

CouncilQuarterly

Northwest Power and Conservation Council > Spring 2011

STRIKING A BALANCE BETWEEN ENERGY AND THE ENVIRONMENT IN THE COLUMBIA RIVER BASIN



Wind power continues to make strides as part of the Pacific Northwest's power supply. Just how fast has wind power grown in the last five years? Here are the numbers:

- In 2006, there were 15 wind facilities with 1,588 megawatts of capacity,* contributing 2.3 percent to the region's capacity supply
- In 2011, there are 41 generating 5,583 megawatts of capacity supplying nearly 10 percent of total supply

That's a lot of new wind power developed in a short timeframe, which has created both opportunities and challenges. One of the biggest challenges has been the growing frequency of periods when wind and hydro generate more energy than we can use. The Bonneville Power Administration reported that wind generation on its system had passed a new milestone on February 22, reaching an all-time peak of 3,006 megawatts — that's enough electricity to serve a city three times

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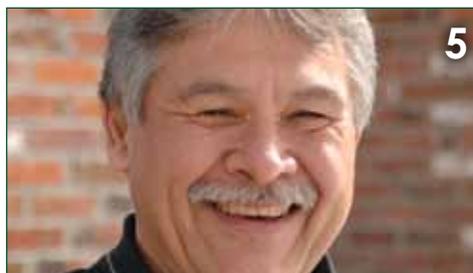
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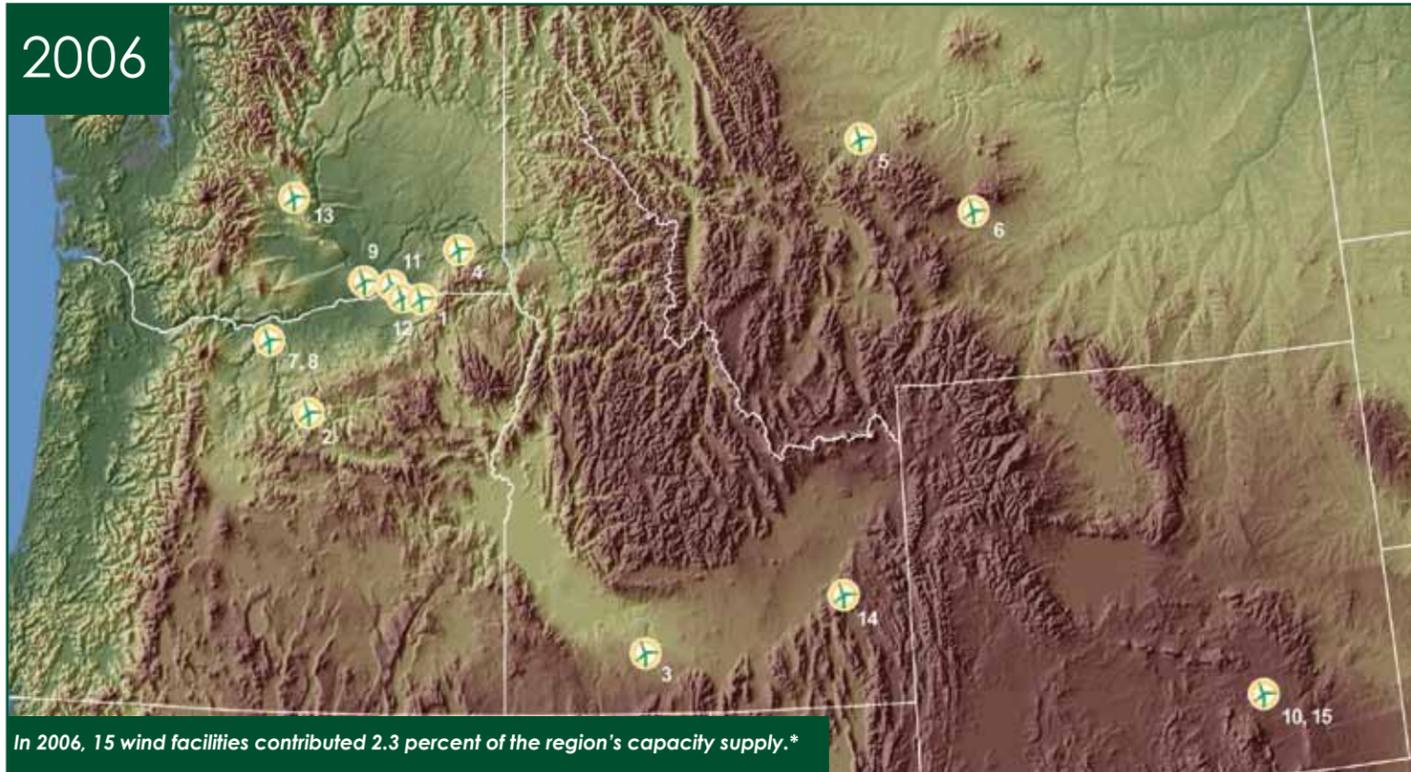
Reassessing the Columbia River Treaty

