



WIND INTEGRATION

NWPPA Briefing

June 25, 2010

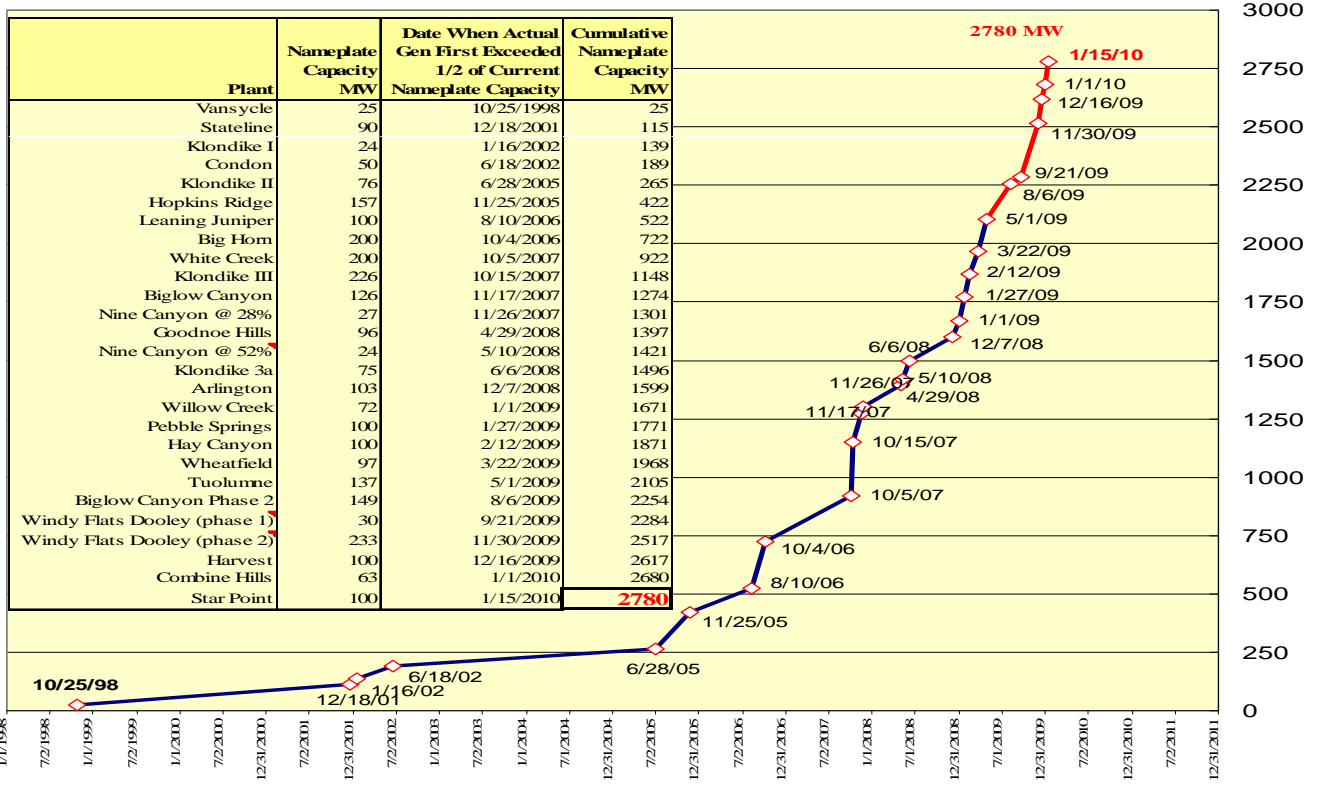
Brian Silverstein

Senior VP, Transmission Services



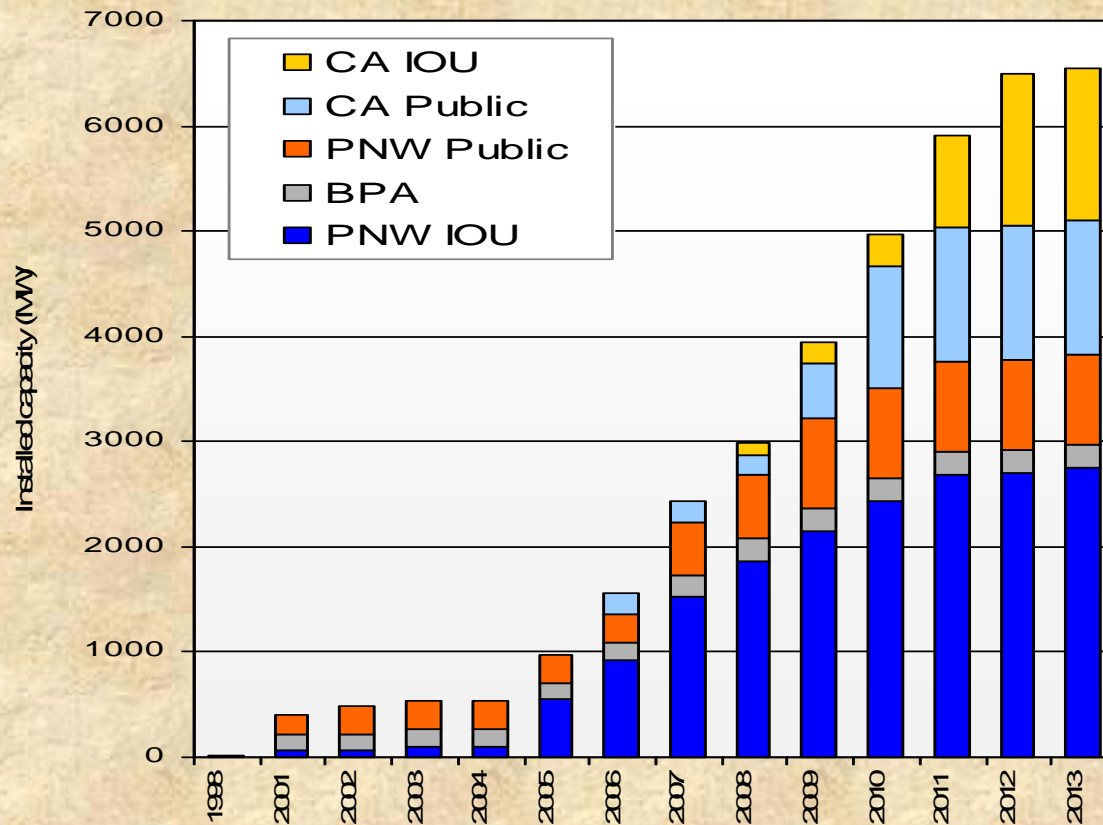
WIND GENERATION CAPACITY IN THE BPA BALANCING AUTHORITY AREA

Sequential Increases in Capacity, Based on Date When Actual Generation First Exceeded 50% of Nameplate





