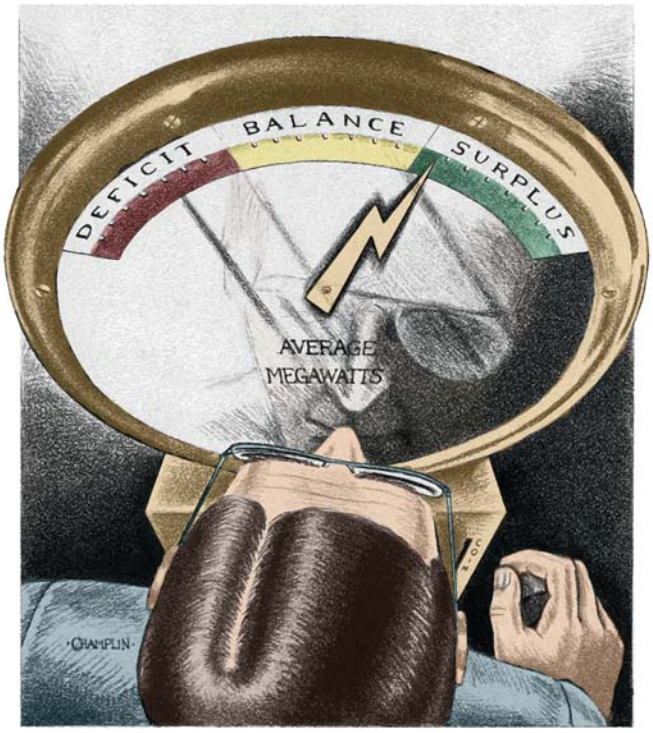
Council Northwest Power and Conservation Council QUARTERLY
Spring 2006
Striking a Balance Between Energy and the Environment in the Columbia River Basin

Council Proposes Voluntary Standard for Westwide Power System Reliability

The West Coast energy crisis of 2000 and 2001 dramatically demonstrated the value of an adequacy standard for the electricity supply — and the chaos that can erupt without one. "Resource adequacy" means having enough electricity to avoid blackouts, brownouts, and exposure to unacceptably high power prices in the wholesale power market.



Today, as electricity ratepayers continue to pay for the high-priced power utilities had to buy during the crisis to keep the lights on, the Northwest Power and Conservation Council, Bonneville Power Administration, and Northwest utilities are working to develop a resource adequacy standard. The standard would be voluntary, but Bonneville might incorporate it into its power sales contracts. With regionwide agreement on what constitutes an adequate power supply, utilities that grow short of power would face pressure from their peers to fix the problem. The goal of developing a standard is to avoid a repeat of the sticker shock of high electricity prices that pummeled the region in 2000 and 2001.

In 2000, there was no West Coast-wide standard for power system adequacy. The Western Electricity Coordinating Council, which coordinates electric system reliability in North America west of the Continental Divide, had a standard for capacity — a recommendation for reserve power to meet sudden, short-term spikes in demand — but not a Westwide standard for long-term power system adequacy.

This proved to be problematic, as there was little warning of an impending crisis of long-term supply and demand. By mid-2000, demand for electricity had been increasing steadily on the West Coast but the power supply had not kept pace. Utility by utility throughout the interconnected power generation and transmission grid, some had an adequate long-term power supply and others did not. Systemwide, the gap between demand and supply was widening. Together, the gap plus California's then-failing attempt to manage its

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Celebrating A Milestone: The Northwest Power Act

The Northwest Power and Conservation Council and the Bonneville Power Administration will celebrate the 25th anniversary of the Northwest Power Act by honoring individuals who were instrumental in creating and implementing the Act.

President Jimmy Carter signed the Act into law on December 5, 1980. The law authorized the states of Idaho, Montana, Oregon, and Washington to form the Council, which the state legislatures did in early 1981. Each governor appointed two Council members, and the Council had its first meeting in April 1981.

The Northwest Power Act is one of the most important federal statutes affecting the development of public policy in the Columbia River Basin. It gave the states the right to develop a power plan to assure the region an adequate, efficient, economic, and reliable power supply, while protecting the fish and wildlife affected by the federal hydrosystem. It also encourages broad public participation in deciding these issues.

Year of Celebration ~ 25th Anniversary
NORTHWEST POWER ACT *of* 1980

At the Council's March meeting, Council Chair Tom Karier and Bonneville Power Administration Administrator Steve Wright announced the yearlong celebration. "The Act is a unique piece of legislation in the United States," said Karier. "We want to celebrate the Act and its contributions to our quality of life in the Northwest by honoring the people who created it and carried it forward."

"The Act literally transformed how we as a region view resource development," said Wright. "Among other things, it set the pace for the nation's most ambitious conservation program and moved development of renewable energy to the region's front burner. It also brought regional focus to the effort to protect and save our fish and wildlife."

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Notes From the Chair

It's been 25 years since Congress enacted the Northwest Power Act, a watershed moment in the region's struggle to manage two disparate, yet interconnected, resources: Columbia River Basin fish and wildlife and the hydroelectric system. Over the years, the issues may have changed, but the fundamental problem of reaching a balance between nature and humans has not. The Act insists both are important, one no more than the other, and it is through our struggle to find that balance that new insight and innovations are born.

The stories in this issue focus on the opportunities in both the energy and fish and wildlife realm. The Council believes that removing the regulatory barriers to acquiring conservation would be beneficial for both utilities and their customers. Two experts on this issue present some ideas on how to overcome the institutional disincentives to improving energy efficiency. Developing a way for the region to know if we have an adequate power supply is an essential tool for securing the reliability of the power system. The Council, in concert with its partners, has been working to develop adequacy measures and targets, and expects to adopt a regional policy this summer. The tribal fishery is a historical component of harvest and represents an essential aspect of Native American culture and heritage. An interview with a representative on this subject offers a unique perspective on the importance of salmon to the region.

Finally, the Council, along with the Bonneville Power Administration, will be celebrating the 25th anniversary of the Power Act by honoring the many people who have contributed to its success over the years. In the time span of a mere generation, thousands of miles of river reaches have been protected from hydroelectric development, hundreds of habitat restoration projects have been implemented throughout the basin, and nearly 3,000 megawatts of conservation have been acquired. The Power Act opened the door to a new way of thinking, but its success is due to the work of individuals committed to fulfilling the vision of the Act. Throughout the year, I look forward to acknowledging these leaders in the pages of the Council's newsletter and at upcoming Council meetings around the region.

