BPA's Approach to Risk

What we are working on.

How we are changing the Northwest.

Brad Miller
April 28, 2005

Agenda

- Define What Risk Means to BPA
- Energy Efficiency's legacy and current efforts
- Solving real problems in the region
- NWS and Program Updates

BPA and the PNW

- BPA is Risk Averse
- Mission is to provide the least cost most reliable electrical power alternative to the Region
  - First Priority: Our Full-Requirements Customers
  - Direct Service Industries
  - Non-load Following Utilities: Slice/Block
  - Non-Firm sales: IOU's/Out of Region
- Post 2001: Avoid the same mistakes
- BPA IS RISK AVERSE

Defining Risk to BPA

- Fluctuating Energy Market
- Weather:
  - 6th year of drought in Northwest
  - Below average snow packs
  - Unseasonably warm winters
- Transmission System
  - Continual need to upgrade and maintain
  - Rising cost for construction
  - Increased environmental issues
- Impacts on Fish and Wildlife mitigation efforts

NW River Forecast Center Water Supply Forecast: January-April Period 2005*

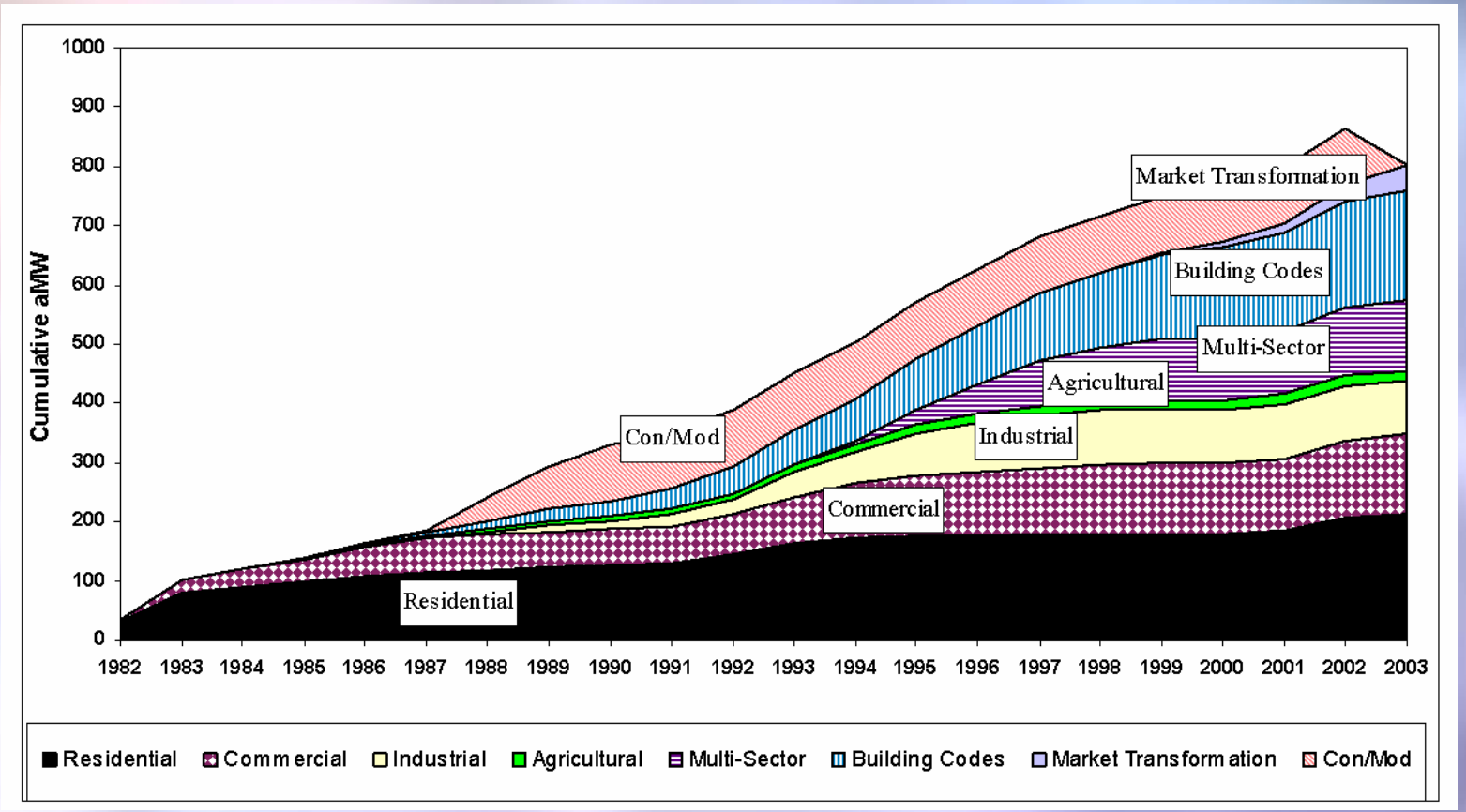
		Grand Coulee		Lwr. Granite		The Dalles	
Date	Forecast	MAF	%	MAF	%	MAF	%
Dec 17	(Dec MM)	63.8	101	26.4	88	102.0	95
Dec 30	(Jan EB)	60.4	96	22.9	76	92.9	87
Jan 7	(Jan FF)	57.2	91	20.7	69	85.6	80
Jan 20	(Jan MM)	59.6	95	20.8	69	87.9	82
Jan 28	(Feb EB)	59.5	95	18.6	62	84.5	79
Feb 7	(Feb FF)	57.2	91	18.0	60	82.4	77
Feb 18	(Feb MM)	52.3	83	15.8	53	74.0	69
Feb 25	(Mar EB)	50.6	80	14.9	50	71.2	66
8-Mar	(Mar FF)	50.5	80	14.6	49	70.7	66
18-Mar	(Mar MM)	49.4	79	13.3	44	67.7	63
1-Apr	(Apr EB)	53.7	85	15.7	52	75.1	70
8-Apr	(Apr FF)	52.2	83	15.7	52	73.8	69
22-Apr	(Apr MM)	53.0	84	16.2	54	75.3	70