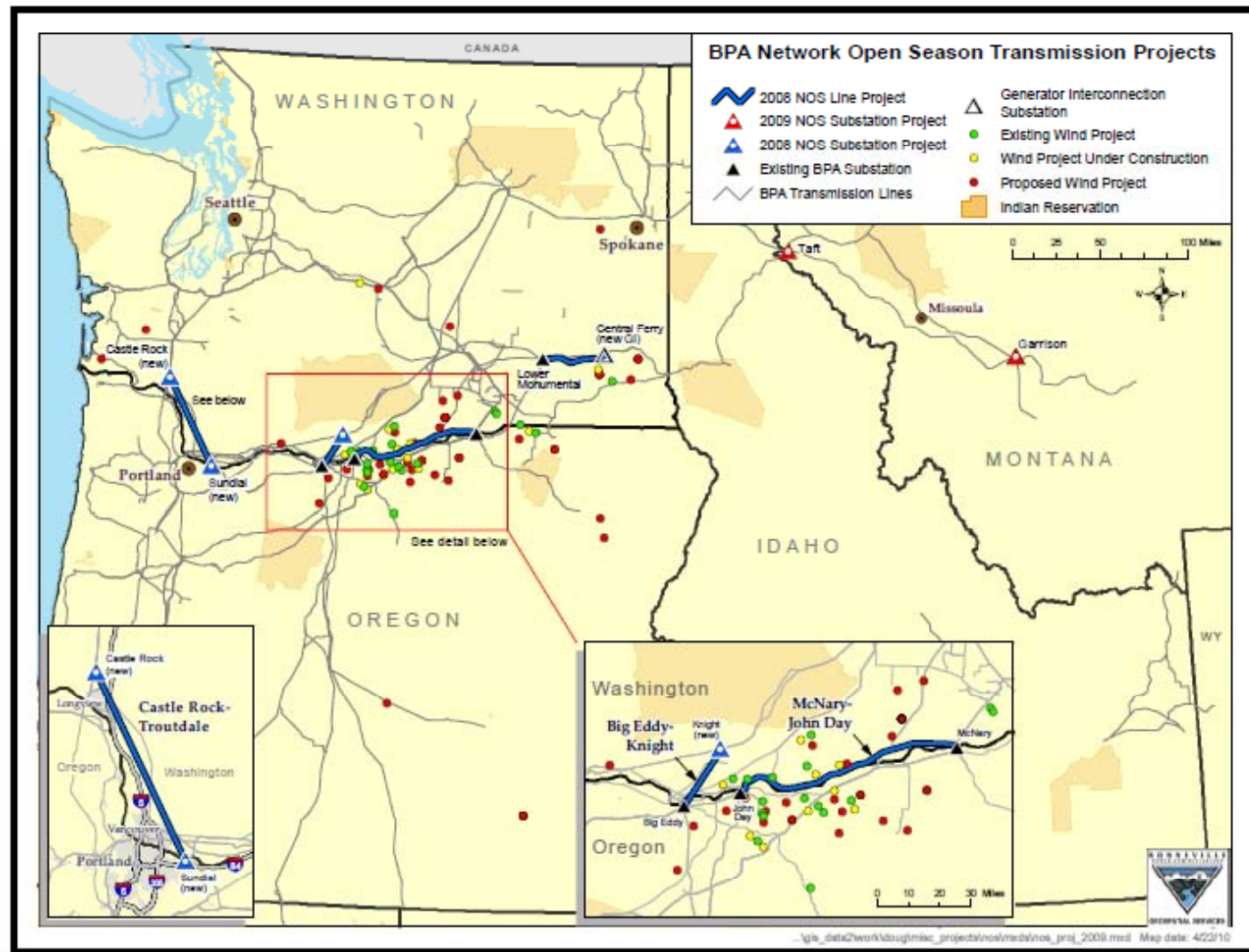
CUSTOMERS FOR NORTHWEST WIND



SOURCE: NORTHWEST POWER AND CONSERVATION COUNCIL



WIND PLANTS ARE CONCENTRATED



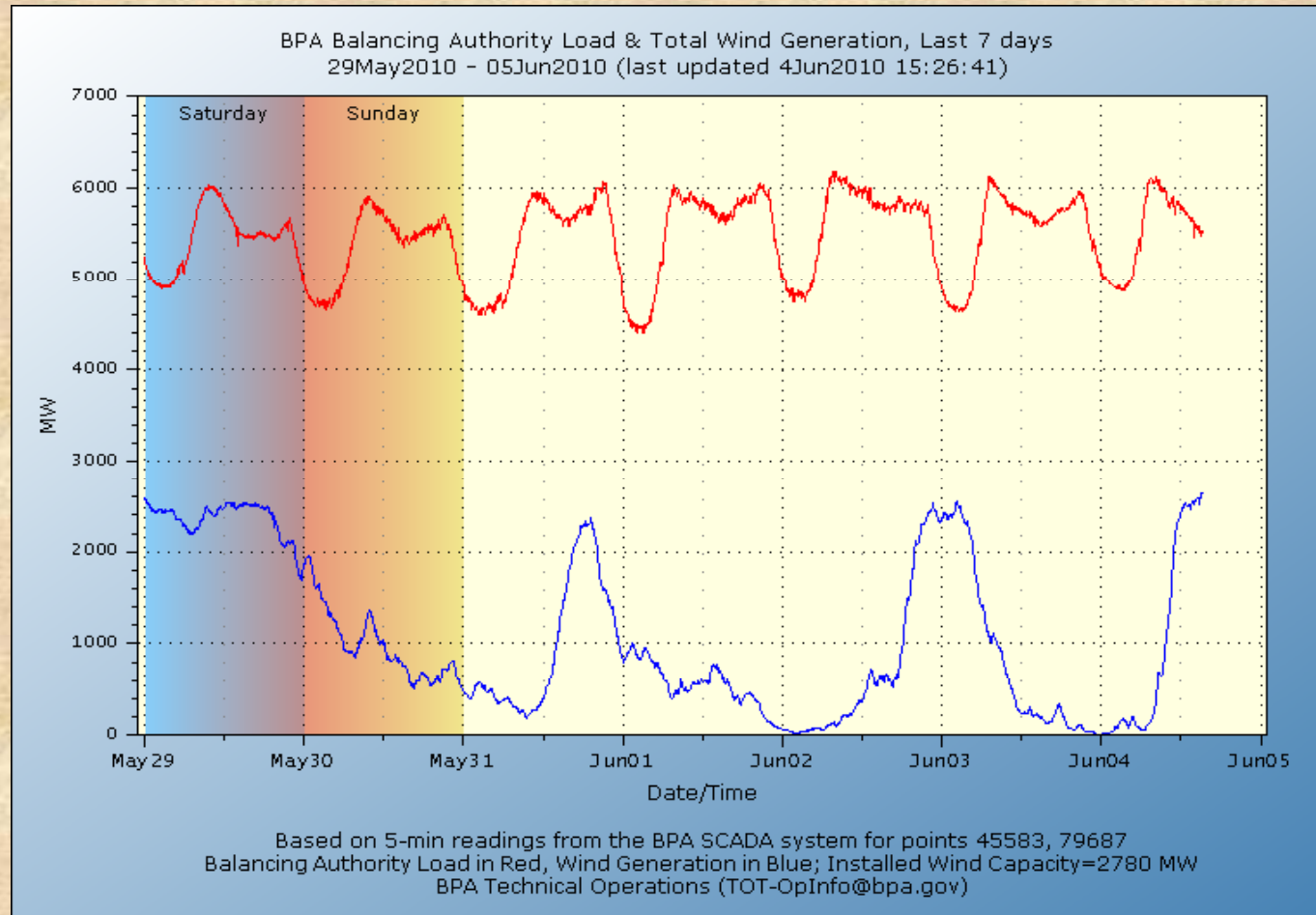


WIND GENERATION IS VARIABLE

AND UNRELATED TO LOAD

Red = Load

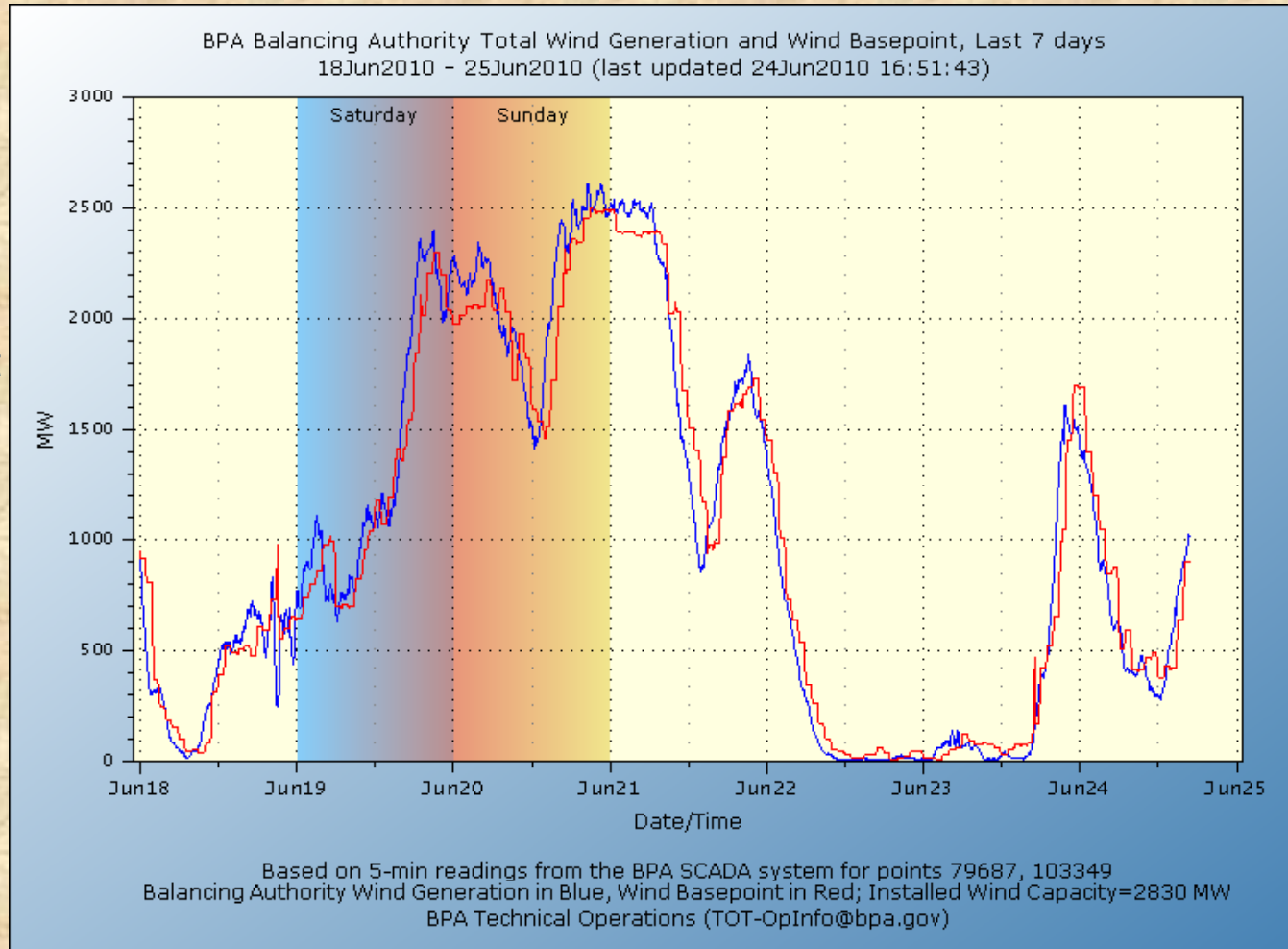
Blue = Wind Generation





FORECASTS ARE IMPROVING

Red = Forecast
Blue = Wind Generation



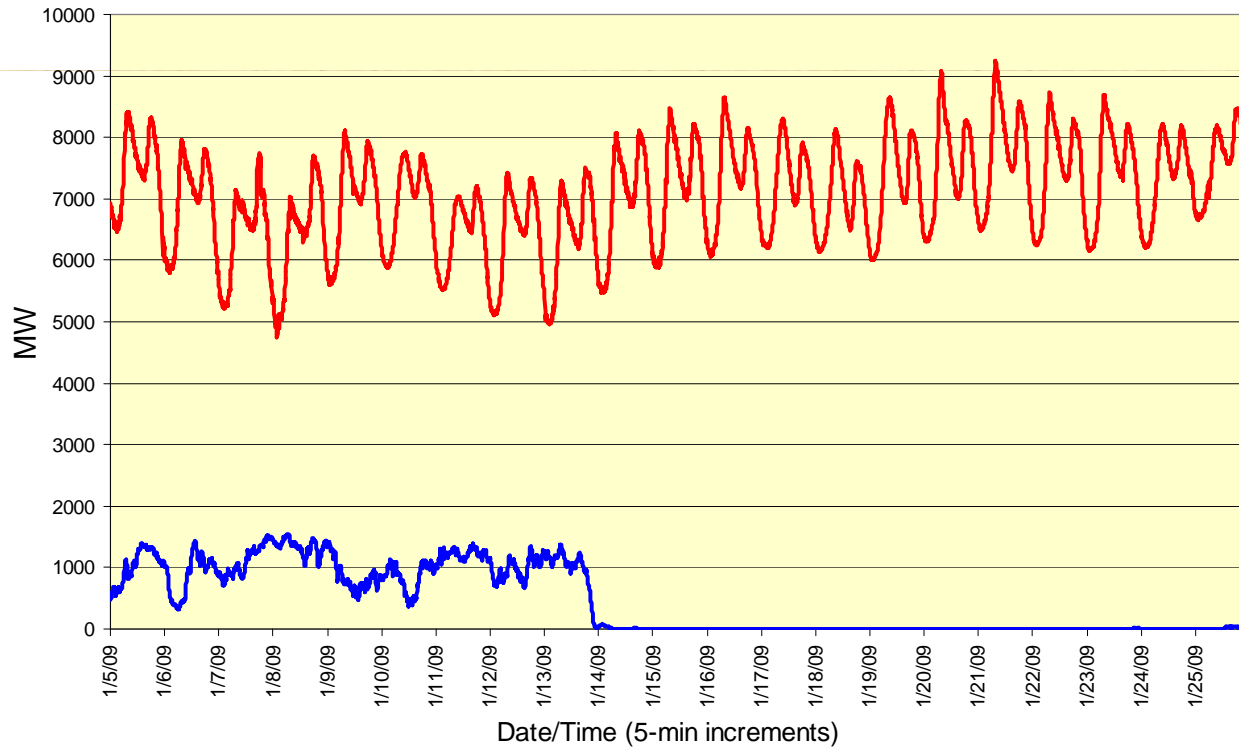


WIND GENERATION PROVIDES ENERGY BUT NOT CAPACITY

BPA Balancing Authority Area Load & Total Wind Generation
Jan. 5-25, 2009