Council Proposes Voluntary Standard for Westwide Power System Reliability

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wholesale power market, and a drought in the Pacific Northwest that reduced the hydropower supply, sent wholesale power prices throughout the West rocketing to 10 times the normal price and higher. Prices didn't approach normal again until June of 2001, and by then the damage was done. Consumers faced double-digit rate increases to pay for the expensive wholesale power their utilities had to purchase, and many businesses and industries foundered on the high cost of power. Some failed.

In 2003, the Federal Energy Regulatory Commission concluded in a report on California's problems that a reduced supply of Northwest hydropower played a role, along with manipulation of the California market by energy traders. According to congressional testimony by Pat Wood, then chairman of FERC: "… for the first two years of its operation, the California market performed well and saved the state's customers billions of dollars. But after the Pacific Northwest could no longer provide abundant supplies of low-cost hydropower to the regional market, the effects of too little infrastructure and inefficient market rules adversely affected wholesale prices."

Hydropower from the Northwest propped up the power supply in California, and perhaps elsewhere in the West, essentially taking the place of power plants that should have been built, but were not. As the hydropower supply dried up — the January-July 2001 Columbia River runoff was the second-lowest in more than 70 years of record-keeping — prices for the diminished supply of electricity in the face of steady demand jumped up to levels never seen before. For weeks on end in early 2001 the wholesale price hovered above $200 per megawatt-hour — compared to $30 or less before the crisis.

In response, both FERC and California regulators recommended a resource

> "…after the Pacific Northwest could no longer provide abundant supplies of low-cost hydropower to the regional market, the effects of too little infrastructure and inefficient market rules adversely affected wholesale prices."
>
> *Pat Wood, chair, Federal Energy Regulatory Commission, 2003*

adequacy standard for the state to ensure that the power supply remains adequate to avoid blackouts, brownouts, and volatile high prices. Others, including the Northwest Power and Conservation Council, were thinking along the same line. Resource adequacy is a key element of the Council's Fifth Northwest Power Plan, developed in the wake of the power crisis and completed in December 2004.

The power plan recognizes that hydropower is the largest single source of electricity in the Northwest and that the Bonneville Power Administration is the largest single supplier of electricity. Most of its surplus hydropower is sold to utilities in California and the desert Southwest. The Northwest and Southwest are linked by high-voltage transmission lines and regularly share power — this occurred to a limited extent even during the energy crisis. The power plan recognizes this interdependence in its proposal to develop a voluntary resource adequacy standard:

"This is not merely a regional issue, because the Northwest is part of an interconnected Western system. This means the region must work with other interests in the West to develop a system that will assure adequacy, recognize the legitimate differences within the West, and ensure that all of the responsible entities bear their share of the responsibility. The region should address these issues soon."

While the Western Electricity Coordinating Council works to establish a Westwide resource adequacy standard, the Council is implementing two action items in the Fifth Power Plan: One is to establish regional and Westwide reporting standards for the assessment of power system adequacy, and the other is to improve consideration of risk — the risk of exposure to unacceptably high power prices, for example — in integrated resource planning. To that end, the Council and Bonneville established the Pacific Northwest Resource Adequacy Forum to develop a resource adequacy standard for the region. The forum has nearly 90 members who represent utilities, utility associations, electricity consumer groups, and others.

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Celebrating A Milestone: The Northwest Power Act

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Throughout the year, representatives from the tribes, utilities, and fish and wildlife community will be recognized for their work and leadership in these areas. Culminating the year will be an anniversary luncheon and award ceremony in December to thank all the nominees. Information on the celebration and nominating process is posted at www.nwcouncil.org/act.

In April, Montana Governor Brian Schweitzer visited the Council at its meeting in Whitefish to note the anniversary and reflect on the energy and fish and wildlife challenges the Council and Montana will face in the coming years. The biggest challenge, for the Council and for the country, is to provide new energy supplies while protecting environmental quality, the governor said.

Schweitzer said the first step is to continue to reduce demand for power through investments in energy conservation. Conservation, he noted, is a key resource in the Council's Northwest Power Plan. In the longer term, new generating plants will need to be built, he said. This, too, is consistent with the Council's power plan. Wind power and electricity from new-generation coal-fired power plants are the thermal resources of choice, he said, and Montana is well-positioned to provide both types of generation.

While wind power development has not proceeded as quickly in Montana as it has in other Northwest states, Montana has a vast wind resource. New plants are coming on line, and others are planned for construction. Montana also is at the forefront of clean-coal technology, a technology that burns coal efficiently at very high temperature and with much lower emissions than traditional coal-fired plants. With the new technology, which has been demonstrated at plants in Montana, pollutants can be sequestered and recovered.

The challenge for new power generation, and in fact for Montana's existing generating plants, is providing sufficient high-voltage transmission to be able to sell power out of the state to the large urban areas on the West Coast where the power is needed, Schweitzer said. Transmission, new generating plants, power-sales contracts — all of these depend on each other, but if the transmission challenge can be resolved the others will fall into place, he predicted.

"It's not going to be easy," he said, but he is confident it can be done. CQ

Council Proposes Voluntary Standard for Westwide Power System Reliability

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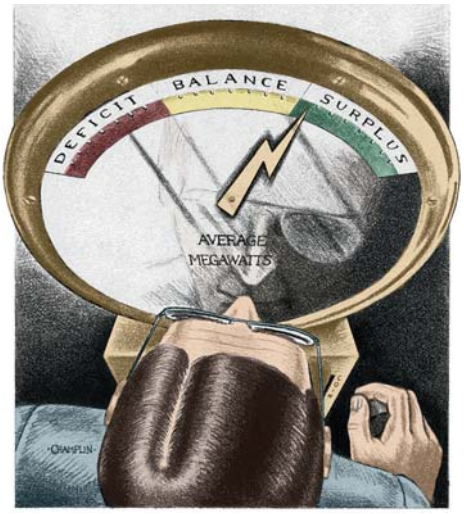
In January 2006, the forum issued a paper with its proposal for a standard. The Council accepted public comments on the proposed standard through April 14 and approved the standard in May. The Council will incorporate the standard into its planning, and Bonneville might incorporate it into its long-term contracts. The Council and Bonneville plan to propose the standard to the Western Electricity Coordinating Council for inclusion in its Westwide effort.

