

**NORTHWEST POWER PLANNING COUNCIL  
BRIEFING BOOK**

**January 2001**

## Northwest Authors Comment on the Council

***Charged with bringing new order to Columbia River management, the Council has generally drawn praise for its efforts at promoting energy conservation but has had a more difficult time gaining consensus on saving salmon.***

-- William Dietrich, *Northwest Passage: The Great Columbia River*, 1995, page 290.

***The 1980 Northwest Power Act seem positively prescient in reducing the utility industry's role in the region's energy planning and in placing policy-making into the hands of the Power Planning Council. The Council would be appointed by the governors of the states of Oregon, Washington, Idaho and Montana. The law seemed as responsive to the needs of the public for its time as the construction of the hydropower system itself had seemed during the New Deal two generations before.***

-- Joseph Cone, *A Common Fate: Endangered Salmon and the People of the Pacific Northwest*, 1995, Page 30.

***The Northwest Power Act, in theory, spelled out a revolution in western water management. It put longtime inmates of the engineered river -- Indian tribes and fish agencies -- in a position of power. To administer the revolution, the Power Act created a novel bureaucratic creature. Not quite a federal agency, not a state agency, the Northwest Power Planning Council was made up of two gubernatorial appointees from each of the four states in the Northwest. The Council had powers (rather vaguely defined powers, as it turned out) to change the behavior of the federal agencies that managed the hydrosystem.***

-- Blaine Harden, *A River Lost: The Life and Death of the Columbia*, 1996, Page 216.

***[The Council, under the Northwest Power Act] gave priority to the runs above the Bonneville Dam. And for the first time, they tried to change the operation of the river rather than just mitigate the effects of management. Their plans regulated flows to help push the salmon downstream, and some dams were retrofitted with juvenile bypass systems to keep the smolts out of the turbines. But given the gravity of the [salmon] situation, the changes were modest; they failed to achieve their goals.***

-- Richard White, *The Organic Machine: The Remaking of the Columbia River*, 1995, Page 103.

***... the Northwest Power Planning Council turned to the basin's state, federal and tribal salmon managers for advice in crafting its salmon restoration program. Consistent with their history, the managers focused on hatcheries, leaving little funding for habitat. Finally, in 1991, it became apparent the program was not working and that several runs of salmon indeed were headed for extinction. In that year, the Snake River sockeye were listed as endangered, and the following year the Snake River fall, spring and summer chinook were listed as threatened. Those actions started a cascade of listings that is still in progress.***

-- Jim Lichatowich, *Salmon Without Rivers: A History of the Pacific Salmon Crisis*, 1999, Page 203.

**Contents**

- I. BACKGROUND ON THE COLUMBIA RIVER POWER SYSTEM AND THE NORTHWEST POWER PLANNING COUNCIL ..... 4**
  
- II. BACKGROUND ON THE COUNCIL’S FISH AND WILDLIFE PLANNING ..... 12**
  - 1. The Columbia River Basin Fish and Wildlife Program.....12
  
- III. BACKGROUND ON THE COUNCIL’S POWER PLANNING ..... 19**
  - 1. The Northwest Conservation and Electric Power Plan .....19
  - 2. Conservation Acquisition Status .....25
  
- IV. SUPPLEMENT ON CURRENT COUNCIL ISSUES ..... 33**
  - A. Fish and Wildlife Issues .....33
    - 1. Amending the Columbia River Basin Fish and Wildlife Program.....33
    - 2. Province-level review of projects; subbasin planning.....33
    - 3. Innovative and high-priority project solicitations .....35
    - 4. Inaugural annual report of the fish and wildlife program.....36
  - B. Power Issues .....37
    - 1. Analysis of western power market prices and Northwest power system reliability .....37
    - 2. RTO West.....43
    - 3. Regional Technical Forum.....44
  
- V. LEGAL ISSUES ..... 46**
  - 1. What kind of legal creature is the Council? .....46
  - 2. Procedures for Amending the Council’s Power Plan and Fish and Wildlife Program.....48
  - 3. Council interpretations of the Northwest Power Act.....50
  - 4. Litigation .....51
  
- VI. ADMINISTRATIVE ISSUES ..... 54**
  - 1. Finance and Administration.....54
  
- VII. GLOSSARY OF TERMS USED IN THE FOURTH NORTHWEST POWER PLAN .... 56**
  
- VIII. GLOSSARY OF FISH AND WILDLIFE TERMS..... 70**
  
- IX. DIRECTORY ..... 75**
  - 1. Central staff directory .....75
  - 3. Council member and state staff directory .....76

## **I. Background on the Columbia River Power System and the Northwest Power Planning Council**

The development of the Columbia River hydropower system in the Pacific Northwest began in the 1930s under a program of regional cooperation to meet the needs of electric power production, land reclamation, flood control, navigation, recreation and other river uses.

From the beginning, the federal government has played a major role in the development of one of the largest multiple-use river systems in the world. The U.S. Army Corps of Engineers and the Bureau of Reclamation built 30 multi-purpose dams on the Columbia River and its tributaries. Investor-owned and publicly owned utilities also built a major system of dams and generating facilities. Congress directed the Bonneville Power Administration, in the Bonneville Project Act of 1937, to build and operate transmission lines to deliver the power from dams, and to market electricity from federal generating projects on the river at rates set only high enough to repay the federal investment over a reasonable period of time.

### **The Columbia River Treaty with Canada**

As demand for power grew, the United States and Canadian governments recognized a need for development of water storage sites in the upper reaches of the Columbia River Basin. The governments of both nations negotiated a treaty in the early 1960s for the cooperative use of dams that would be built by both countries. Four treaty dams were built. Three are on the Columbia River or a tributary in Canada — Keenleyside, Duncan and Mica — and the fourth, Libby, is on a major Columbia tributary, the Kootenai River, in Montana. The Canadian dams were completed by 1973, and Libby was completed in 1975. These dams provide flood control and additional power generation at dams downstream in the United States. The power-generating capability of downstream dams increased by the following percentages as a result of the treaty storage: Grand Coulee, 13 percent; Chief Joseph, 14 percent; the five mid-Columbia public utility district dams, 18 percent; and dams farther downstream on the Columbia, 11 percent collectively. In return, Canada received a cash settlement for its share of the additional power generation. The value of this power, known as the downstream benefit, recently was renegotiated by the two countries.

### **Interties between the Northwest and Southwest**

Also in the 1960s, Congress authorized the construction of three major power lines linking the Columbia River hydro projects with power markets in California and the rest of the Pacific Southwest. The interties benefit the Pacific Northwest in several ways. They allow the sale of hydropower from the Columbia when it is not needed here and would otherwise be lost in the form of water spilled over dams without generating electricity, and they permit this region to buy power from California when power is needed here during shortages and periods of heavy use. In the first instance, sales of surplus Northwest hydropower to California has saved the equivalent of some 200 million barrels of oil. In the second case, California utilities sold power to Pacific Northwest utilities in the drought years of 1973, 1977, 1979, 1992, 1993 and 1994.

To protect Northwest access to power, Congress passed regional preference provisions in 1964. Bonneville must offer any surplus power to utilities in the Northwest before selling it to California. Sales to California can be called back if the power is needed in the Northwest. Sales of

firm energy can be recalled with 60 days notice, sales of peaking capacity can be recalled in five years.

### **Net billing agreements**

With the dams developed in Canada as well as the United States, the river system provided virtually all the electricity needed by the region until the early 1970s. But by that time, all dam sites on the mainstem of the Columbia that were economically feasible and environmentally acceptable were either developed or under development, and the region was looking for other ways to meet electric load growth. Bonneville and the region's utilities were predicting shortages of electricity unless thermal generating plants were brought on line in response to increasing demand.

The region's publicly owned utilities and investor-owned utilities turned mainly to coal-fired and nuclear plants to meet growth throughout the Pacific Northwest. Utilities believed the development of such plants was the most economic and environmentally acceptable option available at the time. Bonneville helped the utilities respond to these needs by participating in a Hydro-Thermal Power Plan for the continued development of electricity resources in the Pacific Northwest.

Under the plan, Bonneville agreed to acquire electricity by entering into "net billing" agreements with its publicly owned utility customers. These agreements made it possible for the publicly owned utilities, which owned shares of power plants, to sell to Bonneville all or part of the generating capacity of thermal projects. Bonneville credited, and continues to credit, the wholesale power bills of these utilities in amounts sufficient to cover the costs of their shares in these plants. Bonneville then sells the output of these plants, melding the higher costs of this thermal power with the lower costs of hydropower, for the benefit of all customers. The plants were cooperative efforts of both publicly owned and investor-owned utilities, but Bonneville purchased only the shares of generating capacity owned by publicly owned utilities.

### **The Hydro-Thermal Power Program**

Under the Hydro-Thermal Power Program (Phase I), Pacific Power & Light Company and other investor-owned utilities built the Centralia coal-fired plant with the co-ownership of several publicly owned utilities. Portland General Electric Company built the Trojan nuclear power plant, with 30 percent co-ownership by Eugene Water and Electric Board (EWEB) covered by a net-billing agreement. And the Washington Public Power Supply System (WPPSS), under net-billing agreements, completed one nuclear plant (WNP 2) and partially constructed two other nuclear plants (WNP 1 and 3) in Washington state. The Hanford N-reactor turbine generator, built by WPPSS, also came on line just prior to the formal initiation of the Hydro-Thermal Power Program, and before its closure in 1987 was considered a part of the overall effort. Bonneville became the agent for integrating these resources so the consumers of the region could benefit from the greatest efficiency and lowest costs from operation of the regional electric system. The thermal power plants, which run continuously, would meet the base, or constant, power needs. The hydroelectric dams would be operated to follow the fluctuation of energy needs throughout the day.

In spite of the efforts of utilities and Bonneville to continue developing the region's generating resources in a systematic way, the region continued to lose ground to rapidly growing demands for electricity. The Hydro-Thermal Program failed to meet the region's expectations for two basic reasons. A revision of regulations by the Internal Revenue Service denied tax exempt status to bonds sold by publicly owned utilities to finance their plants if power from the facilities

was sold to Bonneville, a Federal body. And, Bonneville's financial ability to participate in net-billing agreements reached its limits far sooner than expected because of the climbing costs of new thermal plants.

In 1973, Bonneville and the region's utilities initiated a Hydro-Thermal Program, Phase II, in which the utilities would finance their own plants without net-billing participation by Bonneville. Thus, WPPSS nuclear units 4 and 5, now terminated, were not covered by net-billing contracts. Nonetheless, Bonneville expected to provide electric load management and power integration services and to supply peaking power and reserves from federal facilities in order to bring about the most efficient mix of resources possible. Bonneville's participation in this program was enjoined by a federal court, which required that Bonneville complete an environmental impact statement on its role in the region.

The environmental impact statement found that fluctuation in the use of hydroelectric dams would have to be limited to protect shore structures along the river. In addition, delays in the construction of new plants, costs higher than originally expected, and the realization that the Hydro-Thermal Program would not be adequate to meet needs made it evident that Bonneville would not be able to sell firm power to investor-owned utilities and still provide first priority to serving “preference customers” as directed by federal law.

### **Public power preference**

The Bonneville Project Act of 1937 directed that the co-ops and publicly owned utilities of the region be given first call on available federal resources. They consequently came to be called “preference customers.” Until the 1970s, their legal preference had never been exercised because there had been enough electricity for everyone. In 1973, when Bonneville's firm-power contracts with investor-owned utilities expired, Bonneville could not offer new ones if preference customers were to continue to have first call on federal resources. So the firm power contracts with the investor-owned utilities were not renewed.

However, Bonneville continues to sell some peaking power to the investor-owned utilities — power they need to get through periods of heavy use in the winter heating season. Bonneville also sells “non-firm” power to the investor-owned utilities and utilities outside the region when electricity surplus to the needs of the preference customers is available.

In 1976, Bonneville's power demand and supply projections showed that federal power supplies were running short for preference customers, and that Bonneville would no longer be able to guarantee preference customers that their load growth could be met beyond 1983. Bonneville issued a notice of insufficiency to the utilities in June of 1976.

### **Rate disparities**

With the investor-owned utilities relying on their own hydro and thermal resources to meet the demand of their customers, and with the prices of federal hydropower much lower than that of new thermal generation, a divisive struggle for access to limited federal resources grew. Sixty percent of the residential and farm customers of the region are served by investor-owned utilities. These customers were paying, on average, twice as much for electricity as customers of publicly owned utilities receiving wholesale power from Bonneville. The City of Portland sued Bonneville, claiming a right to a share of hydropower resources for its citizens. The State of Oregon passed a

law authorizing formation of a statewide public utility — the Domestic and Rural Power Authority — to seek service as a preference customer from Bonneville so that all residential customers of private utilities could receive the rate benefits of Federal resources. Elected officials of other states talked of forming their own statewide public utilities.

Stimulated by rate disparities, the public power movement also experienced a renaissance. A strong public power move to buy out investor-owned utility service areas by means of elections in accordance with State law was revived in Oregon. All votes to form new PUDs failed in the November 1980 elections, but one long inactive PUD, the Columbia Peoples Utility District west of Portland won voter approval for issuing bonds to buy out utility properties in Columbia County.

Meanwhile, planning for more resources to meet demand was hamstrung by uncertainty over the allocation of low-cost federal power among competing claimants, existing and new. For example, Bonneville's contracts with its direct service industries, which are large industrial firms that purchase power directly from Bonneville, were to expire in the 1980s. The power sold to these industries would have to be sold to public utilities under the preference clause. If they were to survive in the Northwest, these industries needed an assured source of electricity.

### **Declining salmon runs**

Finally, by the late 1970s it became clear that our regional prosperity, which resulted in large measure from inexpensive hydropower from the federal dams, had extracted a price on fish and wildlife in the Columbia River Basin. Just a century earlier, for example, between 10 million and 16 million salmon returned to the Columbia each year. But by the late 1970s, there were only about 2.5 million salmon, and most of those returned to hatcheries. Environmental groups and other advocates for fish and wildlife considered filing petitions to protect dwindling fish populations under the federal Endangered Species Act.

These pressures on our regional electric power supply, which once seemed inexhaustible, caused Pacific Northwest residents to question the institutions governing the development, sale, and distribution of generating resources. Should new preference agencies be formed to replace private companies in given areas? How would the supply needs of new preference customers be met? Should private utilities undertake new generating projects in a hostile atmosphere of rapidly rising rates and the threatened shift to public power? How would large industrial customers in the region be served? How should the public, and their elected representatives, participate in decisions that were critical to the region's economy and environment? Who ultimately would be responsible for planning and acquiring new resources to avoid impending electricity shortages? How would our region protect the fish and wildlife that had been damaged over the years by the construction and operation of hydropower dams?

The region continued to work for a cooperative solution that preserved local options while obtaining regional efficiencies of an integrated electric system. Several alternatives were explored, but no agreement was reached. To avoid a court battle over allocation issues, the region turned to Congress for a solution.

### **Toward a Congressional solution**

Revisions to the Bonneville Project Act were considered as early as 1975. The legislation was prompted by Bonneville's Notice of Insufficiency in June 1976, coupled with the threat posed

by Oregon's Domestic and Rural Power Authority. However, it was not until 1977 that Bonneville and its customers, through the Pacific Northwest Utilities Conference Committee (PNUCC), drafted legislation to solve the region's energy problems. Senator Jackson introduced the PNUCC bill in September of 1977, but neither that bill, nor a less complex successor drafted a year later, managed to progress very far by the time the 95th Congress adjourned in late 1978.

When the 96th Congress convened in 1979, a coalition of Bonneville customers was solidly behind a legislative solution to the Northwest's power crisis. Neither Bonneville nor its customers wanted an administrative allocation of limited power supplies, although Bonneville did propose an allocation scheme in October of 1979. Bonneville and its customers, however, maintained that such an allocation would be subjected to protracted litigation. They alleged that Congress could avoid the uncertainties accompanying administrative allocation by devising a legislative allocation scheme and equipping Bonneville with the authority to purchase power from non-federal sources on a long term basis. Supplying Bonneville with purchase authority was, they claimed, the key to implementing any legislative allocation scheme. Congress apparently agreed. The Senate passed the regional legislation on August 3, 1979; the House passed an amended bill on November 17, 1980, which the Senate agreed to two days later. On December 5, 1980, President Carter signed the Pacific Northwest Electric Power Planning and Conservation Act into law as Public Law 96-501.

### **Northwest Power Act — major provisions**

After four years of deliberation, Congress devised methods for protecting the preference that existing federal law gives publicly owned utilities, while at the same time providing the benefits of federal hydropower to residential and small farm customers of private utilities. It should be noted that the Act passed largely because it seemed to benefit all the interest groups that lobbied for it.

The Act directs that Bonneville should continue its traditional role of transmitting and marketing power, but also carry out additional responsibilities. Under the Act, Bonneville must acquire all necessary energy resources to serve utilities who choose to apply to Bonneville for wholesale power supplies. The Act contains checks and balances to insure that all customers of Bonneville are treated equitably.

Bonneville remains accountable to the people of the Pacific Northwest for the actions it takes to meet the needs of residents and industry. By creating a regional planning council consisting of two members from each of the four Northwest states to develop a regional plan, Congress provided a regional decision-making system. It emphasizes local control of resource development and power planning.

