



Renewables in the NW

Northwest Landfill Gas Energy Workshop

April 10, 2002





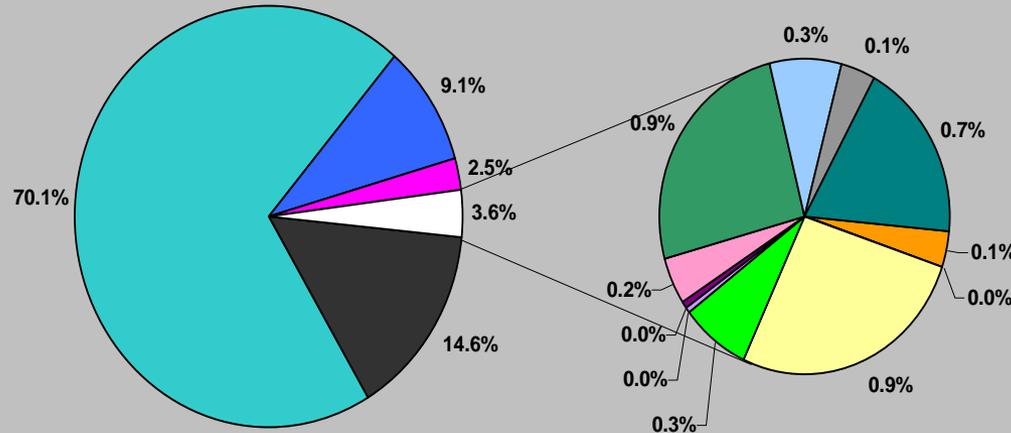
Present Conditions for Renewables in the NW

1. State legislation: (WA. HB 2247, CA SB 532, OR SB 1149). (Also, on the Federal level SB 517.)
2. Existing Resource Mix



NW Power Pool 2001 Resource Mix

Pacific Northwest Resource Mix: Capacity Basis



- Coal
- Fuel Oil
- Hydro
- Natural Gas
- Solar
- Uranium
- Wind
- Wood Residue
- Wastewater Gas
- Landfill Gas
- MSW
- Black Liquor
- Refinery Gas
- Pet Coke
- Pmp Storage

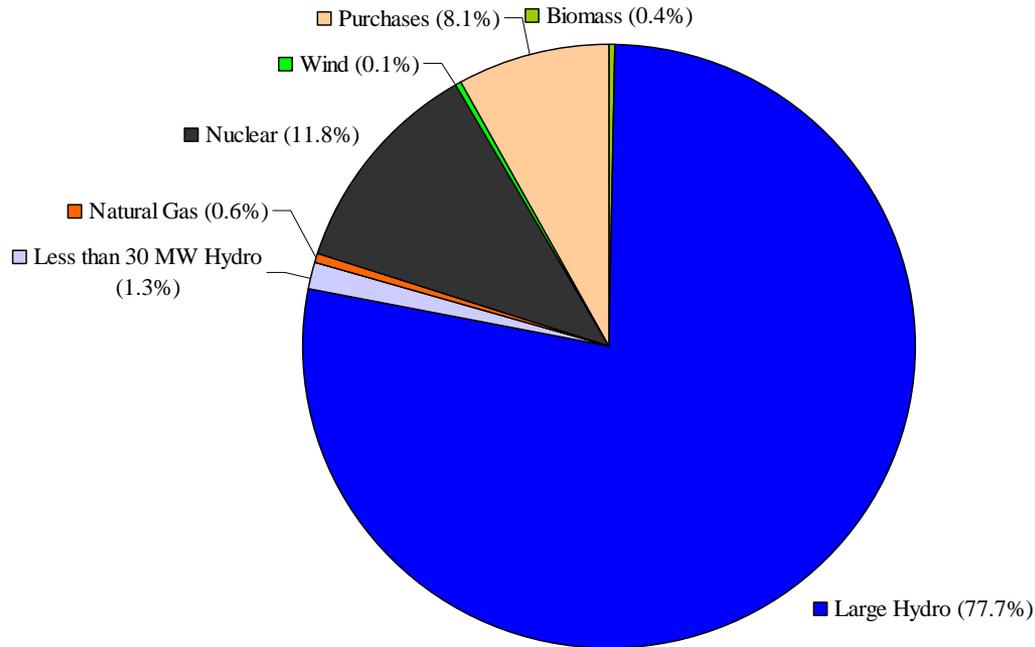
47,000 MW Total. Source: NWPPC 4/05/02





BPA's 2001 Resource Mix

BPA 2001 System Mix (before resource specific sales deducted)