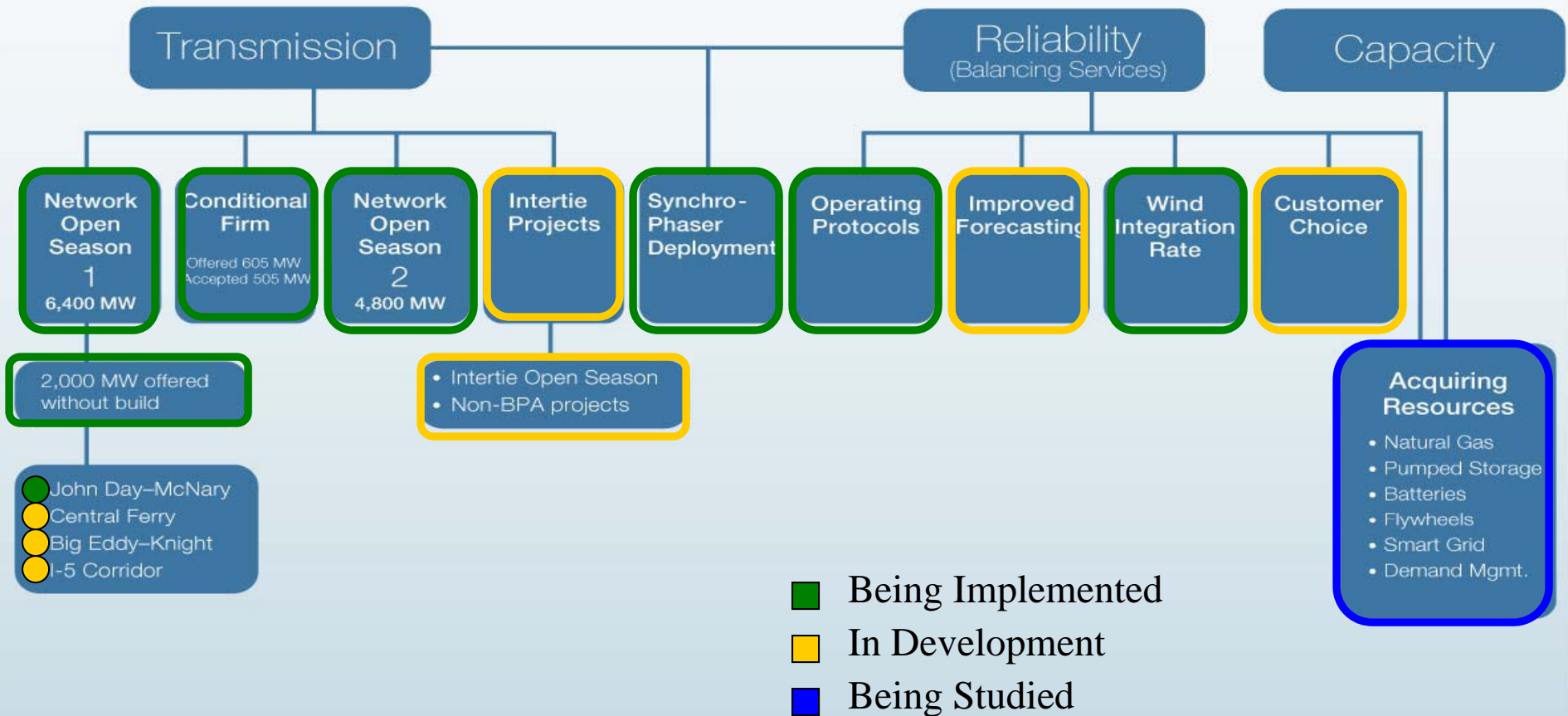
Red = Load

Blue = Wind
Generation





Challenges and Solutions for Expanding Wind Resources





ONGOING WIND INITIATIVES

- 1) Reinforce reliability and operational protocols (e.g., DSO 216).
- 2) Development of state-of-the-art wind forecasting and situational awareness capability.
- 3) Development of common business practices and electronic bulletin board to enable robust intra-hourly transmission scheduling.
- 4) Evaluate effectiveness of self-supply of generation imbalance.
- 5) Increase ability to dynamically schedule with other transmission systems.