*Source: NWS-RFC & USDA-NRCS coordinated forecast

% = Percent of 1971-2000 Normals

BPA's Historical Conservation Savings

Adjusted Cumulative Savings (aMW)
FY 1982 – 2003



As a resource, only Grande Coulee and John Day produce more energy on an average annual basis than BPA's conservation programs.

Delivered and Planned Savings

BPA's Existing Conservation Programs (Current Rate Period, in aMW)

Programs	**FY 01**	**FY 02**	**FY 03**	**FY 04**	**FY 05**	**FY 06**	**Total**
	----------delivered----------				///	***-------planned-------***	
C&RD	*4.6*+*	*18.5+*	*17.8+*	*13.4+*	10.7	?	65.0
ConAug	*3.7**	*21.8*	*20.8*	*14.5*	16.6	13.3	90.7
Market Transformation	--	*12.0*	*16.0*	*14.0*	12.0	8.0	62.0
Low Income Wx	--	*0.2*	*0.3*	*0.2*	0.3	0.3	1.3
Fed. Reimbursable (non-ConAug)	--	--	*0.1*	*0.1*	0.4	0.4	1.0
Totals	*8.3**	*52.5*	*55.0*	*42.2*	40.0	22.0	220.0#
Rate Period Target (Steady Production)	***44.0***	***44.0***	***44.0***	***44.0***	***44.0***	***44.0***	***220.0***

Note: BPA's target from all conservation programs is **220 aMW** minus the **158 aMW** we achieved in FYs 01, 02, 03 and 04 = **62 aMW left to capture**. This means we have to average about 31 aMW/year for FYs 05 and 06 to meet the 220 aMW target.

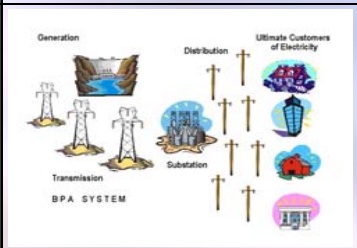
+ - The ***actual*** numbers include the aMW savings associated with the C&RD donations to the Alliance and the Energy Trust of Oregon; they exclude the irrigation scheduling savings since they have only a 1-year measure life.