An interview with Garry Merkel, chair of the Columbia Basin Trust

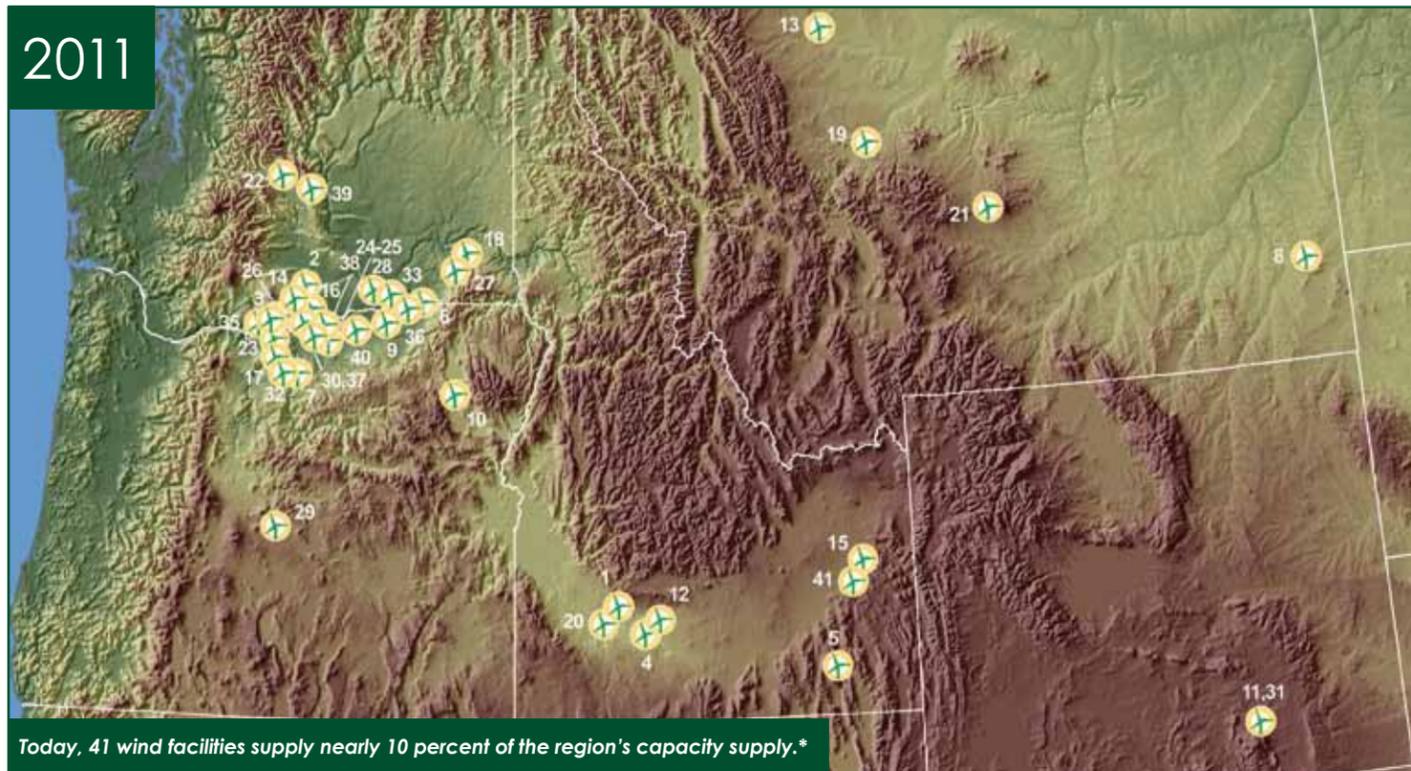


The Council's 30th anniversary

Celebrating a milestone of regional cooperation



Comparison of Wind Power Growth in the Pacific Northwest



*For additional information, check out the interactive maps on our website.

the size of Seattle. In just the last two years alone, more than 1,500 megawatts have been added.