BPA'S RENEWABLE RESOURCE PROJECTS

PROJECT NAME	LOCATION	DEVELOPER/ OPERATOR	MW	AMW	ANNUAL OUTPUT (MWH)	ONLINE DATE
Operating Wind Projects						
Foote Creek 1	Carbon County, WY	PacifiCorp/ EWEB/ SeaWest	15.3	6.3	55,399	4/22/1999
Foote Creek 2	Carbon County, WY	SeaWest	1.8	0.8	6,906	6/18/1999
Foote Creek 4	Carbon County, WY	SeaWest	16.8	7.4	64,460	10/1/2000
Condon	Gilliam County, OR	SeaWest	49.8	12.0	104,700	24.6 MW online 12/31/01;25.2 MW online 6/1/02
Stateline	Walla Walla County, WA, & Umatilla County, OR	FPL Energy/ PacifiCorp Power Marketing	90.4	30.2	264,114	12/18/2001
<i>Total for Operating Wind Projects</i>			174.1	56.6	495,579	
Wind Projects in Progress						
Maiden	Yakima and Benton Counties, WA	Pacific Winds	150.0	49.5	433,620	3/1/2003
<i>Total for Wind Projects in Progress</i>			150.0	49.5	433,620	
Shortlisted Wind Projects						
Roosevelt	Klickitat County, WA	SeaWest	150.0	49.5	433,620	12/1/2003
Summit Ridge	Wasco County, OR	SeaWest	50.0	15.0	131,400	12/1/2003
Columbia Wind Ranch	Klickitat County, WA	Cielo Wind Power	80.0	28.9	253,160	12/1/2003
Horse Heaven Hills	Benton County, WA	Pacific Winds	150.0	47.6	417,000	6/1/2003
<i>Total for Shortlisted Wind Projects</i>			430.0	220.5	1,931,600	
Total for Wind Projects			580.0	270.0	2,365,220	
Geothermal Projects						
Fourmile Hill	Siskiyou County, CA	Calpine	55.0	49.9	437,100	10/1/2004
<i>Total for Geothermal Projects</i>			55.0	49.9	437,100	
Solar Projects						
Solar Ashland Project	Ashland, OR	City of Ashland	0.015	0.0031	27	6/15/2000
Hanford Solar Project	Richland, WA	Energy Northwest	0.0275	0.0056	49	7/2/2002
<i>Total for Solar Projects</i>			0.0425	0.0087	76	
Total for Renewable Resource Projects			635.04	319.9	2,802,396	