Here are some of the major provisions of the Act:

Here are some highlights of the Act:

- The Northwest Power Planning Council was formed with representation from each of the states. The Act directed the Council to draw up a plan for meeting the electrical needs of the region at the lowest possible cost. The plan must give highest priority to cost-effective conservation, treating it as a resource preferable to all other means of responding to demand for electricity. Renewable sources of energy must be given next highest priority in the region's power planning, to the extent that they are cost-effective



ranking ahead of conventional thermal generating resources. Among thermal options, fuel-efficient methods of producing energy, such as cogeneration, must be given priority.

- Bonneville became responsible for meeting loads of customers and managing the regional electrical system to achieve the purposes of the Act relating to fish, system efficiency, and experimental projects. The plan adopted by the Council, which is amended periodically, is the basis for Bonneville's actions in meeting loads of its customers. Congress exercises budget review of all proposed Bonneville expenditures. If Bonneville decides to acquire resources not consistent with the Council's plan, specific Congressional approval is required prior to any commitment by Bonneville. Bonneville must give priority to cost-effective conservation and renewable resources in meeting the region's needs. Bonneville may also purchase the generating capabilities of new thermal projects, but only after determination that they are required in addition to all cost-effective conservation and renewables that can be achieved or developed in time. Such projects must also be found reliable and compatible with the regional electric system. Bonneville must spread the benefits and the costs of resources among all of its customers through its rates.
- The supply preference and resulting price advantage to co-ops and publicly owned utilities by Federal law was protected and enhanced. Bonneville was given the responsibility of meeting the full future requirements of preference customers — something Bonneville was not previously authorized to do.
- Residential and farm customers of investor-owned utilities received rate relief. The utilities sell to Bonneville, at the average cost of their power, an amount of electric energy equal to their residential and farm loads. Bonneville sells to them, in return, enough energy at Bonneville standard rates to cover these residential and farm loads. The rate advantages cannot enhance company profits, but must be passed on directly to the customers.
- Direct service industries received new 20-year contracts for power from Bonneville, but at a higher price than they paid under previous contracts. In effect, they pay the cost of rate relief to residential and small farm customers of investor-owned utilities during the first four years, and a substantial portion thereafter, which they agreed to do in exchange for assurances of long-term supplies.
- Bonneville sells electricity at a rate that reflects the melded cost of Federal hydropower and more expensive thermal resources, conservation, and renewable sources of energy. The Act contains incentives, as well, to encourage conservation and renewables. Bonneville may credit utilities for their individual actions to implement conservation and renewables.
- The Council established a program to protect and enhance the fisheries resources of the Columbia River and to mitigate damage already done to anadromous fish. Funding for the program is to come from Bonneville rate revenue.

- All planning for electric resources and fish protection must involve the public. State and local control of land use and water rights is protected under the Act and the decision to allow construction of new resources is left with utilities and state siting authorities.
- The Council must provide a method for balancing environmental protection and the energy needs of the region. For each new energy resource, the provisions of the National Environmental Policy Act must be complied with.
- The Council is required to seek the recommendations of the region's tribal, state and federal fish and wildlife agencies. In addition, the Council's measures must be consistent with the legal rights of the region's tribes.

### **Challenges for the future**

The electricity industry in the United States is in the midst of significant restructuring. This restructuring is the product of many factors, including national policy to promote a competitive electricity generation market and state initiatives in California, New York, New England, Wisconsin and elsewhere to open retail electricity markets to competition. This transformation is moving the industry away from the regulated monopoly structure of the past 75 years. Today we are served by individual utilities, many of which control everything from the power plant to the delivery of power to our homes or businesses. In the future, we may have a choice among power suppliers that deliver their product over transmission and distribution systems that are operated independently as common carriers.

There is much to be gained in this transition, as electricity consumers can benefit from competition. Only a few years ago, competition in the natural gas industry helped lower the cost of electricity produced by gas-fired generating plants. Competition among manufacturers and developers of combustion turbines contributed to the availability of less expensive, more efficient power plants that can be built relatively quickly. Surplus generating capacity on the West Coast, combined with increasing competition among wholesale suppliers, reduced the price utilities must pay for power on the open market. Broad competition in the electricity industry that extends to all consumers can result in lower prices and more choices about the sources, variety and quality of their electrical service. That is, if supply and demand remain somewhat aligned. But as the experience of 2000 made abundantly clear, competitive markets can be volatile. In a competitive energy marketplace, prices can explode to unheard-of levels in a matter of months when demand increases and the supply decreases. Coupled with rapidly increasing costs for natural gas, the advantages of competition can turn quickly to disadvantages.

If nothing else, the absurdly high prices for wholesale electricity in 2000 on the West Coast demonstrate that there are risks inherent in the transition to more competitive electricity services. Merely declaring that a market should become competitive will not necessarily achieve the full benefits of competition or ensure that they will be broadly shared -- particularly when the weather, power plant outages, regulatory rules and natural gas prices don't cooperate.

It is entirely possible to have deregulation without true competition. Similarly, the reliability of our power supply could be compromised if care is not taken to ensure that competitive pressures do not override the incentives for reliable operation. How competition is structured is important.

It is also important to recognize the limitations of competition. Competitive markets respond to consumer demands, but they do not necessarily accomplish other important public policy objectives. The Northwest has a long tradition of energy policies that support environmental protection, energy-efficiency, renewable resources, affordable services to rural and low-income consumers, and fish and wildlife restoration. These public policy objectives remain important and relevant. Given the enormous economic and environmental implications of energy, these public policy objectives need to be incorporated in the rules and structures of a competitive energy market, and not abandoned in the face of escalating demand and tight supplies of power.

In some respects, the transition to a competitive electricity industry is more complicated in the Northwest because of the presence of the federal Bonneville Power Administration. Bonneville is a major factor in the region's power industry, supplying, on average, 40 percent of the power sold in the region and controlling more than half the region's high-voltage transmission. Bonneville benefits from the fact that it markets most of the region's low-cost hydroelectric power. It is hampered by the fact that it has comparatively high fixed costs, including the cost of past investments in nuclear power and the majority of the costs for salmon recovery. As a wholesale power supplier, Bonneville is already fully exposed to competition and struggles when market prices are above its own cost-based rates. The transition to a competitive electricity industry raises many issues for the Bonneville and the region. For example, can Bonneville continue to meet its financial and environmental obligations in the face of intense competitive pressure? When market prices rise and some of Bonneville's debt obligations have been retired, how can the Northwest retain the economic benefits of its low-cost hydroelectric power when the rest of the country is paying market prices? And finally, what is the appropriate role of a federal agency in a competitive market? The question is not only whether Bonneville can compete in the near term, but also, should it be a competitor? Just two years ago, or so, Bonneville was struggling in a low-cost market. In 2000, with market prices 10 times as high as just a year before, federal power was the envy of every utility facing marketplace sticker shock.

The federal power system in the Pacific Northwest has conferred significant benefits on the region for more than 50 years. The availability of inexpensive electricity at cost has supported strong economic growth and helped provide for other uses of the Columbia River, such as irrigation, flood control and navigation. The renewable and non-polluting hydropower system has helped maintain a high quality environment in the region.

But while the power system has produced significant benefits, these benefits came at a substantial cost to the fish and wildlife resources of the Columbia River Basin. Salmon and steelhead populations have been reduced to historic lows, and many runs are or are about to be listed under the federal Endangered Species Act. Resident fish and wildlife populations have also been affected. Native Americans and fishery-dependent communities, businesses and recreationists have suffered substantial losses due in significant part to construction and operation of the power system. The region's ability to sustain its core industries, support conservation and renewable resources, and restore salmon runs is threatened if we cannot reach a consensus regional position to bring to the national electricity restructuring debate. Ironically, when market prices were low there was concern that Bonneville might not be able to sell all of its power and that its funding for important public purposes like energy conservation and fish and wildlife enhancement might be diminished. Today, with market prices so much higher, there is concern that Bonneville's low-cost power might be siphoned off to other parts of the country -- perhaps with the same financial impact on the region. Clearly, keeping the benefits of the region's power system here in the region is a challenge for the future.

## II. Background on the Council's Fish and Wildlife Planning

### 1. The Columbia River Basin Fish and Wildlife Program

The Northwest Power Act requires the Council to prepare a program to protect, mitigate and enhance fish and wildlife, and related spawning grounds and habitat, of the Columbia River Basin that have been affected by hydroelectric development, and to review the program at least every five years.<sup>1</sup> The last review led to a revision of the fish and wildlife program in October 2000.

The 2000 Program marks a significant departure from past versions, which consisted primarily of a collection of measures directing specific activities. The 2000 Program establishes a basinwide vision for fish and wildlife -- the intended outcome of the program -- along with biological objectives and action strategies that are consistent with the vision. Ultimately, the program will be implemented through subbasin plans developed locally in the 53 tributary subbasins of the Columbia and amended into the program by the Council. Those plans will be consistent with the basinwide vision and objectives in the program, and its underlying foundation of ecological science.

The 2000 program addresses all of the "Four Hs" of impacts on fish and wildlife -- hydropower, habitat, hatcheries and harvest:

- It recommends that resources and energy be directed away from breaching the four federal dams on the lower Snake River, recognizing that the federal government has decided breaching will not occur in the next five years (coincidentally, that is the Council's statutory planning horizon for the fish and wildlife program). Instead, the program recommends actions to improve dam-passage survival that are biologically sound and economically feasible -- actions that benefit the range of species in the river and fit natural fish behavior patterns.
- It directs significant attention to rebuilding healthy, naturally producing fish and wildlife populations by protecting and restoring habitats and the biological systems within them.
- It requires that fish hatcheries funded through the program operate consistent with reforms recommended to Congress by the Council in 1999, reforms that would shift hatchery production away from a primary focus on providing fish for harvest to also providing fish to rebuild naturally spawning populations.
- It promotes increased fish harvest, consistent with sound biological management practices, recognizing that harvest provides significant cultural and economic benefits to the region.

In preparing the 2000 Fish and Wildlife Program, the Council solicited recommendations from the region's fish and wildlife agencies, Indian tribes, and others, as required by the Northwest

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<sup>1</sup> The Act considers the power plan and the fish and wildlife program as a single plan, and so when one is reviewed the other must be, also. Before the Council's October 2000 revision of the fish and wildlife program, the previous revision was completed in 1995; the last power plan revision was in 1998. Having revised the fish and wildlife program in 2000, in 2001 the Council will begin a review and revision of the 1998 Power Plan.

Power Act. The agencies and tribes responded, and the Council also received proposals from other interested parties. In all, the Council received more than 50 recommendations totaling more than 2,000 pages. After reviewing the recommendations, the Council prepared a draft and then conducted an extensive public comment period before finalizing the program, in December 2000.

The 2000 program is the fifth revision since the Council adopted its first program in November 1982. This time, as in the series of program amendments between 1991 and 1995, the program is being revised in phases. Unlike past versions of the program, which were criticized by scientists for consisting primarily of a number of measures that called for specific actions without a clear, programwide foundation of scientific principles, this version of the program expresses goals and objectives for the entire basin based on a scientific foundation of ecological principles. In the future, the Council will amend into the program locally developed plans for the tributary subbasins of the Columbia River and a plan for the mainstem. These plans will be consistent with the goals and objectives for the basin and also with goals and objectives that will be developed for the 11 ecological provinces of the basin.<sup>2</sup> The provinces are groups of adjacent subbasins with similar ecological features.

With the subbasin plans in place, the program will be organized in three levels: 1) a basinwide level that articulates objectives, principles and coordination elements that apply generally to all fish and wildlife projects, or to a class of projects, that are implemented throughout the basin; 2) an ecological province level that addresses the 11 unique ecological areas of the Columbia River Basin, each representing a particular type of terrain and corresponding biological community; and 3) a level that addresses the subbasins (there are more than 50), each containing a specific waterway and the surrounding uplands.

The Council believes this unique program structure, goal-oriented and science-based, will result in a more carefully focused, scientifically credible and publicly accountable program that will direct the region's substantial fish and wildlife investment to the places and species where it will do the most good.

The program's goals, objectives, scientific foundation and actions are structured in a "framework," an organizational concept for fish and wildlife mitigation and recovery efforts that the Council introduced in the 1994-95 version of the program. The 2000 program, organized with the framework concept, is intended to bring together, as closely as possible, Endangered Species Act requirements, the broader requirements of the Northwest Power Act and the policies of the states and Indian tribes of the Columbia River Basin into a comprehensive program that has a solid scientific foundation. The program also states explicitly what the Council is trying to accomplish, links the program to a specific set of objectives, describes the strategies to be employed and establishes a scientific basis for the program. Thus, the program guides decision-making and provides a reference point for evaluating success.

To develop a framework for the program, in November 1998 the Council initiated the Multi-Species Framework Project. The Framework Project was managed by a state-federal-tribal committee and administered by the Council. The project brought together hundreds of individuals representing state and federal agencies, Indian tribes, environmental and industry groups and interested citizens to propose and discuss potential fish and wildlife recovery actions. The actions

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<sup>2</sup> For planning purposes, the Council's program also considers the North Pacific Ocean a separate geographic unit, but the area is not designated as an ecological province.

ranged from breaching dams to leaving them in place, and from shutting down fish hatcheries and fish harvest to boosting artificial production of fish. From more than 100 actions proposed in the process, the Council assembled seven alternatives for analysis using a state-of-the-art analytical system called Ecosystem Diagnosis and Treatment (EDT). The EDT analysis addressed the biological benefits of each alternative, and a separate Human Effects Analysis addressed the economic and social impacts and benefits of the alternatives.

The Council did not choose a specific alternative for this version of the program. Rather, the goals and objectives in this program were assembled from among several of the Framework Project alternatives. Through an amendment proceeding that began in January 2000, the Council restructured the program with a comprehensive, underlying framework of general scientific and policy principles that apply to the entire Columbia River Basin. The fundamental elements of the program are:

The *vision*, which describes what the program is trying to accomplish with regard to fish and wildlife and other desired benefits from the river;

The *biological objectives*, which describe the ecological conditions needed to achieve the vision; and

The implementation *strategies, procedures and guidelines*, which guide or describe the actions leading to the desired ecological conditions.

In other words, the vision implies biological objectives that set the strategies. In turn, strategies address biological objectives and fulfill the vision. The scientific foundation links the components of the framework, explaining why the Council believes certain kinds of management actions will result in particular physical habitat or ecological conditions of the basin, or why the ecological conditions will affect fish and wildlife populations or communities.

In the 2000 revision, the Council adopted the following vision for the program:

*The vision for this program is a Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife, mitigating across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem and providing the benefits from fish and wildlife valued by the people of the region. This ecosystem provides abundant opportunities for tribal trust and treaty right harvest and for non-tribal harvest and the conditions that allow for the recovery of the fish and wildlife affected by the operation of the hydrosystem and listed under the Endangered Species Act. Wherever feasible, this program will be accomplished by protecting and restoring the natural ecological functions, habitats, and biological diversity of the Columbia River Basin. In those places where this is not feasible, other methods that are compatible with naturally reproducing fish and wildlife populations will be used. Where impacts have irrevocably changed the ecosystem, the program will protect and enhance the habitat and species assemblages compatible with the altered ecosystem. Actions taken under this program must be cost-effective and consistent with an adequate, efficient, economical and reliable electrical power supply.*

### **Primary strategies in the 2000 Program**

Here is a brief summary of the primary, basinwide strategies in the program, as approved by the Council in October 2000:

Habitat:

Identify the current condition and biological potential of the habitat, and then protect or restore it to the extent described in the biological objectives.

Artificial production:

Artificial production can be used, under the proper conditions, to (1) complement habitat improvements by supplementing native fish populations up to the sustainable carrying capacity of the habitat with fish that are as similar as possible, in genetics and behavior, to wild native fish, and (2) replace lost salmon and steelhead in blocked areas.

Harvest:

Assure that subbasin plans are consistent with harvest management practices and increase opportunities for harvest wherever feasible.

Hydrosystem passage and operations:

Provide conditions within the hydrosystem for adult and juvenile fish that most closely approximate the natural physical and biological conditions, provide adequate levels of survival to support fish population recovery based in subbasin plans, support expression of life history diversity, and assure that flow and spill operations are optimized to produce the greatest biological benefits with the least adverse effects on resident fish while assuring an adequate, efficient, economical, and reliable power supply.

Wildlife:

Complete the current mitigation program for construction and inundation losses and include wildlife mitigation for all operational losses as an integrated part of habitat protection and restoration.

Ocean conditions:

Identify the effects of ocean conditions on anadromous fish and use this information to evaluate and adjust inland actions.

Research, monitoring and evaluation:

(1) Identify and resolve key uncertainties for the program, (2) monitor, evaluate, and apply results, and (3) make information from this program readily available.

**Coordinating with other entities**

Under the Northwest Power Act, the Council's fish and wildlife program is not intended to address all fish and wildlife problems in the basin from all sources. But the Council adopted the vision, objectives, strategies and scientific foundation with the belief that they will complement and help support other fish and wildlife recovery actions in the region.

This program recognizes that others besides the Council are developing plans and taking actions to address these issues. In particular, the four Northwest states and the Columbia Basin's 13 Indian tribes each have fish and wildlife initiatives under way. Many of these parties already have subbasin and watershed planning initiatives under way, and are also addressing Endangered Species Act concerns.

