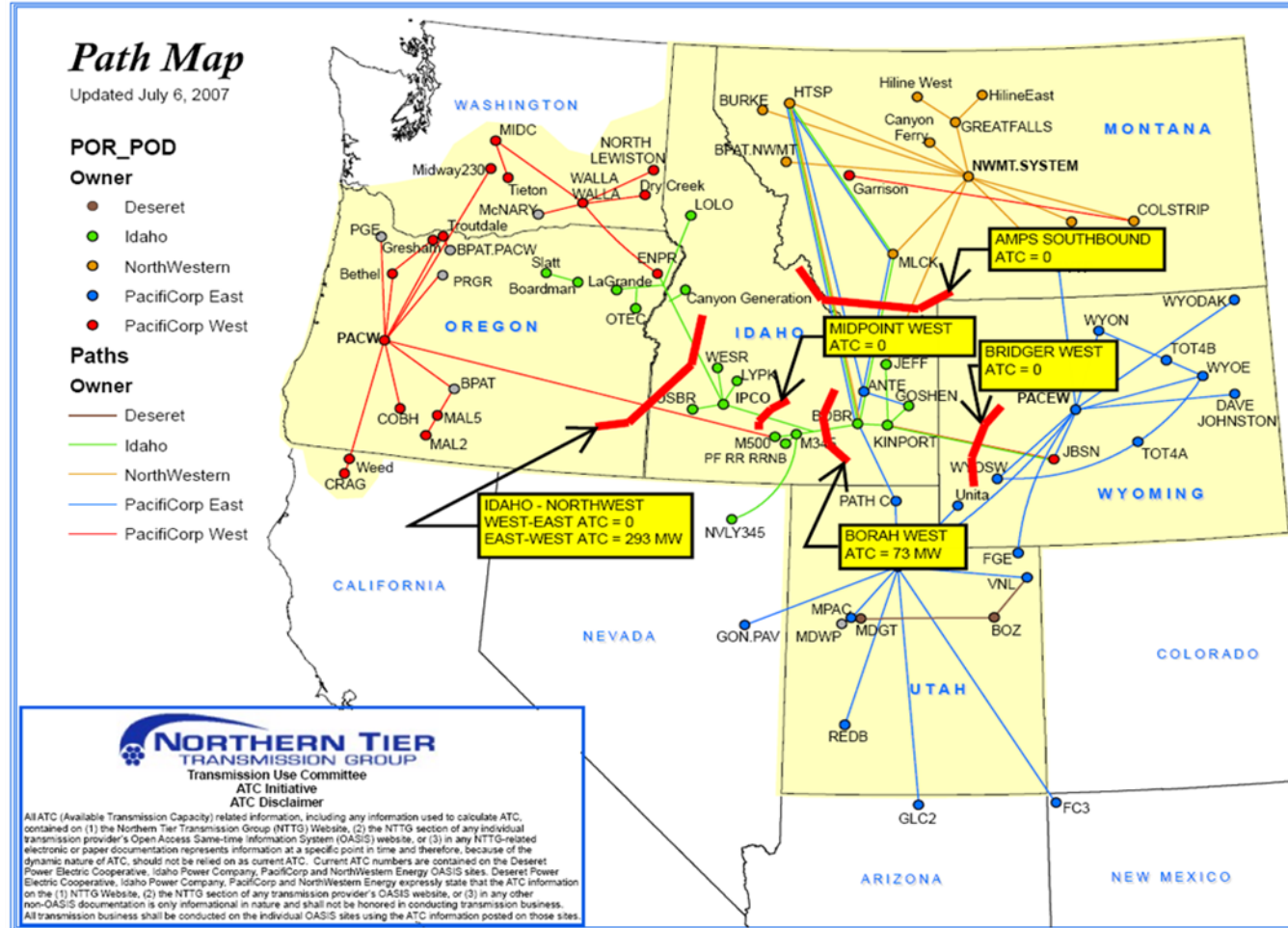
Project Overview

- 298 mile, single 500 kV AC circuit
- Boardman Power Plant, Oregon to Hemingway, Idaho (near Melba)
- Project Operating Date: Summer 2013
- Project Website: <http://www.boardmantoh>