So what does the future hold? Will wind continue to grow at this pace? Will other resources emerge, continuing to diversify our supply portfolio? Here are some thoughts from the Council's Ken Dragoon, senior resource analyst.

"We're close to achieving the 6,000 megawatts of wind generation that the wind integration forum identified in 2007, so it's time to look at how to prepare for the next 6,000."

According to Dragoon, work is underway on a number of fronts, like shorter operating periods, reducing barriers to intra-hour scheduling, and mechanisms that will allow utilities to access both generation and load flexibility.

The Federal Energy Regulatory Commission released a study that included using 15-minute operating periods as a tool to balance generation and load more accurately, reducing the amount of generating capability operators would need to keep in reserve. "It could reduce reserve requirements by about 20 percent," says Dragoon.

In another example of efforts to achieve greater system efficiencies, both the Western Electricity Coordinating Council and the Southwest Power Pool have made progress on establishing more fluid, open markets that give participants real-time prices and dispatch signals, improving access to flexibility in existing generation around the region. It makes it easier for operators to balance supply and demand, and it also helps to integrate renewable resources.

WECC has developed what it calls the efficient dispatch toolkit, which it's continuing to analyze. As for the SWPP's voluntary market, initial reviews of it have been quite positive. "It appears to have saved them a lot of money," notes Dragoon.

In the Northwest, the Bonneville Power Administration has funded a grant to look at



Notes From the Chair

The region's growing wind development continues to set records.

The Bonneville Power Administration recently announced that wind generation on its system had reached an all-time peak of 3,006 megawatts in February. In this issue, we're taking a look at where we go from here, both to address the challenges wind presents and how we can integrate more of it into the Northwest's power system.

A new tool to fight the spread of invasive mussels was unveiled in Idaho, and we were on hand to document it: a system to quickly decontaminate watercraft. The Shoshone-Paiute Tribes spearheaded the project with help from federal and regional partners, including the Council.

The second part in our series on the future of the Columbia River Treaty features an interview with Garry Merkel, chair of the Columbia Basin Trust, our Canadian counterpart agency. Merkel shares his thoughts on the importance of public participation to update the treaty between Canada and the U.S.

This spring, we also note the 30 year anniversary of the Council's creation. Thirty years isn't a long time, but the region is a very different place than when we began, and we take a moment to reflect on how far we've come.

Council Chair Bruce Measure

using electric water heaters to provide balancing services. The idea is that during short fluctuations in supply (when wind generation rapidly increases), the unscheduled power can go to heat water. The Milton-Freewater area has used water and space heaters to limit peak loads since 1985.

"Right now, we're set to test 40 water heaters with new high-tech controls in the service territories of Cowlitz PUD, the Eugene Water and Electric Board, and Lower Valley Electric Cooperative," says Dragoon. The project should be up and running sometime this June.

The over supply issue is thorny since the two

Continued from page 4

obvious options — spilling water or curtailing wind — have downsides. Too much spill can harm fish and taking wind offline hurts the bottom line for wind operators. The Bonneville Power Administration has begun curtailing wind generation during periods of over supply.

Still, Dragoon, who has extensive experience with renewable resources like wind, believes it's not an insurmountable obstacle. "Bonneville doesn't have the institutional mechanisms to deal with limiting wind generation. Ultimately, the region needs to have straightforward protocols spelled out in advance." The Council's analysis on the issue describes the challenges and outlines some possible solutions. (See sidebar story below.)

In the meantime, the wind integration forum will be reconvening in June. The task at hand: How do we get to the next phase in wind's development? Some of the big picture items on their agenda will be:

- a review of development since 2003; environmental and economic consequences
- what actions need to happen next
- review transmission needs

At the national level, a 2008 Department of Energy study explored the feasibility of using wind energy to generate 20 percent of the

United States' electricity demand by 2030, outlining a road map to expand this renewable resource and lower carbon emissions.

Dragoon hopes the region will start thinking bigger about renewable energy. "There's a lot going on to keep together, but it's time to begin thinking more broadly about how to design and operate our system where a significant portion of the energy comes from new renewable resources."

*The maximum amount of power that a power plant can produce at specified times under specified conditions. One average megawatt can power about 700 homes for a year.