The standard proposed by the forum consists of a metric (a unit of measurement) and target (a measurable amount or value) for both energy and capacity. For energy, the metric is the sum of non-hydro energy, plus the amount of hydropower available under critical-water conditions, plus a 1,500 average megawatt cushion. Critical-water hydropower means the amount of electricity that could be generated with the lowest-recorded annual Columbia River runoff. Currently, that is the period from August 1936 through July 1937. The energy target is zero — that is, on an annual basis, the measurement of energy resources should be equal to the expected annual demand for power.



Because of the variable nature of the hydropower supply, it is more difficult to define a capacity standard for the Northwest than in other parts of the country where thermal power plants dominate. The forum plans to complete work on the capacity metric and target by July. CQ

Council Supports Flood Control Study, But Objects to Partial Funding by Ratepayers

While the Northwest Power and Conservation Council supports a proposed comprehensive review of flood control in the Columbia and Snake River system — such a study could determine whether fish would benefit if dam operations were changed — the Council also believes electricity ratepayers should not have to repay a large portion of the study, estimated to cost $30 million.

In comments to the U.S. Army Corps of Engineers on its Draft Columbia River Fish Mitigation System Flood Control Review reconnaissance study, the Council also expressed concern about the broad scope of the study's proposal and its potential costs and benefits. The Corps plans to decide later this year whether to proceed.

The Council recommended that the Corps convene regional interests in a workshop to identify alternative modeling scenarios. This could support an evaluation of potential impacts and benefits for

migrating salmon and resident fish, storage reservoir elevations, and the power system.

The matter of who will pay for the study also needs clarification, according to the Council. On the one hand, the Corps' proposal states that flood control and Endangered Species Act compliance are federal responsibilities and the Corps, therefore, will not seek local sponsors to share in the cost of the flood-control study. On the other hand, the report indicates that the Corps will request federal appropriations for the study through the Columbia River Fish Mitigation Project (CRFM), which is the construction program that pays for fish-passage improvements at Corps dams.

The Council pointed out that approximately 80 percent of the CRFM appropriations are reimbursed to the Treasury by Bonneville — representing the hydropower share of the fish-passage mitigation obligation. It appears, the Council commented, that the Corps really is asking Bonneville ratepayers to share as much as 80 percent of the study cost. The Council commented that while it supports a comprehensive flood control study, electricity ratepayers should not be forced to pay for a project that ought to be the sole responsibility of the federal government. This would be a major change in federal policy that Congress should scrutinize, according to the Council. The Council also expressed concern that adding flood control expenditures to the CRFM budget inevitably would take money away from projects that are important to fish-passage survival at the dams. CQ

Council Decisions

Research Plan Approved

February

The Council approved the Columbia River Basin Research Plan to guide development of a fish and wildlife research program and foster collaboration with research programs directed by natural-resource management agencies in the Northwest. The research plan will help the Council manage the fish and wildlife program, inform decision-making, facilitate scientific review, focus project selection for funding through the fish and wildlife program, and provide a basis for redirecting future research and making the program more effective. The plan is posted on the Council's website, www.nwcouncil.org.

Annual Review by BPA

March

The Council asked the Bonneville Power Administration to begin reporting annually to the Council on the progress of each project funded through the fish and wildlife program. The Council approved a letter signed by Chair Tom Karier.

BPA Conservation Policies

The Council approved a letter to the Bonneville Power Administration expressing concern that Bonneville's current and developing conservation policies could prevent accomplishing two primary goals in the Council's 5th Northwest Power Plan: 1) meeting or exceeding energy conservation targets throughout the region, and 2) redefining the roles of Bonneville and utilities in the regional electricity system. The letter points out the impediments in Bonneville's conservation policies and urges Bonneville to resolve them.

Two Experts Offer Perspectives on 'Decoupling' Energy Sales From Profits to Encourage Conservation Investments

At a recent meeting of the Northwest Power and Conservation Council, two energy experts offered differing perspectives and solutions to one of the thorniest problems facing energy planners today: how to encourage utilities to invest in energy conservation when their financial health depends on selling energy.

At the Council's request, Ralph Cavanagh of the Natural Resources Defense Council and energy consultant Jim Lazar discussed and debated the problem and potential solutions. The matter currently is before utility regulatory commissions in all four Northwest states and both men have advised utilities about how to address the dilemma.

"The fundamental problem is how can utilities be reliable, committed partners on energy efficiency when their financial health is tied to how much electricity they sell?" Cavanagh said.

Since the early 1980s, nearly 3,000 megawatts of energy conservation have been achieved in the Northwest through utility programs and energy codes and standards. Converted to electricity, that's nearly enough for three cities the size of Seattle. The pace of that acquisition, however, was inconsistent— rapid when electricity prices were high, because conservation is comparatively inexpensive, and slow when prices were low. Yet conservation is desirable — it uses no fuel, doesn't pollute, and reduces exposure to volatile wholesale market prices for electricity — and the Council believes it should be acquired at a consistent pace over time.

The problem for utilities is that by reducing demand for electricity, they may sell less and their income may decline. But even as electricity sales decline, utility costs do not necessarily follow. That is because the price a utility charges for electricity includes both fixed costs (for debt service, facilities, personnel, and so on) and variable costs (for power-plant fuel like natural gas and for electricity purchased on the wholesale market). So as conservation reduces the cost of fuel and power because customers are using less electricity, utilities still have to pay their fixed costs — but from a lower income base. Fixed costs typically account for 40-60 percent of the price a utility charges its customers for a kilowatt-hour of electricity.

> "The fundamental problem is how can utilities be reliable, committed partners on energy efficiency when their financial health is tied to how much electricity they sell?"
>
> *Ralph Cavanagh, Natural Resources Defense Council*

"Now this is a real problem, but my principal message is it is a problem that is relatively easy to solve," Cavanagh said. "You could solve the problem by inflicting whopping fixed charges on every customer so that they pay big electric bills regardless of how much they use, but neither Jim nor I think that's a good idea. So the question is: is there anything else you can do to break the link between the utilities' financial health and the kilowatt-hour sales on the system?"