* - Because of the 2000-01 energy crisis, BPA started these programs 8 months earlier than the planned 10/1/01 launch date.

- This number represents the potential savings that could result from the approved funding levels for BPA's conservation programs over the rate period. Because all programs will not be completed at the targeted level, these preliminary numbers will be adjusted as we get closer to BPA's 220 aMW target.

BPA is on schedule to meet 220 aMW target.

The Energy Future

	Traditional	TRANSITIONAL PROGRAMS		FUTURE
Stage of development				**Hydrogen Economy** 
Organization:	Linear	Smart Network		Self Healing Network
Goal: (10 years from now WSJ mentions Smart Energy and the world thinks PNW, just like saying chips and think Silicon Valley)	Universal service & Reliable power for all consumers	1) to optimize loads on the electrical network 2) reduce costs to consumers and utilities 3) facilitate the integration of renewable resources 4) increase electrical system reliability 5) reduce environmental impacts of load growth	100% Load Factor 100% overtime All load met near real time with lowest cost (Integrated Resource Planning on a grand scale)	H2 economy - sustainable, renewable & clean (no imported oil/energy?)
Basis:	Iron in ground technologies Hydro & fossils	Emerging Tech - Supports grid with temporal & locational value intelligence	Processing power, communication & control advances balances all loads and resources in real time	Efficiency valued over all else, very secure, 100% renewable generation, H2 stored for peaks
Concept Supporters:	Consumers, regulators, utilities, RTO - ISO's, ETO, NEEA, Unions	BPA, BC Hydro, DOE, PNNL, CIEDS, EPRI, E2I, NGO's, NWETC, PDC, CTED, CEC, Universities	VCs, Start ups, Investors, PGE, Pacific, NW Natural (with return on investment), Portland Business Alliance	DOE, NWHA, NHA, NGO's
Sector:	All users	Public	Private	Govt., NGO
Reasons:	System works well	Economic growth & new jobs	Make $ & grow jobs	Research/Policy
How to make it happen:	In place	Support for regional conferences like BPA Non Wires Solutions in Sept. & NWETC, PBA Smart Energy meetings, broaden the BETC to include new technologies that lower long term utility costs and support system reliability - for end users	Technology Innovation cost recovery for utilities (PUC), regulatory change to encourage adoption of new technology purchases by utilities, involve high tech compnies like Intel, HP	Fund Technology Innovation for system efficiency & prioritze needs/technology via a public board

Gridwise/EnergyWeb/Non-Wires Solutions

- BPA active in Gridwise, EnergyWeb and Non-Wires Solutions
  - BPA Founding Member of Gridwise Alliance
  - BPA Participant in EPRI's Intelligrid Initiative
  - BPA also Pursuing Pacific Northwest Initiatives e.g. Northwest Energy Technology Collaborative
- Synergies for all three efforts is significant
- For ease of presentation and focus, BPA has placed all these efforts primarily under the umbrella of Non-Wires Solutions.

Non-Wires Solutions (NWS)

- The Bonneville Power Administration (BPA) wants to ensure it is providing the most cost-effective solutions for the region's transmission needs, from an engineering, economic, and environmental perspective

