Draft Fifth Northwest Electric Power and Conservation Plan

A Guide for the Northwest's Energy Future








Northwest Power and Conservation Council

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The Fifth Power Plan: A Guide for the Northwest's Energy Future

Background

The Northwest is unique in how it plans its energy future. Through the Northwest Power and Conservation Council's power plan, strategies to ensure the affordability and adequacy of the power system are developed in an open forum where the public can voice its opinion. Why is this so important? With the building of the region's first mainstem Columbia River dams in the 1930s, the Northwest would have access to inexpensive electricity for many years. But by the 1960s, increased demand led energy planners to believe that hydro-generating resources would soon be unable to keep up with the demand for electricity.

In the 1970s, the Bonneville Power Administration—the federal agency that markets the electricity generated at federal dams on the Columbia River—began working with public and private utilities in the region to develop major new generating resources, including several nuclear plants. But the projects proved to be hugely expensive and electricity rates, as a consequence, skyrocketed. Growth in electricity demand fell far short of earlier projections, in part because of the high rates. The region was left with an energy surplus in the early 1980s, eliminating the need for most of these new and expensive generating plants. Many of the projects were abandoned, and the region was left with the then-largest municipal bond default in U.S. history. Northwest customers continue to make payments on part of this debt.

Amidst the turmoil caused by this massive planning failure, Congress enacted the 1980 Pacific Northwest Electric Power Planning and Conservation Act authorizing the states of Idaho, Montana, Oregon, and Washington to form the Council as an "interstate compact" agency. The Act requires the Council to develop a 20-year power plan to assure the region of an adequate, efficient, economical, and reliable power system; and to develop a fish and wildlife program to protect, mitigate, and enhance fish and wildlife affected by the dams.

When the Council published its last power plan in 1998, the focus was on the changing energy industry and the trend toward deregulation. Deregulation, by introducing the risks and rewards of the marketplace, was expected to increase consumer choices and generation efficiency, and encourage innovation. But the unpredictability of factors like weather and fuel prices greatly affects the market price of electricity; and uncertainties about the pace and nature of deregulation inhibited generation and conservation development—one of the important factors leading to the 2000 - 2001 West Coast electricity crisis.

In planning for the future, events can turn out very differently from what we expect or assume. Mindful of this, the Council has evaluated energy choices against a variety of risk factors such as natural gas prices, load, hydro generation performance, global climate change policies, and wholesale electricity market prices. This analysis illustrates the trade-offs between cost and risk for different choices. Through a rigorous examination of various energy options, and a healthy willingness to question given assumptions, the Council believes its new power plan offers sound guidance on how the region can secure its energy future.

Recommendations

Conservation

With respect to resource choices, the Council recommends that the region increase its efforts to secure cost-effective conservation immediately. The Council considers improved energy efficiency to be a resource for meeting future electricity demand. Although conservation may result in small rate increases in the short-term, it can reduce both cost and risk in the long-term. The power plan calls for aggressive and sustained development of conservation: 700 average megawatts between 2005 and 2009.

Demand Response

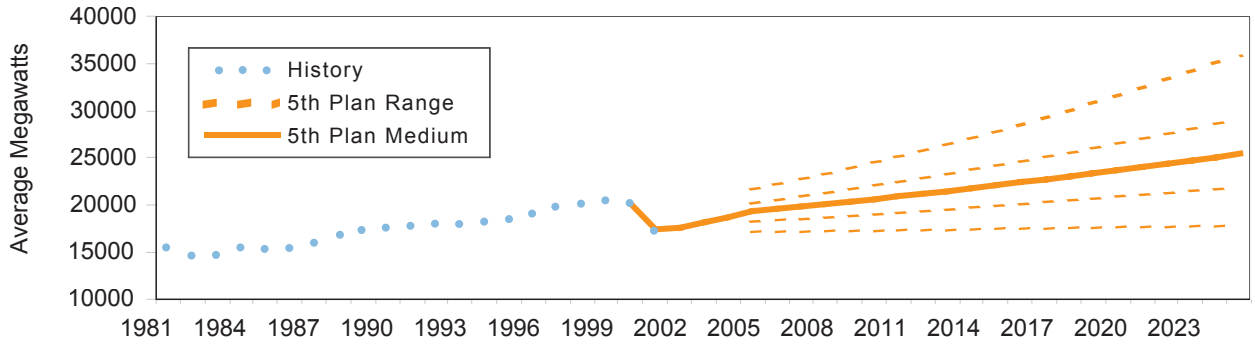
The Council also recommends developing demand response programs—voluntary agreements between utilities and customers to reduce demand for power during periods of high prices and short supply. The Council recommends developing 500 megawatts of demand response between 2005 and 2009. Demand response has proven helpful in stabilizing electricity prices and in preventing outages. The Council's analysis shows that although it will probably be used infrequently, demand response reduces both cost and risk compared to developing additional generation.

