


B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Integrating Variable Energy Resources

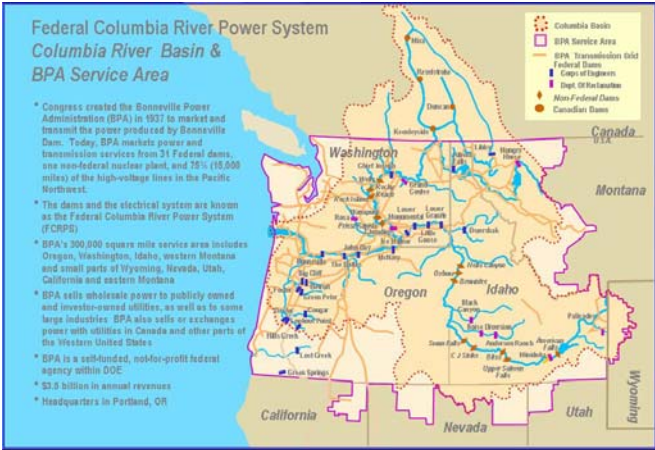
A Power Marketing Administration Perspective

Elliot Mainzer
 Exec VP, Corporate Strategy, BPA
 Northwest Energy Systems Symposium – Seattle, WA
 March 21, 2012


1 

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Federal Columbia River Power System Columbia River Basin & BPA Service Area



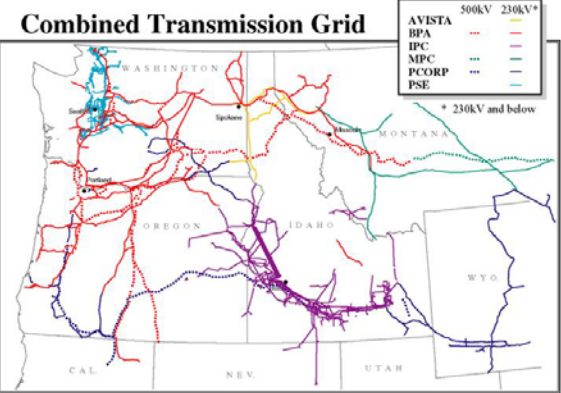
- * Congress created the Bonneville Power Administration (BPA) in 1937 to market and transmit the power produced by Bonneville Dam. Today, BPA markets power and transmission services from 31 Federal dams, one non-federal nuclear plant, and 251 (15,000 miles) of the high-voltage lines in the Pacific Northwest.
- * The dams and the electrical system are known as the Federal Columbia River Power System (FCRPS).
- * BPA's 300,000 square mile service area includes Oregon, Washington, Idaho, western Montana and small parts of Wyoming, Nevada, Utah, California and eastern Montana.
- * BPA sells wholesale power to publicly owned and investor-owned utilities, as well as to some large industries. BPA also sells or exchanges power with utilities in Canada and other parts of the Western United States.
- * BPA is a self-funded, not-for-profit federal agency within DOE.
- * \$1.5 billion in annual revenues
- * Headquarters in Portland, OR

2 

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N


Regional High Voltage Transmission Grid

Combined Transmission Grid



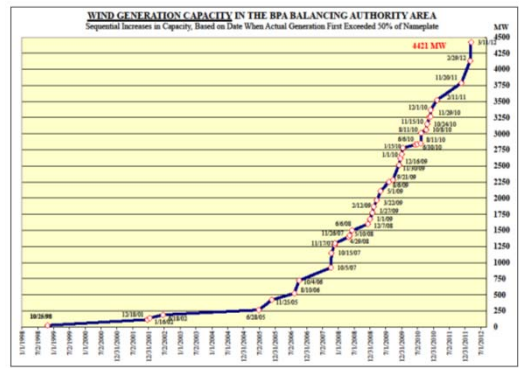
Company	500kV	230kV*
AVISTA	—	—
BPA	—	—
IPC	—	—
MPC	—	—
PCORP	—	—
PSE	—	—