One answer, the subject of the discussion between Cavanagh and Lazar, is to "decouple" power sales from utility income. Decoupling is a regulatory approach that has many potential variations but a common goal: cover fixed costs so that a utility depends less on income from power sales. In theory, decoupling should encourage investments in energy efficiency by de-emphasizing income from power sales.

One way to decouple, an approach Cavanagh favors, is for a utility to add an increment to its kilowatt-hour charge on an annual basis to cover its estimated fixed costs for the coming year. Then, once a year, the utility's actual income would be compared to the amount it was authorized to collect in what Cavanagh calls a true-up.

"If they under-recover, they get it back the next year; if they over-recover, which is possible if sales go up, they have to give it back to the consumers," he said. "So decoupling is not an automatic rate increase or reduction, it is an adjustment to make sure that the company's ability to recover the authorized fixed costs that its regulators approve isn't affected by changes in kilowatt-hour use. I think that's a good idea."

Lazar didn't disagree, but he sees the matter as a radical departure from traditional ratemaking and one that needs careful consideration to ensure ratepayers are not victimized.

Ratemaking traditionally uses the "test year" concept, in which actual budget data is projected into the future with adjustments for known and measurable changes. "The basic theory is that as new customers come to the system, sales grow, expenses grow, investment grows, and revenues grow, all more or less in lock step," Lazar said. Investments in conservation deviate from the usual pattern — spending money to reduce sales when the typical ratemaking formula is based on increasing sales and producing revenues to cover increasing costs.

Decoupling can help investor-owned utilities — those with rates and profits regulated by state commissions — in just the way Cavanagh describes, Lazar said. But decoupling is most effective for what he calls "island utilities" — those with a single source of power that the utility turns up or down depending on the cost of wholesale power — up when wholesale power is expensive, down when it is inexpensive. Most utilities are not islands; they acquire power from a variety of suppliers and sell power to other utilities or into the wholesale market, all at prices that can vary widely with supply and demand. If sales increase, most utilities won't see their profits increase, and if sales go down, profits won't necessarily go down, he said. At the same time, a utility with its own power plants could reap windfall profits or at least cover the cost of its investments in conservation if the wholesale market price of power is higher than its own cost of generation and if the utility has surplus power to sell because conservation has reduced sales to its customers.

"Decoupling has to be done right," he said. Done wrong, it could shift the financial risk of reduced power sales from shareholders to ratepayers through higher charges for electricity to cover fixed costs.

There are regulatory alternatives to decoupling, but each has problems. One alternative is what Lazar called a "lost-margin recovery mechanism" in which regulated utilities get a credit in their ratemaking formula for lost profit that results from conservation. The problem is that utilities might overstate their accomplishments in order to boost the credit. Another alternative, particularly for publicly owned utilities like those primarily served by the Bonneville Power Administration, is to decouple by setting a high monthly fixed charge. But that could encourage excessive use of electricity and punish those who use less because all customers would pay the same fixed charge regardless of usage. This problem could be addressed by imposing tiered rates with the high fixed charge. The first tier of power would be low-cost — say, the cost of Bonneville's power — and subsequent tiers would reflect the costs of higher-priced electricity from the wholesale market. Bonneville has considered tiered rates, but they could not be imposed until at least the end of the current power sales contracting period in 2011.

The decoupling option Lazar said he likes is to "take the conservation responsibility away from the utility and give it to somebody else — somebody who doesn't have the conflict between achievement of cost-effective results and enterprise profitability." He said the Oregon Energy Trust and a similar effort in Vermont — Efficiency Vermont — are examples of independent entities funded by the states' regulated utilities. "Both are working very well," he said.

Cavanagh agreed that the lost-margin recovery mechanism and the high fixed charge approaches would not work, and he said the concept of assigning the conservation work to a third party works — but only if the utilities are partners. "I don't want to leave them out," Cavanagh said. "I want them as a partner in the process because I've seen how well they can do." He disagreed with Lazar, however, that regulated utilities might cover lost income from reduced retail sales by selling power into the higher-priced wholesale market. The current situation, in which wholesale power is more expensive than power many utilities can generate at their own plants, is a "bizarre historical anomaly," he said. "Wholesale markets are almost always well below retail markets," he said. Additionally, he said, "utilities making transactions in the wholesale market have to give their gains back to

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Tapping the Energy Efficiency Resource

Web-streaming video now available

Utilities lose revenues when they invest in cost-effective energy efficiency.

Ralph Cavanagh and Jim Lazar, experts on utility regulation, talk about how removing regulatory barriers (decoupling) can make conservation a win-win for utilities and their customers.

Northwest Power and Conservation Council

See the 45 minute video on the Council's web site at:
www.nwcouncil.org/video/decoupling

Coal Gasification: An Old Technology Gains New Ground

Could coal-based generating resources make sense for the Northwest? With the announcement of its plans to build the region's first Integrated Gasification Combined Cycle (IGCC) complex last fall, Energy Northwest positioned itself at the forefront of a growing movement toward clean coal technology. The joint operating agency of public power organizations in Washington is proposing to build a 600-megawatt electric power complex near Kalama.

While it may be the first organization to propose construction of a coal gasification plant in the region, other utilities have also shown interest in the emerging technology. After completing an initial study, PacifiCorp decided to commission an engineering feasibility study to further explore the prospects for IGCC development. They will be issuing a request for proposals for supply-side resources this coming fall for service in 2012.

Coal gasification is the cleanest and most efficient way of producing electricity from coal, the most abundant and least expensive of the fossil fuels. With coal gasification, it's possible to remove carbon dioxide (CO_2)—a key greenhouse gas connected to global warming—and one of the main objections to constructing coal-fired generating plants. Rather than burning coal directly, the gasification process breaks the coal—or other hydrocarbons—into its basic chemical parts.