Throughout the basin, the National Marine Fisheries Service and the U.S. Fish and Wildlife Service are administering the Endangered Species Act, which requires information gathering, planning, and mitigation actions. In addition, the Environmental Protection Agency, in cooperation with the states and tribes, is taking actions to achieve compliance with the Clean Water Act. (As used elsewhere in this program, “applicable federal laws” includes both the Endangered Species Act and the Clean Water Act.)

This framework is not intended to pre-empt the legal authorities of any of these parties, but it does provide an opportunity for each of these regional participants to coordinate information gathering, planning, and implementation of recovery actions on a voluntary basis. That is, the Council’s program is designed to link to, and accommodate, the needs of other programs in the basin that affect fish and wildlife. This includes meeting the needs of the Endangered Species Act by describing the kinds of ecological change needed to improve the survival and productivity of the diverse fish and wildlife populations in the basin.

Measures implementing this program are funded by the Bonneville Power Administration through revenues collected from electricity ratepayers. Although Bonneville has fish and wildlife responsibilities under both the Endangered Species Act and the Northwest Power Act, in many cases, both responsibilities can be met in the same set of actions. Therefore, in recommending projects for funding under this program, the Council will address both sets of responsibilities wherever feasible. Again, knowledge of the plans and activities of other regional participants will be essential for the Council to be able to assure that the projects it recommends for funding are coordinated with, and do not duplicate, the actions of others.

### **Implementation during a period of transition**

In the future, the program will be implemented primarily through subbasin plans, which will be consistent with the programwide goals, objectives and scientific foundation. While those plans are under development, the Council has provided for ongoing project review and funding.

A subbasin assessment and planning process will complete the program at the subbasin level and provide the implementation plans out of which fish and wildlife projects are proposed for Bonneville funding to implement the program.

The subbasin assessment is a technical exercise designed to identify the biological potential of each subbasin and the opportunities for restoration. Based on this, fish and wildlife managers, land managers, private landowners, and other people responsible for fish and wildlife and habitat conditions in the respective subbasins can develop subbasin plans consisting of goals, objectives, strategies, and proposed actions that are consistent with the objectives and criteria in the program.

Depending on the extent and quality of past assessment and planning work, the planning process in a particular subbasin could range from a relatively quick and straightforward review and updating of existing plans to a fundamental and extensive development process. Using the program amendment procedures in the Northwest Power Act, the Council intends to review subbasin plans and adopt agreed-upon plans into the program.

Meanwhile, the Council will continue to make annual recommendations to Bonneville regarding funding of projects to implement the program. The Council relies on the recommendations of the Independent Scientific Review Panel (ISRP) and the region’s fish and



wildlife managers as the basis for its funding recommendations. The Council and the ISRP also have a responsibility for reviewing other fish and wildlife projects proposed for funding by federal agencies and reimbursed by Bonneville.

The 2000 Program describes a rolling project review process in which one-third of the program and fish and wildlife projects funded by Bonneville are reviewed each year in some depth by the fish and wildlife managers, the ISRP and the Council. An important criterion for a funding recommendation is consistency with the vision, objectives and strategies in the revised program and in the relevant subbasin plan, when adopted. In the rolling project review, the priorities for actions at the basin, province, and subbasin level will be reflected as budget priorities for implementation of specific projects.

The program includes procedures for monitoring and evaluating the biological benefits gained by actions taken under the program. The evaluation process feeds information back into the program planning and project review process, with adaptive management mechanisms for revising program objectives or actions if what has been adopted proves unsuccessful.

Because this program has a significantly different structure and implementation procedure than past versions of the program, the Council wanted to make a provision for projects initially funded under previous versions of the program to continue -- as long as they are approved by the ISRP. Thus, unless expressly modified by the provisions of this program, existing projects will continue to be in effect.

Most of the existing projects in the program are specific items for implementation at specific locations. As part of the subbasin planning process described above, these measures will be reviewed, together with proposals for new measures, for inclusion in subbasin plans. When a subbasin plan is adopted, it will include both the new measures for that subbasin and the existing measures that will be continuing. At that time, the measures currently in the program for that subbasin will be replaced by the subbasin plan.

### **Protected Areas amendment**

The Protected Areas amendment is an important part of the program that was incorporated into the 2000 amendment but not specifically changed from the previous version of the program. The Protected Areas Rule dates to August 10, 1988, when the Council adopted a proposal to designate some 44,000 miles of Northwest streams as “protected areas” because of their importance as critical fish and wildlife habitat.

The “protected areas” amendment was a major step in the Council’s efforts to rebuild fish and wildlife populations that have been damaged by hydroelectric development. Low cost hydroelectric power has provided tremendous benefits to the Northwest, but those benefits also have imposed significant costs. The Northwest’s fish and wildlife have suffered extensive losses; salmon and steelhead runs in the Columbia River drainage, for example, are a fraction of their former numbers. The region’s concerted efforts to restore these populations could not be fully effective without strong protection of fish and wildlife habitat. The Council’s goal of doubling salmon and steelhead runs in the Columbia River Basin will require hardy wild and natural fish populations, which rely on high-quality habitat. To protect the ratepayers’ investment in fish and wildlife restoration, it is necessary to protect the best remaining habitat.

The designation of protected areas also is intended to play a positive role in the efficient development of environmentally benign hydropower. New hydro development in the region's most critical fish and wildlife habitat is likely to generate divisive, time-consuming and costly controversy. By identifying this habitat as "protected," the Council hopes to point developers to less sensitive areas, where the time and cost of development will be lower. Ratepayers should benefit from both more productive fish and wildlife investments and from reduced hydro development costs.

While the Council does not license hydroelectric development, certain federal agencies have a legal obligation to take the Council's action into account in their decision-making. Those agencies include the Federal Energy Regulatory Commission, which grants licenses to nonfederal hydropower projects, and the Bonneville Power Administration, which acquires and transmits electrical power from the projects.

The Council periodically amends new areas into the protected-areas rule and removes the designation from other areas, based on analysis and public comment. The Council last amended the protected-areas rule in June 1992.

### **III. Background on the Council's Power Planning**

#### **1. The Northwest Conservation and Electric Power Plan**

The Northwest Power Act directs the Council to prepare a plan to assure the Pacific Northwest Region an adequate, efficient, economical and reliable power supply. The Council adopted its first power plan in the mid-1980s and has revised it several times since then.

When the Draft Fourth Northwest Conservation and Electric Power Plan was released in March 1996, the region had just embarked on an effort to develop consensus on how the electricity industry of the Northwest should be restructured to accommodate increasing competition. That effort, the Comprehensive Review of the Northwest Energy System, was convened by the governors of Idaho, Montana, Oregon and Washington. The governors appointed a steering committee to conduct the review and charged them to “develop, through a public process, recommendations for changes in the institutional structure of the region’s electric utility industry. These changes should be designed to protect the region’s natural resources and distribute equitably the costs and benefits of a more competitive marketplace, while at the same time assuring the region of an adequate, efficient, economical and reliable power system.”

To support this process, the draft power plan was intended as a reference tool on the changes in the industry. Public comment on the draft power plan was left open for a year with the goal of revising the plan when the conclusions of the Comprehensive Review, as well as other public comment, could be taken into account. In July 1998, the Council issued an addendum to the draft plan reflecting the recommendations of the Comprehensive Review. The addendum, in combination with the original draft power plan, constitute the Fourth Northwest Power Plan.

The power plan focuses primarily on issues raised by the transition to competitive electricity markets and highlights, where possible, important considerations and principles in that transition. The Comprehensive Review dealt with many of the same issues. In general, the recommendations from the Review are supported by the analysis of the power plan or, where they are not, the recommendations reflect legitimate policy choices on the part of the Review’s Steering Committee. In many instances, however, the recommendations from the Review were specific in intent but, of necessity, lacking in detail. For example, one recommendation was that provisions for recovering stranded investments be made as part of opening retail electricity markets to competition. However, the recommendation provided little guidance regarding how stranded investment recovery might be structured and why. The addendum built on the analysis in the draft power plan to suggest important considerations in recovering stranded investments. The same is true with respect to several of the recommendations for competition and consumer access, and provisions for conservation and renewable resources.

The revised plan also describes potential new roles for the Council that are based on recommendations from the Comprehensive Review. After the conclusion of the Comprehensive Review, the governors of Idaho, Montana, Oregon and Washington created the Northwest Energy Review Transition Board to oversee implementation of the Steering Committee’s recommendations. The Transition Board was made up of the four governors’ representatives who served on the Steering Committee.

During the transition to a more competitive electricity market, the Council was asked to help the region ensure that the benefits of competition are shared by all electricity consumers, and that public purposes, such as energy-efficiency improvements, development of renewable resources and services to low-income customers, continue to be provided.

### **Summary of key issues and recommendations in the current plan**

The Fourth Northwest Power Plan explores key issues this region must address as the electricity industry becomes more competitive. Many of these issues were addressed by the Northwest Energy Review Transition Board. For example, the Transition Board created a public process, including work groups, to address two significant questions: how can the Bonneville Power Administration survive competition when its power rates are at or above market prices; and how can the region maintain an efficient and reliable transmission system. The wholesale energy market has changed dramatically since 1998, of course, and the Council's more recent analysis of the West Coast power market, and the reasons for the dramatic spikes in the price of electricity in, are addressed in Section IV of this briefing book.

Most of the issues in the Power Plan relate to the region's ability to facilitate effective competition in electricity markets while sustaining the commitment to improving efficiency of electricity use, encouraging renewable resources and providing electricity services to low-income customers. Utilities and their regulators are working to promote competition, protect consumers, maintain reliability, improve efficiency and develop renewable resources at the same time that the entire industry is being restructured. The analysis presented in the draft power plan and the recommendations from the Comprehensive Review point out some important directions the region can take to ensure an effective and equitable competitive retail electricity market and maintain the Northwest's commitment to conservation, renewable resources and low-income energy services. Nonetheless, these directions frequently mean dramatic changes for the institutions involved, and they are not without their tensions and, in some instances, contradictions.

#### Competition and Consumer Choice: Separation of Distribution and Energy Marketing

The Comprehensive Review Steering Committee noted that effective separation of utilities' distribution and energy marketing functions is necessary if a truly competitive retail market is to be established. The alternative is the potential for self-dealing and preferential treatment of the incumbent utilities' energy marketing activities.

#### Recommendations in the plan:

- If effective separation is to be achieved, policy-makers will have to provide for either increased regulatory oversight to guard against abuses or require actual separation.
- Achieving effective separation without actual separation poses potential conflicts for the boards and commissions of publicly owned utilities. On the one hand, they are responsible for facilitating a competitive retail electricity market. On the other, they are responsible for seeing that their energy marketing activities can recover their costs. Policy-makers should give careful consideration to how those conflicts can best be avoided or managed.
- Competition in energy services means the potential for losses. Investors clearly accept the risks of competition. There are, however, no clear willing "bearers of risk" if publicly owned utilities engage in competitive activities. Policy-makers will need to address the

question of who bears the risk associated with competitive activities undertaken by publicly owned utilities.

### Pricing

The Comprehensive Review Steering Committee recommended that the unbundling of electricity prices and recovery of transition costs (e.g., stranded investment recovery and public purpose funding) be carried out in a competitively neutral fashion.

Recommendations in the plan:

- Efficient competitive markets require marginal cost pricing — products and services priced at the cost of producing the marginal or last unit.
- “Unbundling” of prices requires, at a minimum, separating the costs of distribution from the cost of the energy commodity. This is essential if consumers are to be able to accurately compare one competitor’s product with another’s.
- Finding a competitively neutral means to charge for stranded investments or fund public purposes, such as conservation, renewable resources or low-income energy services, means that, to the greatest extent possible, these charges should affect all suppliers equally and not affect the marginal price of the electricity product being purchased. This suggests a charge that is based on some measure of historical use, not one that is based on the current level of use, such as an additional per kilowatt-hour charge.

### Market Information

The Comprehensive Review Steering Committee noted that information about the market is critical if the market is to be both fair and efficient. The Steering Committee made specific recommendations regarding information to be provided on customer bills.

Recommendations in the plan:

- In addition to unbundled prices and billing information, consumers need to be provided information that allows them to compare the characteristics of the products and services being offered by competitors before they are expected to choose suppliers.
- Energy service marketers need to have access to information about the demand characteristics of customers so they can tailor services to the needs of particular types of customers. That information is currently held by the incumbent utility. To avoid market power issues, that information must be available on a comparable basis to competitors.
- During the transition to competition, aggregate information on trends in energy consumption, average prices paid by different classes of consumers, and the composition of demand will be necessary to judge the effectiveness of competition, the degree of cost shifting occurring and whether public policy goals are being met. This information is unlikely to be readily available in a competitive environment unless the states establish reporting requirements and charge some entity with the responsibility for gathering such information.

### Accountability and Administration

The Comprehensive Review Steering Committee recommendations include a number of new public responsibilities — provision of consumer information services, monitoring and enforcing competitive conditions, development and evaluation of pilot programs, ensuring reasonably consistent market conditions and consumer protection laws and their enforcement, registration and licensing of energy service providers, development of a consumer complaint and arbitration process, and creating and administering a universal service fund.

Recommendation in the plan:

- If these functions are to be carried out, responsibility needs to be assigned and the activities supported. Provision should be made for many of these services to be funded through a competitively neutral distribution system charge, as has been proposed for other public purposes.

#### Stranded Investment and "Windfall Profits"

Utilities with higher-cost resources could experience stranded investment during the transition to competition — fixed costs that cannot be recovered at market prices. Conversely, utilities with low-cost supplies could experience "windfall profits" from being able to charge market prices. The Steering Committee noted that an opportunity for recovery of stranded investments from the historical customer base is an appropriate transition mechanism.

Recommendations in the plan:

- Just as stranded investment recovery is appropriate, so is the sharing of windfall profits with the historical customer base. This is the other side of stranded investment recovery.
- Stranded investment or windfall profits should be determined on the basis of the utility's entire generating system, not individual resources.
- Recovery or distribution should follow principles of competitive neutrality.
- Stranded investment recovery should include incentives for minimizing stranded costs.
- Stranded investment recovery should be time-limited.

#### Conservation and Renewable Resources

##### 1. Aligning Responsibility for Conservation with Business Interests

The Comprehensive Review Steering Committee recommended that local utilities be responsible for collecting and using most of the public purpose funding for conservation and low-income weatherization.

Issues:

- If utilities continue to link distribution and energy marketing, or the conservation responsibility is assigned to the energy marketing function, the primary business interest will be in maintaining and increasing electricity sales. If conservation services prove to be an effective marketing tool, restricting access to public purpose conservation funding to the incumbent utility will put competing suppliers at a disadvantage. If not, the utility will have an incentive not to encourage efficiency improvements that reduce sales or even to use the conservation funding to promote electricity uses that increase electricity sales.
- If the distribution function is separated out, the distribution utility will have no great incentive to continue conservation efforts (other than where they can reduce distribution system costs), but neither will it conflict with conservation in the ways the energy marketing function might.

Recommendations in the plan:

- In assigning responsibility for conservation in a restructured, competitive retail electricity market, policy-makers should consider how that responsibility will align with the business interests of the different utility functions and try to minimize conflicts.
- How unbundled rates are structured will affect the incentives for a utility to carry out conservation efforts. If a distribution utility's fixed costs are predominantly collected in a per kilowatt-hour charge, the utility will face a disincentive to pursue energy conservation. If the conservation significantly reduces peak demands, and the utility's

fixed costs are recovered in a demand-based charge, the utility will face a disincentive to pursue conservation.

## 2. Aligning Responsibility for Renewable Resource Development with Business Interests

The Comprehensive Review Steering Committee recommended that public purpose funding for renewable resource development be administered by a regional non-profit entity, but gave local utilities the right to choose to use those funds for their own renewable resource development.

Issue:

- The energy marketing staff at local utilities frequently have the knowledge and expertise for renewable resource development, but in a competitive environment, they may be averse to the risk that the public purpose funding will not be sufficient to cover the above-market costs of renewable resources, potentially creating stranded investments.

Recommendations in the plan:

- Local utilities undertaking renewable resource development should consider mechanisms such as power purchase contract provisions, production incentives and financing incentives that limit their risk exposure and promote competition.
- Renewable resource development and marketing should not be a responsibility of the distribution function, except where such development is used to reduce distribution system costs. Mixing the distribution and energy marketing function regarding renewable resource development would defeat the intent of separation of those functions.

### Consistency with the Competitive Market

The Comprehensive Review Steering Committee expressed a preference for relying on market forces wherever possible to achieve the region's goals for developing conservation and renewable resources. This implies that, to the greatest extent possible, the restructuring of the electricity industry should be done in ways that complement or encourage the development of competitive markets for energy-efficiency services and renewable resources.

Recommendations in the plan:

#### 1. Access to Information

- As in the case of energy marketers, energy service providers should have access to information regarding consumer electricity use. This information is necessary to effectively target energy-efficiency services. To deny energy-efficiency service providers this information puts them at a competitive disadvantage.
- Consumers also need adequate information about suppliers. This is particularly so in the case of so-called green marketing — where consumers are offered the opportunity to purchase power from renewable resources.
- If, as was recommended by the Steering Committee, opportunities to purchase "green power" are offered to consumers before open access is established generally, there need to be minimum criteria for what constitutes a green power product, including a minimum average content of energy from new renewable resources.
- After open access, consumers should be provided with consistent information about the product they are being offered before they choose a supplier, and after they choose, they should be kept informed about what is actually produced.

