

## Wind Integration Forum

# Wind Integration Action Plan Action Status Report

Portland, OR  
December 2, 2008



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## Action 1: Assess capacity value

**Purpose:** Assess sustained peaking capacity value of wind power

**Lead organization:** Resource Adequacy Forum (RAF)

**Completed work:** Initial analysis completed; 5% sustained peaking capacity value adopted by RAF

**Current activity:** Developing long-term temperature-correlated hourly dataset

**Remaining work:** Complete long-term dataset, reassess sustained peaking capacity value

**Issues:** No identified obstacles to completion in 2009



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## Action 2: Wind integration assessments

**Purpose:** Refine utility assessments of the cost and availability of existing wind integration capability

**Lead organizations:** PNW utilities

**Completed work:**

- Initial assessments reviewed during development of the WIAP (PacifiCorp, PSE, Idaho Power, Avista, BPA)
- Subsequent refinements by BPA, Avista, Idaho Power

**Current activity:** PGE has released integration study

**Remaining work:**

- Refinement is expected to continue, propelled by the needs of balancing authorities to justify cost recovery and the need of load-serving entities to assess the cost of acquiring wind resources
- Regional synthesis needed to support continuation of Action 15

**Issues:** Forum could support peer review and regional synthesis of individual utility studies.



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## Action 3: High-resolution data base

**Purpose:** Develop high-resolution wind data base

**Lead organization:** NREL

**Completed work:** 2004 - 06, 2km cell, 10-minute, 5-elevation wind speed dataset + production estimates for 30,000 cells; Available on request

**Current activity:** Developing web-based user interface

**Remaining work:** Complete web portal

**Issues:** No identified obstacles to completion, completion expected by end of 2008





## Action 6: Regulatory barriers

**Purpose:** Remove regulatory barriers to use of conditional firm transmission for wind and other renewable resources

**Lead organization:** State commissions

**Completed work:** May 2007 workshop hosted by OPUC at which participants concluded that commissions have discretion to weigh on a case-by-case basis the higher costs of firm transmission vs. the delivery risk of conditional firm transmission.

**Current activity:** None, complete

**Remaining work:** None, complete



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## Action 7: Initiatives for more efficient use of the transmission system

**Lead organization:** BPA

**Completed work:**

- Redispatch platform for alleviation of transmission congestion
- Removal of the price cap on reassignments
- Conditional firm transmission service (to be offered March 2009)

**Current activity:**

- Development of a wind power ramp rate control policy and procedures
- Development of a feed-forward AGC system

**Remaining work:** Possible opportunities for more widespread regional redispatch mechanisms

**Issues:** No identified obstacles to completion; definition of next steps may be desirable



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## Action 8: Transmission plans of service

**Purpose:** Develop plans of service (POS) for W. of McNary, I-5 and cross-Cascades N. & S. corridors

**Lead organization:** BPA

**Completed work:** POS released for W. of McNary and I-5 corridor.

**Current activity:**

West Of McNary & I-5 Corridor in WECC 3-phase rating process (BPA)

Southern Crossing proposal (cross-Cascades S.) in WECC 3-phase rating process (PGE)

Precedent Transmission Service Agreements (PTSA) cluster study (BPA)

**Remaining work:**

Continue WECC 3-phase process for above projects

Cross-Cascades N. reinforcement

Develop POS for reinforcements identified in PTSA cluster study

**Issues:** No identified obstacles to completion as defined; definition of next steps may be desirable.



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## Action 9: Transmission financing

**Purpose:** Develop an approach to financing expansions to the BPA transmission system

**Lead organization:** BPA

**Completed work:**

- Approach to financing through network open season
- Network Open Season, April - June 2008
- 6410 MW of signed Precedent Transmission Service Agreements
- Cluster study to determine the cost of facilities needed to serve signed agreements

**Remaining work:** Complete financial analysis to determine if the cost of the facilities can be recovered at embedded cost rates

**Issues:** No identified obstacles to completion



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## Action 10: Delivering energy from isolated wind resource areas

**Purpose:** Plan for delivering wind power from Montana and other isolated wind resource areas

**Lead organizations:** Transmission providers

**Current activity:**

- Transmission proposals in WECC rating process: Gateway West (PacifiCorp), Mountain States Transmission Intertie (NorthWestern), Boardman-to-Hemingway (Idaho Power), Northern Lights (TransCanada) and Montana-to-Alberta Transmission Line
- Colstrip transmission upgrade feasibility assessment (Colstrip Transmission Partners)
- Western Renewable Energy Zone (WREZ) project (WGA)
- Harney Area reinforcement assessment (BPA)

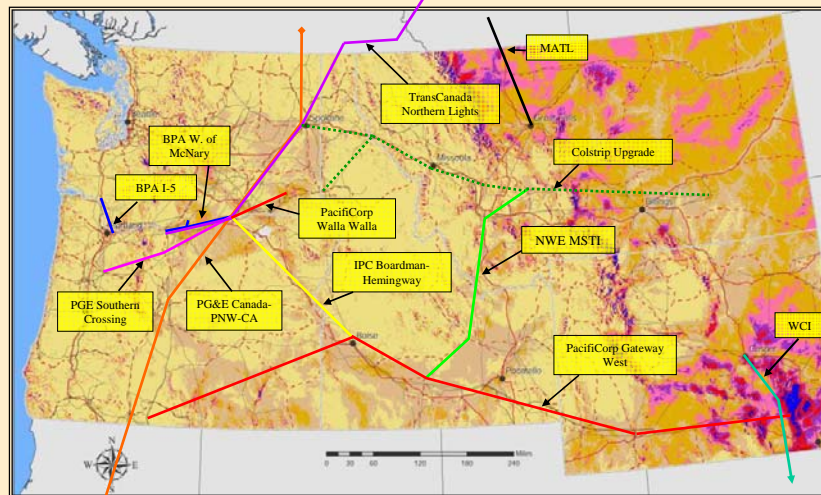
**Remaining work:** Continue development of proposals