The Effects of Surplus Energy in the Pacific Northwest

One of the trends to come out of all the wind power that's been developed in the Pacific Northwest the last several years is an increasing surplus of generating capability.

Historically, the combination of high springtime runoff and low demand has led to episodes of excess energy in the region, causing operators to send water over spillways instead of through turbines. The recent large-scale development of wind power to meet state renewable portfolio standards has added to the frequency and magnitude of these events. But too much spill can cause trauma to migrating fish, which is why Bonneville decided to curtail wind when we have too much energy.

The growing surplus can contribute to lower electricity market prices, the reduced value of hydropower energy, and the increasing frequency and severity of excess energy events.

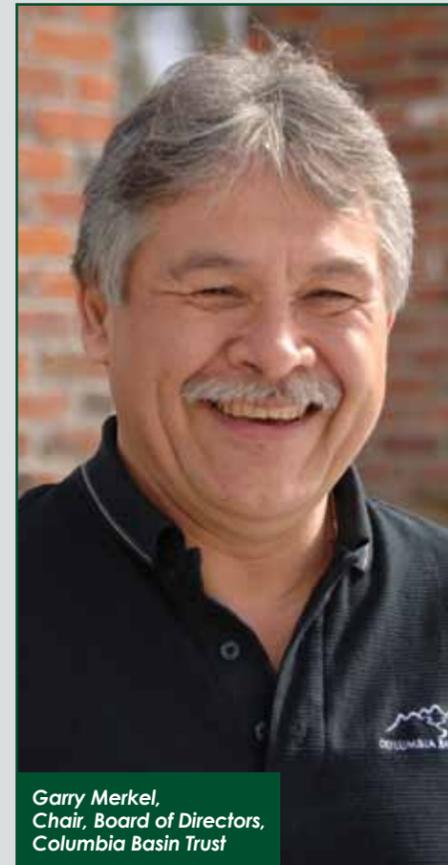
Some of the key findings in the Council's issue paper examining the problem include:

- Developing resources to meet state renewable portfolio standards tends to increase excess energy events until the final renewable targets are met; afterwards, their frequency declines.
- Additional wind development for renewable energy credits is likely to increase the frequency of excess energy events.

- Good water years increase the probability of these events, and poor water years decrease the probability. Unusual runoff patterns can create excess energy conditions even in average water years (which happened last June).
- Current state renewable portfolio standards are causing renewable energy to increase more rapidly than loads are growing. Market prices are expected to be lower than they would be without renewable resources.
- The average impact of lower market prices will be moderate relative to other variables such as hydro conditions and economic growth. Hydropower will be disproportionately affected because hydro sales are greatest in the spring when the effect of wind on market prices is greatest.
- Measures are available to reduce the frequency of excess energy events, to alleviate the economic and operational issues associated with excess energy events, to counter equity issues, and to use available low-cost, low-carbon energy more productively. Policy-related measures are generally low-cost and quickly effective, but may be politically difficult to implement. Structural measures tend to be capital-intensive, and slow to implement.

Northwest Q & A: Garry Merkel, Columbia Basin Trust

The Columbia River Treaty between the United States and Canada authorized three dams to be constructed in the 1960s. The dams caused significant changes to the environment, economy, and culture of the affected area.



Garry Merkel,
Chair, Board of Directors,
Columbia Basin Trust

The Columbia Basin Trust was established in 1995 in recognition of the lack of consultation with residents of the Canadian Columbia River Basin—the region most affected by the Columbia River Treaty.

The Trust, which is a partner in three hydroelectric power plants and is currently constructing a fourth, earns income from power sales and other investments through its original \$315 million endowment. The Trust invests in programs and initiatives that focus on fostering quality of life, improving environmental conditions, addressing social and economic issues, and improving public understanding and involvement regarding water issues.

While the treaty has no end date, either country can terminate most of its provisions on or after September 16, 2024 — 60 years after ratification — with 10 years' notice. With Sept. 16, 2014 just three years away, both countries are studying the future of the treaty.

In the winter 2011 edition of *Council Quarterly* we interviewed Steve Oliver, vice president of generation asset management for the Bonneville Power Administration and co-coordinator of the U.S. Entity for implementing the treaty. In this edition, Garry Merkel, a resident of Kimberley and

chair of the Columbia Basin Trust, discusses the future of the treaty from their perspective.