* 230kV and below


3 

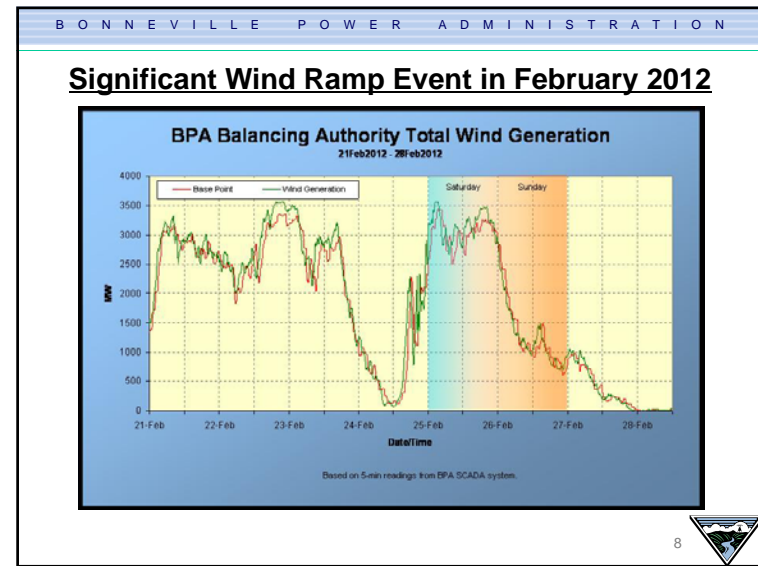
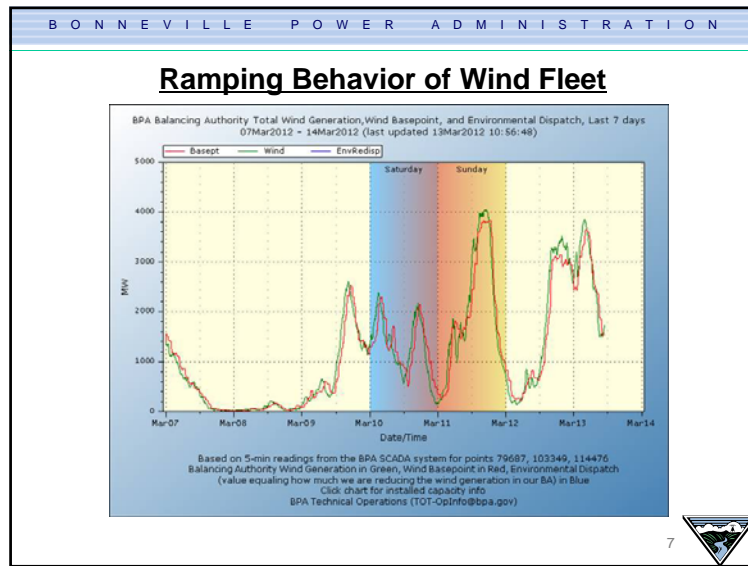
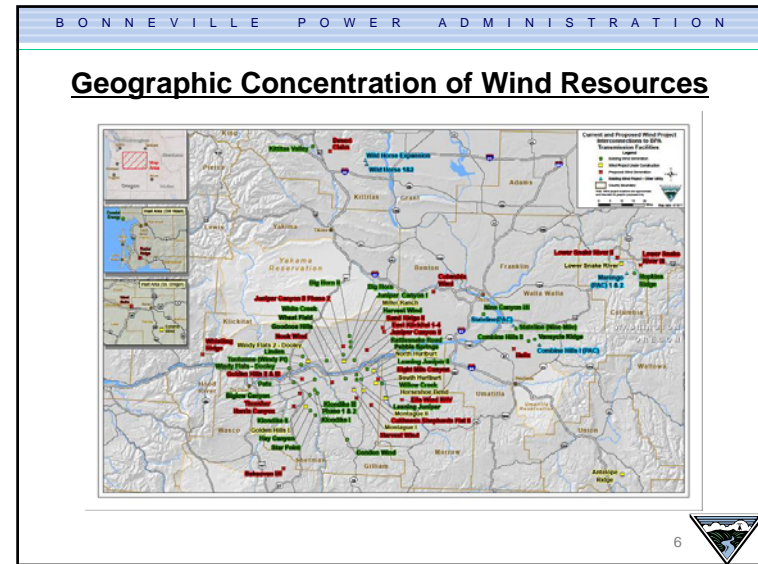
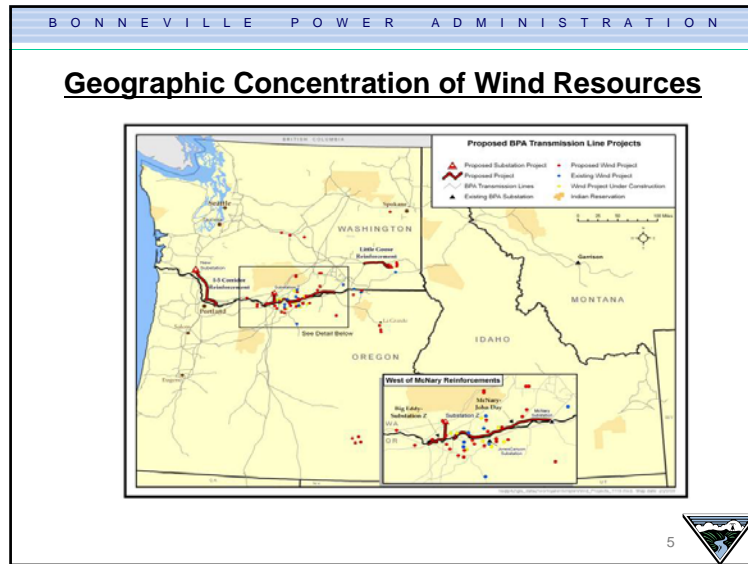
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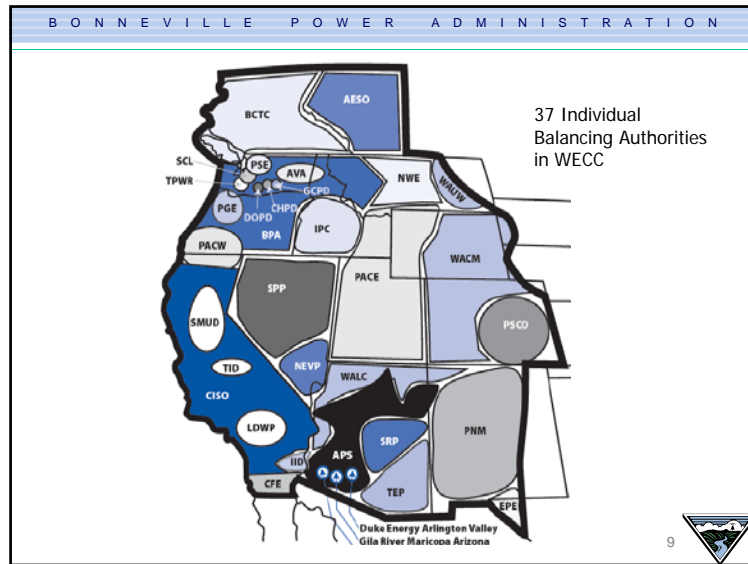
Growth of wind in the BPA Balancing Authority