Wind

Wind generation figures prominently as a resource in the next decade. The attractiveness of wind depends on a number of factors: tax credits, pollution controls, decreasing production costs, and large areas suitable for development. Over the next five years, the power plan calls for gathering more experience and information about wind resources and their performance and cost within the regional power system. The Council recommends developing wind generation at a moderate commercial scale—between 50 and 100 megawatts per year—at geographically diverse wind resource areas to resolve the uncertainties associated with this resource and to prepare for its eventual large-scale development. The level of near-term development is consistent with the wind development identified in the resource plans of regional utilities.

The Council's power plan comprises a resource development strategy to ensure the region's power supply with the least cost and least risk; and recommendations on key policy issues that affect the power system.

Range Forecast of Electricity Demand



This graph shows the range of forecasts compared to historical consumption. Electricity demand dropped by 2,800 average megawatts between 2000 and 2002 because of electricity price increases and the economic slowdown.

Prepare for New Power Plants

The region currently has a modest power supply surplus due to reduced demand and new generating plants constructed over the past three years. However, independent power producers rather than regional utilities own most of the surplus capacity, which is available to the region at market prices. The Council believes the region should secure sites and permits to be able to begin constructing new coal-fired generating resources as early as 2010; and significant amounts of additional wind generation shortly thereafter. Later in the 20-year planning period, some additional gas-fired generation may be needed. Transmission upgrades should be identified so all these resources can be built and brought on line quickly when required. If major transmission upgrades are needed, pre-construction planning, siting, and permitting will have to begin well before actual construction of the power plants.

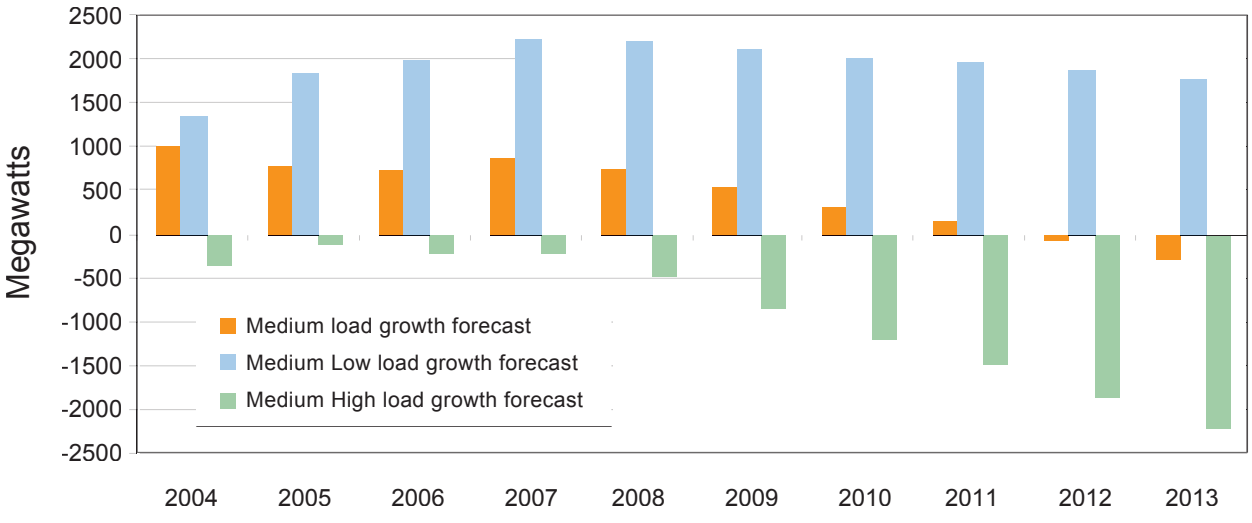
Key Policy Issues

Along with the Council's recommended resource development plan—the least cost, least risk development plan according to the Council's analysis—the power plan includes recommendations on key policy issues confronting the region. These include transmission operation and planning issues, the establishment of resource adequacy standards, and the future role of the Bonneville Power Administration in power supply.