Q. What benefits do the United States and Canada enjoy under the treaty, and would those change if the treaty is terminated? If so, how?

That's a technical question and I'm not a technical expert, but what I understand is that we both benefit. We both get the benefit of flood control, which allowed us to develop and maintain stable towns close to the river.

We both get the benefits of improved hydroelectric power generation. Also, from a Canadian perspective, we receive what is called "downstream benefits" from the United States. Canada gets a portion of the additional power produced in the U.S. as a result of water storage located in Canada, and these benefits are owned by the Province of British Columbia.

Would things change? If the treaty were terminated, we would not have guaranteed flood-control provisions, as there are now. Canada would still be obligated to provide some flood control, but it would be of a different nature. So that means we could potentially run our reservoirs differently, like keeping them higher over certain periods when it makes sense for us, and the U.S. would have to draft its reservoirs a lot more

to provide the flood control that we would no longer provide. What that means is the potential for a lot more uncertainty in Canadian operations compared to what the U.S. sees now. I have a strong feeling that we need some form of coordinated mechanism to manage the waters of the river between our two nations. We're looking to retain the existing benefits we receive and also explore ways to gain ecosystem benefits. We need to examine if the treaty is still that mechanism as we go forward into the future. Without some form of coordinated mechanism, we'll lose some of the benefits we now enjoy, and I just don't know how you'd operate the river and dams without that coordination.

Q. Why is the Columbia River Treaty important to the Trust? Will the Trust be involved in helping the

were very frustrated by being displaced and treated poorly.

When the reservoirs filled behind the dams, it meant communities were displaced, fertile agriculture and forests were lost, as well as important fish and wildlife habitat. There are still ongoing effects related to the operation of the reservoirs, which results in large fluctuations in water levels.

While the treaty provided benefits to the Pacific Northwest as a whole, the people in the region felt they were bearing the consequences and not enough benefits were coming back here. Residents told the politicians of the day (early 1990s) that this region deserved some share of the benefits to allow us to provide ongoing environmental, social, and economic development.

sure that residents are educated and informed. That doesn't mean everybody is going to get exactly what they want. What it means is that people will be informed, and that they will have access to credible information, and they will be able to provide informed input themselves. And if a decision is made along the way that is contrary to their views, that decision should be communicated and they should be given a chance to talk about it.

That's a lot different than the 1960s when the treaty was established. Back then, the consultation was extremely limited; so we're beginning to engage the public in thinking about the future of the treaty.

With respect to the Trust's role with the provincial and federal government in the process, consultation regarding the treaty in

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province and national government think about the future of the treaty?

The treaty is important to the Trust because the residents in our region have told us it's important to them. In fact, the genesis of the Trust was that British Columbia built these dams without adequately consulting local residents, and so at the time, people

Today, people are saying to us, "We don't want that to happen again. If they're going to think about changing the treaty, we want to be part of this, and we want the Trust to help us be part of the process."

As for the future of the treaty, the Trust doesn't advocate any particular position on behalf of the basin residents. Our role is to be

Canada is the responsibility of the Province of British Columbia. The Province of B.C. and the Canadian federal government will be the decisionmakers with respect to the future of the treaty. The Trust is willing to work with both in a number of ways, including helping design engagement processes, but we are not decisionmakers when it comes to the treaty.

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Q. The treaty addresses only flood control and hydropower generation. Should other river values and uses be incorporated in a new or modified treaty?

I'm not really sure, frankly. I think each country can rely on its legislative framework to be sure environmental issues are taken care of. Having said that, though, for me, it wouldn't be bad if a new or modified treaty said something like, "This is all for flood control and maximizing hydroelectric power while making sure ecological integrity is maintained." In effect, that's how the system is operated already in the states because of the U.S. legislative framework.

We don't have as much control because we're required to operate the Columbia River Treaty dams in accordance with the treaty and its priorities (flood control and hydroelectric power). Having said that, over the last decade, we've seen an increased focus in Canada on hydrosystem operations that address ecosystem issues.

Q. While there are myriad issues to address and resolve regarding the future of the treaty, what are the most important in your opinion?

It's critically important to be sure the public is informed and involved. Like anybody, I hope we take care of the land and water, and beyond that it becomes a tradeoff of values.

If you don't take care of the land and water, what do you have? You do that indirectly by taking care of the things that live on the land and in the water — by trying to maintain habitat and preserving the integrity of the ecosystem.

