

**Northwest Wind Integration Action Plan
Steering Committee Meeting
Aug. 24, 2006
Summary notes**

I. Opening Remarks

Walt Pollock, process facilitator: Pollock opened the meeting and highlighted the importance of maintaining Federal Energy Regulatory Commission Standards of Conduct throughout this process. Anything said, discussed or presented needs to be available to all. An easy way to achieve this is to post information.

The committee action plan will examine one-system solutions; transmission providers must then decide what they individually do with it.

Tom Karier, Chair, Northwest Power and Conservation Council: Karier said the Council identified 6,000 megawatts of potential wind power over the next 20 years in its Fifth Northwest Power Plan. Events have overtaken the plan. The Council now expects an additional 660 MW to begin construction in the next two years. Another 3,000 MW have requested integration or facilities over the next several years. The Western Governors Association has called for 30,000 MW of wind 2015.

Steve Wright, Bonneville Power Administrator: Wright said wind has moved from being a pilot project to a significant contributor to the region's resource base. But wind operates differently from traditional resources, he said, raising three issues.

- 1) How wind affects short term reliability (regulation and load following).
- 2) How wind contributes to meeting peak loads (wind capacity).
- 2) How best to meet transmission needs of a resource that uses transmission only 30 percent of the time.

These issues can be solved, he said. The question is, at what cost? "Our common goal is what's best for consumers in this region," Wright said. "We will find a way."

Jim Kempton, Chair, Northwest Power and Conservation Council Power Committee: When the Council wrote the plan, it could not have hoped to gather such a stellar group to address this issue, Kempton said.

John Savage, Oregon Public Utility Commissioner: Oregon utilities have a lot of wind in their integrated resource plans, Savage said. This issue is so important to the governor and the commission that he'd like to speed up discussion of solutions in the work plan and would like to see big ideas surface early.

Jorge Carrasco, Superintendent, Seattle City Light: Seattle is interested in making sure that the natural resources plan that anticipates 6,000 MW of wind is feasible. Washington State is likely to pass that will raise immediate implications for Seattle City

Light. Also, Seattle has a 10-year arrangement on wind integration with PacifiCorp that ends soon. Carrasco said he hopes the region can help integrate wind going forward. Carrasco also said he'd like to see discussion of tradeoffs between wind and other resource issues, particularly fish.

Tim Culbertson, Manager, Grant County PUD, Wash.: As a control area operator with experience in integrating wind for itself and for others, this discussion is timely, Culbertson said. There are widely varied opinions on the true cost and capacity value of wind. Culbertson said he's hearing about a lot more wind power than 6,000 MW in the next 20 years, perhaps as much as 12,000 MW. "We need understand the true costs of wind so we can stop arguing about it and understand how much hydro can integrate so we can deal from educated basis going forward," he concluded.

Brian Skeahan, General Manager, Cowlitz County PUD, Wash.: Cowlitz is part owner of the White Creek wind project, one of those going in "where all the wind is going." Skeahan said he also represents small to medium-size utilities that will depend on others to integrate wind they purchase. "As I've talked with colleagues in public power, I found a lot of people think they have the answers already, but those answers are based on less than thorough analysis and predispositions," Skeahan said. "I want a work product that is analytically based and oriented so we get the true costs," he said.

Louise McCarren, CEO, Western Electricity Coordinating Council: McCarren said WECC's obligation is to reliability; including issues of frequency response, load following and resource availability at peak loads. WECC also has a new role in developing mandatory reliability standards and compliance over the next two years [as the Regional Entity for Western states working with the North American Electric Reliability Corp, the nation's Electric Reliability Organization]. WECC brings technical expertise and problem solving to the table.

Kelly Norwood, Vice President, State and Federal Regulation, Avista Corp.: Avista is integrating 35 MW of wind now and expects to acquire much more under its integrated resource plan. Northwood suggested that, with or without portfolio standards, the region may see up to 10,000 MW of wind. Some amount can be integrated at an inexpensive cost, but there may be a step function at some point, perhaps where you use gas-fired generation to integrate, she suggested. It would be helpful if the near term work in the work plan were completed in next month or two.

Teresa Conway, CEO, Powerex: Conway said Powerex can be a player in driving some of the commodities and products that are needed to support wind. Powerex has flexibility available in its hydro system, though that flexibility is decreasing.