With respect to Bonneville's role, the Council recommends that the agency sell the electricity from the existing Federal Columbia River Power System to eligible customers at cost. Customers that request more power than the existing system can provide should be required to pay the additional cost. The Council recommends that Bonneville implement this change through new long-term contracts to be offered in 2007. The Council also believes that Bonneville must continue its commitment to support conservation, renewable energy, and fish and wildlife mitigation.

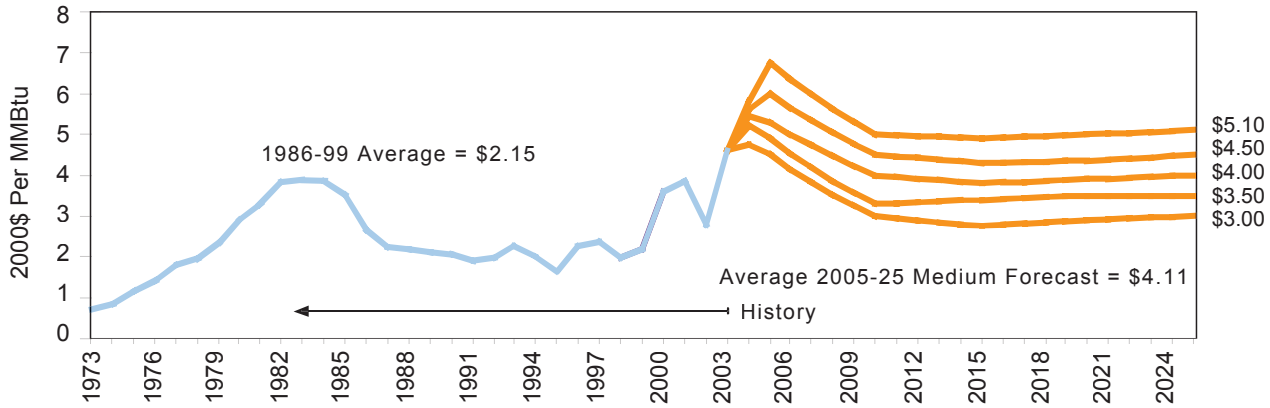
An adequate power system has the capability to cover times when the region experiences a poor water year, unexpected load growth, or the failure of new resources to be developed as planned. It means we have a cushion of surplus power when an unexpected event occurs.

Annual - Average Load/Resource Balance (under the driest conditions)



Since 2000, over 4,500 megawatts of generating capacity has been built in the Northwest. This, combined with the loss of load shown in the demand forecast graph, has led to a surplus of generation. The bars in this graph show the amount of generation in excess of load for three demand forecasts. The graph indicates that under the most likely range of load growth, new generating resources are unlikely to be needed until the end of the decade.

Historical and Forecast Natural Gas Prices



Natural gas prices have risen significantly and are expected to remain at high levels in the future.

Resource Supply Forecast (beginning with least cost)

