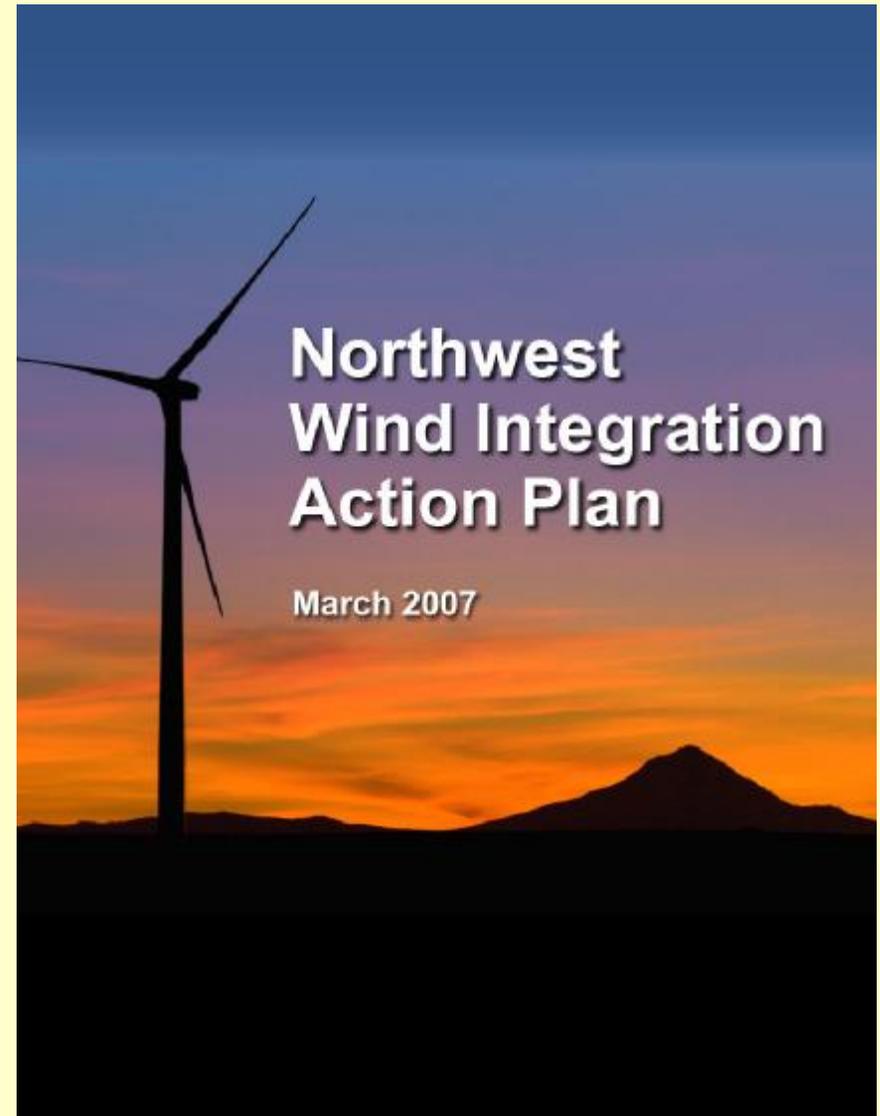


Northwest Wind Integration Action Plan

Resource Adequacy
Technical Committee

March 16, 2007



Key findings

- No fundamental technical barriers to integrating 6000 MW.
- Preliminary estimates of integration cost: \$2–\$16/MWh.
- Control area cooperation and improved markets will lower cost and increase availability of integration services.
- Existing transmission capacity can support anticipated wind development (~3000 MW) through 2009.
- Transmission expansion, firm/non-firm products and new regulatory policies needed to achieve 6000 MW and to increase diversity.
- Wind's capacity value probably lower than provisional 15%.

Recommended actions 1 - 6

1. The Resource Adequacy Forum should reassess its 15% pilot sustained wind capacity value.
2. Northwest utilities should refine estimated integration costs and develop estimates of potential cost reductions.
3. The Northwest Wind Integration Forum (NWIF) should contract for the development of a high-resolution Northwest wind data set.
4. The Northwest Transmission Assessment Committee (NTAC) should propose a planning methodology to balance the cost of transmission capacity and the value of delivered wind energy.
5. Columbia Grid and the Northern Tier Transmission Group should apply the NTAC methodology to regional transmission planning.
6. States should review and amend regulatory policies to remove barriers to more efficient use of transmission for renewable resources.

Recommended actions 7 - 12

7. BPA and others should explore conditional firm service, redispatch and other ways to improve efficiency of transmission use.
8. BPA should complete Plans of Service and review the business cases for proposed West of McNary, I-5 Corridor and Cross-Cascades transmission reinforcements.
9. BPA should develop a general model for financing market-driven transmission improvements, using West of McNary as a prototype.
10. NTAC should identify and evaluate approaches to delivering wind energy from Montana and other isolated wind resource areas.
11. a) NWIF should evaluate the costs and benefits of a regional wind forecasting network. b) If positive, develop an implementation plan.
12. The participants in the ACE Diversity Interchange pilot should provide a progress report to the Forum.

Recommended actions 13 - 16

13. NWIF should address market barriers for control area services and wind integration products.
14. a) NWIF should characterize options for augmenting system flexibility. b) The NPCC should complete Action GEN-9 of the Fifth Plan to improve understanding of the tradeoffs between competing uses of system flexibility.
15. Future power plans should incorporate a planning framework to maximize the economic and environmental value of wind energy.
16. The NPCC should establish a Wind Integration Forum to facilitate implementation of these actions.

Action 1 (Full text)

- **ACTION 1:** By July 2007, the Northwest Resource Adequacy Forum (NWRA Forum) should reassess its 15 percent pilot sustained wind capacity value using currently available data on wind plant operation during periods of peak load. In 2008, the NWRA Forum should further refine the sustained peaking capacity value of wind power using the improved wind resource data set of Action 3 and other available data.