#### 2. Leveraging Consumer Investment in Conservation

- The Comprehensive Review Steering Committee recommended that the investments in energy efficiency by "large consumers" should be credited against the public purpose funding requirements for local conservation. If the intent is to foster a market for energy-

efficiency services, then this crediting of consumer investment should be interpreted as liberally as possible, consistent with being able to ensure that legitimate efficiency investments are actually made. In that way, utilities will be encouraged to foster the marketing of energy-efficiency services to consumers, as opposed to simply making utility purchases of conservation.

### 3. Broadening Access to Public Purpose Funding

- As open access occurs, it will be important that all qualified entities have the opportunity to compete for the use of the public purpose funding for conservation and renewables. This will promote a competitive market for these services.

### 4. Consumer-directed Renewable Resource Incentives

- Using the public purpose renewable resource development funding in the form of a consumer-directed credit against the cost of power purchases from qualified renewable resource producers is a market-oriented approach to encouraging renewable resource development.

### Establishing Implementation Objectives

The recommendations of the Comprehensive Review Steering Committee appear to focus on ensuring that funds are collected to sustain development of conservation and renewables. They do not provide much guidance on how the money should be directed, other than in very broad categories.

Recommendations in the plan:

- Implementing rules to guide the use of public purpose funding should be established. Policy criteria that should be considered include:
- Using public purpose funding to encourage development of cost-effective conservation that is the least likely to be developed by the market alone;
- Establishing cost-effectiveness criteria that reflect the public rather than utility nature of the funding. Such criteria should take into account environmental benefits and other non-electrical and non-energy benefits of a conservation investment; and give priority to low cost and "lost-opportunity" resources [Lost opportunity resources are those that can only be effectively developed at a particular point in time, for example, building energy-efficiency measures that can only be implemented at the time of construction or major renovation.] to maximize the effectiveness of public investment.

### Regional Action and Coordination

The recommendations of the Comprehensive Review Steering Committee generally give preference to local implementation of conservation and renewable resources. There are, however, several areas where regional activities are recommended and others where regional coordination of local activities would be desirable:

#### 1. Responsibility and Support of Oversight and Reporting

The Steering Committee recommended establishment of a "regional technical forum" to track progress on conservation and renewables, and provide feedback for improving effectiveness of these efforts. This is an important function to ensure accountability. To accomplish these functions, this body will have to be given adequate support and authority by the states and/or local utilities.

#### 2. Adjusting Targets to Reflect Changing Market Conditions



The Steering Committee recommended that regional conservation and renewable resource goals should be reviewed at least every five years, taking into account changes in market conditions. Provisions should be made in state legislation and/or local regulations to permit adjustments to regional goals, and the function of reviewing these goals, should be given adequate support and authority.

### 3. Conservation Market Transformation

The Steering Committee recommended that conservation market transformation be undertaken through a regional non-profit entity. Such an entity, the Northwest Energy Efficiency Alliance, has been established with voluntary funding from Bonneville and investor-owned utilities. That funding is not assured beyond 1999. State legislation establishing public purpose funding should ensure continued funding. In addition, the makeup of the board of directors should be revised to reflect the public nature of the funding.

### 4. Renewable Resource Market Transformation

The Steering Committee recommended that renewable resource development intended to transform the market for renewable resources be administered by a regional non-profit, but gave “first right of refusal” to local utilities. The limited amount of available funding and the characteristics of the most promising renewable resources suggest that regional coordination of such development is required if there is to be any substantial effect. State legislation establishing public purpose funding for renewable resources should require regional coordination and adequate support for that function.

The Northwest Energy Efficiency Alliance was not constituted to address renewable resource issues. Either its mission and makeup should be altered or a different entity should be charged with this responsibility.

### 5. Renewable Resources Research, Development and Demonstration

The Steering Committee recommended a minimum level of funding for renewable resource research, development and demonstration to be administered by a regional entity. The limited amount of funding and the economies of scale of such activities clearly support regional administration. State legislation establishing public purpose funding for renewable resources should require regional administration and stable support for that function.

Because of the public nature of the funding, the products of that research, development and demonstration should be publicly available.

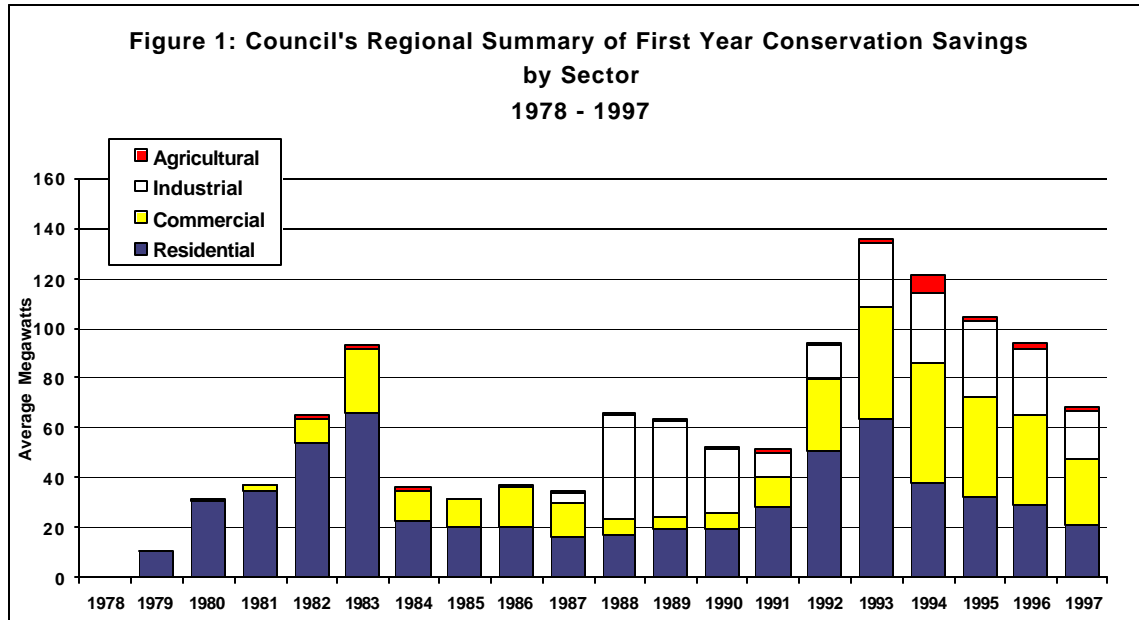
### 6. Distributed Generation Research, Development and Demonstration

The Steering Committee recommended that public purpose funds for distributed generation research, development and demonstration be administered by a regional entity. However, the localized nature of distributed generation opportunities requires a coordinated regional/local approach. The kinds of technologies eligible for this funding should be identified by the regional entity. Specific projects should be designed and implemented locally. State legislation establishing public purpose funding for distributed generation research, development and demonstration should require regional administration, local implementation and stable financial support for these efforts.

## **2. Conservation Acquisition Status**

The Northwest has a long history of acquiring conservation as a resource. Over the past 20 years, the region has acquired roughly 1,200 average megawatts of conservation; enough power to supply the city of Seattle. The rate of acquisition has varied significantly over this period from a low

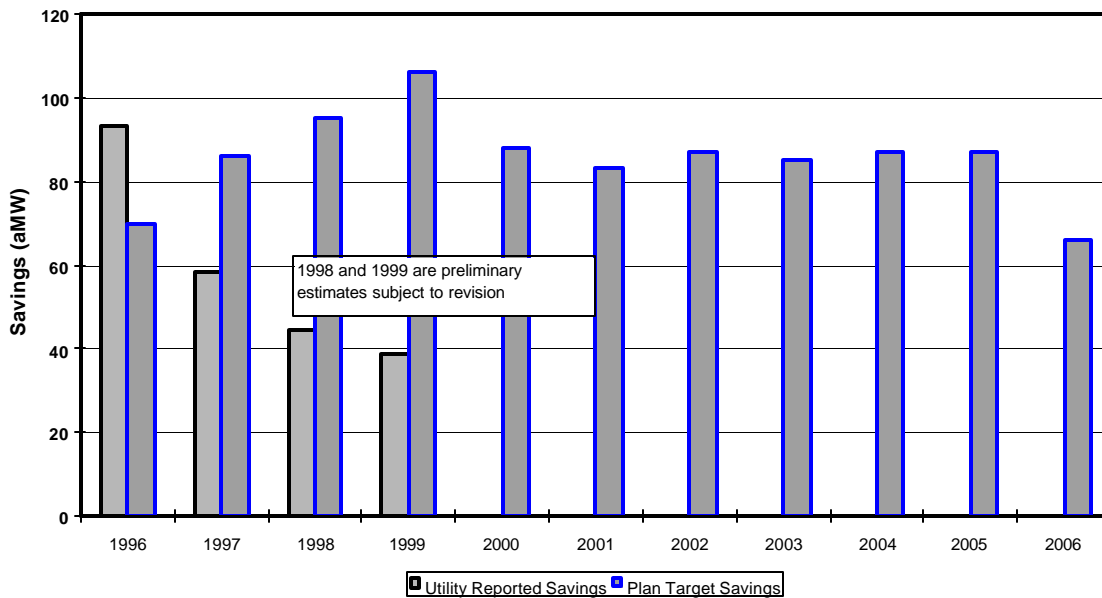
of about 30 average megawatts per year in the mid 1980s to a high of over 130 average megawatts in 1993. The composition of this conservation has also varied over time. Initial efforts in the early 1980s saw more than 80 percent of the conservation acquired in the residential sector. In the late 1990s, almost two-thirds of the conservation comes from commercial and industrial sectors. Figure 1 illustrates the conservation accomplishments of the region.



In its Fourth Northwest Power Plan, the Council identified 1,550 average megawatts of energy savings that remain cost-effective to acquire for the region. This despite what at that time were relatively low estimated alternative resource costs compared to previous power plans. Since 1998, when the Fourth Power Plan was completed, utilities in the region have continued to acquire conservation, although at a reduced pace compared to that recommended by the Council. Figure 2 depicts the region's success in acquiring conservation compared to the goals set in the Plan.

Figure 2 clearly illustrates the difficulty of acquiring conservation given the uncertainties posed by a more competitive utility environment. Most utilities dramatically scaled down their conservation program efforts in response to increases in real or perceived competition. Conservation acquisition levels in 1999 approached the historically low levels of the mid 1980s. However, unlike the 1980s, electric loads in the last part of the 1990s continued to grow at a healthy rate, indicating an increased need for conservation.

**Figure 2.  
Conservation Savings  
Actual vs Power Plan 1996 - 2006**



### Sustaining conservation investments in a more competitive environment

The National Energy Policy Act of 1992, which permits open competition at the wholesale level and the reduced cost of natural gas-fired generation technologies, have left some utilities concerned about their ability to remain cost competitive. Some utilities have asserted that continued investments in conservation are not sustainable in a competitive market. They argue that because their likely competitors (AKA, independent power producers) need not invest in conservation, the price (i.e. rates) they can charge for power will be lower.

While energy conservation costs less than other alternatives, it can increase utility rates slightly. Conservation programs cost money and reduce the sales of electricity. Therefore, the cost per kilowatt-hour can go up.

The Council, working with Bonneville and other utilities, regulators and others, developed alternative approaches to acquiring conservation that would reduce costs to utilities and potentially mitigate some conservation rate impacts. These approaches are known collectively as “market transformation ventures.”

Market transformation is a strategic effort by utilities and other entities to induce lasting structural or behavioral changes in the market that result in increases in the adoption and penetration of energy efficient technologies and practices. Because the market for energy using products (e.g. motors, refrigerators) does not match the service territory of individual utilities, it is necessary for utilities to act collectively to leverage change. In the Northwest, Bonneville and the region’s utilities have historically cooperated on some of the nation’s most successful market transformation programs, the Super GOOD CENTS/Northwest Energy Code programs and Manufactured Housing Acquisition Program (MAP). Although most of the major public and private utilities in the region

have indicated a preference for pursuing market transformation programs where they make economic sense, few have been willing to allocate staff to develop these programs. Moreover, with increasing utility concerns about competition, there may be less willingness to continue such collaboration in the future.

## **The Northwest Energy Efficiency Alliance**

Perhaps the most visible, broadest-ranging market-transformation effort being undertaken by the Alliance, a non-profit association of electric utilities, state governments, public interest groups and industry representatives committed to bringing affordable, energy-efficient products and services to the marketplace. The Council played a major role in founding the Alliance in 1996, and several Council staff members now sit on the Alliance board of directors. The Alliance executive director, Margaret Gardner, is a former Council employee. At any one time, the Alliance implements around 30 market transformation projects. The projects are quite diverse and cover many different market sectors: residential, commercial, industrial and agricultural. Some of the priority market segments the Alliance has identified include lighting, appliances, commercial buildings, industrial motors and motor systems.

There are different ways to achieve efficient use of electricity. The Alliance relies on a method called market transformation, which encourages the marketplace to adopt energy-efficient products and services as the norm. Alliance projects work to remove barriers that prevent a targeted product or service from being naturally accepted and offered by a market and educate consumers and businesses about why they should choose these higher efficiency products and services.

Because the Alliance is a regional organization, it can follow markets across utility service territories and state boundaries to achieve the biggest impact. Projects work within established market chains and focus on strategic leverage points to bring about lasting increases in the market share for higher efficiency products and services.

At any one time, the Alliance implements around 30 market transformation projects. The projects are quite diverse and cover many different market sectors: residential, commercial, industrial and agricultural. Some of the priority market segments the Alliance has identified include lighting, appliances, commercial buildings, industrial motors and motor systems.

The Alliance has three primary avenues for developing projects:

1. An open process for unsolicited proposals through its web site.
2. Alliance-developed proposals in priority markets. These projects are designed by Alliance staff and contracted through a Requests for Proposals process. RFPs for these projects are posted on the Alliance web site and announced through the Alliance listserve.
3. Review of current projects in the Alliance portfolio. The Alliance Board systematically reviews current projects to ensure that the goals are being met. This process can result in changes to a project, contract extensions or ending contracts.

There are six key criteria from the Alliance's strategic plan used to evaluate projects and determine whether projects will be accepted. These criteria include:

1. Financial Return (cost-effectiveness). Overall cost-effectiveness is typically measured by comparing the total regional cost per kilowatt hour saved in the project with the cost per kilowatt hour of the marginal electricity producing resource (in most cases, combined-cycle, gas-fired turbines) it would displace.
2. Long-term Market Impact. Projects should work to create a lasting acceptance in the marketplace for energy-efficient products and services. Potential initiatives will be reviewed in terms of their likely sustainability in the market after intervention has diminished or stopped.
3. Electricity Savings. The Alliance project portfolio seeks sizeable cost-effective electricity savings. These savings could include some short-term projects that may achieve lesser kilowatt-hour

savings, but have a high likelihood of success and some long-term projects where the savings potential may be higher although the risk may be greater.

4. Geographic Balance. The Alliance project portfolio will return long-term savings and benefits equitably across the region, considering the geographic distribution of electricity consumption.

5. Customer Class Reach. The Alliance project portfolio will touch all customer classes including residential, commercial, industrial and agricultural sectors.

6. Private Sector Co-Investment. A portion of Alliance project funding is matched with private sector investments and/or projects that have revenue generating opportunities. This criteria is desirable, but not required.

For more information about the Alliance, its staff and the projects it funds, visit the website at [www.nwalliance.org](http://www.nwalliance.org).

### **Council recommendations to Bonneville regarding conservation acquisition 2002 – 2006**

Bonneville intends to augment its power supplies by 800 to 1,000 average megawatts (aMW) to meet expected loads during the 2002 – 2006 rate period. It intends to accomplish this primarily through market purchases of power but recognizes that the acquisition of cost-effective conservation must also be part of the mix. The key question is how Bonneville can acquire cost-effective conservation during this period in ways that are compatible with the circumstances it faces?

To explore this question, Council released an issue paper in December 1999 entitled *Bonneville Conservation Acquisition 2002 – 2006*. The paper reviewed the reasons for the conservation mandates of the Northwest Power Act and the experience of the last almost 20 years in implementing conservation, leading to the current situation. It also estimated the amount of conservation that is cost-effective for Bonneville to acquire on a long-term basis. These estimates take into account the changes in expected value of power since the 1998 Plan's estimates were developed. The analysis indicates that the approximate development schedule of the cost-effective conservation potential for loads expected to be served by Bonneville would amount to approximately 30 aMW per year at a *total* cost of approximately \$60 million per year. However, the cost to Bonneville should be significantly less because of customer and end-user contributions.

The paper went on to describe three possible approaches to acquiring conservation for the 2002 – 2006 period. One is the traditional, long-term approach in which conservation investments are valued over their useful life. This approach has proven effective in the past but exposes Bonneville to the risk that it will not receive the full benefit of its investments if customers take load off at the end of the contract period. A second approach is intended to have effects for Bonneville that are as much as possible like a relatively short-term purchase of power on the market. This approach removes most risk from Bonneville but seems unlikely to produce additional conservation that would not have occurred in response to market forces. Finally, a "middle ground" approach was described in which Bonneville is willing to pay for conservation savings as long as and to the extent that a customer keeps load on Bonneville. Bonneville would endeavor to limit what it pays to have minimal impact on its net revenue requirement. This approach limits Bonneville's risk while permitting development of longer payback, but still cost-effective conservation.

Finally, the paper made some draft recommendations, proposing to endorse the "middle ground" approach and the overall conservation target and making some specific implementation recommendations.

