Managing the Wind Energy Growth Curve

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Northwest Power and Conservation Council Meeting
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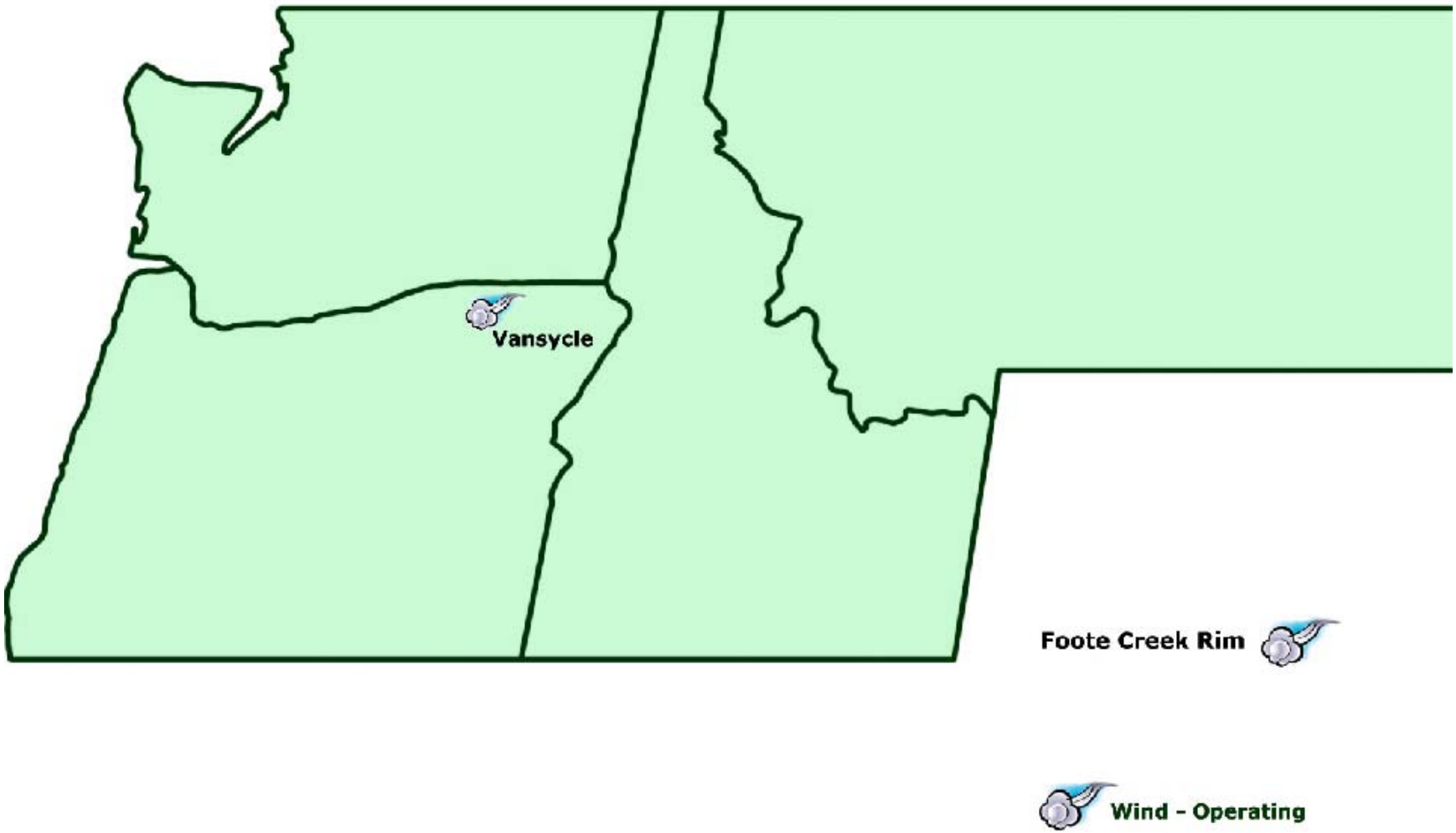
Presentation Overview

- The Growth in Northwest Renewables
- An Interconnection Facility Field Trip
- A Call for Regional Action
- Action Plan Project Status

Renewable Energy Projects in the Northwest
1998



Source: Renewable Northwest Project

Renewable Energy Projects in the Northwest 2006

Legend

- Wind - Operating
- Wind - Construction
- Wind - Proposed / Env Review
- Geothermal
- Wave/Tidal
- Solar

Last Updated 4/18/06

The McNary-Ross 345 kV and Harvalum-Big Eddy 230 kV lines run through a region just to the East of the Columbia River Gorge that will be blanketed with wind turbines by the end of 2007.

The $30 mm Rock Creek Substation in Southern Washington will interconnect 3 new wind projects with up to 1,150 MW of nameplate capacity into the Wautoma-John Day 500 kV line.