Angus Duncan, President and CEO, Bonneville Environmental Foundation: Duncan said not only are renewable portfolio standards coming, but carbon constraints, too. He suggested the group start with the assumption that the optimum solution is regional, beginning with maximizing, stretching and sharing system flexibility. The work plan should focus first on 2,000 to 3,000 MW of wind, and then look at 6,000 MW to 10,000

MW for the long term, using control and storage strategies. Consider the maximum value of wind for both electricity and carbon reduction, he suggested.

Paul Kjellander, Idaho Public Utilities Commission: The IPUC's primary interest is getting the price right, Kjellander said. Wind contracts in the state have come in under PURPA [Public Utility Regulatory and Policy Act] avoided cost structures, which don't consider integration costs. The state has called a time-out on wind contracts while the IPUC develops a plan and discusses right pricing. "A range of costs for integration would be a valuable tool for us," he said.

James Lobdell, Vice President, Power Operations and Resource Planning, Portland General Electric: PGE expects wind will play a large role in meeting its current and future load growth, Lobdell said. PGE would like to address the volatility of the power market and the volatility of the wind. PGE was not surplus on July 24 [during a heat wave], and faced challenges to make delivery of energy.

Reliability and network reliability are key aspects of this review, and integrating wind in ways that support reliability. The region's hydro resources are finite, Lobdell said. Its FELCC [firm energy load carrying capability] meets today's needs but will not meet all future needs, so the region needs other opportunities to meet potential demand. Lobdell said he hopes the market will start coming up with solutions.

Dave Gates, Vice-president of Wholesale Operations, NorthWestern Energy Corp. Northwestern is unique in that it is operating a control area through power purchase agreements and power purchase contracts. It also has one of the region's highest wind penetrations. NorthWestern has seen problems with load following. NorthWestern has increased its load following contracts reserves with others. It is taking steps with other utilities, but it is "at the mercy of the market for those services, and it's an illiquid market," Gates said. If NorthWestern cannot get regulation and reserves from the market, it may look at acquiring a dispatchable unit of its own.

Bill Drummond, Manager, Western Montana G&T: Drummond said his utility views wind integration as resource it may want to acquire. But Western Montana G&T will likely be a load following customer of BPA post 2011, as now. "We view load following and system flexibility as preference products subject to preference requirements. We are concerned about calls on these products and who will pay," Drummond said. He said the issue is broader than just wind.

Marilyn Showalter, Executive Director, Public Power Council: Showalter said she was "terribly impressed" with the work plan and the complexity of assessing the capacity value of wind. Because the Northwest is hydro-based, not thermal, "We need to rely on ourselves for answers and not on studies done elsewhere," she said. "I hope we get rigorous analysis of the physical effects and cost efficiencies of wind so when other [resources] come along, we have a good way to evaluate them," she said.

Terry Hudgens, President and CEO, PPM Energy. PPM owns about 40 percent of the wind in the region and is going to 50 percent. It also owns natural gas storage. Wind is a learning business, Hudgens said. “When we put good resources on the problem and learn, it is doable.” In three European countries, wind makes up 20 percent of the average energy production, not capacity. He advised against trying to solve integration for 10,000 MW of wind now “because a lot will change as we go down the path.”

Eric Markell, Sr. Vice President, Energy Resources, Puget Sound Energy: Puget expects to see 40 100 MW wind projects come in service in the next 12 years. The last 10 will be a lot more costly than the first 10. The Northwest has a de facto ban on coal, Hudgens suggested, adding, “I see a far gassier, windier future for the West Coast.”

Rachel Shimshak, Executive Director, Renewable Northwest Project: “This is just the right conversation at just the right time,” Shimshak said. She said she hopes everybody will treat this as a regional issue, not a BPA issue. She said she is interested in the analysis that this group and the technical experts this group empowers will produce. “There will be a cost of doing business, which resource developers and utilities understand,” Shimshak said. “This is not an opportunity to heap costs on the newest kid on the block but to look at who causes costs and put them on them.”

Mark Klein, Vice President, Commercial and Trading, PacifiCorp: PacifiCorp’s large thermal fleet provides integration and storage services for renewables. In its Integrated Resource Plan, PacifiCorp has made a commitment to deliver 1,400 MW. Its interest is making sure to do that in the most cost effective way for customers.

Greg Jergeson, Montana Public Service Commissioner: There are no questions in the work plan Jergeson would take out, but he might add a few, he said, such as technologies that could be developed for energy storage to firm up wind and what role demand-side management can play in firming and meeting peaks.

