

Northwestern Energy Wind Integration



Northwestern Energy

- Approximately 29,800 miles of Electric Transmission and Distribution Lines
- Approximately 1, 600 MW of Peak Load
- 305,000 customers, 191 Communities in Montana and Yellowstone National Park in Wyoming
- No Utility-Owned Generation Resources

Northwestern Energy

- **Control Area Responsibilities**
 - Maintain Safety, Security, and Reliability
 - Balance Load and Generation
 - Follow Prudent Utility Practices and Procedures

NorthWestern Energy

- NorthWestern Purchases through RFP Process both Load-Following and Energy Imbalance Products
- Limited Response to RFP for Load-Following Services
- Currently Purchasing Load-Following Services from Two Entities Outside of Control Area

Northwestern Energy

- IPP Control Area Generation Mix:
 - Coal
 - Hydro
 - Wind
 - Natural Gas

Northwestern Energy

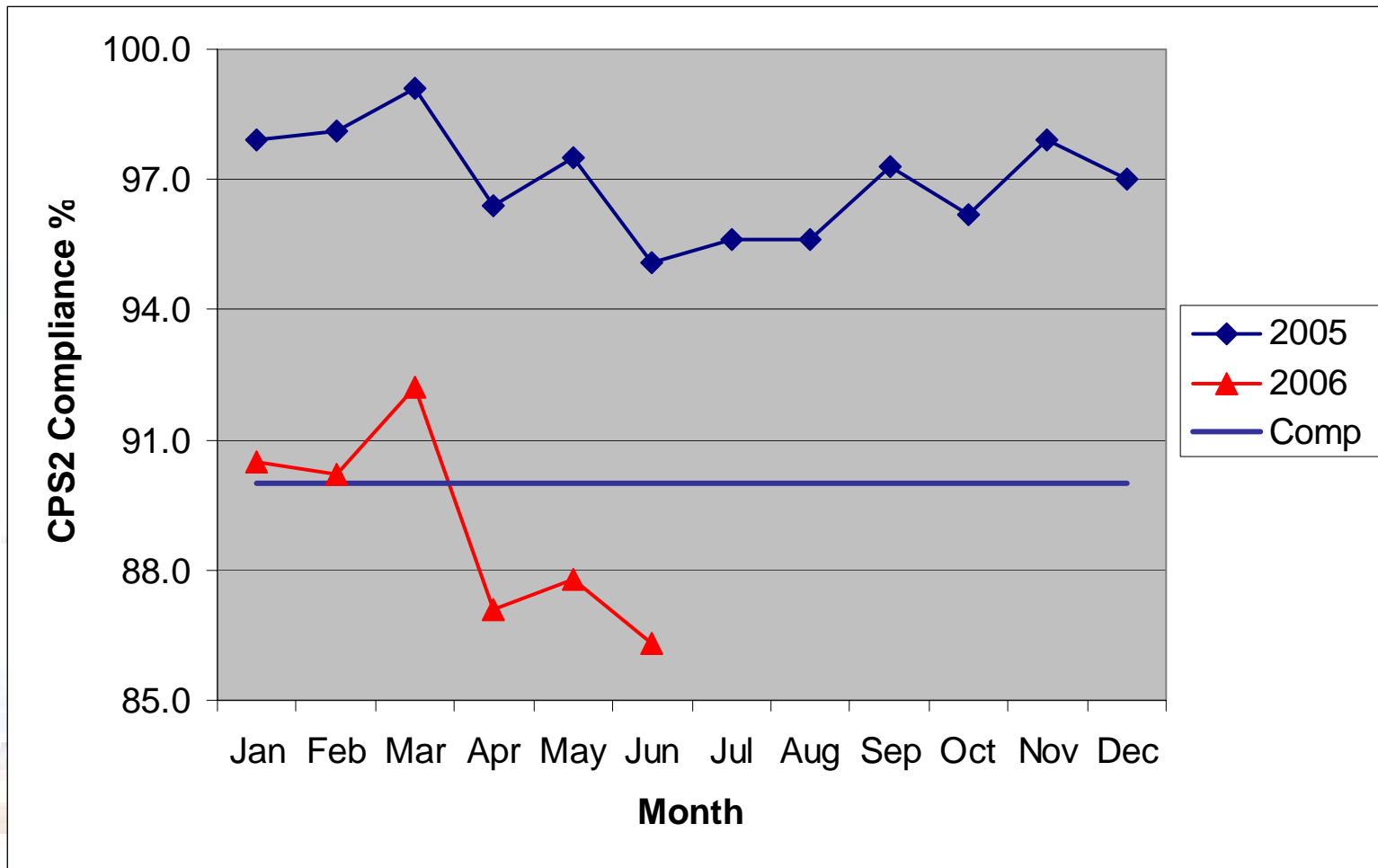
- Wind Resources in Montana:
 - 135 MW Wind Farm near Judith Gap, MT
 - 9 MW of Wind near Great Falls, MT
 - 5MW additional Miscellaneous Wind Generation in Control Area
 - Proposed Wind Generation in Control Area
 - 2006 – 446 MW
 - 2007 – 194 MW
 - 2008 – 104 MW
 - **Total (including current MW) = 893 MW**

Northwestern Energy

- Majority of Wind Generation Came On-line in January 2006
- NorthWestern Working with Wind Generation Owners to Mitigate Issues
- NorthWestern Energy Supply (Load Serving Responsibility) Purchased Additional Load-following in December 05 and Again in June 06 to Mitigate Regulation Issues
- More Analysis to be Done to Determine Need for Additional Regulation Services.

Northwestern Energy

NWE CPS2 Compliance Data



Northwestern Energy

- Wind Integration Issues
 - Within-hour Regulation Issues
 - Forecast Issues
 - Forced Outage Notification Issues
 - No 24/7 Plant Operators on Site
 - Limited Resource Availability for Regulation Services
 - Present Regulation Resources May Not be available in the Future due to Increased Penetration of Wind in Other Control Areas.

Northwestern Energy

- Wind Integration Issues (cont.)
 - Transmission Issues Relative to Load Following Services when Purchased outside the Control Area
 - Increased Regulation Costs – Who Pays? Local Load Not Necessarily Responsible
 - Increased Penetration Levels for Wind Generation (Near Future)

Northwestern Energy Questions?



Northwest Power and Conservation
Council Meeting July 11, 2006