In a modern gasifier, coal is exposed to steam and carefully controlled amounts of air or oxygen under very high temperatures and pressures. Under these conditions, the carbon molecules break apart, setting off chemical reactions that produce a synthesis gas or "syngas." Oxygen is typically used as the oxidizer for gasification power plants. The syngas produced by an oxygen-blown gasifier is mostly carbon monoxide and hydrogen, with small amounts of "acid gases" and trace contaminants. The syngas is cooled and cleaned of hydrogen sulfide, ammonia, and particulate matter downstream of the gasifier in separate gas clean-up equipment. Highly effective gas clean-up equipment enables gasification power plants to operate with lower pollution emissions than conventional boiler-steam plants with flue gas clean up. If carbon dioxide is to be removed for sequestration, the syngas is reacted with steam, converting the carbon monoxide to CO_2. The CO_2 is then stripped, leaving a hydrogen-rich fuel gas. The captured CO_2 can be sequestered rather than escaping into the atmosphere, thereby reducing greenhouse gas emissions. In fact, the potential of IGCC to capture CO_2 at a lower cost than conventional coal plants is one of the main reasons for its appeal. Coal gasification power plants may also be able to reduce mercury releases at less cost than conventional plants.

Gasification also allows coal to be used to fuel efficient combined-cycle generating plants, a technology that requires liquid or gaseous fuel. The combined-cycle system has two basic components: a gas turbine that burns the clean syngas to produce electricity, while the exhaust heat from the gas turbine is captured to produce steam that powers a steam turbine. It is the use of these two types of turbines that enables gasification based power systems to achieve unprecedented power generation efficiencies compared to conventional coal based generation technologies. Gasification based combined-cycle systems using the latest gas turbine technology are expected to operate at around 38 - 40 percent efficiency. A conventional coal based boiler plant, by comparison, employs only a steam turbine-generator and is typically limited to about 33 percent efficiency. In the future, IGCC systems may be able to achieve efficiencies exceeding 43 percent.

The concept of coal gasification may sound state-of-the-art, but in fact it dates back to the 19th century. It originated in the early 1800s as a way of producing flammable gas used for streetlights and to light buildings. Called "town gas," it was the product of the earliest form of coal gasification. With the discovery of

Tampa Electric's Polk Power Station, an integrated coal gasification, combined-cycle (IGCC) power plant.

abundant supplies of natural gas and the construction of pipelines to transport it in the 1940s and '50s, the use of town gas became obsolete.

In 2004, the most recent year for which figures are available, there were 117 coal gasification plants in operation worldwide, employing 385 gasifiers. Only 19 percent produce electric power. Most are operated to produce high value products such as synthetic natural gas, liquid fuels, chemicals, and fertilizer from coal, petroleum coke, and other byproducts of petroleum refining.

In the late 1970s, fuel shortages and concerns about the country's reliance on imported oil prompted renewed interest in coal gasification power as a possible avenue to greater energy independence. Federal funding helped to build demonstration projects in the mid-1990s, two of which are still in operation. The Polk Power Station near Mulberry, Florida is capable of generating 313 megawatts of electricity, 250 megawatts of which are supplied to the electric grid (most of the balance goes to power the air separation (oxygen) plant). It is one of the world's cleanest coal-fired power plants and has won numerous awards. The Wabash River Coal Gasification Repowering Project was the first full-size commercial gasification combined-cycle plant built in the United States. Located outside West Terre Haute, Indiana, the plant started full operations in 1995. The plant can generate 292 megawatts of electricity, 262 megawatts of which are supplied to the electric grid. "After a long shakedown period when both plants went through redesign changes and equipment replacements, they're operating well," says Jeff King, senior resource analyst. He notes, however, that they both use petroleum coke and a higher grade of coal than what is commonly available in the Northwest.

The Council's Fifth Power Plan supports coal gasification. "The analysis found it to be a lower cost, lower risk resource compared to conventional coal plants," according to King. The power plan calls for IGCC generation, under the condition that it is commercially available at the time that it is needed. The Council is scheduled to reassess the technology's commercial prospects at the end of the year.

> "The analysis found it to be a lower cost, lower risk resource compared to conventional coal plants."
>
> *Jeff King, Senior Resource Analyst NWPCC*

Coal gasification is not risk-free or emissions-free. These projects cost more to build and operate than conventional coal plants. Construction costs, for example, are between 10 - 15 percent higher than conventional plants, although the difference has been declining. Reliability is also an issue. Because the gasifier operates at extremely high temperatures, the refractory tiles that surround it need to be replaced fairly often, a time consuming process that can take several months. To avoid being unable to operate for extended periods, plants can be equipped with a spare gasifier, though this adds greatly to the construction cost. Also, uncertainties remain about the economics of operation using the low quality (subbituminous) coals typical of the Northwest, and the long-term reliability of combustion turbines operating on a high hydrogen fuel.

Despite these questions, the outlook for coal gasification appears promising. Interest in developing the technology remains high, especially in light of growing concerns about greenhouse gas emissions and their potential impact on global warming. Montana's Governor Brian Schweitzer has made clean-coal technology a priority to tap the state's vast coal reserves. Also in its favor, the 2005 Energy Policy Act includes incentives in support of the technology through investment tax credits and loan guarantees, although plants do not necessarily have to include CO_2 separation equipment in order to qualify.

The U.S. Department of Energy's Office of Fossil Energy is looking at future gasification concepts that will improve the technology's efficiency, fuel flexibility, and economy. For example, tomorrow's gasification plants may be able to process a wide variety of low-cost fuels besides coal—biomass, municipal and other solid wastes, or perhaps combinations of these feedstocks. It seems for coal gasification, its time has come (again). CQ

Success Stories — Kootenai River

Kootenai River work aims to improve fish populations and nutrient levels

In northern Idaho, the Kootenai Tribe of Idaho and partners including the Idaho Department of Fish and Game, the U.S. Fish and Wildlife Service, and entities in British Columbia are working to restore depleted populations of white sturgeon and burbot in the Kootenai River. They will use fish production, habitat restoration, and direct injections of nutrients — liquid nitrogen and phosphorus into the river — to boost the productivity of aquatic insects and algae the fish feed on. Much of the work is authorized by the Northwest Power and Conservation Council's Columbia River Basin Fish and Wildlife Program and funded by the Bonneville Power Administration.