The Wautoma-John Day 500 kV and Midway-Big Eddy 230 kV lines run in parallel towards the Big Horn Project being energized by PPM Energy next month.

The 200 MW Big Horn Project

The final stage of construction underway at Big Horn

The final stage of construction underway at Big Horn

The final stage of construction underway at Big Horn

230 kV collector lines will carry Big Horn’s output to the Spring Creek switchyard.

The $8.5 mm 230kV Spring Creek switchyard will interconnect PPM Energy's 200 MW Big Horn Project into the Midway-Big Eddy 230 line. Their 200 MW Leaning Juniper project will connect at the Jones Canyon Sub into the McNary – Santiam 230 kV line on the other side of the river.

With the rapid interconnection of wind projects in the Lower Columbia region, it has been said that we are building another John Day Dam at John Day.

This patch of farmland will soon be the site of a new, 230-500 kV substation that will connect up to 1,200 MW of new wind projects into the heart of the 500 kV system at John Day.

A Call for Regional Action

- At 200-500 MW, wind integration presented few serious reliability or operational issues.
- This next phase of wind development (up to 2,500 MW) will require much greater planning and regional collaboration.
- This growth is coming at a time of increasing pressure on the region's hydroelectric resources.
- If the region is to continue to harness its considerable endowment of intermittent renewable resources and achieve the Council's targets of up to 6,000 MM of wind, we will need to develop a multi-faceted regional strategy for optimizing and enhancing system flexibility with a clear sense of the expected costs, benefits, and lines of responsibility.
- At its last meeting, the Council voted to sanction the development of an Action Plan for Northwest Renewable Resource Integration. Such an effort is called for in the Council's Fifth Power Plan.
- We have begun working with utilities, developers, renewables advocates and technical specialists to define the participants and scope of work for the effort.

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Action Plan Project Status

Steering Committee Members

Tom Karier, Chair, Northwest Power and Conservation Council
Steve Wright, Administrator and CEO, BPA
Jim Kempton, Chair Northwest Power & Conservation Council Power Committee
Walt Pollock (Facilitator)
John Savage, Oregon PUC
Paul Kjellander, Idaho PUC
Greg Jergeson, Montana PUC
Stan Watters, President, Pacific Power
Eric Markell, Sr. Vice President, Energy Resources, Puget Sound Energy
J. LaMont Keen , CEO, Idaho Power Corp.
Peggy Fowler, CEO and President, Portland General Electric
Scott Morris, President and Chief Operating Officer, Avista Corp.
Tim Culbertson; Manager, Grant County PUD
Bill Gaines, Power Supply and Environmental Affairs Officer, Seattle City Light
Randy Berggren, General Manager, Eugene Water & Electric Board
Brian Skeahan, General Manager, Cowlitz Co. PUD
Angus Duncan, President and CEO, Bonneville Environmental Foundation
Rachel Shimshak, Executive Director, Renewable Northwest Project
Terry Hudgens, President and CEO, PPM Energy
Teresa Conway, CEO, PowerEx
Louise McCarren, CEO, WECC

First Steering Committee Meeting

Scheduling for the first Steering Committee meeting is underway.

At the first meeting, participants will be asked to:

- Share their perspective on renewables integration issues
- Review the background and purpose of the Action Plan
- Provide input and sanction the Project Work Plan
- Commit staff and other resources to the effort.

Purpose of the Action Plan

The purpose of the Action Plan is to a) develop a package of specific, measurable, and pragmatic strategies to address the operational, infrastructure, and policy issues associated with increasing renewables penetration in a least-cost fashion, and b) to define the commitments needed from utility and regulatory decision makers to implement them.

Examples of potential Action Plan outcomes:

- Development of a centralized wind forecasting network;
- Development of a formal plan for pooling regulating reserves;
- Recommendations on specific transmission paths requiring upgrades to enhance geographic diversity with an estimate of potential costs and methods of cost allocation;
- Information and recommendations for ways to meet incremental or “Tier 2” load growth with firm generating resources that have the flexibility to ramp up and down around a sizeable fleet of intermittent and variable wind generation.

Ultimately, the Action Plan will equip regional decision makers with the knowledge and tools to make rational decisions about the future of renewable resource development in the Northwest.

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Analytical Approach

The Work Plan will define the overall analytical approach underlying the development of the Action Plan. In its current iteration, the analytical approach is to:

I. Identify current integration capability without a reallocation of system capacity, a reduction in control area performance, changes in the way the wind fleet is operated, or the purchase of additional flexibility;

II. Identify additional capability/flexibility that might be secured through operational and market (i.e. non-hardware) mechanisms;

III. Identify additional hardware, i.e. transmission and generation resources, required to integrate additional renewable resources in a reliable and geographically diversified manner.

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