		Levelized cost in cents per kilowatts/hour	Energy in average megawatts	
1	Commercial New & Replacement Lighting	1.22	245	
2	Commercial New & Replacement Infrastructure	1.42	11	
3	New & Replacement AC/DC Power Converters	1.49	156	
4	Residential Dishwashers	1.6	10	
5	Agriculture – Irrigation	1.6	80	
6	Commercial New & Replacement Shell	1.62	13	
7	Industrial Non-Aluminum	1.7	350	
8	Residential Compact Fluorescent Lights	1.7	535	
9	Commercial Retrofit Lighting	1.84	114	
10	Residential Refrigerators	2.1	5	
11	Residential Water Heaters	2.2	80	
12	Commercial Retrofit Infrastructure	2.2	105	
13	Commercial New & Replacement Equipment	2.22	84	
14	Chemical Recovery Boiler Upgrades (incremental cost)	2.34	280	
15	Residential New Space Conditioning— Shell	2.5	40	
16	Central MT Wind for local load, firmed and shaped	2.59	100	(typical project)
17	Residential Existing Space Conditioning – Shell	2.6	95	
18	Commercial Retrofit Shell	2.87	9	
19	Residential HVAC System Efficiency Upgrades	2.9	65	
20	Commercial New & Replacement HVAC	3.03	148	
21	Residential HVAC System Commissioning	3.1	20	
22	Eastern WA/OR Wind	3.23	100	(typical project)
23	Commercial Retrofit HVAC	3.29	117	
24	Commercial Retrofit Equipment	3.45	109	
25	Landfill Gas Energy Recovery	3.75	150	
26	Montana pulverized coal for local load	3.81	400	(typical project)
27	Goldendale CCCT (Cost to complete)	4.17	248	
28	Eastern WA/OR Integrated coal gasificiation w/o carbon dioxide separation	4.29	425	(typical project)
29	Residential HVAC System Conversions	4.3	70	
30	Residential Heat Pump Water Heaters	4.3	195	
31	Eastern WA/OR Pulverized Coal or MT Coal w/ TX to Mid-C at embedded cost	4.31	400	(typical project)
32	Grays Harbor CCCT (Cost to complete)	4.31	640	
33	Montana First Megawatts (Cost to complete)	4.39	240	
34	Residential Hot Water Heat Recovery	4.4	25	
35	Mint Farm CCCT (Cost to complete)	4.55	286	
36	Eastern WA/OR CCCT	4.71	610	
37	Animal Manure Energy Recovery	4.83	50	
38	Residential Clothes Washers	5.2	135	
39	Wood Residue Energy Recovery (non-cogen)	5.54	25	
40	MT Coal Steam w/ TX to MidC at cost of expansion	6.04	1000	each sized to capacity
41	Central MT Wind w/ TX to MidC, firmed and shaped	6.08	1000	capacity of 500 KV
42	MT Integrated coal gasificiation w/ TX to MidC and carbon dioxide separation	6.9	1000	transmission expansion

The power plan includes analysis that evaluates alternative regional adequacy standards and how they would interact with the Western system, with the goal of establishing an effective regional adequacy standard.

The move toward deregulation and the opening up of wholesale electricity markets, along with changes in technology, changed the character of the traditional transmission system making it more difficult to manage. Efforts to establish an organization to assess the long-term requirements of the transmission system and a mechanism to encourage investments to meet those requirements are underway. The Council supports the work to resolve these problems and is an active participant in efforts to improve the regional transmission system.

Recommended Action Items: Next Five Years

1) Develop resources now that can reduce cost and risk to the region
   - 700 average megawatts of conservation, 2005 - 2009
   - 500 megawatts of demand response, 2005 - 2009
   - Secure cost-effective cogeneration and renewable energy projects
   - Develop cost-effective generating resources when needed

2) Prepare to construct additional resources
   - Develop and maintain an inventory of ready-to-construct projects
   - Resolve uncertainties associated with large-scale wind development
   - Encourage use of state-of-the-art generating technology when siting and permitting projects
   - Plan for needed transmission
   - Improve utilization of available transmission capacity

3) Confirm the availability and cost of additional resources that promise cost and risk mitigation benefits
   - Oil sands cogeneration
   - Coal gasification
   - Carbon sequestration
   - Energy storage technologies
   - Demonstration of renewable and high efficiency generation with Northwest potential

4) Establish the policy framework to ensure the ability to develop needed resources
   - Carry out a process to establish voluntary adequacy targets for the Northwest and the rest of the Western system
   - Work through the Grid West, Regional Representatives Group process to address emerging transmission issues within the next two years
   - Revise the role of the Bonneville Power Administration in power supply, consistent with the Council's May 2004 recommendations

5) Monitor key indicators that could signal changes in plans
   - Periodically report on the regional load-resource situation and indicate whether there is a need to accelerate or slow resource development activities
   - Monitor conservation development and be prepared to intensify efforts or develop alternative resources, if necessary
   - Monitor efforts to resolve uncertainties regarding the cost and availability of wind generation, and prepare to develop alternatives, if necessary
   - Monitor climate change science and policy for developments that would affect resource choices

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