**Issues:** No identified obstacles to completion as defined; identification of optimal regional plan based on framework of Action 15 may be desirable



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## Transmission proposals serving Northwest wind resource areas



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## Action 11: Wind forecasting network

**Purpose:** Evaluate costs and benefits of improving near-term forecast accuracy with a regional wind forecasting network

**Lead organization:** BPA Wind Integration Team

**Current activity:**

- Assessment of forecasting network initiated in fall of 2008
- Discussions underway regarding implementation of improved persistence forecasting

**Remaining work:** Complete action

**Issues:** No identified obstacles to completion; consider redefining more broadly to include all methods of improving forecast accuracy



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## Action 12: Area Control Error (ACE) diversity interchange

**Purpose:** Complete and report on ACE diversity interchange (ADI) pilot project

**Lead organizations:** WECC balancing authorities (BAs)

**Completed work:**

- Pilot project w/4 BAs initiated March 2007
- Favorable report on results of pilot July 2007
- ADI interchange agreement executed by 12 additional WECC BAs

**Current activity:**

Technical analysis by WECC Operating Procedures Subcommittee

**Remaining work:** Establish permanent ADI agreement across the region

**Issues:** No identified obstacles to completion



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## Action 13: Reduce barriers to marketing system flexibility

**Lead organizations:** PNW balancing authorities & transmission planning organizations

**Current activity:**

- Explore feasibility and benefits of sub-hourly scheduling capability (Joint Initiative)
- Establish dynamic scheduling capability across PNW interchange points (Joint Initiative)
- Implement pilot project to access 3<sup>rd</sup> party flexibility (BPA)
- Expand Northern Intertie dynamic scheduling limits (BCTC, BPA, PSE, SCL)

**Issues:**

- Further define and expand sub-actions, identify needed personnel, funding and deliverables; obtain commitments
- Assess desirability of increasing dynamic scheduling capability on southern interties
- Schedule progress reporting



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## Action 14a: Flexibility augmentation

**Purpose:** Identify and characterize resources that can provide needed system flexibility

**Lead organization:** NPCC

**Completed work:**

- Organization of subcommittee and scoping meeting
- Pumped storage workshop

**Current activity:** Assessment of the ability of resources added for system reliability to also provide adequate system flexibility for integration of wind and other renewables

**Remaining work:** Complete initial assessment for Sixth Power Plan; identify needed follow-on work

**Issues:** Raise awareness through joint Commission hearings; CREPC workshop, or Regional Resource Adequacy Forum



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## Action 14b: Flexibility tradeoffs

**Purpose:** Improve understanding of hydro system operational constraints and the availability of flexibility from the hydro system

**Lead organization:** NPCC

**Completed work:** Add hourly wind capability to the GENESYS system reliability model

**Current activity:** Developing long-term temperature-correlated hourly wind dataset (Action 1)

**Remaining work:** Demonstrate ability to:

- Identify frequency & magnitude of over-generation events resulting in spill or minimum flow violations
- Identify level of wind capacity resulting in failure to meet sustained peak load
- Assess frequency, magnitude & cost of non-hydro peaking resource operation

**Issues:** Long-term synthetic hourly data set of Action 1 required to complete



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## Action 15: Planning framework

**Purpose:** Develop planning framework to maximize value of wind energy

**Lead organization:** NPCC

**Current activity:** Preliminary analyses for 6<sup>th</sup> Power Plan:

- Tradeoff between the marginal cost of transmission and the marginal value of wind energy
- Impact of geographic diversity on net wind volatility, including frequency and magnitude of short-term ramping events
- Value of co-locating system flexibility or storage resources at wind resource areas

**Issues:**

- Recommendations for further work to appear in action plan of the Sixth Power Plan
- Further work will likely require additional modeling and personnel resources



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## Action 16: Charter Wind Integration Forum

**Purpose:** Establish Wind Integration Forum to support accomplishment of actions and to publicize findings

**Lead organization:** NPCC

**Completed Work:**

- Wind Integration Forum chartered as Council Advisory Committee in April 2007
- Technical Work Group met as a whole May 2007, July 2007 and January 2008
- Forum convened November 2007, December 2008

**Issues:**

Charter expires April 2009; decisions required regarding continuation and future role of Forum



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## Summary of issues

**Integration assessments (2):** Support peer review and regional synthesis

**Transmission planning methodology (4/5):** Reassess need; redefine actions and identify lead organization if value is present

**Efficient transmission (7):** Define next steps

**Plans of service (8):** Define next steps

**Accessing isolated WRAs (10):** Identify optimal regional plan based on framework of Action 15

**Forecasting (11):** Redefining to include all methods of improving forecast accuracy

**Flex markets (13):** Further define and expand sub-actions, identify needed personnel, funding and deliverables; obtain commitments

**Flex augmentation (14a):** Raise awareness and participation

**Planning framework (15):** Post-6<sup>th</sup> Plan work will need additional modeling and personnel resources

**Forum (16):** Decide on future role



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