A panel of experts met with the Council to discuss the paper, and the Council also took extensive written public comment. The recommendations that follow are based on the analysis in the issue paper, public comment on that paper and consultations that staff has held with Bonneville and other interests. These recommendations are intended to guide Bonneville in conservation acquisition as part of their power augmentation effort.

The Council recommended that Bonneville use the “middle ground” approach described in the paper. The pertinent features of this approach are:

- Bonneville should strive to acquire conservation for as little as it can while still meeting its goal. It should not employ an explicit rate-impact test. Doing so could, in some circumstances, disadvantage Bonneville in negotiating what it will pay for conservation and, in other circumstances, could result in very cost-effective conservation going undeveloped.
- What it is willing to pay for conservation savings should be based on the market value of the saving produced. Because market prices exhibit much more seasonal and daily variation than in the past, the time at which savings are produced should be reflected in the value. Similarly, where there are variations in value due to geographic location, those values should also be taken into account and captured by the Power Business Line if possible.
- Bonneville's should be willing to acquire conservation that would produce savings beyond the 2002-2006 period. However, if customers choose not to contract with Bonneville beyond that period, they accept the responsibility for any costs not yet recovered or savings yet to be delivered to Bonneville.
- The conservation acquisition is intended to reduce the necessity for market purchases of power. Therefore, it will be necessary for customers that purchase other than load-based products from Bonneville (e.g. a block purchase) to commit to reducing their purchase from Bonneville in the amount of the saving to be produced by Bonneville-funded conservation.

The conservation target proposed in the issue paper was determined by allocating the regional resource potential on the basis of the percentage of loads estimated to be served by Bonneville in the 2002 – 2006 period. Comment was received to the effect that the allocation overlooked the pre-subscription loads served by Bonneville and did not include the full responsibility for IOU residential and small farm loads. Inclusion of these factors would tend to increase the amount allocated to Bonneville. At the same time, Direct Service Industry loads were inappropriately included in determining the allocation when the regional conservation potential does not include an estimate of conservation potential in the DSIs. These recommendations reallocate the regional target to Bonneville according to the revised load estimates and estimating a separate target for the DSIs.

The issue paper also recommended that the savings produced as a result of the Conservation and Renewables Discount, Bonneville's "share" of the savings produced by the activities of the Northwest Energy Efficiency Alliance (NEEA) and the savings produced by Bonneville-funded low-income weatherization be counted toward the regional target. The Council believes this is

appropriate. However, the Council also believes it is important to provide a clear, unambiguous target for power augmentation and to avoid pressures that might distort the missions of these other activities. Consequently, these recommendations provide estimates of the amount of savings that will be produced by these activities a priori and reduce the augmentation target levels by those amounts. The targets are as presented in the table below. These targets are based on then-current estimates of Bonneville's subscription loads. The targets will be revised as necessary when subscription is complete.

Bonneville "Share" of regional Non-DSI potential 2002 – 2006 <sup>3</sup>	166 average megawatts
Target for savings produced by activities under Conservation and Renewables Discount; Northwest Energy Efficiency Alliance, and low-income weatherization 2002 – 2006 <sup>4</sup>	80 average megawatts
Bonneville Non-DSI augmentation target 2002 – 2006	86 average megawatts
Bonneville DSI augmentation target 2002 – 2006	Under development
Bonneville total augmentation target 2002 – 2006	86 average megawatts plus DSI target

The Council recommended that the target be considered a minimum, not a maximum. Staff has identified conservation that could be cost-effective to implement earlier than was specified in the Power Plan. Bonneville should acquire that conservation it can identify that is cost-effective.

The issue paper proposed considering modifications to the Conservation and Renewable Discount (C&R Discount) so that it could serve as the basis of the augmentation effort. Information being produced by the Regional Technical Forum for the C&R Discount will be helpful in the augmentation effort. However, the Council recommends that the C&R Discount not be modified. It was designed with a different purpose in mind and would require extensive modification to be the basis for the acquisition activity. Because it is part of the rate case, significant changes would delay the rate case.

The issue paper proposed that a competitive bid process that includes the possible participation of third parties be used for the augmentation process. The paper was not, however, clear about what that meant. The Council recognizes that for some more or less standard conservation measures or programs, primarily affecting the residential and small commercial sectors, a "standard offer" approach (i.e., "If you do X we will pay you Y") may be more efficient. The Council recommends that the standard offer approach be used where appropriate. The Council continues to believe that for industrial and large commercial, where the bulk of the potential lies, a more flexible approach is required. The Council recommends that Bonneville solicit interest from customers and third parties and work with those parties to negotiate mutually acceptable terms (quantity, price, timing, etc.). Bonneville's utility customers should have first right of refusal but should not have the ability to block access of consumers to Bonneville-supported conservation services.

While not addressed explicitly by the issue paper, comments were received to the effect that progress toward achieving the conservation target should be carefully monitored so that corrective

<sup>3</sup> Based on estimate that Bonneville will serve 38 percent of the region's non-DSI load.

<sup>4</sup> NEEA contribution based on Bonneville share of savings from current NEEA activities, not including the Microelectronics or Efficient Building Practices initiatives or initiatives for which savings have not been estimated. Low-income weatherization contribution estimated at 1 average megawatt per year. Conservation & Renewables Discount contribution estimated assuming half the discount goes for conservation projects that produce savings at the cost of \$2 million per megawatt.

action can be taken on a timely basis if necessary. The Council requested that Bonneville report to the Council regarding the progress made in acquiring conservation as part of the power augmentation effort on at least a biannual basis. Reporting should include documented savings from the C&R Discount, the Northwest Energy Efficiency Alliance (NEEA) and low-income weatherization. For the C&R Discount, only those savings documented through use of Regional Technical Forum evaluation protocols and/or deemed measure savings should be counted. To the extent the overall conservation target is not achieved, the Council expects that Bonneville will undertake additional efforts to meet the overall target.

The issue paper proposed that the Transmission Business Line cooperate in funding conservation activities where transmission system savings would result. The Council encourages the Transmission Business Line to invest in conservation and demand management where such investment can reduce transmission investment requirements. However, to preserve the separation of Bonneville's transmission and power marketing functions, conservation/demand management activities of those functions should not be combined.

Renewable resources were not addressed in the issue paper. The Act requires that resources being acquired by Bonneville be cost-effective. The Council's current plan does not identify any cost-effective renewables. If a developer or sponsor offers to sell power from renewable resources to Bonneville at a competitive rate, Bonneville can and should acquire that power. The Council supports renewables demonstration and "green-power" marketing efforts to stimulate renewables development. The C&R Discount is a vehicle that is appropriate for funding such activities.



## **IV. Supplement on Current Council Issues**

### **A. Fish and Wildlife Issues**

#### **1. Amending the Columbia River Basin Fish and Wildlife Program**

In October 2000, the Council completed a major revision of its program, the largest regional effort to protect and enhance fish and wildlife in the nation. Through the program, the Council directs about \$130 million in electricity ratepayer funds per year to mitigate the impact of hydropower dams. As discussed in Section II of this Briefing Book, the 2000 Program, the first revision since 1995, establishes a basinwide vision for fish and wildlife recovery -- the intended outcome of the program -- along with biological objectives and action strategies that are consistent with the vision. Ultimately, the program will be implemented through plans that will be developed locally during the next three years in the 53 tributary subbasins of the Columbia and amended into the program. Those plans will be consistent with the basinwide vision and objectives and the program's underlying foundation of ecological science. In the next phase of the amendment, in 2001, the Council will address mainstem Columbia and Snake river issues.

#### **2. Province-level review of projects; subbasin planning**

In the past, the Council has reviewed annually new and ongoing projects for funding from throughout the entire Columbia River Basin. This year the Council will focus its review on projects from much smaller areas called provinces.

The program organizes the Columbia Basin into 11 ecological provinces. Within those provinces there are groups of adjacent subbasins with similar climates and geology; in all there are 58 tributary subbasins of the Columbia River. Beginning this year, project proposals for three to four provinces will be reviewed every year, and then those projects will be approved for a three-year period.

Each year, a different group of provinces will be targeted for project review. The review is based on how projects relate to the identified needs of the watershed, which will eventually be explained in subbasin plans. In the future, the Council will review and adopt subbasin plans into its program to guide the selection and funding of projects. Recognizing that the planning process involves the participation of local stakeholders who will play a lead role in developing subbasin plans, and that this takes time to accomplish, the Council has provided a transitional period so ongoing projects continue to be reviewed and funded.

Until formal subbasin plans are created, interim plans called "subbasin summaries" will be used to guide project selection. Summaries are a compilation of all the existing information about a subbasin, including past and ongoing fish and wildlife activities, and current management plans, objectives and policies. Much of the summary information will help to fulfill the inventory component of subbasin plans. These summaries will include as much information as possible until the more comprehensive plan is completed, and eventually, the summaries will be replaced by subbasin plans.

#### Why Subbasin Planning?

The goal of subbasin planning is to achieve a comprehensive, integrated and scientifically sound fish and wildlife program for the Columbia River Basin. The Council believes that by working with local stakeholders, fish and wildlife managers, tribes, government agencies and citizens to connect their efforts at the subbasin level we can achieve a greater degree of cohesiveness and coordination between the many various projects, develop projects that directly relate to the specific needs of a particular subbasin, and more effectively review those projects for their effectiveness and scientific merit.

The program also intends to address, as much as possible, Endangered Species Act requirements, the Clean Water Act, the broader requirements of the Northwest Power Act and the policies of the states and Indian tribes of the Columbia River Basin. It is designed to link to, and accommodate, the needs of other programs in the basin that affect fish and wildlife. The subbasin planning process provides an opportunity for regional participants to share knowledge, collaborate on planning and implementation issues when possible, and overall, foster greater support of, and direction for, efforts with similar goals.

### What is a Subbasin Plan?

Subbasin plans, once completed, will not only incorporate all the existing information about the subbasin, but also scientific data that will help assess the needs of a particular subbasin and identify gaps in what is currently being done. The plans will be consistent with the Council program goals and objectives for the basin, and also with goals and objectives that will be developed for the 11 provinces.

With the subbasin plans in place, the program will be organized on three levels: 1) a basinwide level that articulates objectives, principles and coordination elements that apply generally to all fish and wildlife projects that are implemented throughout the basin; 2) an ecological province level that addresses the 11 unique ecological areas of the Columbia River Basin; and 3) a level that addresses the individual subbasins, each containing a specific waterway and the surrounding uplands.

The required elements of a subbasin plan are:

- Assessment: A subbasin assessment is a technical analysis to determine the biological potential of each subbasin and the opportunities for restoration;
- Inventory: An inventory of existing projects and past accomplishments;
- Management Plan: A 1 to 15-year management plan that includes a projected budget.

Extensive public involvement is also a critical component to developing subbasin plans. The Council hopes to involve a wide range of constituents to review the information and reach consensus on the elements of subbasin plans.

### Getting There From Here...

The Council, in partnership with the Columbia Basin Fish and Wildlife Authority, has begun to convene stakeholders to gather information and inform people of this new process. In each

province, a workshop will be conducted where project sponsors present existing assessment-type information. Subsequent workshops will be held to document existing fish and wildlife goals, policies and plans, as well as existing activities.

### **3. Innovative and high-priority project solicitations**

#### Innovative projects

In 1999, the Independent Scientific Review Panel (ISRP) recommended that the Council establish a special funding category to encourage innovative projects for the Council's fish and wildlife program. The purpose of innovative projects is to explore new methods and technologies and new applications for existing methods and technologies designed to directly benefit fish and wildlife. An innovative project is one that relies primarily on a method or technology that (1) has not previously been used in a fish and wildlife project in the Pacific Northwest, or (2) although used in other projects, has not previously been used in an application of this kind. Bonneville will allocate up to \$2 million for innovative projects in Fiscal Year 2001.

The November 2000 project solicitation specified that proposed projects be consistent with the Council's fish and wildlife program and set a per-project funding maximum of \$400,000. This would allow for at least five projects to be funded in 2001. Without excluding other types of innovative projects, the solicitation expressed an interest in projects demonstrating the effect of nutrient supplementation and those testing experimental selective fishing gear.

In response to the solicitation, Bonneville received 66 proposals totaling about 2,000 pages and requesting a total of about \$20 million. These were forwarded to the Independent Scientific Review Panel for review. The proposals fell into several broad topic areas: 1) nutrient supplementation; 2) fish health; 3) fish population monitoring; 4) information transfer/planning; 5) artificial production; 6) habitat restoration and enhancement; and 7) fisheries technology.

The ISRP ranked all of the proposals and recommended the top 20 to the Council. The ISRP's report was posted on the Council's website for public review. The Council intended to make its decision on the projects in February 2001.

#### High-priority projects

Responding to the urgency surrounding efforts to recover Endangered Species Act-listed fish, the Council solicited proposals in November 2000 for "high-priority" projects for quick implementation. The one-time solicitation for high-priority projects also allows these projects to be implemented outside the normal project-selection process, which is in transition in 2001 from the previous version of the program to the 2000 Program, which will focus project selection in subbasin planning.

The Council intends that other projects will wait for consideration in the provincial review in order to maximize the benefits gained from that more comprehensive planning and review process. High-priority project funding will not be provided for infrastructure or to build capacity, actions that would require separate follow-on funding in future years. On the other hand, high-priority projects could continue in future years if they are reviewed and approved through the provincial review process.

The 2000 Program sets criteria for high-priority projects. Among other requirements, the projects must:

- Address imminent risks to the survival of one or more ESA-listed fish, and 1) represent a time-limited opportunity or 2) be broadly recognized as projects that would achieve direct anadromous fish benefits.
- Be consistent with the Northwest Power Act and provide appropriate mitigation for the impacts of the hydrosystem and not be in lieu of other expenditures or actions authorized or required by other entities.
- Have all required permits and agreements in place so that on-the-ground work can begin no later than September 30, 2001.

The Council planned to make its decision in March 2001.

#### **4. Inaugural annual report of the fish and wildlife program**

In July 1999, the Governors of Idaho, Montana, Oregon and Washington asked the Council to prepare an annual report that provides an ongoing accounting and assessment of the Bonneville Power Administration's fish and wildlife expenditures. Additionally, in their letter the Governors requested that the first report summarize, to the extent possible, historical documentation on past expenditures and program successes and failures, and that the Council devise a method of assessing the impact of funding decisions on the basin's fish and wildlife.

The Council completed the first report in January 2001 and presented it to the Governors. In the report, the Council documented that since 1978, Bonneville's fish and wildlife expenditures total \$3.48 billion. Of this total, approximately 39 percent was attributed to hydropower operations generally intended to support migrating fish. These costs are calculated based on changes in electricity generation caused by altering water flows or implementing increased spill at the dams. The direct program, for which the Council provides more oversight, constitutes approximately 23 percent of the total Bonneville expenditures. Most of the direct program budget is dedicated to habitat (42 percent) with significant amounts allocated to artificial production (32 percent) and mainstem passage (23 percent). Most of this money is directed toward anadromous fish (76 percent), especially salmon and steelhead, with the remainder benefiting resident fish (12 percent) and wildlife (12 percent).

The report also noted the confusing state of fish and wildlife data collection and reporting in the basin. The Council is working with Bonneville and others in the region to improve data collection and reporting in order to make results more accessible not only to specialists but also to the public at large.

## **B. Power Issues**

### **1. Analysis of western power market prices and Northwest power system reliability**

Almost two years ago, the Council initiated a study of the adequacy of the Northwest's power supply. This study was motivated by the observation that while the region had enjoyed several years of robust economic growth and, consequently growth in the demand for electricity, there had been very little in the way of new generation development. At the same time, efforts to improve the efficiency of electricity use in the region had been reduced dramatically because of the uncertainty of utility restructuring. This raised the concern that under conditions of high stress, the system might not be able to fully meet the region's power needs to serve load and to maintain the reserves essential to a reliable system. Conditions of high stress involve combinations of high weather-driven loads, poor hydropower conditions, and forced outages of thermal and hydropower generating units.

The study was completed late last winter. It concluded that:

- There is an increasing possibility of power supply problems over each of the next few winters (December, January, February), reaching a probability of 24 percent by 2003. This takes into account both regional resources and the availability of imports. The level and duration of the possible shortfalls could be relatively small – a few hundred megawatts for a few hours – or quite large – a few thousand megawatts for extended periods.
- The region would need the equivalent of 3,000 megawatts of new capacity to reduce the probability to a more acceptable 5-percent level. That new capacity should take the form of new generation and economic load management, i.e., reductions or shifts in consumer loads that make economic sense for the consumer and the power system.
- It was unlikely that market prices would be sufficient to stimulate the development of sufficient new generation in that time frame. This meant that in the near-term, an even higher priority needed to be placed on developing economic load management opportunities.

While this study generated a good deal of interest, it has been difficult for people to get too concerned about probabilities generated by arcane computer models. During the summer of 2000, however, developments in the power system captured the attention of the industry and the public. Those developments resulted in unprecedentedly high prices in Western power markets, including the Northwest. Average prices for power traded for the heavy load hours of June 28th at the Mid-Columbia trading hub reached almost \$700 per megawatt-hour (MWhr). This is more than 10 times the previous high and is consistent with the prices seen at other trading hubs in the West. Moreover, even for off-peak periods and days for which prices were not at extreme levels, they were considerably higher than past summers.