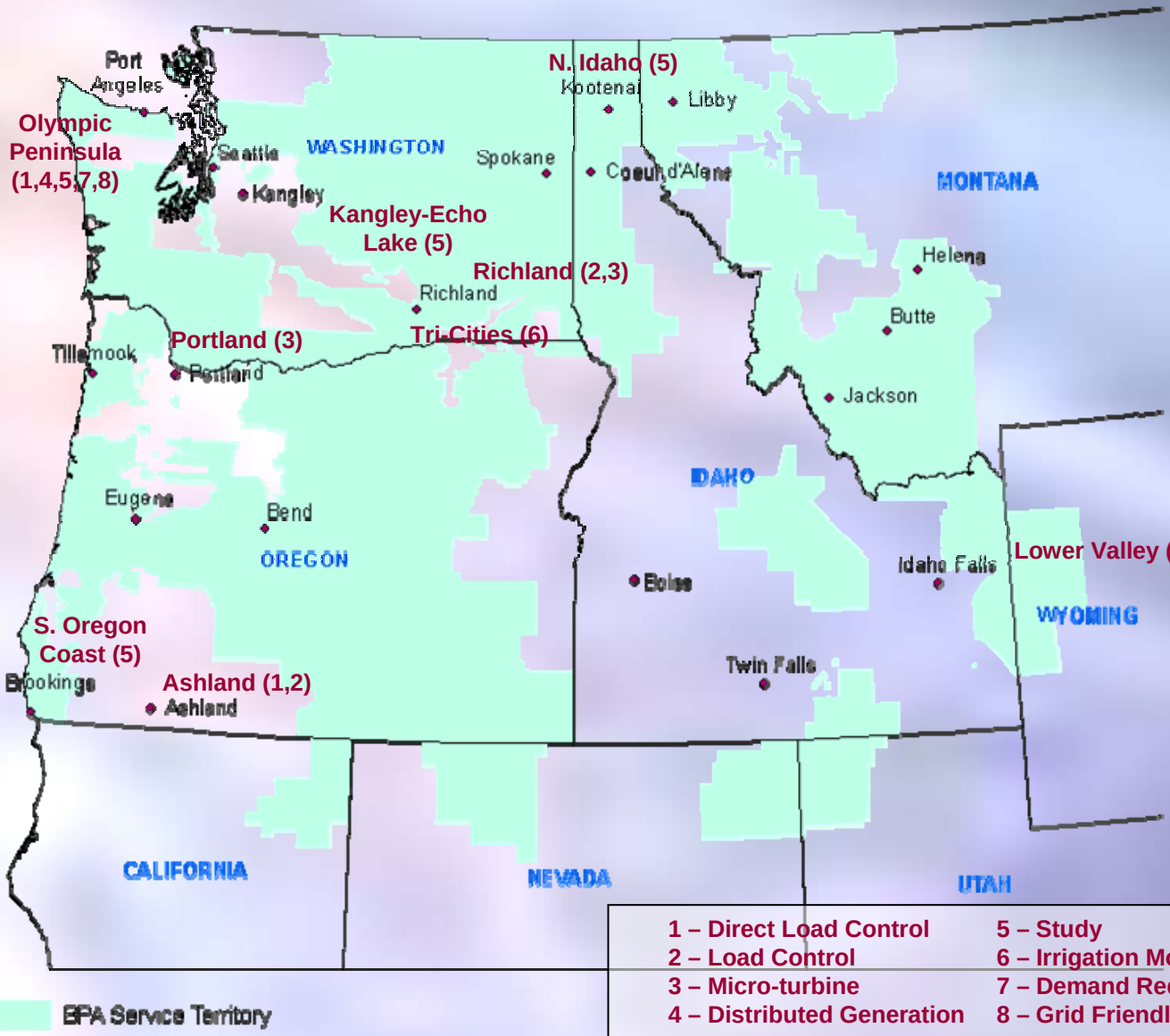
- BPA is investigating how to fully and effectively integrate Non-Wires Solutions into its transmission planning process