Chris Lewandowski, left, and Eric Wagner handle an adult Kootenai River white sturgeon that will be used as broodstock in the Kootenai Tribe's sturgeon hatchery.

The Kootenai River, 485 miles long, begins in British Columbia, where it is spelled "Kootenay." The river flows south into Montana, west and north through Idaho and back into British Columbia at Kootenay Lake, and then discharges into the Columbia River at Castlegar. A number of human-caused impacts have affected fish populations and habitat over the years in the Kootenai system, including flood-plain development, watershed degradation from mining and logging, pollutant discharges from industry, overfishing, and river flow and nutrient-level changes caused by the construction and operation of Libby Dam and its reservoir, Lake Koocanusa.

Here is an update on the tribe's progress in addressing the declines in fish populations and aquatic nutrient levels.

White sturgeon: Kootenai River white sturgeon have been declining for at least 50 years, according to studies done by the Idaho Department of Fish and Game and the tribe, and only 630 adult fish were estimated to remain in 2002. The population was believed to be 10 times larger just 20 years earlier. The remaining population consists primarily of large, old fish — sturgeon can live more than 80 years — and consistent annual production of wild, juvenile fish hasn't been observed since the early 1970s. Without continued intervention, the species will be extinct by about 2040. The U.S. Fish and Wildlife Service listed the population as endangered under the Endangered Species Act in 1994. The Kootenai Tribe began a conservation project for sturgeon in 1989 that has grown to include a hatchery on the tribal reservation near Bonners Ferry and also habitat restoration work to encourage spawning. As the number of wild adult fish continues to decline, the hatchery will provide the

Sturgeon raised at the hatchery are released into the river when they are two years old, like this one.

next generations of sturgeon and the best chance of avoiding extinction.

The U.S. Fish and Wildlife Service Recovery Plan for Kootenai White Sturgeon includes 1) increased flows from Libby Dam during the spring to mimic natural conditions and encourage spawning; 2) identifying suitable habitat conditions for juvenile sturgeon; and 3) hatchery production using wild fish as broodstock. Despite intensive efforts, successful spawning in the wild has not been observed. The tribe continues to work on identifying and implementing habitat-restoration strategies. Recovery activities are being coordinated through fish and wildlife agencies and river-operation managers in the United States and Canada, but the matter is complicated by rules and regulations for the many uses of Kootenai River water, including hydropower, flood control, and downstream salmon needs.

The conservation aquaculture program for Kootenai sturgeon, which entered its 15th year in 2006, has been successful in preserving the species, if not yet resulting in observed increases in spawning numbers of fish, due to the long time frame for maturation (30 years for females). According to a 15-year review of the program published by the tribe in March, the current white sturgeon generation would have been the last without the implementation of the conservation aquaculture program.

Nutrient restoration: Nutrients once flowed from the upper Kootenai River in Montana and British Columbia and settled in the lower river, nourishing the food organisms and small fish that are food for burbot, sturgeon, and other native species. After the completion of Libby Dam in 1972, however, Lake Koocanusa trapped these naturally occurring nutrients and biological productivity declined in the river downstream of the dam. As well, construction of dikes along the lower river to protect Bonners Ferry and the city of Creston, British Columbia, from flooding, separated the river from its natural floodplain and reduced biological productivity.

These juvenile sturgeon were produced at the Kootenai hatchery and are being transferred to a tanker truck for release into the Kootenai River.

Today, the tribe and the Idaho Department of Fish and Game, through the Council's fish and wildlife program, are implementing a program funded by Bonneville to add liquid nitrogen and phosphorus to the river from late June through September. Experimental nutrient restoration in the Kootenai River involves the controlled and evaluated addition of liquid nutrients to increase nutrient levels, primary production, and aquatic insect and fish communities. The experiment, which began in 2005, will last five years and the effects will be monitored regularly.

A similar program farther downstream in Kootenay Lake, where fish populations suffered from the same loss of natural nutrients, resulted in a strong and steady increase in kokanee populations. Native populations of rainbow trout, cutthroat trout, whitefish, and kokanee are expected to benefit from the nutrient-restoration project in the Kootenai River. The project also is expected to boost production of aquatic organisms that are food for sturgeon, burbot, and bull trout.

NW/Q&A: Terry Courtney, Warm Springs Confederated Tribes

This is the third installment in a series of interviews about salmon and steelhead harvest.

Terry Courtney, Jr. was born on the Warm Springs Reservation and attended Eastern Oregon State College. He worked for the Bureau of Indian Affairs in the Roads Department as a surveyor for 17 years, then as a heavy equipment operator for 18 years. He retired from the bureau in 1992, working for a contractor until 1999. He joined the Columbia River Inter-tribal Fish Commission in 1999, representing the Warm Springs Confederated Tribes until 2004. He has fished at Sherars Falls, on the Deschutes River since 1963.

Why are salmon so important to Native Americans?

Salmon have always been the main form of subsistence in our life, our money so to speak. We lived on the Columbia River, and my ancestors grew up where The Dalles Dam is, and we fished there until about 1955. In 1956 the dam was built. We've always treasured the salmon because every year they came back. The Columbia River was our lifeline and salmon was our money. We caught and dried the fish, mostly because there was no way to freeze it. In our feast, water cleanses the soul and then the first thing on the table is the salmon. The salmon is very spiritual, and it is very religious to us. The First Salmon Feast is carried out each year as a ceremony. Traditionally, a band or clan of people would go down to catch the first salmon. After it was caught, they would bring the salmon up, prepare it on the bank, and all the people partake of the fish. Next, they gather up the bones and intestines and put them on a series of leaves or reeds and place the skeleton and the innards back into the water facing downriver. This is done because to us it is the salmon's spirit that

goes back down river. This is what we were taught all our lives: When you put it back in the water, the spirit goes out and tells the other fish to keep coming up. So, if we forget to do these things, if we forget to honor our own ways, the Creator, who gave us these foods, asking only that we take care of them, will start taking them away. The salmon can't talk, we must talk for the salmon, and we must talk for the water. The Creator gave us the salmon as a blessing, and we are to take care of it, the same as the deer, elk, berries, the roots, and everything else that's in our lives. So it's very sacred to the tribes.