These prices caused some economic hardship in the Northwest. The hardships have been limited by the fact that spot market purchases represent a small portion of the total amount of power consumed in Northwest. Relatively few retail customers purchase directly from the market or are on market-indexed rates. However, several industrial customers who are on such rates found it uneconomical to continue operation at these power rates. In addition, several utilities are seeking increases in their retail rates to cover the increased cost of power purchases. Because of these impacts, Governors Locke of Washington and Racicot of Montana asked the Council to undertake a

study to explain the reasons for the prices seen on the market and the actions that might be taken to mitigate these prices.

The Council believes that the market prices seen last summer were a tangible manifestation of the fundamental problems identified in the Council's power supply adequacy study of last winter. That is, the prices are an indicator of approaching scarcity. Last summer, the system, which already is facing tight supplies, was further stressed by combinations of unusually high loads, poor hydropower conditions, and forced outages of thermal units. There is little in the way of price-responsiveness in demand to mitigate these prices. Those who had available supply were able to ask for and receive high prices. This combination of factors is precisely what leads to the power supply adequacy problems identified in the Council's earlier study. These factors apply not only to the Northwest but also to the entire Western Interconnected System. There were some additional factors acting last summer related to the design of the California market, but they should not obscure the basic underlying problem. Absent some action, the next similar event could result in not only high prices but also a failure of the system to meet loads.

#### What Caused last summer's Prices?

As noted above, we believe the prices experienced last summer are symptomatic of an overall tightening of supply, exacerbated by a number of factors. Some of these factors are physical and economic, others are related to the relative immaturity of the competitive electricity market and the uncertainties involved in the transition from a regulated structure. The physical and economic factors include:

- Unusually high weather-driven demands throughout the West,
- A unusual pattern of hydropower generation,
- A high level of planned and forced outages of thermal generating units, and
- High gas prices.

Factors related to market immaturity and transitional uncertainties include:

- The lack of a demand-side price response in the market;
- Inadequate utilization of risk mitigation strategies, and
- Factors related to the design and operation of the California market.

#### Overall Tightening of Supplies

Between 1995 and 1999, Western Systems Coordinating Council peak loads increased by nearly 12,000 megawatts, or by about 10 percent. The increase would have been even more if 1999 hadn't been a relatively mild weather year. Generating capacity available during peak load months did not increase to keep pace with peak load growth. While peak loads increased by 12,000 megawatts from 1995 to 1999, generating capacity only increased by 4,600 megawatts.

We also believe that efforts to improve the efficiency of electricity use, i.e., conservation, have fallen off considerably in recent years. This is largely the result of the uncertainty created by the restructuring of the electricity industry. Utilities, who were the primary vehicle for conservation development, generally reduced their efforts because of concerns about creating potentially stranded investment if retail access resulted in the loss of customers. There were also concerns about the need to raise rates to cover conservation costs and the revenues lost as a result of conservation.

The effect of growth in demand outstripping the growth in resources is a narrowing of reserve margins. This implies more efficient utilization of existing capacity and was an anticipated

benefit of moving to a competitive generation market. However, when it proceeds to the point of putting reliability at risk and destabilizing prices, it is a problem.

#### Physical and Economic Factors

##### 1. High Peak Loads

The period of the highest prices coincided with a period in which loads in the Northwest, California and the Desert Southwest were at high levels as a result of high temperatures throughout the West. In the Northwest, peak loads were approximately 3,400 MEGAWATTS greater than last year while in California on the same day loads were approximately 1,400 megawatts higher. [California and the U.S. portion of Northwest Power Pool (NWPP) combined, increased 4,826 MEGAWATTS from the peak on June 30, 1999 to the peak on June 28, 2000, both Wednesdays.]

##### 2. Unusual Hydropower Production

While the summer of 2000 was expected to be a more or less normal year in terms of overall runoff in the Northwest, the runoff came in an unusual pattern. Runoff in the early spring was somewhat higher than usual. But in May and particularly in June, the runoff and hydropower generation was less than normal and much less than 1999. Hydropower generation in late June was approximately 6,000 megawatts less than the same time in the previous year.

##### 2. Planned and Forced Outages of Thermal Units

Maintenance on thermal generation is frequently planned for the May-June period when abundant hydropower is typically available. In addition, plants do break down, sometimes when it is least desirable to do so. We have attempted to identify Northwest thermal units that were either on planned or forced outage status during the last week of June. This was done by examining the generation data reported to the Western Systems Coordinating Council or supplemental data that was provided by Northwest generators. These combined data sets comprise about 85 percent of the capacity in the Northwest. From these data it appears that approximately 1,670 megawatts of capacity was out on a long term basis, either planned or extended forced outages, and another 3,400 and 2,700 megawatts experienced short-term forced outages on the 27th and 28th respectively. Total generation, thermal and hydro, for the last week of June was approximately 4,000 megawatts below the levels of 1999.

#### Load/Resource Balance for the Northwest

A preliminary analysis of loads and resources for the Northwest Power Pool - U.S. Systems for June 28, the peak price day of June, indicates a peak net hourly load (native load plus exports) of about 41,000 megawatts. We were unable to identify more than 38,000 megawatts of capacity, including imports, available to meet these loads. This analysis has a high level of uncertainty (hourly operating data was available for about 85 percent of installed capacity and the output of the remaining installed capacity had to be estimated and data errors are possible). Obviously, since the lights did not go out, the system was able to balance loads and resources. It is likely that data errors and errors in our estimates for the non-reporting generators are at fault. Nonetheless, the evidence strongly suggests that the Northwest was operating under near-deficit conditions during the heavy-load hours of that day.

#### Natural Gas Prices

Between the summer of 1998 and the summer of 2000 natural gas prices at Sumas (on the Washington-British Columbia border) increased from about \$1.50 per million Btu to \$3.30. Prices into Southern California increased over the same period from about \$2.40 to \$4.18. Prices have moved substantially higher during late August and September. During mid-September, prices at Sumas were \$4.60 and prices into Southern California were over \$6.00, although the California prices were affected by a serious pipeline explosion.

Higher natural gas prices, should they persist, will result in higher "normal" prices of electricity. Depending on the generating technology used, a \$2 dollar increase in natural gas prices (roughly consistent with the doubling of gas prices seen by mid-summer) could increase electricity prices by between \$15 per megawatt-hour and \$22 per megawatt-hour. Average electricity prices during high load hours in the Pacific Northwest mid-Columbia market increased by \$140 per megawatt-hour between June 1999 and June 2000, and light load hour prices increased by \$46. The comparable price increases in Southern California were \$113 and \$28. The increase in natural gas prices can not come close to explaining the observed increase in electricity prices.

### Factors Related the Immaturity of the Competitive Electricity Market and the Uncertainties in the Transition from a Regulated Structure

#### 1. Lack of Price-Responsive Demand

A systemic problem associated with the immaturity of the competitive electricity market is the lack of a demand side to that market. Price responsive demand is important to an efficiently operating competitive market. Price responsiveness is an essential mechanism to balancing supply and demand. Without some degree of demand responsiveness, there is no check on the prices that can be charged when supplies are tight, except for artificial caps. This is particularly critical when supplies are stretched to their limits. Under those circumstances, a relatively small degree of price responsiveness can have a relatively large reducing effect on prices, and could also mean the difference between maintaining service and curtailments.

Currently, at any given hour, the amount of electricity demand is virtually independent of wholesale price. This is because the vast majority of electricity consumers do not see market prices in anything approaching real time and, for the most part, have done little if any thinking about how they could reduce their demands if power were very expensive. The Council is not advocating retail access as means of achieving price responsiveness. The states are making their decisions about when and how much to open their retail markets to competition. But developing price responsive demand does not require passing real-time market prices on to all consumers. It does mean, however, that those the suppliers who do see wholesale prices should act as intermediaries between the market and consumers to effect load reduction or shifting that is in the mutual economic interest of the consumer and the power system. We believe this will develop in time and that the current high prices will help motivate that development. However, given the tight supplies and high prices now affecting the market, the Council believes that special effort should be devoted to encouraging and facilitating the expedited development of the demand side of the market now.

#### 2. The California Effect

Among the Western States, California's electricity industry is farthest down the restructuring path. Their path is, in many ways, quite different than most other examples. They have created a market structure that is quite centralized and quite complex. For most of its three-year life, the California market demonstrated competitive power prices. However, under periods of stress, we believe there are characteristics of the California market structure and the incentives it creates that arguably result in prices that are higher than they might otherwise be. The California Independent System Operator (ISO) and experts acting in an advisory capacity to the ISO have identified these characteristics. These include restrictions on the ability of California utilities to enter into longer-term contracts, thus forcing most loads into day-ahead and hour-ahead spot markets operated by the California Power Exchange. Other facets of the market design create incentives that, when supplies are tight, result in as much as 20 percent of the load being met in a real-time market operated by the



ISO. This is not a situation conducive to moderating price spikes. We know California is studying these issues and we are hopeful that they will resolve them in a satisfactory fashion.

### 3. Did Market Participants Manipulate the Market?

Much is made of market participants exercising market power during last summer's price spikes. Clearly the prices we have seen are well above a "competitive" price, if that is defined as the operating cost of the most expensive unit on the system that must run to meet load. The ability of market participants to ask for and receive more than the competitive price can be defined as market power. However, this is also the normal functioning of a market when supplies are tight and there is no moderating effect of price responsiveness. It is neither illegal or immoral.

The Council did examine the generating records of most Northwest power plants to see if there was evidence of manipulating the market by "withholding," i.e., holding power off the market to drive up prices. We found no clear evidence of such behavior. Power plants were generally being operated as one would expect given the characteristics of the plants. Hydro plants were typically following load. Thermal plants were typically running "flat out" or, in the case of units with higher operating costs, backed down during the off-peak periods. Where there were operating patterns that might be interpreted as withholding, the quantities involved were too small to affect the market.

The Council did not have access to information that would permit analysis of the bidding strategies of different market participants. We do not know whether that information would suggest market manipulation.

### Recommendations

#### 1. Encourage the Greater Use of Risk Mitigation Mechanisms

One of the characteristics of a commodity market is the emergence of mechanisms to manage risk, and electricity is rapidly becoming a commodity market. These mechanisms include actual physical longer-term contracts for supply, futures contracts, financial hedging mechanisms, and so on. These mechanisms can limit exposure to high prices. At the same time, however, there is always the risk that they will prove more costly than the spot market. Risk mitigation comes at a cost, and it is not realistic to be fully hedged for all risk. But the experience of last summer suggests there could be greater use of risk management tools.

As noted earlier, we believe the limitations on forward contracting by California utilities was a contributing factor to the price extremes of last summer. We believe the same is true of other market participants in the Northwest and elsewhere. While opportunities to enter into forward contracts and other hedging arrangements have existed, it may be that the protracted period of low market prices for electricity lulled some market participants into believing they had no need of such mechanisms. Recognizing the commodity nature of the electricity market and taking appropriate steps to protect against the upside risk is important. Had more market participants done so, it is likely that last summer's price volatility and its impacts would have been moderated. Forward contracting is also a vehicle by which new entrants in the generation market can limit their downside risk, thereby facilitating the development of new generation.

#### 2. Evaluate the Need and Options for Further Encouraging Generation Development

As noted earlier, the Council's analysis of power supply adequacy indicated that market prices would not be sufficient to support the development of "merchant" power plants, i.e., plants selling into the spot market exclusively, until 2004. The Council has also done analyses looking at actual market prices over the past year to see if prices had been sufficient for a new entrant to cover

its variable operating costs and its fixed costs and earn a reasonable rate of return. Until last summer the answer has been "no."

With the electricity and gas prices experienced over the past year, the answer has become "yes." With the higher prices, a couple of plants not considered in the Council's adequacy study have begun construction. In the Northwest, there are now 1,276 megawatts of capacity under construction that should come on line in 2001 through 2002. There are another 2,977 megawatts that already have site certificates, 1,291 megawatts of which we judge to be "active" projects, and another 3,060 megawatts that are in or have begun the siting process. The siting process does not appear to be a problem in that there is a backlog of sites that have been permitted and many more in the process. Almost all of these are natural-gas-fired combustion turbines, and nearly all of them are located within reasonable proximity to natural gas pipelines and transmission lines. There is a similar story to be told elsewhere in the West.

The degree of developer activity is encouraging. However, if we were to experience a couple years of relatively warm, wet winters and cool summers with good hydro conditions, market prices would probably fall and many of the active projects might become inactive. If followed by a dry spell and a hot summer or a cold winter, we would be up against the supply limits again.

The question this possibility raises is whether we can rely on the market to provide sufficient capacity for reliability purposes. And if not, what are the options for assuring that there is capacity available to assure reliability and mitigate excessive price spikes? The Council intends to pursue this question.

### 3. Accelerate Efforts to Develop the Demand Side of the Market

While the lead time for the development of new combined cycle generation is relatively short, development will take some time. During that time, the region and the West are vulnerable to further price spikes and possible reliability problems. Moreover, it is not certain that the long-term market will support the level of development necessary to assure adequate reliability. Developing the demand side of the market has the potential for somewhat shorter lead times. Price-responsive demand can help mitigate price spikes and potentially avert reliability problems.

The Northwest has a great deal of successful experience in increasing the efficiency of electricity end-use as a resource. The region needs to reinvigorate those efforts in light of the market prices we are experiencing. There are cost-effective means of slowing the growth of demand that should be exploited. However, the region in particular needs to move aggressively to implement price-responsive demand management – reducing loads during periods of high prices or shifting the loads to periods of the day where prices are less. The bad news is that this region has relatively little experience with these approaches, although that is changing. The good news is that there should be significant untapped potential.

The Council believes that market-like mechanisms wherein the consumer receives a significant part of the benefit will be most effective. Pilot programs have been initiated this year in the region in which the serving utility and the load-reducing consumer share the cost savings of avoided power purchases (or the revenues from selling the freed-up power on the market). These programs appear to have been successful although limited in scope. The greatest potential for such partnerships probably exists within industry and large commercial buildings. What can be done will vary from building to building and process to process. Nevertheless, if provided the incentive, the

Council believes people will rise to the challenge. Creating these incentives should be a priority for the utilities of the region.

#### 4. California Should Correct the Incentives in their Market Structure that Contribute to Excessive Prices and Volatility

The Council believes that the California ISO and others in the California market have done a credible job of identifying the barriers and incentives created by their market structure that have contributed to excessive prices and price volatility. We know the issues are complex and politically volatile. We hope that the state can move quickly to correct these problems.

#### 5. At Least Until the Market Matures, Data for Monitoring and Evaluating the Performance of the Market Should be Available on a Timely Basis

One thing that the experience of last summer has shown is that it is difficult to obtain the data necessary to monitor and evaluate the performance of the market. Despite the fact that utilities in the Northwest were extremely cooperative, there was a delay of many weeks before the relevant data could be obtained. While the WSCC maintains a data base of generation and transmission loading data, not all generators report to the system and of those that do, the data link is not necessarily carefully maintained. Despite incompleteness data, the WSCC has chosen not to release the information to independent body like the Council, even when the Council agreed to keep the data confidential and to use the data in such a way that individual plants could not be identified. We understand the possible commercial sensitivity of some of this information. We believe, however, that there should be arrangements possible that both protect the commercial value of the information and make it possible for responsible independent parties to evaluate market performance on a timely basis. At least until the market has matured and the public has greater confidence in its operation, this should be a high priority for market participants and organizations like the Western Systems Coordinating Council, the California ISO and regional transmission organizations as they are formed.

#### 6. Electricity Emergency Process and Procedures Need to be in Place

If we are correct in our assessment that the electricity market prices experienced last summer are a warning of approaching scarcity, then establishing the processes and procedures that would be used in the event of an actual supply emergency should be a priority. Until new generation comes on line and demand-side programs can be implemented, there is significant probability that our emergency readiness will be tested. Necessary elements include an inventory of the actions that could be taken, the trigger points for taking these actions, clear definition of roles and responsibilities, and a communications plan to inform the public. We are pleased that efforts to accomplish this are underway involving the Pacific Northwest Utilities Conference Committee, the Northwest Power Pool, Bonneville, the Council, the Northwest states and region's utilities.

## **2. RTO West**

Northwest investor-owned utilities (IOUs) and Bonneville have committed to formation of an independent regional transmission organization (RTO) that would take over operation, including commercial scheduling of transactions and responsibility for reliability, from their transmission affiliates. This is in response to a Federal Energy Regulatory Commission (FERC) order intended to enhance competitive power markets by further separating control of monopoly transmission systems from deregulated generation which may still be part of the same corporate entity. A wide spectrum of Northwest interests, including the Council through its staff, are actively working on developing the Northwest RTO, currently called RTO West, during the summer of 2000.

### Timeline:

The FERC order required a filing by October 15, 2000 either setting out the details of the RTO to be put in place by December 15, 2000 or explaining the problems encountered and the steps being taken to overcome the problems. It is widely expected that FERC does not really want to see the latter and may take further action to encourage real progress if none is being demonstrated.

The filing utilities submitted a revised Transmission Operating Agreement (the agreement between the Filing Utilities and RTO West; does not include the transmission tariff) to FERC on December 1, 2000, along with a response to comments on the October 16 filing materials. The Filing Utilities now are moving on to State Two of the development process, which will address the transmission tariff that would be assessed by RTO West, congestion pricing, and other related issues.