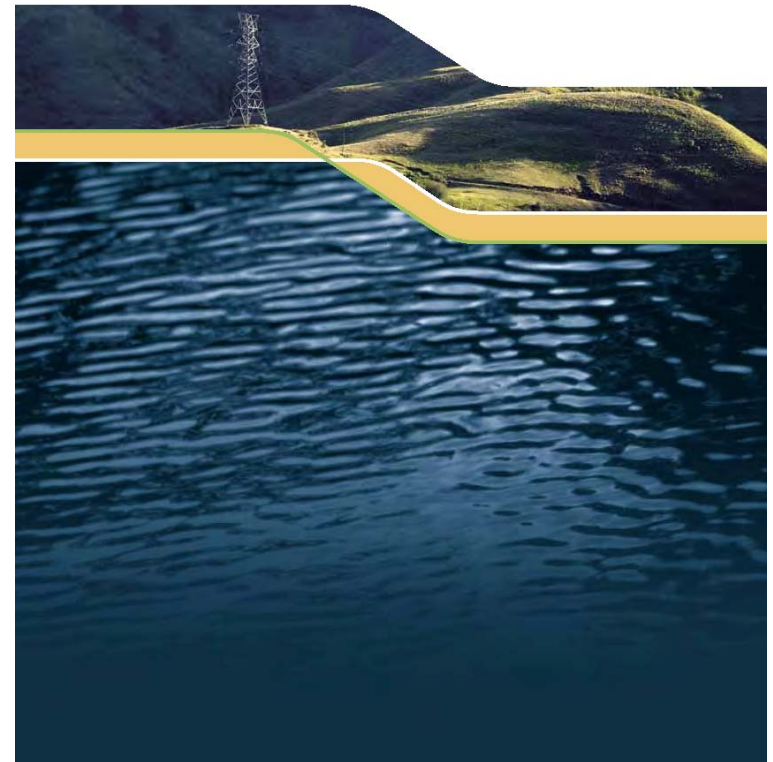
Existing Transmission System

- All transmission paths to other utilities constrained



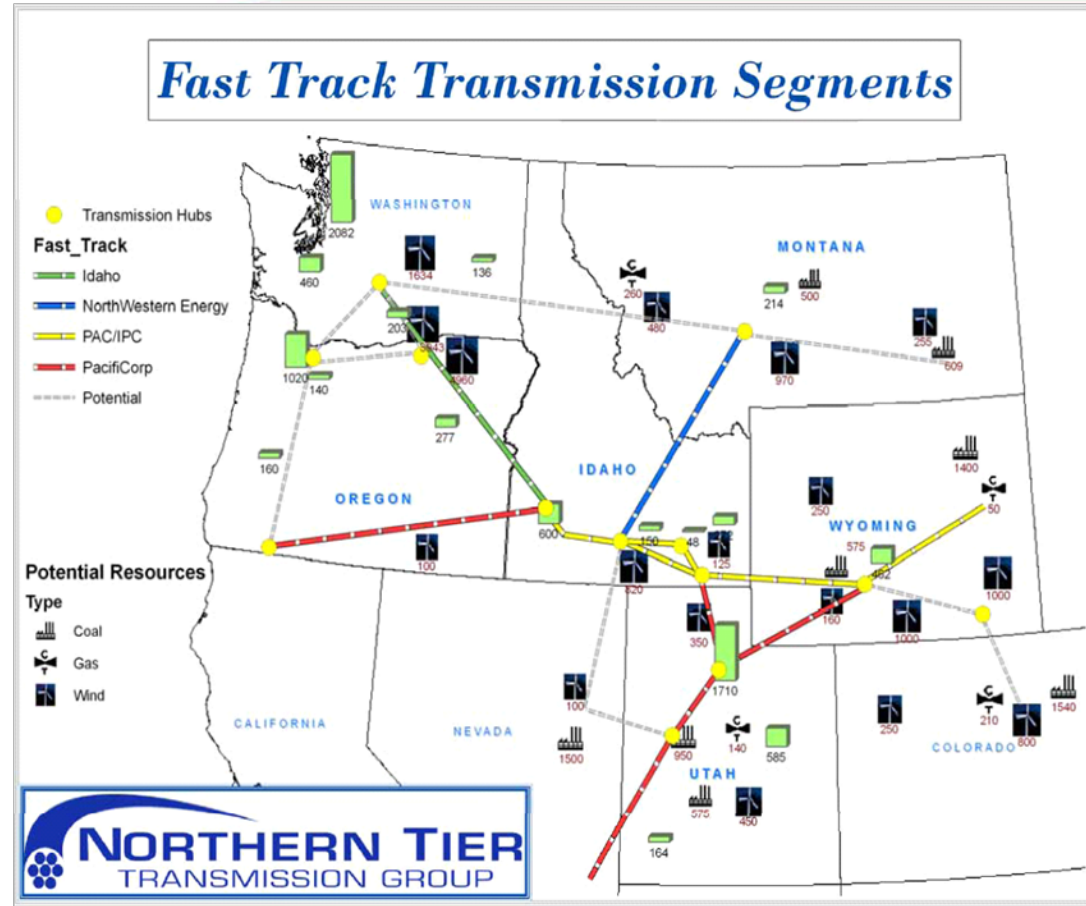
Genesis

- 225 MW McNary–Boise transmission upgrade
 - 230 kV Transmission
 - McNary to Brownlee
 - Brownlee to Ontario
 - Ontario to Garnet
 - Garnet to Locust



Regional Coordination

- In consideration of
 - Available transmission rights of way
 - other regional projects
- Increased 500 kV for greater capacity
- Project announcement produced many Transmission Service Requests



Initial Project Rating

- Proposed project rating submitted
- Responses due next week

Flow Direction	Path	Existing Rating (MW)	New Rating (MW)
Import	Idaho to Northwest	1090	750
	Boardman to Hemingway		1300
Import	Total	1090	2050
Export	Idaho to Northwest	2304	1770
	Boardman to Hemingway		800
Export		2304	2570

Proposed Schedule