Year	Capacity (MW)
1978	1000
1979	1000
1980	1000
1981	1000
1982	1000
1983	1000
1984	1000
1985	1000
1986	1000
1987	1000
1988	1000
1989	1000
1990	1000
1991	1000
1992	1000
1993	1000
1994	1000
1995	1000
1996	1000
1997	1000
1998	1000
1999	1000
2000	1000
2001	1000
2002	1000
2003	1000
2004	1000
2005	1000
2006	1000
2007	1000
2008	1000
2009	1000
2010	1000
2011	4421

4 





B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Regional Balancing Initiatives

Initiatives to Facilitate Shorter Transaction Intervals	
Intra-Hour Scheduling	NTTG/ColumbiaGrid/WestConnect
WebExchange	NTTG/ColumbiaGrid/WestConnect
Dynamic Scheduling System	NTTG/ColumbiaGrid/WestConnect
BPA Committed Intra-Hour Scheduling Pilot	BPA
California ISO Intra-Hour Scheduling Pilot	BPA and California ISO
Customer Self-Supply of Generation Imbalance	
	BPA/Iberdrola
Initiatives to Leverage Diversity Between Balancing Authorities	
ACE Diversity Interchange Project	Participants in ADI Agreement
Variability Energy Resource Diversity Interchange	ColumbiaGrid
Reliability-based Control Field Trial	WECC
Flex-Capacity Initiative	
	NTTG/ColumbiaGrid/WestConnect
Energy Imbalance Efforts	
	WECC, Western PUC Group, WSPP, NWPP member utilities

10