NWS Oversight Structure and Barriers

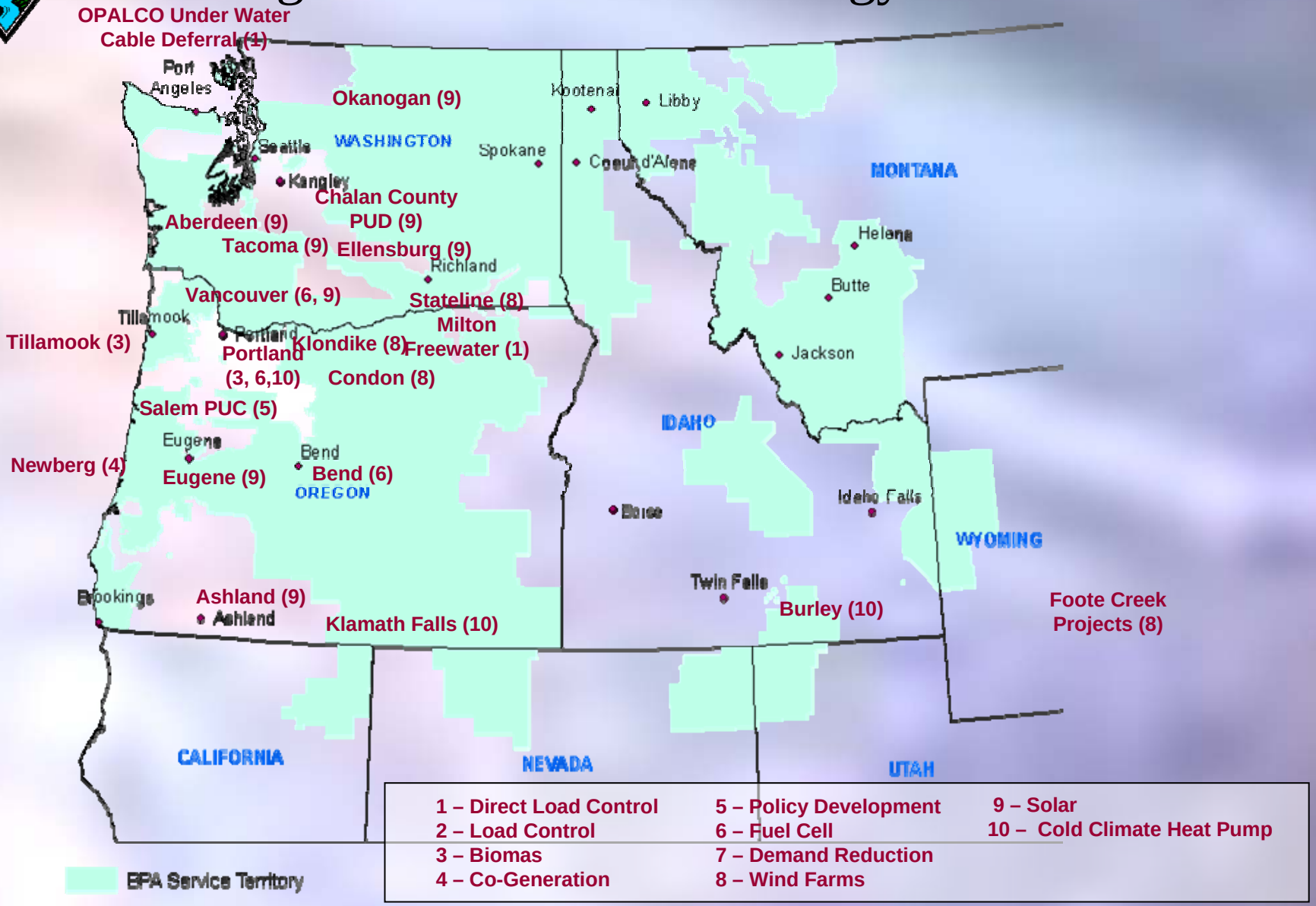
- Established an external NWS Roundtable
  - Meets quarterly since January 2003
  - Roundtable comprised of regional and national stakeholders & industry leaders
- Begun to address institutional barriers to the implementation of NWS

  (Started with higher priority 6 out of 16 institutional barriers identified)
  - Lost revenues for BPA and distribution utilities
  - Incentives for distribution utilities to do accurate forecasting
  - Lack of coordination and transparency in transmission planning process
  - Better price signals
  - Reliability of NWS vs. transmission upgrades
  - Who funds? Who implements?

New Pacific Northwest NWS Efforts



Existing Pacific Northwest EnergyWeb Efforts



NWS – What We Are Doing

- Design and implement pilot programs (FY04-06) to test NWS measures in addressing transmission needs
- Pilots implemented and in test phase
  - Demand Reduction (DEMX)
  - DG Aggregation (Celerity)
  - Ashland Direct Load Control
  - Richland Commercial Bldg Control
  - Richland Micro Turbine
- New Pilots This Year
  - Olympic Peninsula Direct Load Control
  - Irrigation Motor Load Control
  - Integration of Pacific Northwest Lab & Montana Tech Smart Energy Initiatives
- Southern Oregon Coast Detailed Study