### Background::

In December, 1999, FERC issued Order No. 2000, setting out its expectations that FERC-jurisdictional utilities (the IOUs) and other transmission owners, such as federal and public power utilities would form RTOs. The order says that an RTO filing is voluntary, even for jurisdictional utilities, but it is widely expected that FERC will take further action if voluntary responses are inadequate, using its other authorities under the Federal Power Act. The Secretary of Energy has committed the federal power marketing administrations, including Bonneville, to participate actively in the October 15 filing and the subsequent RTO. Bonneville is committed internally to the same goal.

There are eight formal work groups dealing with specific issues raised by Order 2000 that the RTO needs to address to satisfy FERC requirements:

- Pricing, dealing primarily with the recovery of fixed costs and cost shifting issues.
- Planning, dealing with creating planning mechanisms that maintain reliability and encourage market-driven system expansion to relieve congestion.
- Ancillary services, dealing with the establishment of markets for these services (e.g., spinning and supplemental reserves, regulation to maintain system frequency) that are required for the transmission of power but that are mostly provided from generation sources rather than from the transmission system itself.
- Congestion management, dealing with the creation of efficient market mechanisms for resolving competing claims to use the transmission system in the short term (typically the day-ahead to real-time market time frames).
- Market monitoring, dealing with the creation of mechanisms to evaluate market design flaws and the exercise of market power after the RTO begins operation.
- Implementation, dealing with the requirements for and hierarchical relationships among multiple control centers under an RTO regime (with an eye to reducing the number if cost effective) and with the overall budget of the RTO.
- Seams, dealing with potential incompatibilities in commercial practices at the boundaries between RTOs in the West, particularly those that would constrain power markets or create reliability problems.
- Legal, dealing with governance, contract language and legal issues raised by RTO formation, particularly those for Bonneville and other publicly owned utilities.

### **3. Regional Technical Forum**

In 1996, Congressional appropriations language charged Bonneville and the Council with forming a Regional Technical Forum on conservation evaluation and verification. Membership in the RTF includes individuals with technical expertise in conservation program planning, implementation of conservation programs and evaluation of program results. These 19 individuals represent electric utilities, other electricity service providers, government agencies, energy service companies and public interest groups. The RTF has conducted nine meetings since it was formed in July 1999.

The services of the RTF are available to all electric utilities in the Northwest. The RTF's primary task is to develop standards and protocols for verification and evaluation of energy savings. There are four specific tasks:

1. Track regional progress toward conservation and renewable resource goals.
2. Provide feedback and suggestions for improving conservation and renewable resource development programs in the region.
3. Conduct periodic reviews of the region's progress.
4. Communicate recommendations to appropriate decision-makers.

Congress called on the RTF to develop standards and protocols by which utilities could assess the effectiveness of what was then anticipated to be independent conservation activities. In addition to the tasks above, Bonneville was looking for an entity like the RTF to establish and update a recommended list of "standard" conservation measures with their estimated savings and regional value, evaluation protocols for individual projects not on the list, and a means of tracking accomplishments for its Conservation and Renewables Discount.

The RTF produced its draft list of measures, programs, estimated savings and regional power value in July 2000. Protocols for estimating savings and value for measures and programs not on the list were completed in August 2000. A web-based tracking system also was completed in August 2000. Later in the fall, the RTF made its recommendations to Bonneville regarding the discount. These included screening criteria, a list of eligible measures and activities, verification protocols for energy savings, conservation program standards, quality control criteria and a process for modifying qualifying measures and activities on the list of approved measures.

The list of measures includes more than 1,000 electrical uses in areas such as lighting, appliances, water heating, room and central air conditioning, weatherization and motors.

The RTF is an ongoing activity that includes assistance by the Council's power planning staff.

## **V. Legal Issues**

### **1. What kind of legal creature is the Council?**

The Northwest Power Act specifies that the Council is not a federal agency. The Council is also not a state agency in the usual meaning of the words, because it acts on behalf of more than one state. So what is it?

The Council is one of a small group of hybrid organizations known as interstate compact agencies. These multi-state organizations are created by an agreement among the participating states with the consent of Congress. The Council was authorized by Congress in December 1980, and came into being when each of the legislatures of the participating states passed a law agreeing to participate in the Council, subject to the conditions spelled out in the Northwest Power Act.

Interstate compact agencies are usually created to deal with issues or to manage resources that involve more than a single state. The Constitution gives most of the authority over matters between states to the federal government exclusively. In the Northwest Power Act, however, Congress gave back to the Northwest states some of this federal authority. In other words, although the Council is not a federal agency, it exercises certain powers granted to it by the federal government.

In particular, the Council has authority to adopt plans and programs that guide the actions of federal agencies. The Bonneville Power Administration is required to ensure that its actions are “consistent” with these plans and programs. Other federal agencies are required to take the Council’s fish and wildlife program into account “at each relevant stage of decision-making processes to the fullest extent practicable.” The Council also must make recommendations on Bonneville’s annual expenditure of fish and wildlife funds, based on advice of an independent scientific panel. These are unique authorities. This grant is one of only a few instances in which the federal government has given states significant power over a federal agency.

### **Federal laws applicable to the Council**

State agencies are governed by state law. Federal agencies are governed by federal law. For interstate compact agencies, there is no general body of governing law.

When Congress created the Council, it solved this problem by making a number of laws regulating federal agencies applicable to the Council. In Section 4(a)(4) of the Northwest Power Act, the open meetings law applicable to the Federal Energy Regulatory Commission, and federal laws applicable to Bonneville relating to contracts, conflicts of interest, financial disclosure, advisory committees, disclosure of information, judicial review, and “related matters” are made generally applicable to the Council.

However, Congress recognized that not all of these laws would fit the Council exactly and therefore gave the Council yet another unique authority, the power to adapt federal laws to fit its own circumstances. The Northwest Power Act says that specified federal laws “shall apply to the Council to the extent appropriate.” The legislative history of the Act explains that the Council is to

determine when it is and is not “appropriate” to follow the federal law, and explains that the Council has discretion to depart from the requirements of federal law where it has good reason to do so.

For the most part, the applicable federal laws have proved to be workable, and the Council has followed them as written. However, various administrative details have been modified to fit the Council. For example, financial disclosure forms are filed with the Council's General Counsel, not with the U.S. Department of Energy. When the Council has departed from the federal laws, it has usually made written findings explaining why the law as written was inappropriate, and how the adaptation was more appropriate.

There are a few rules regarding the financial disclosure and ethics laws that apply to the Council. The Council recently adopted a policy covering these matters, a copy of which will be provided to you. First, Council Members and staff are required to file financial disclosure forms, some parts of which are public records and some parts of which are confidential. Second, Council Members and staff may not participate in particular Council matters that will have a direct and predictable effect on their own financial interests, including, among others, those of their spouses and dependent children. Participation will be permitted in the case of *de minimis* holdings and/or if the individual is granted a waiver. The Council has always observed a blanket prohibition on holding a financial interest in some firms, primarily energy companies and fish and wildlife concerns doing business in the Western United States. While this is part of the Council's current policy, it is under review, in light of a recent change in the law. Third, Council Members and staff generally cannot accept anything of more than nominal financial value from people whose interests stand to be affected by Council actions. The Council's legal division has always advised that political activity is not disallowed, provided you are not a candidate for partisan office and you do not use your Council position for political purposes. The candidacy prohibition is currently under review. In addition, the legal division seeks guidance from other federal laws and regulations as issues arise. The legal division is available for advice on any questions that may arise with Council Members and staff.

### **State laws applicable to the Council**

While federal laws govern most of what the Council does as a body, some state laws are still applicable to individual Council members and Council staff. In particular, Council members are officers of their respective states, and, if paid by their states, are state employees subject to the various state laws and regulations that apply to state officers and employees, including requirements governing how much time must be devoted to Council activities, state salary schedules, and the like. These state laws apply to Council members so long as they do not conflict with the federal laws that are made applicable under Section 4(a)(4).

Employees in the Eastern Washington office are state employees and, like Council members, are employed subject to the laws and regulations of their state governments. Employees of the Council's central office and the remaining Council offices are employees of the Council, rather than of a single state. The Council sets the salaries, benefits, employment conditions, and the retirement plans for the central staff. In questions of labor laws and workers compensation, the Council follows the applicable laws of each state as applied to non-profit and governmental organizations.

In some instances, state and federal laws applicable to Council members may overlap or have conflicting requirements. Only rarely has such overlap resulted in a public debate. In 1988, for example, an Oregon member who was leaving the Council was offered employment with a public utility. Under the federal conflict of interest law, the member was allowed to take the job. Under

Oregon conflict of interest law, the member was not allowed to take the job. The Council took the position that the federal law preempted state law on this point. A protective lawsuit was filed by the utility based on threats of prosecution by the Oregon Attorney General. However, nothing further came of the matter, and the suit was eventually withdrawn.

### **Liability and indemnification**

As of 1988, the attorneys general of each of the Northwest states had confirmed in writing that Council members from their state were considered state employees for liability purposes, and that each state was obligated to defend Council members and pay judgments rendered against them in the same manner as with other state employees. Thus, it is unlikely that any Council member would be subject to personal liability for an official action taken while a Council member.

The Council has also entered into an indemnification agreement with each of its members, promising to defend claims and pay judgments. The indemnification appears in Chapter 19 of the Council's bylaws.

For the first several years of its existence, the Council was able to obtain an insurance policy to cover such claims. However, as a result of the Washington Public Power Supply System (WPPSS) nuclear power plant bond default, the premiums for this type of insurance increased enormously, and the available policies contained exclusions removing coverage for decisions relating to nuclear plants and other power planning decisions. For these reasons, the Council chose to adopt an indemnification agreement rather than to continue to purchase this type of insurance.

The Council continues to maintain a normal commercial liability policy, which covers such matters as personal injuries on Council premises. This policy also covers Council members while driving rental cars on Council business. It is therefore not necessary for Council members to purchase the optional additional insurance offered by rental car companies when renting cars on Council business.

## **2. Procedures for Amending the Council's Power Plan and Fish and Wildlife Program**

In developing the Power Plan and the Fish and Wildlife Program, the Northwest Power Act directs the Council to observe certain procedures unique to the Power Act, the informal rulemaking procedures of the federal Administrative Procedure Act (APA) and any other procedures the Council may adopt. The Council must hold public hearings in each of the member states before adopting the plan or program, or substantial, non-technical amendments to either. The Council must review the plan at least every five years.

### **Power plan amendments**

For purposes of power plan amendments, the federal APA requires public notice of proposed amendment or a description of the subjects and issues involved, and a statement of how the public may participate in the process. The public must be given an opportunity to submit written material.

Once the period for public comment has closed, people outside the Council may be foreclosed from communicating with the staff and Council members on the subject of the rulemaking. In some rulemakings the Council has allowed limited, additional public comment up to



the time of decision, although the Council must have enough time to analyze all comments before taking final action.

An agency must give a concise general statement of the basis and purpose of the rules it adopts. The Council, following an approach approved by the courts, has satisfied this requirement by publishing a Response to Comments, which briefly summarizes the major comments received and explains how the Council has dealt with them.

### **Fish and wildlife program amendments**

The Fish and Wildlife Program is published separately from the Power Plan, although it is legally an element of the Plan. But the Act sets out specific procedural requirements for developing and amending the Fish and Wildlife Program that make it quite distinct from the Power Plan.

In amending the Fish and Wildlife Program, the Act requires the Council to request from the region's fish and wildlife agencies and appropriate Indian tribes recommendations for measures for fish and wildlife affected by hydropower in the Columbia and its tributaries. Section 4(h)(2) of the Act provides that recommendations must be solicited prior to the development or review of the power plan, or any major revision to the plan. Others may also make such recommendations. Once the Council has received these recommendations, along with supporting documentation, it must make them available for comment. Typically, the Council also issues its own draft fish and wildlife amendments, which reflect the Council's attempt to fit the recommendations into a systemwide context, and invites public comment. The Council must act on the recommendations within one year. The Council may reject a recommendation only for certain reasons spelled out in Section 4(h)(7) of the Act. If the Council rejects a recommendation, it must give its reasons in writing.

The role of the fish and wildlife agencies and Indian tribes is particularly important. Not only must the Council solicit their recommendations for fish and wildlife measures, but if there are conflicting recommendations, the Council must consult with the tribes and agencies and give "due weight" to "their recommendations, expertise and legal rights and responsibilities" in resolving the inconsistency. In determining which recommendations to accept, moreover, the Council must determine whether a proposed measure would: (1) "complement the existing and future activities" of the agencies and tribes, and (2) be consistent with the tribes' legal rights. In 1994, the federal appeals court said, in dicta, that the Council must give a "high degree of deference" to the fish and wildlife agencies and tribes.

The 1994 court opinion also said that the program must include sound biological objectives to structure the program and guide Council decisions.

Because the Fish and Wildlife Program must be based on recommendations submitted to the Council, and because the Council must make findings on any recommendations it rejects, program amendment processes are organized around the recommendations. Most of the comments the Council receives are directed to recommendations, and most of the Council's responses to comments are made in findings.

### **Petitions for rulemaking**

The APA also requires administrative agencies to give interested persons the right to petition for the issuance, amendment or repeal of an administrative rule, such as changes in the Power Plan

or Fish and Wildlife Program. The Council has adopted a policy for how it will treat such petitions. A petition must set forth the substance or text of a proposed amendment or identify the provision to be repealed; explain the interest of the petitioner; and set forth the facts, reasons and new information that support the petitioner's request. The Council will conduct such study as it deems appropriate and within 120 days of receipt of the petition, grant or deny it. If an amendment process results from the petition process, the Council has committed to completing the process within seven months from the decision to begin the amendment process.

### **3. Council interpretations of the Northwest Power Act**

#### **Section 6(c)**

In November 1986, the Northwest Power Planning Council and the Bonneville Power Administration each issued complementary policy statements on the implementation of Section 6(c) of the Northwest Power Act. Section 6(c) requires Bonneville to submit certain proposals related to major resources to a public review process to determine whether they are consistent with the Council's Northwest Power Plan. The Council then has the right to make its own determination regarding consistency. If either Bonneville or the Council finds a resource inconsistent with the power plan, the resource can be acquired only after congressional action.

The Act identifies as "major" resources those over 50 megawatts with more than five years' duration.

The purpose of review under Section 6(c) is to ensure that a major resource is needed and is cost-effective before the Northwest invests a great deal of money in it. The process speaks directly to the balance of power between state and federal interests. The Northwest Power Act established Bonneville's authority to acquire resources, but it also gave the states, through the Council, the right to review those acquisitions before committing ratepayers to large expenditures.

In March 1993, the Council and Bonneville completed a five-year review of their respective 6(c) policies. The region had had little experience under Section 6(c) in the years since the adoption of the original policies, and therefore, little was changed. The revised policies were expanded, however, to cover all the Bonneville proposals made subject to review under the terms of the Act. In early 1998, in light of the restructuring occurring in the utility industry, the Council and Bonneville decided to postpone for five years further review of their 6(c) policies.

#### **Section 5(d)**

Bonneville was authorized under Section 5(d) of the Act to sign power sales contracts on special terms with existing direct service industrial customers (DSIs) for an amount of power that each customer was receiving under its earlier contract. The DSIs are customers that had industrial firm power contracts with Bonneville in 1975. The Act expressly precluded sales to new direct service industrial customers, but did permit Bonneville to sell additional power to existing DSIs, provided Bonneville and the Council made certain findings.

In late 1989, Bonneville tentatively agreed to sell additional power to an existing DSI customer without the review called for under Section 5(d), provided the customer could arrange an assignment of unused contract demand from another existing direct service customer. Bonneville took the position that Section 5(d) review was not required so long as the total amount of power it

sold to the DSIs did not exceed the aggregate amount to which all the DSIs were entitled when the Act was passed. Public comment brought this proposed transaction to the Council's attention.

The Council has adopted an interpretation of Section 5(d) that requires review whenever a proposed sale to an individual DSI would result in that DSI receiving more power than it received under its initial entitlement. The Council's interpretation does not call for review if an existing DSI assigns its power sales contract to a successor in interest for use at the same location for purposes similar to those established under the original contract. Except for transfers of the sort just described, an amendment or assignment of a contract that results in the delivery of additional power to an existing DSI is a sale subject to Section 5(d) review.

#### **4. Litigation**

##### **Seattle Master Builders Association, et al. v. Northwest Power Planning Council**

On April 10, 1986, the United States Court of Appeals for the Ninth Circuit decided this challenge to the Council's model conservation standards (MCS) brought by several construction-related organizations. The petitioners had advanced two principal lines of argument. First, with respect to the Council's model conservation standards, petitioners challenged the cost effectiveness of the measures to make new residential buildings more energy efficient, and the methodologies used by the Council to determine cost effectiveness. Petitioners also argued that the Council should have prepared an environmental impact statement regarding promulgation of the standards.

Second, petitioners challenged the constitutionality of the Council, citing the appointments clause of the U.S. Constitution, which requires officers of the United States to be appointed by the executive branch of government. Council members are officers of an interstate compact agency appointed by the governors of the four Northwest states and not by the President.

The Bonneville Power Administration intervened in the case and ultimately argued that the Council's adoption of the MCS did not violate the constitution. Bonneville said that the Council's model conservation standards did not impose a legal obligation on anyone, and therefore adoption of the standards was not the sort of exercise of significant authority over a federal agency that might require Council members to be appointed by the executive branch.