Jergeson said the region needs to figure out a better balance and optimize system for fish, power and load following. “Is there a better way to run the system to meet multiple needs without negatively impacting either?” he asked.

The transmission and interconnected system dimensions of the wind integration issue are significant, Jergeson continued. Alberta is interconnected with British Columbia and soon will be with Montana. Montana is interconnected with North Dakota and the Northwest with California. “It will be good if we can get insights on the broad transmission issue,” Jergeson said.

II. Presentations (see posted PowerPoints)

Jeff King, Northwest Power and Conservation Council

<http://www.nwcouncil.org/energy/Wind/PSC%20Briefing%20082406.pdf>

Elliot Mainzer, BPA.

<http://www.nwcouncil.org/energy/Wind/Wind%20Integration%20101%20Final.pdf>

III. Discussion of Issues

1. Wind power economics

Pollock said people have asked of this process the ability to assess the cost of wind on comparable basis to other resources.

Kellander suggested wind may be economic “until you get to those last 10 units.” Pollock agreed that there may be pinch points where things get more expensive and difficult, and suggested the action plan may provide insights. Gates said Alberta has done such a study, as has the California Independent System Operator. Both will be referenced.

2. Wind firming sources: DSM, interruptible loads, storage, etc.

Duncan, Lobdell and Hudgens emphasized the need to develop “whole new products” for wind regulation, load following and firming. “Engineers can integrate anything,” Lobdell said, “but the real key for all of us is how deal with variability. In the marketplace last year, parties put out offers saying they will do this for this dollar amount. All those offers are gone; they’re not in market now. What is this group going to do that will get those offers back on the table so we’ll have machine capacity out there that will allow integration to take place?” The industry needs standard trading products. Absent that, it’s difficult to do any wind integration, he said.

The group discussed expectations that the action plan will identify potential products to provide shaping and load following services. Members emphasized that technologies on demand side and storage need to be addressed as part of answer.

Culbertson said Northwest utilities have a lot of interruptible load and recommended comparing the cost of buying load interruptibility to the cost of adding capacity to firm up wind. Duncan asked why the region didn’t take the [former] load-serving [interruptibility] services of the direct service industries and bid them out to other industries.

Karier suggested that the region might want to consider turning *on* loads when there is extra wind. He also suggested using Banks Lake for storage. Culbertson noted that the Bureau of Reclamation may define two incremental storage projects for the upper Columbia system at the end of this year.

McCarren asked whether Northwest system studies presume an ability to turn wind off. So far most studies have assumed utilities will take all wind production. Jim Caldwell will lead a group to look at wind controls in the work plan. Several members noted that it wouldn’t make sense to buy regulating reserves for two to three standard deviations. McCarren suggested looking WECC-wide on this issue. Geographical diversification is needed to smooth wind output.

Hudgens said he sees an opportunity to get resources working together. For example, he said if he has one gas plant, he could provide it to the market to ramp up and down.

Drummond expressed concerns that, given current hydro system constraints, additional integration products might take away from other system uses, including BPA service to its preference customers. Wright clarified that BPA will meet its load commitments and will plan its system to meet its load commitments; wind integration will not compromise BPA requirements service. But, when BPA sells surplus power products, it deals with risks in pricing. “At end of day, if we commit to something and don’t have it, we have to buy and end up with a cost,” Wright said.

3. Wind financing concerns

Markell said requirements to feather or dump wind machines would have a huge impact on those who acquire wind, because it would affect how power purchase agreements are negotiated and how risks are shared. “The tax equity community won’t like it,” he said. “Get a tutorial on project finance and tax equity investing.”

Caldwell said if wind output is controlled 1/10th of 1 percent of the time, it’s not a significant issue. If 10 percent, it is. “Our utilities have the best ability to get a handle on those risks and come up with reasonable cost definition,” he said. This issue highlights the importance of having regulators in the discussion, he added.

Markell suggested there’s a huge value proposition in the range of opportunity costs – from less than \$1 per megawatt-hour in April to \$400 per MWh on July 24. “How do we get a capital commitment with that variation?” he asked. He suggested wind could be seen as a value proposition rather than a capacity proposition.

4. Scale of prospective wind development to be addressed

There was considerable discussion about the scope of prospective wind power development to be studied, and where the technical work group’s priorities should lie. Markell said that worrying about 12,000 wind might be premature. For each project, the first question is availability of transmission. Five projects must be sited to build the proposed John Day-McNary transmission line.