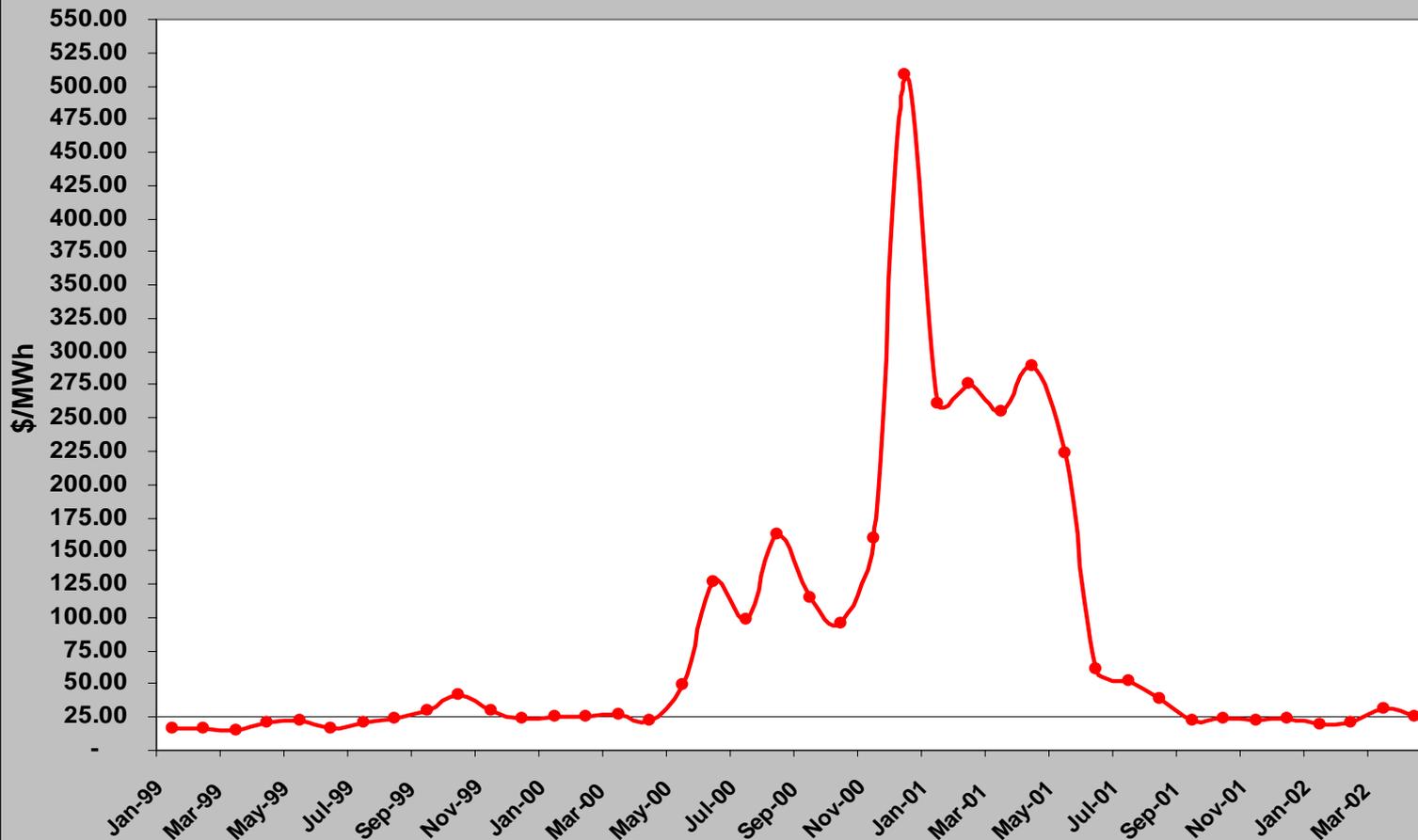
4 Critical Issues for Renewables

1. Market prices
2. Green tag revenues
3. Need for power
4. Market Transformation



Dow Jones Mid-Columbia Monthly Average Flat Prices

DJ Mid-C Flat Prices: Jan 1999 - Present





BPA' Renewables Budget

(Cost of output)

+ (Firming/Shaping/Transmission Costs)

– (Long Run Marginal Cost of Power)

– (Green Tag Revenue)

\leq \$15 million/year



Green Tag Revenue

- Green “Tags” or “Certificates” are the non-power attributes associated with renewable resources. E.g. “wind”, “biogas”, “solar” etc.
- Certificates sold separately from electricity.
- West coast certificate market beginning to develop.
- Certificate prices are presently in low single digits.