Q. What role do you see for others in addressing the future of the treaty?

In Canada, we have a legal obligation to First Nations to consult and accommodate where necessary for potential infringements on their constitutionally protected aboriginal rights. These are rights to use and occupy the land in a manner consistent with communal practices and customs. If you live on the land, you have the right to continue to do that and

the government has the right to infringe, but that has to be justified. First Nations and the U.S. tribes will definitely have a very unique relationship in terms of the treaty and what happens with it.

The kind of work the Trust and Council do together across the border is the kind of work I think is essential to really try to come up with a treaty that makes more sense for the river. As we start to know a lot more about each other, we understand each other's issues and land more, and the public is better informed. I have a lot of faith in human nature that once we get to know each other fairly well, we're going to start to think about solutions that make sense for the river and people as opposed to having more of a financial and political discussion. We need to engage people in their community, and that's what we're about at the Trust.



A New Tool in the Fight to Protect Columbia Basin Waters From Invasive Mussels

The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation unveiled the first-of-its-kind boat wash decontamination system in a recent demonstration at the Boise, Idaho office of the Bureau of Reclamation.

The tribes purchased the system to protect their waters from an infestation of quagga and zebra mussels. The tribes depend on the Owyhee, Snake, and Columbia rivers, as well as Wildhorse Reservoir and the Duck Valley Reservation lakes and streams.

The tribes purchased the system from the Prefix Clean Company, which designed and built the system to the specifications provided by invasive species experts in the Northwest. The watercraft is pulled across the wash platform while hot water is sprayed over it for a specified time to assure that the mussels are killed. The wash water is collected, filtered, purified, and reused. The solid waste is captured in the filters and collection basins to be placed in containers and deposited in a landfill. Hot water



and electricity is provided by the self-contained unit.

“We would like to thank the cooperative partners that joined this effort and helped with funding, especially the Bureau of Reclamation, U.S. Fish and Wildlife Service,

Idaho Power Company, Nevada Department of Wildlife, U.S. Senator Mike Crapo, and the Idaho office of the Northwest Power and Conservation Council. The Nevada Department of Parks and the Idaho Congressional offices have also provided



support, especially the Idaho Department of Agriculture,” said Robert Bear, chair of the tribal business council.

The Shoshone-Paiute Tribes are working with the Nevada Department of Parks and the Nevada Department of Wildlife to place the system at Wild Horse Reservoir State Park to inspect boats traveling north from Elko, Nevada to Wildhorse Reservoir. For boats where mussels are found, decontamination will only be a 5 to 10 minute boat wash instead of the customary month-long quarantine. And both the boat inspection and boat wash are free.

Establishing the decontamination system illustrates the importance of collaboration. The project wouldn’t have been possible without the support of many different partners with varying responsibilities and mandates.

“The effort was a work in progress for over a year and required coordination among a lot of people and groups,” said Idaho Council member Jim Yost. “But when we hit an obstacle, we figured a way around it, and this summer we expect to have the system up and running.”



Left to right: Jim Yost, Idaho Council member; Terry Gibson, Business Council (Shoshone-Paiute Tribes); Robert Bear, Chair, Tribal Business Council (Shoshone-Paiute Tribes); Bill Booth, Idaho Council member.

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Council Marks 30 years of Improved Energy Efficiency and Fish and Wildlife Protection



Standing, left to right: Roy Hemmingway (Oregon), Chuck Collins (Washington), Chris Carlson (Idaho) and Gerald Mueller (Montana)
Sitting, left to right: Herb Schwab (Oregon), Dan Evans (Washington), Bob Saxvik (Idaho), and Keith Colbo (Montana)

Thirty years ago, the Northwest Power and Conservation Council met for the first time.

The Council's first meeting occurred five months after President Jimmy Carter signed the 1980 Northwest Power Act that authorized the states of Idaho, Montana, Oregon, and Washington to form the Council. From then on, the Council, with input from the public, would plan the region's future electricity resources while also protecting Columbia River Basin fish and wildlife affected by the hydrosystem.

Among the Act's notable requirements — regional cooperation and putting the environment on an equal footing with energy — was making energy efficiency the number one resource to meet future energy demand. It was an extraordinary decision at the time,

changing the region's approach to energy planning and contributing to achievements that continue to influence our quality of life.