Shimshak said no one knows enough to know which projects will advance through screens and which won’t. She suggested looking at wind potential maps from the Western Governors’ Association to assess how much wind development can realistically be expected in the next few years.

Carrasco called for an emphasis on short-term impacts. He suggested assuming there’s a limit to wind potential in region, and said he likes the idea of devising filtering criteria so that the region doesn’t overreach. “The tendency now is to mandate certain amount of

renewables without considering the limits to what can be feasible,” Carrasco said. “Better focus on what we know for a fact we’ll have to do.”

Culbertson pointed out that if a significant portion of Northwest wind power goes to California, the impacts will be different, and suggested splitting impacts by where the generation will go. Mainzer said the technical work group will build some curves on growth of wind.

Wright called for a focus on problems expected in 2007 and 2008. “When I talk with folks who have been here a long time, they say capacity used to be hard to count and talk about gold-plated transmission,” Wright said. “Those days are gone. Most of what we do these days is figure out how to meet existing commitments.” Wright said he is concerned about integrating the next 1,000 to 2,000 of wind power. The solutions will come in a supply curve, with lower cost and higher cost options, he said. He hopes the action plan will focus on the lower cost options, figure out how to deal with problems in 2007-2008 that the region can implement in January and move to further end of the supply curve as the effort goes to phase 3.

Markell suggested focusing on projects now in an OASIS queue [for transmission service].

Duncan agreed that immediate problems be addressed quickly, and said he’s concerned about how sponsors will integrate the second hundred megawatts of the White Creek project. He suggested adding a more rigorous look at financial strategies to the work plan, so that supply curves do not just reflect the quickest and easiest projects in an abstract sense but reflect whether there are financial strategies that can push costs down further.

The group agreed to a phased approach that would start with the smaller challenge but would also begin dealing with bigger numbers.

5. Geographic scope of work plan and data availability

Members asked whether the work plan should include Alberta and perhaps California. Most generally agreed on focusing on the Northwest, though there remains interest in Alberta, particularly once its system is linked to Montana.

Mainzer said Northwest data is limited, and, to the extent utilities are comfortable sharing information, it will help. King noted that the technical work group is doing a search of other studies, including studies in other regions.

6. Environmental concerns

Skeahan asked whether environmental impacts of alternatives are being addressed. King said added costs of environmental consequences could be developed.

Culbertson said that Grant County PUD is getting feedback on visual pollution, as wind turbines are built on mountains and ridge tops. Markell said the idea of 6,000 MW to 12,000 MW of wind is “stunning,” and would mean 400,000 to 600,000 acres covered with turbines. “Put a screen of likelihood of obtaining local permits on as a sanity check,” he said.

Norwood noted that not backing off wind may mean spilling water in the hydro system, which could increased dissolved gas in water [a danger for fish]. The technical work group will address this issue.

7. Relationship to other efforts

Karier pointed out that other forums are carrying related efforts, such as the Regional Resource Adequacy Standard. The Western Governors Association renewable initiative will also be referenced.

IV. Conclusion and next steps

Work plan accepted. Walt Pollock said that, from the discussion, the work plan looks fundamentally sound but could use fine tuning on load management and storage and defining the products and services associated with integration. He asked if group members were sufficiently comfortable with the work plan to ask technical groups to go forward, adapting the work plan to reflect comments in this meeting. Members agreed.

Technical work group volunteers sought: Wright emphasized that the process will only work with continued strong participation in the technical group. Pollock asked if anyone had general concerns about structure of work group and employee contributions? None were expressed. Skeahan asked if the technical committee was still looking for volunteers. Mainzer replied, “We need people who have expertise in control area operation on the transmission side,” and invited volunteers to call Jeff King.

Public nature of effort emphasized: Pollock emphasized that Action Plan development is an open, public process. Information will be posted on Council’s web site. BPA and Council will be available to take press inquiries, and other participants are encouraged to take press and public inquiries. Showalter said that, to extent all materials can be written for a lay audience, it will really help. Shimshak encouraged BPA and the Council to “provide the big picture” and keep the group focused on the goal.

Deadlines set: The group tentatively set a meeting date of Jan. 18, 2007 to receive the draft Action Plan from the Technical Work Group. Members emphasized that if a good work product is available before that time, they’d be willing to come to another, earlier meeting and give feedback. The Technical Work Group will provide e-mail update at least once a month and provide a monthly update to the Council.

Pollock closed the meeting calling the participation of such a stellar group a miracle. “It will be extraordinarily helpful to have the perspectives of this group,” he said.