How are fish allocated to the tribes?

The U.S. v. Washington, or Bolt decision, has clarified the amount of fish that the sportsmen and the tribal people are entitled to. The entitlement is 50 percent of the harvestable rate in any given year. The numbers are prepared by federal entities, tribal entities, the fish and wildlife services of Washington, Oregon, and probably Idaho. Once they come up with the numbers, they're hashed around and they figure out the mortality rate, and how many fish they need, and the numbers start from there. Most years the salmon run is pretty good, depending upon drought conditions. Other factors are the availability of water for migrating smolts and adults, both up and down the Columbia River system, and in the back streams like the Deschutes and Warm Springs rivers.

Years ago there really wasn't a limit because the tribes depended on the fish. We went out and fished, mainly during the day. One of the laws was that we would have to make sure the salmon didn't spoil; we had to use everything. The tribes also had dogs in the camp. When the fish were cleaned, everything was cut up and dried, and then the guts were boiled and fed to the dogs. Now, each tribe on their own reservation gets fish numbers for both returning hatchery fish and the native fish. Thereafter, each tribe comes up with a consensus of how many fish are available to catch. Most years there is no limit, but each fisherman usually knows how many fish he can catch. In my case, I catch about 24 fish; that's the amount I use for canning and drying and eating fresh. Every three years I catch enough fish to can to last me for three years. So on the off years I fish for some of the people who have lost husbands. Many of the salmon also end up being given away to neighbors and family.

This is a bad salmon year; about 88,400 are predicted in the mainstem of the Columbia River. [As of June 1, 103,111 spring Chinook had passed Bonneville Dam] I already know as a fisherman, from experience, that we're probably not going to be allowed to fish; possibly we might get some fishing in. One thing I see as a problem is that when fish numbers are low, the tribes still need to have their dip nets and set nets on the banks. When you weed out the weaker strain of the fish, the strongest fish still go up the middle of the river. When we pull our nets out and don't fish, we are upsetting the balance of nature. This allows the weak strain and the strong to mix, so by not fishing, we dilute the brood stock. I know it's real hard because sometimes we're down

to 300 fish, but the tribes still need to fish on the banks with traditional nets off the platforms and not use gill nets.

What are the different categories of tribal fishing? Can you explain the differences?

Ceremonial fish are taken to use basically for funerals and weddings, and all religious purposes. These fish are usually not just handed out to anybody. Many tribal members do subsistence fishing off of platforms, and some are able to fish in the Columbia River with gill nets. The commercial seasons are really iffy because the salmon numbers have been so low. Often, many boats go unused for a long time, so the equipment isn't in good shape. People try to take care of things, but our people don't have good jobs, don't have consistent sources of income. We don't have unemployment, and we're not entitled to government buyouts if the fishing fails, so the tribes have a lot of problems. Many of our people try to sell or hawk personal stuff, or worse yet, they go to the fish buyers and borrow money, so it's like going to the company store. Our fishermen take a big hit just trying to survive in modern times.

Where are the tribes allowed to fish?

The treaties of 1855 apply to the Yakama, Nez Perce, Umatilla, and the Warm Springs Indian reservations. They have rights established after 1977 on the Columbia River between Bonneville Dam and McNary Dam. The treaties also guarantee fishing rights on the reservation and off the reservation in accustomed areas where their ancestors fished. The Warm Springs Tribes, for example, have access to Willamette Falls, the Clackamas River, the John Day, the Hood River, and the Deschutes River. Some people in our tribe have rights to fish in the Yakima River or on the Washington side of the Columbia River. We also have shared rights with other tribes, but it's not tribal rights, it's individual family rights from different tribes in different areas. I want to make this really clear, because people tend to encroach on other areas, and I think something like this has to be taken up with the tribal councils. It is up to the tribal councils to meet and decide what happens in these matters. It's not up to individual fish and wildlife or natural resource departments.

> " ...the tribe believes that if you take a short cut, or you don't do what you should, you are giving up on the salmon."
>
> *Terry Courtney,*
> *Warm Springs Confederated Tribes*

What kinds of equipment do you use?

I use dip and set nets. A set net is held in place off of the platform. It sets down with a holding rope to the front that holds it open, and one to the side to hold it up against the bank so the fish swim into it. If the water rises or lowers, you can move it up or down, upriver or downriver to try and intercept the fish. A dip net is used to sweep the water and intercept fish.

Before the dams were built, in areas where the water was really rough, at Celilo Falls for example, there were areas where people roped the fish. They waited for the fish to come up and threw their nets out, sweeping the river in a motion they called roping. They also had spear fishermen and gaffing. In places where the water was rough and too narrow for a hoop, people used a gaff hook to reach under the water to feel the fish and hook them. Sometimes when the fish got to the upper reaches of the stream people would herd them around and use their hands and club them. Back when the river was wild, everything was rapids and they had square basketry about four feet by four feet with a net approximately four or five feet deep strung on heavy duty cedar twining. The baskets were a pulley system where one basket would be pushed out in the river so fish would fall back in the net. They would pull one net, clean it out, and as they did, the other net would go into place. And they had weirs; they put weirs across some of the smaller streams and took what they needed. It was unbelievable because they would put up weirs that were sometimes 200 feet across the river, and they would spear the fish. Netting the fish was almost impossible so they speared them.

Once they caught their fish, the tribes or bands all got together. It was phenomenal; after they took all the fish they needed, you could go back the next day and not even tell they had been there. And so, as today, that's the way tribal people try to handle everything: like we were never there. In earlier times there was a smaller gill net system. Basically, the way we fished then, and the way we're supposed to fish now, we're taking out the weakest strain of fish and the stronger fish are still going. Because the system has changed so much on the Columbia River, and so many people are now fishing, we have to use the gill nets. I'm not a great fan of gill nets or tangle nets because you block channels and start taking out lots of stuff like a vacuum cleaner. So if you're fishing for steelhead, and salmon come along, you catch salmon. This will most likely cause mortality rates to go up. But gill nets are something we have to use. I just wish every third year they would say, "Well, we're not going to fish on the main part of the run, we'll fish before and we'll fish after." And then go back to regular fishing and see what happens in ten, 20 years.

(continued on page 14)

Do tribal members use tangle nets or gill nets?