Since the Act's passage, the region has saved 4,300 average megawatts, an amount equal to the electricity use of four cities the size of Seattle, and it's met half of the region's growth in demand. Today, it's the region's third-largest energy resource (12 percent) behind hydropower (56 percent) and coal (18 percent).

Thanks to those savings, consumers pay significantly less for electricity than they would have without all of that efficiency. In 2009, regional electricity bills were \$2.3 billion lower as a result of efficiency gains.

Saving that energy has also meant that millions of tons of carbon dioxide and other gases weren't released into the atmosphere by plants that burn coal or natural gas. In 2010 alone, the efficiency displaced more than 19 million tons of gases.

In terms of the environment, juvenile salmon and steelhead survival through the Columbia River hydropower system has improved; in the case of some Snake River stocks, their survival numbers have doubled.

Sockeye salmon from Idaho, the first basin salmon listed under the Endangered Species Act, are enjoying a resurgence. Only 14 returned to spawn in lakes in the Stanley Basin of central Idaho in 1985. In 2010, the number was 1,336, the highest since 1956. Snake River fall Chinook are rebounding, too, from just 337 adult fish counted at Lower Granite Dam in 1981 to routinely more than 3,000 annually over the last decade, and a remarkable 41,285 in 2009.

More than 400,000 acres have been acquired for wildlife habitat, 44,000 stream miles have been protected from hydroelectric development, and more than 1,400 miles of river and stream habitat have been protected and improved for fish spawning and rearing.

"Over time, the Power Act and the Council's power plan and fish and wildlife program have saved Northwest electricity ratepayers hundreds of millions of dollars through investments in energy efficiency, reduced carbon emissions in the region, and helped to improve the survival of fish and wildlife in the Columbia River Basin," Council Chair Bruce Measure said. "The Power Act continues to benefit the people and the environment of the Northwest."

Looking ahead, the Council anticipates the region to add nearly 6,000 more average megawatts of energy efficiency over the next 20 years, meeting nearly 85 percent of its anticipated power needs. If so, the region's carbon emissions from power plants will drop 15 percent below 1990 levels and ratepayers' monthly electricity bills will be about \$20 lower than without the new efficiency.

At the Council's initial meeting, held at the Portland School District administration building on April 28, 1981, three Northwest governors urged their appointees — two from each state — to work together to make the Power Act successful.

"How we take this supply of energy with which we have been blessed and use it, expand it, distribute it, is a great opportunity," Washington Governor John Spellman said.

"The Council's role is to draft a kind of energy Magna Carta that will enable the region to progress," Montana Governor Ted Schwinden said.

Oregon Governor Vic Atiyeh noted the collaboration among members of the Northwest congressional delegation that led to approval of the Power Act and told the new Council, "That unity must be continued...Each state must be an equal partner." Idaho Governor John Evans was unable to attend, but sent a message that he supported the Council and looked forward to the region enjoying the benefits of the Power Act.

Council Decisions

February 2011 April 2011

Blackfoot River Subbasin Plan

The Council added a fish and wildlife protection plan for the Blackfoot River in western Montana to its Columbia River Basin Fish and Wildlife Program. The plan paves the way for potential funding to improve fish and wildlife habitat and production. <http://www.nwcouncil.org/fw/subbasinplanning/blackfoot/plan/>

Economic study of instream flow improvements

The Council's Independent Economic Analysis Board will compare the costs and effects of improving instream flows for fish through improvements in irrigation efficiency and direct acquisition of water rights from willing sellers. The Council approved \$25,000 for the study.



Project Updates

The Council recommended 100 projects, some new and some ongoing, to improve scientific knowledge about fish and wildlife throughout the Columbia River Basin. The projects are part of the Council's Columbia River Basin Fish and Wildlife Program funded by the Bonneville Power Administration as part of its responsibility to protect and enhance fish and wildlife affected by hydropower dams in the basin. Bonneville has designated \$81.2 million in FY 2012 for this group of projects.

Regional Technical Forum Policy Advisory Committee

The Council authorized an advisory committee for the forum, which the Council created in 1996 in response to direction from Congress to establish a panel to develop "consistent standards and protocols for verification and evaluation of energy savings, in consultation with all interested parties." The advisory committee will provide increased visibility of, and policy guidance for, the forum's activities. <http://www.nwcouncil.org/news/2011/04/8.pdf>



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Council Quarterly

is produced four times a year by the Public Affairs Division of the Northwest Power and Conservation Council

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