NWS – Accomplishments to Date

- Major 2004 Accomplishments
  - Olympic Peninsula Detailed Study
  - EE Measures Reliability Study
  - RFP for Pilot Demonstrations

- 2005 Goals
  - Screen all transmission projects & rank for NWS opportunities
  - Pursue implementation of NWS for Olympic Peninsula Deferral
  - Detailed Study of Southern Oregon Coast Resource availability

NWS Pilots

- Olympic Peninsula
  - Demand Reduction (DEMX)
  - DG Aggregation (Celerity)
  - DLC - 2005 Implementation

- Irrigation Load Curtailment – 2005 Implementation Update
- Ashland Load Control – Experience & Findings to Date
- Richland Load Control – Experience & Findings to Date

Olympic Peninsula Transmission Project Deferral

- 5 year transmission deferral need: ~50MW
  Proposed NWS measures capable of at least 5 year deferral (Total ~55MW)
- Portfolio passes Total Resource Cost Test
- Puget Sound Energy could contribute additional through DG & EE: ~20MW
- BPA's Transmission Business Line NWS portfolio costs less than avoided cost of transmission

2005 Target OLY/PEN

Develop package of Non Wires Measures for the Olympic Peninsula Transmission Project Deferral

Program	Expected MW
Demand Response	**16**
Direct Load Control (DLC)	**20 (5 pilot)**
Distributed Generation (DG)	**4**
Energy Efficiency (EE)	**15**
Total	**55**

Olympic Peninsula DLC

Direct Load Control Pilot Goal: Obtain 5 MW (2500 sites X 2kw) of curtailable loads by December 1, 2005 from one utility or a combination of utilities.

Explore Financial Interests

- A way to reduce costs by reducing monthly coincident peak demand charges
- Pioneer a new way to limit peak demand in the Pacific Northwest
- Cold Climate Heat Pump evaluation in progress for EE use (not official NWS pilot – parallel work)

Ashland Residential Load Control

- Summer curtailments: 4° setback
- Winter curtailments:
  - Tested several strategies. 2° setback, 4° setback and a 4° pre-heat with a 4° setback

Ashland Commercial Load Control

- Three Facilities Selected from 20 Potential Sites
- Each Facility Received a Custom Solution
- Common Elements Included:
  - Internet connection for control and monitoring
  - Wireless local network within each facility
  - Direct metering of power consumption for the connected loads
  - Control strategy aims for 30 to 50% reduction of connected load through duty cycling

Ashland Commercial Load Control

Participants

- **Ashland Public Library –** Controlling 13 heat pumps and three lighting circuits.
- **Ashland YMCA –** Duty cycle 12 rooftop air conditioning units.
- **Ashland Windmill Inn –** Duty cycle 100 room air conditioners.

Schedule

- Installations Completed in September of 2004.
- Winter Curtailments Began in January 2005
- Summer Curtailments Planned for Summer of 2005

Richland Commercial Load Control

Goals for 2005

- Quantify Indoor Comfort Effects in 2005
- Extend Load Shedding Duration to 1- 3 hours
- Four Buildings on PNNL Campus selected
- Four Types of Loads Controlled
  - Rooftop Units (10kW)
  - Duty Cycling of Air Handling Units (20kW)
  - Cooling Pond Pumps (100HP)
  - Chiller and Air Handler Controls (130kW)

Richland Distributed Generation

- 30-kW Capstone micro turbine system installed near a PNNL building in Richland
- The micro turbine controls were integrated with PNNL's existing enterprise-wide energy management and controls system (EMCS) Johnson Controls Inc.
- PNNL developed a web interface providing easy access to the enterprise EMCS and the ability to monitor and start/stop the turbine remotely

Since March 2005

- Dry Year Strategy
  - Developed in 2004 to deal with extreme dry weather impacts
  - Incorporates all aspects of Gridwise/Energy Web/NWS
  - Placed in BPA toolbox for use when needed
- Implemented in March
- Targeting possible severe July/August conditions
  - Low stream flows
  - Changes in market prices
- Focusing on public awareness and participation