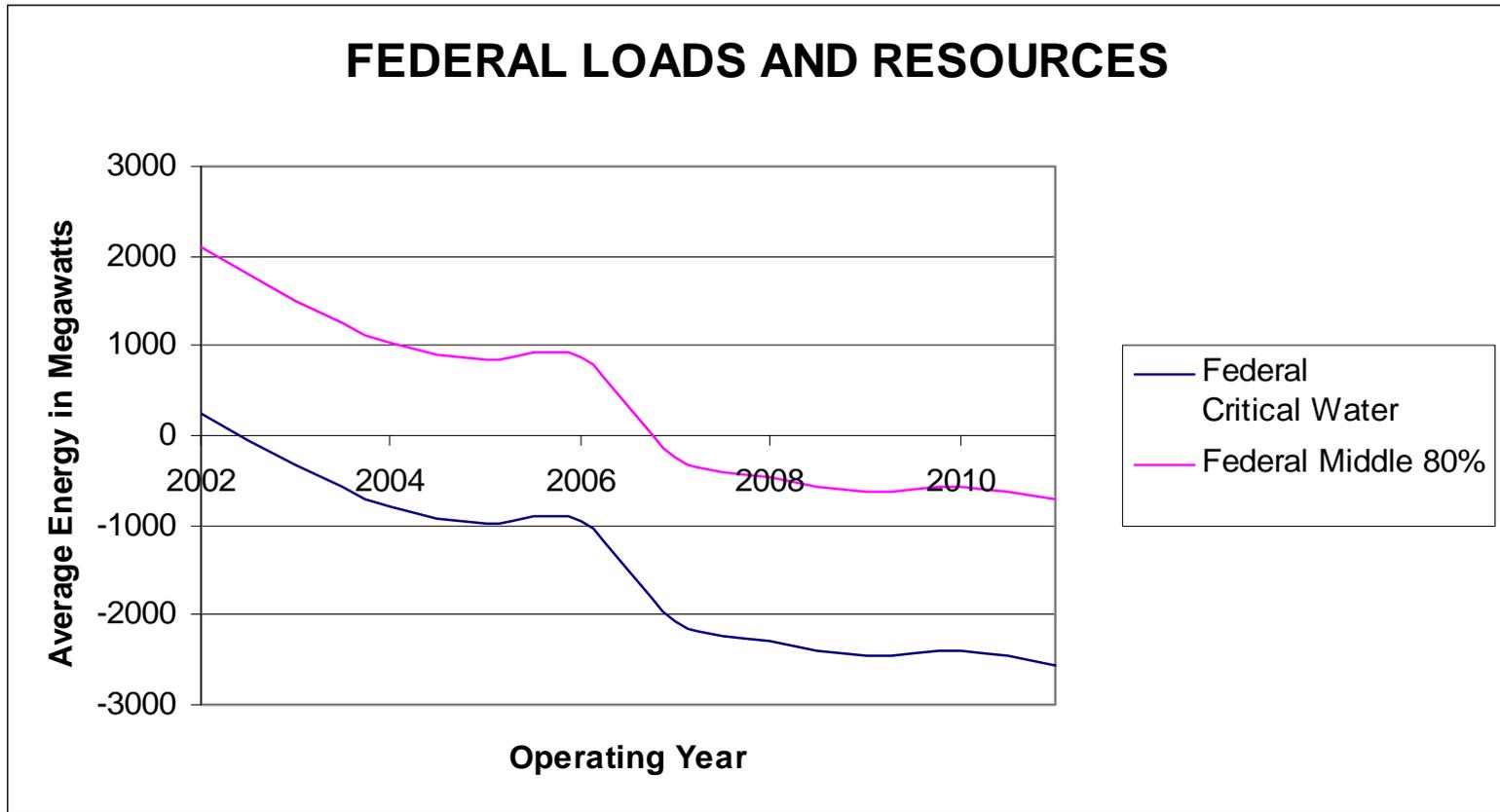
Need for Power

- BPA likely to be in resource deficit post-2006
- Region is in resource deficit now
- NW Power Planning Council plans to examine meaning of cost-effectiveness in today's market