FERC NOI ON VARIABLE ELECTRIC RESOURCES

- BPA provided comments to the Federal Energy Regulatory Commission on April 12 in response to FERC's Notice of Inquiry on Integrating Variable Energy Resources.
- BPA emphasizes that it supports reliable, cost-effective integration of variable resources and that its comments are intended to further FERC's efforts to advance national clean-power goals.
- In its comments, BPA suggests that the single best way to reduce wind integration costs is to improve the accuracy of wind generation forecasting .
- BPA strongly supports the cost allocation principle that aligns costs with benefits and says market structures also need to align costs and risks with benefits and provide transparency.
- BPA recommends that balancing authorities that host large amounts of exported wind power should be allowed to clearly define and enforce limits to their balancing reserve obligations and should not be considered the default supplier of balancing reserves for wind generators that export their output to serve loads elsewhere. BPA calls on FERC to *encourage but not mandate* regional efforts that can help reduce wind integration costs and operating impacts.



RENEWABLE ENERGY CREDITS

- **Instrument to certify generation by renewable generation**
- **Western states have differing rules for how RECs may be used to comply with renewable standards**
- **California considering new rules for RECs without actual delivered energy**
- **Decision could accelerate – or stall – California demand for Northwest wind generation**
- **BPA comments to California Public Utility Commission note potential system reliability concerns and urge support for improvements in transfers between transmission systems**