We use gill nets. The tribes don't believe in the tangle nets because it's more like a selective fishery and we've always been taught that whatever fish comes to you is a gift, and you take it and show appreciation for it. I don't feel tangle nets are being used right. The tangle net sits out there three to four hours; that's the same as a gill net. So you're not pulling your fish in right away. In all the meetings that I've been to, the tribes have been very reluctant to use them because they don't see this working in their favor. One of the biggest issues is lack of money to switch over to tangle nets, if they are effective in lowering mortality. It would also depend on the quality of the fish, and if we can get a better market. Right now there are too many ifs. Maybe the tribes would change, but that would be up to Washington and Oregon fisheries to approach each tribal council separately and see what they think. But they would have to show that there is definitely less mortality because that is what the tangle net is supposed to do, it's supposed to cut down mortality.

Are you interested in gear that would allow you to be more selective in what you catch?

I think that the tribes have all the nets that they need. I also know the tribes don't have a great amount of money to buy new nets or to try and switch over. I know they tried a nine-inch mesh, I believe, for a while to protect the steelhead heading to Idaho. Some of the tribes used nine-inch mesh and some didn't. They prefer having their own gear. Steelhead is not a game fish to the tribes. It is a fish that we eat and honor just about as much as the salmon because they are a very essential ingredient in our pemmican.

How many tribal members fish commercially? Can they make a living doing it?

Well, when there's a season we probably have between five and seven tribal member commercial fishermen. Fishing commercially comes down to use of the boats. The boats can sit for two or three years, developing rust while the nets and gear weather. Whenever there's a season, they try to string together what they need, but it's hard. So we don't have many commercial fishermen, primarily because there aren't enough fish to harvest year after year. Many of our people who try fishing commercially end up just bringing their catch home about half the time and donating it to tribal members. They do this in hopes someone will give them money for gas or money to help them through tough times.

Are younger members continuing the tradition?

We have a few tribal members who have taken it upon themselves to work with some of the younger people. There are problems that arise from this because not all of them know the rules and regulations of our forefathers. Sherars Falls is one of the most beautiful, phenomenal places to me, even though the first part of spring season the rocks are cold and it's hard to sleep when the cold wind is coming off the mountains, chilling you to the bone. Some nights you catch one or two fish, some nights you don't catch any. Some nights it's unbelievable; you can't keep your pole in the water because of the number of fish that are there. The young people don't always receive the proper teaching. One of the things I tried to do, back in 1999 and 2000, was to encourage the tribe to put on classes so we could educate our people in hunting and fishing. My hope was to teach not only techniques, but about our unwritten laws and the traditional ways we honor and respect the fishing places. All the fishing places are handed down from generation to generation, they belong to families. So you can't just build a platform and start fishing. I was taught to honor the fish, the fishing spots, the fishermen, and the elders.

There are a lot of things the tribe has forgotten. One of the main things I see is when someone drowns; no one fishes for one whole day. That's the way it used to be on the river and that's the way it should be now. There are other beliefs that are unwritten laws that people have to know and do. There are no short cuts, because the tribe believes that if you take a short cut, or you don't do what you should, you are giving up on the salmon. When we don't carry out the traditions the salmon, the roots, the deer, the elk, and the berries will all start to disappear because we're not honoring them the way we should. CQ

Two Experts Offer Perspectives on 'Decoupling' Energy Sales From Profits to Encourage Conservation Investments

(continued from page 7)

customers, and I think that's a principle many in this room would support."

Cavanagh said it is important "to get the incentives right" so that utilities are rewarded for investing in conservation. The best way to do that, he argued, is through an annual adjustment in rates "based simply on comparing the actual recovered fixed costs with the authorized costs and truing up." Such an adjustment would be "pretty much automatic and would require the equivalent of a single employee with a calculator and a half-hour of spare time and one afternoon a year."

Lazar didn't dispute that, but he said decoupling only will work if five conditions are imposed on the decoupled utility: 1) the utility must commit to invest in conservation in return for decoupling; 2) the rate design must reflect long-term costs — and therefore risks — of future power sales by the utility on all of its customers; 3) the utility's equity/capitalization ratio must be lowered in recognition of the fact that the company needs less equity because decoupling will make its earnings less volatile (this would effectively lower consumer rates because the utility would have to collect less); 4) rate increases must be capped — anything more than 3 percent up or down should be spread over two or three years; and 5) rate cases should be scheduled periodically to ensure that revenues remain in line with costs.

"Put together that way, decoupling can be a positive," Lazar said. "Without the elements it is not."

In the end, both experts agreed, the proof of decoupling's promise will be in whether, and how, it is embraced by the region's utilities. Both are optimistic, but guardedly and for good reason.

"There isn't an earnings opportunity associated with conservation to my knowledge for any utility system in the Northwest," Cavanagh said. "There are large earnings opportunities associated with coal-fired power plants and high voltage transmission lines. If we believe conservation is our highest-priority resource, and if we believe it is our best hope for an affordable and sustainable energy future, it is crazy that that situation persists."

Nor does any utility tie employee compensation or bonuses to conservation achievement, as opposed to power sales, Cavanagh said. "That's telling you something about how important management thinks it is to the financial health of the enterprise to do well on conservation," he said. "We've got to do better on that."

Lazar agreed.

"I did a regression (analysis) of utility executive compensation against sales volumes and yes, there is a linear relationship," he said. "Executives of bigger utilities make a lot more money than those of smaller utilities, measured by sales volume. The state commissions could address that. They could tie allowable executive compensation to measures of performance that matter to consumers, including energy-efficiency programs or noble energy acquisition and customer service." CQ

Letter to the Editor:

In your Winter 2006 issue, you publish an interview with Steve Fick, an advocate for commercial fisheries. In response to your query about your fall interview with Gary Loomis of Fish First, Fick basically states that Loomis does not know what he is talking about when it comes to gillnetting. Then in the very next answer, Fick demonstrates his ignorance of the issues when he states the spill was ordered because stream flow is related to smolt survival. Of course, as I assume you know, and Fick should, spill is unrelated to stream flow. In fact, if I recall correctly, augmentation of stream flow was rejected by Judge Redden.

Jack Smith

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