Need for Power - BPA

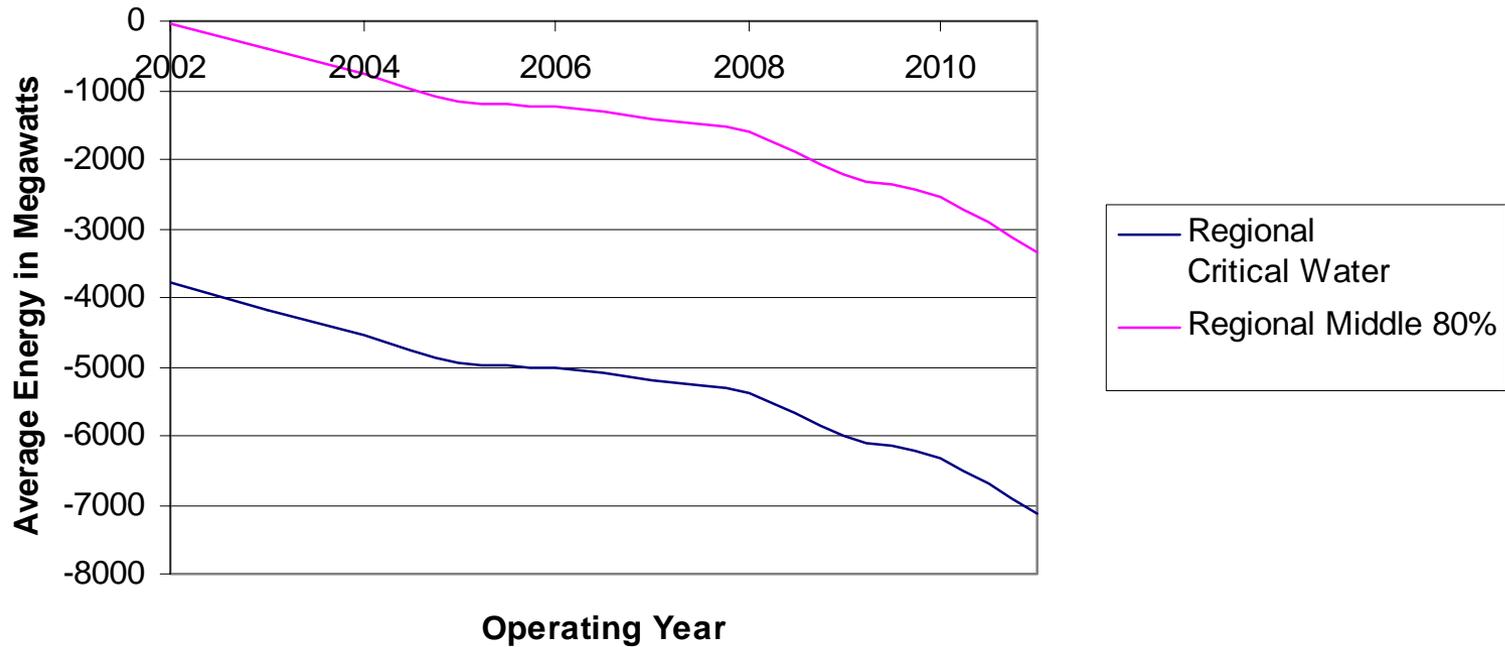
FEDERAL LOADS AND RESOURCES





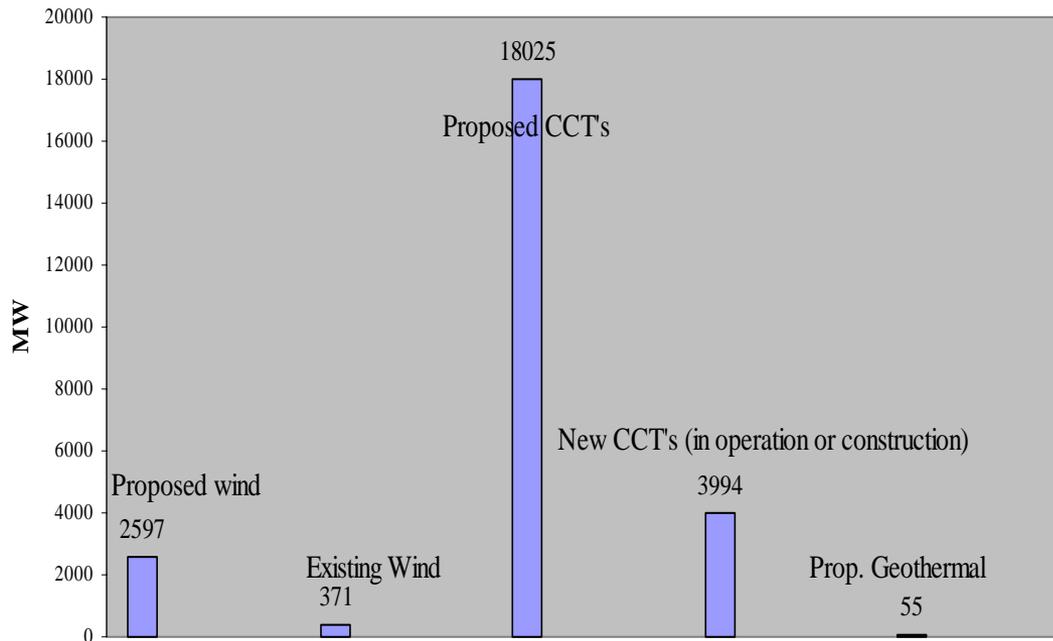
Need for Power - Regional

REGIONAL LOADS AND RESOURCES



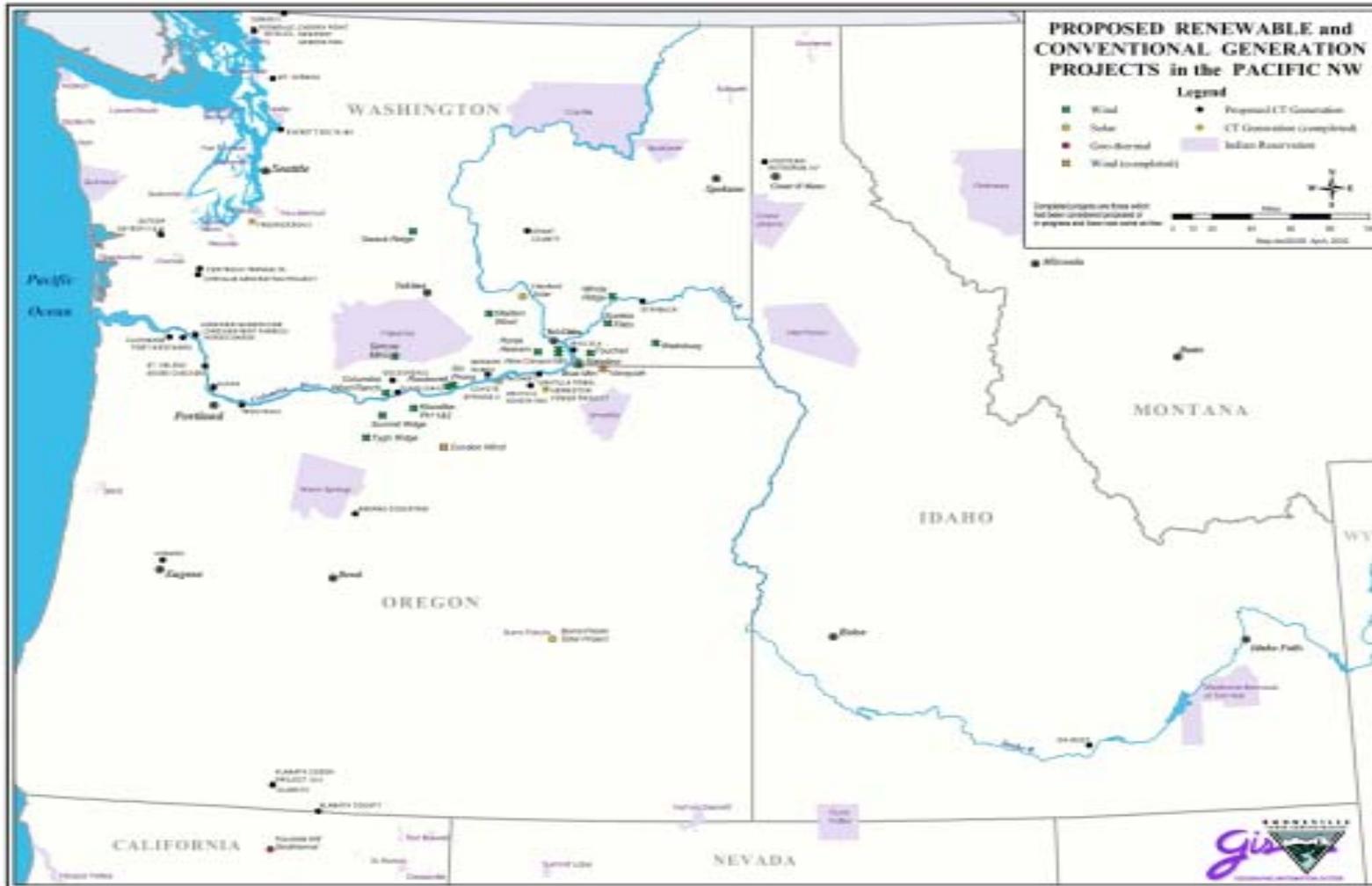


New Generation In BPA Service Territory





Proposed new Generation in the BPA Service Territory





Market Transformation

- Production Tax Credits
- Customer Choice Programs
- Renewable Portfolio Standards
- Education
- Marketing
- Carbon Trading