In earlier communications, however, regarding what posture the Department of Justice should adopt, the Department of Energy had taken a more aggressive position. The Secretary of Energy, Don Hodel, wrote to Justice in early 1985 and urged that if the Council were, indeed, anything more than advisory, and if it could, in fact, significantly limit Bonneville's actions, it ought to be found unconstitutional and replaced by a federal council. John Dingell, the Chairman of the House Energy and Commerce Committee that drafted the Northwest Power Act, wrote a strong letter in opposition to Energy's request. Mr. Dingell fully supported the view that the Council was intended to be more than an advisory body, with functions that are more significant than the Secretary of Energy had contended. He also concluded that the Council was properly formed and was operating according to the expectations of Congress.

In a two-to-one decision, the Ninth Circuit ruled for the Council on all the issues. With respect to the model conservation standards, the court held that the Council had adopted a proper approach to determining the cost effectiveness of conservation measures; that the methodology the Council used for determining conservation value was within the Council's discretion; and that the

Council was not obliged to prepare an environmental impact statement on the standards, pursuant to the laws of the states that are members of the interstate compact. On the constitutional question, the court noted that the functions of the Council and Bonneville “directly overlap,” and held that the Council “violates neither the compact nor appointments clauses of the United States Constitution. The Act established an innovative system of cooperative federalism under which the states, within limits provided by the Act, can represent their shared interests in maintenance and development of a power supply in the Pacific Northwest and in related environmental concerns.”

The Master Builders petitioned the Ninth Circuit for rehearing en banc (before a larger panel of judges in the circuit) on the ground that the panel overlooked material laws and facts. The United States also petitioned for rehearing or for rehearing en banc, arguing that the court decided constitutional questions not presented by the case. The Ninth Circuit denied both petitions. The Master Builders’ subsequent petition for certiorari was denied by the Supreme Court of the United States.

### **Northwest Conservation Act Coalition, et al. v. Northwest Power Planning Council**

The Coalition and the Natural Resources Defense Council filed a petition for review in the Ninth Circuit challenging the model conservation standards amended in 1986, in an effort to make the requirements of the amended standards more rigorous. In particular, petitioners alleged that the Council’s standards for conservation in new commercial buildings ought to be more stringent; that a surcharge is necessary if the standards governing the energy efficiency of buildings that convert to electric space heat are to be effective; and that the Council’s amended standards ought to contain standards for utility-financed incentives to conserve electricity in existing residences. Upon petitioners’ request, the Council entered rulemaking to amend the standards in the respects summarized above. Petitioners then dismissed their suit in the Ninth Circuit.

### **Cascade Natural Gas Corp. v. Evans**

In 1983, six regional natural gas companies brought suit challenging the Council’s plan, arguing, among other things, that the Council had unfairly ignored natural gas as a conservation resource. The case was settled before trial and the Council agreed to modify the plan to make clear that the model conservation standards apply only to electrically heated homes. The Council also said that it would consider modifying the plan if significant fuel switching from natural gas to electricity were demonstrated. The terms of this settlement expired on April 27, 1988.

### **CASE, The Utility Reform Project and Michael Rose v. Northwest Power Planning Council**

In May of 1986, CASE (Citizens for and Adequate Supply of Energy), The Utility Reform Project and Michael Rose filed suit in the Ninth Circuit, challenging certain portions of the 1986 model conservation standards. Petitioners also asked the Council to enter rulemaking to address the matters raised in the Ninth Circuit. In response to these two actions, the Council: Clarified that its then current MCS rulemaking addressed model standards for new residential and commercial buildings at federal agency facilities; committed to assess the conservation potential of existing buildings and other electricity uses at federal agency facilities as part of the next major plan revision; and extended the period for comment and consultation on MCS for federal agency customers beyond the deadline for the then current MCS rulemaking. The Council also agreed to defer action on the CASE petition to enter rulemaking to develop model conservation standards for the direct service industries, pending further analysis of increased interruptibility of the direct service industries, which

the Council agreed to conduct before calling for Bonneville acquisition of new resources or before the next major revision of the Power Plan, whichever is first. As a result of these actions by the Council, the petitioners agreed to settle the case.

**Northwest Resource Information Center, Inc., et al v. Northwest Power Planning Council; Confederated Tribes and Bands of the Yakima Indian Nation v. Northwest Power Planning Council (the “Phase Two” cases)**

To act as quickly as possible to improve conditions for salmon and steelhead, which were then proposed for listing under the Endangered Species Act, beginning in August 1991 the Council began a multi-phase rulemaking on salmon and steelhead measures. In January 1992, the Council published its notice of final action on measures dealing with increased flows and drawdown of the lower Snake River. Three petitions were subsequently filed challenging the measures, one by the Northwest Resource Information Center, Trout Unlimited, the Oregon Natural Resources Council, Idaho Steelhead and Salmon Unlimited, and The Wilderness Society, represented by the Sierra Club Legal Defense Fund; a second petition was filed by the Yakama Tribe; and a third was filed by a group of aluminum companies and other industrial customers of the Bonneville Power Administration. After the petitions had been filed, 15 to 20 additional parties intervened, including Oregon Trout, the United States government, a number of utilities and the State of Idaho.

On September 9, 1994, the Court ruled that the Council had not adequately explained its reasons for rejecting amendment recommendations because the Council’s findings on the recommendations were put in a separate document, rather than in the fish and wildlife program itself. The Court also held that the Council’s findings in an early phase of the amendment process were voided by findings in a later phase. While the Court’s holdings were limited to these procedural matters, the opinion offered extensive interpretations (called “dicta” because they are not strictly binding) of the Northwest Power Act. Some of the dicta told the Council that it should give a “high degree of deference” to the fish and wildlife agencies’ and Indian tribes’ recommendations and expertise, and that the Council’s discretion to reject these recommendations is narrow. The Court remanded the Strategy for Salmon for the Council to develop new findings.

**A.H. Canada v. Northwest Power Planning Council**

In 1994, Mr. Alfred H. Canada, a retired power engineer, sued the Council in federal District Court. Mr. Canada sought to overturn the Council’s denial of a petition for rulemaking he had earlier filed. The rulemaking would have considered replacing the plan’s call for conservation with an equivalent amount of solar photovoltaics. The District Court dismissed, reaffirming the established rule that suits challenging final actions of the Council are to be brought in the Ninth Circuit Court of Appeals.

**Nez Perce and other tribes v. Northwest Power Planning Council**

In 1997, four Indian tribes challenged the Council’s recommendations pursuant to Section 4(h)(10)(D) of the Northwest Power Act regarding the Bonneville Power Administration’s fish and wildlife expenditures. The petitioners and the Council agreed to withdraw the case in 2000 and asked the Ninth Circuit Court of Appeals to dismiss it.

## **VI. Administrative Issues**

### **1. Finance and Administration**

#### **Council funding**

Expenses of the Council necessary for carrying out its functions and responsibilities under the Northwest Power Act are paid from funds received from the Bonneville Power Administration. Funds are advanced to the central office from Bonneville on a request basis. Each state, in turn, requests funds to be advanced from the central Council office to the state to cover the operating expenses of the state Councils.

Costs associated with the operation of the Council's central office in Portland are paid for from the central office budget. Expenses for each state Council office are paid from each state Council budget by the central office accounting and payroll systems.

#### **Budgets**

The Act requires the Council to develop annual (state and central office) budgets for transmittal to the Bonneville Power Administration and which are included in Bonneville's budget submittal to the Department of Energy, Office of Management and Budget, and Congress.

That limits the Council's budget to an amount equal to 0.02 mills multiplied by the kilowatt hours of firm power forecast to be sold by the Bonneville Administrator during the year to be funded. In most years, this limitation represents approximately \$2 million. However, based on an annual showing by the Council that such limitation will not permit the Council to carry out its functions and responsibilities under the Act, the Administrator may raise such limit to any amount not in excess of 0.10 mills. In most years, this maximum limitation represents approximately \$10 million. From 1981 to 2001, the Council's budget has ranged from approximately \$5.9 million to \$8.5 million annually, but the Council currently is on a \$1.7 million budget reduction trajectory from approximately \$8.0 million in Fiscal Year 1997 to \$6.2 million in Fiscal Year 2001. These reductions were intended to conform with the Council budget cap that was anticipated to occur from the phase-out of Bonneville's residential exchange of firm power sales in 2001. Early in Fiscal Year 2001, however, it became apparent from Bonneville's rate case filing for the period 2002-2006 that the residential exchange sales will not be phased out. However, the Council's cost-cutting from Fiscal Year 1998 through Fiscal Year 2001 is projected to achieve approximately \$5 million for Bonneville.

The Council's annual budget process occurs between the months of March and June. Each state Council office develops its budget (usually on a biennial basis) which is approved through the state legislative process and then integrated with the Council's central office budget.

The Council's draft budget is distributed for a 30 to 60-day public review and comment period during which time consultations are held with interested parties regarding the Council's proposed funding requirements. Following final revision and adoption by the Council, the budget is transmitted to Bonneville.

## **Audits**

The U.S. General Accounting Office (GAO) is the government entity authorized to audit the Council's fiscal and program operations. However, the Council, through an agreement with Bonneville, engages an independent CPA firm to conduct annual financial audits of the Council's operations. A copy of these audits is forwarded to the Portland office of the General Accounting Office and to other interested parties, as well as being included in the Council's Annual Report to Congress. In addition, state audit agencies audit each state Council office's fiscal operations in the course of their regular state agency audit schedules. In 1996, the GAO conducted an extensive audit of the Council's business policies and practices. That audit resulted in a very positive finding by the GAO.

## **Council organization**

The Act provides that the Council shall determine its organization and prescribe its practices and procedures for carrying out its functions and responsibilities under the Act.

### State offices

Council members organize and staff their state offices based on the level of support they determine necessary. This typically includes technical assistants and/or policy analysts in the areas of power planning, fish and wildlife, and public information and public involvement. Administrative support is also provided.

Council members may also use outside contractors or the technical services of state agencies to conduct special studies and analyses regarding issues stemming from the power plan and the fish and wildlife program as they impact their respective states.

State staff are usually employees of the state. State laws, rules and regulations are applicable. There are some exceptions where state support for Council members is administered (payroll, travel and office expenses) by the central office.

### Central office

The central office provides overall support to the Council in the areas of power planning, fish and wildlife, public affairs, legal matters, and finance and administration.

Staffing levels for the central office are established by the Council in its budget. All personnel actions are authorized by the executive director after consultation/approval by the Council chairman. Staff compensation plans and benefit programs are established by the Council based on recommendations by outside consultants, and are subject to periodic reviews by the consultant with the Council.

Travel rules and expense reimbursement policies for central staff are set by the Council.

Contracts to assist the Council in carrying out its responsibilities are awarded on a competitive basis. Contracts over \$25,000 require approval by the full Council.

The central office also provides computing and information systems support to the state offices augmented by occasional assistance from state agencies and local vendors.

## **VII. Glossary of Terms used in the Fourth Northwest Power Plan**

### **administrative costs**

Certain overhead costs related to conservation or generating resources, such as project management and accounting costs incurred by utility or contractor staff.

### **alternating current (AC)**

An electric current in which the electrons flow in alternate directions. In North American electrical grids, this reversal of flow is governed at 60 cycles per second (Hertz). With some exceptions (see “direct current”), commercial electric generation, transmission and distribution systems operate on alternating current.

### **anadromous fish**

Fish that hatch in freshwater, migrate to the ocean, mature there, and return to freshwater to spawn. For example, salmon or steelhead trout.

### **available technology**

In the power plan, the term “available technology” refers to equipment or facilities for generating and conservation resources, including electrical appliances, that are currently available and are expected to be generally available in the marketplace during the 20-year planning period.

### **average cost pricing**

A concept used in pricing electricity. The average cost price is derived by dividing the total cost of production by the total number of units sold in the same period to obtain an average unit cost. This unit cost is then directly applied as a price.

### **average megawatt or average annual megawatt**

Equivalent to the energy produced by the continuous operation of one megawatt of capacity over a period of one year. (Equivalent to 8.76 gigawatt-hours, 8,760 megawatt-hours or 8,760,000 kilowatt-hours.)

### **avoided cost**

An investment guideline, describing the value of conservation and generation resource investments in terms of the cost of more expensive resources that would otherwise have to be acquired.

### **base loaded resources**

Base loaded electricity generating resources are those that generally are operated continually except for maintenance and unscheduled outages.

### **billing credit**

Under the Northwest Power Act, a payment by Bonneville to a customer (in cash or offsets against billings) for actions taken by that customer to reduce Bonneville's obligations to acquire new resources.



**Bonneville Power Administration (Bonneville)**

A federal agency that markets the power produced by Federal Base System resources and resources acquired under the provisions of the Northwest Power Act of 1980. Bonneville sells power to public and private utilities, direct service industrial customers and various public agencies. The Northwest Power Act charges Bonneville with other duties, including pursuing conservation, acquiring sufficient resources to meet its contract obligations, funding certain fish and wildlife recovery efforts and implementing the Council's plan.

**Btu (British thermal unit)**

The amount of heat energy necessary to raise the temperature of one pound of water one degree Fahrenheit (3,413 Btus are equal to one kilowatt-hour).

**Buy-back program**

A conservation program that, in effect, purchases electrical energy in the form of conservation measures installed by a consumer. The consumer is paid a certain amount per kilowatt-hour of energy saved.

**callback**

A power sale contract provision that gives the seller the right to stop delivery of power to the buyer when it is needed to meet other specified obligations of the seller.

**capacity**

The maximum power that a machine or system can produce or carry under specified conditions. The capacity of generating equipment is generally expressed in kilowatts or megawatts. In terms of transmission lines, capacity refers to the maximum load a line is capable of carrying under specified conditions.

**climate zone**

As part of its model conservation standards, the Council has established climate zones for the region based on the number of heating degree days, as follows: Zone 1: 4,000 to 6,000 heating degree days (the mild maritime climate west of the Cascades and other temperate areas); Zone 2: 6,000 to 8,000 heating degree days (the somewhat harsher eastern parts of the region); and Zone 3: more than 8,000 heating degree days (western Montana and higher elevations throughout the region).

**coal gasification**

The process of converting coal to a synthetic gaseous fuel.

**cogeneration**

The sequential production of electricity and useful thermal energy. This is frequently accomplished by the recovery of reject heat from an electric generating plant for use in industrial processes, space or water heating applications. Conversely, cogeneration can be accomplished by using reject heat from industrial processes to power an electricity generator.

**combined-cycle power plant**

The combination of a gas turbine and a steam turbine in an electric generation plant. The waste heat from the gas turbine provides the heat energy for the steam turbine.

**combustion turbine**

A turbine engine generator, often fired by natural gas or fuel oil, used to generate electricity. The turbine generator is turned by combustion gases rather than heat-created steam.

**conductor**

Wire or cable for transferring electric power.

**conservation**

According to the Northwest Power Act, any reduction in electric power consumption as a result of increases in the efficiency of energy use, production or distribution.

**construction lead time**

The length of time between a decision to construct a resource and when the resource is expected to deliver power to the grid. Generally defined for purposes of this plan as the interval between detailed engineering and equipment order to completion of start-up testing.

**cost-effective**

According to the Northwest Power Act, a cost-effective measure or resource must be forecast to be reliable and available within the time it is needed, and to meet or reduce electrical power demand of consumers at an estimated incremental system cost no greater than that of the least-costly, similarly reliable and available alternative or combination of alternatives.

**cost of debt**

The amount paid to the holders of debt (bonds and other securities) for use of their money. Generally expressed as an annual percentage in the power plan.

**cost of equity**

Earnings expected by a shareholder on an investment in a company. Generally expressed as an annual percentage in this plan.

**critical period**

The sequence of low water conditions during which the regional hydropower system's least amount of energy can be generated (see "critical water") while drafting storage reservoirs from full to empty. Under the Pacific Northwest Coordination Agreement, critical period is based on the lowest multi-month streamflow observed since 1928. Based on analysis of streamflows at The Dalles Dam, this is also the lowest streamflow since recordkeeping began in 1879.

**critical water**

The sequence of streamflows in the critical period under which the hydropower system will generate about 12,500 average megawatts. In an average year, the Northwest hydropower system will produce about 16,600 average megawatts.

**curtailment**

An externally imposed reduction of energy consumption due to a shortage of resources.

**debt**

Investment funds raised through the sale of securities having fixed rates of interest.

**debt/equity ratio**

The ratio of debt financing to equity financing used for capital investment.

**demand forecast**

An estimate of the level of energy that is likely to be needed at some time in the future. The Council's demand forecast contains a range of estimated consumption based on various assumptions about demographics and the state of the economy.

**direct application renewable resource**

Technologies that use renewable energy sources to perform a task without converting the energy into electricity. These sources and their functions may include wood for space heat, solar for space heat and drying, geothermal space and water heating, and wind machines used for mechanical drive (such as pumping).

**direct current (DC)**

An electrical current in which the electrons flow continuously in one direction. Direct current is used in specialized applications in commercial electric generation, transmission and distribution systems.

**direct service industry**

An industrial customer that buys power directly from the Bonneville Power Administration. Most direct service industries are aluminum smelting plants.

**discount rate**

The rate used in a formula to convert future costs or benefits to their present value.

**dispatch**

Operating control of an integrated electrical system involving operations such as control of the operation of high-voltage lines, substations or other equipment.

**distribution**

The transfer of electricity from the transmission network to the consumer. Distribution systems generally include the equipment to transfer power from the substation to the customer's meter.

**drawdown**

Release of water from a reservoir for purposes of power generation, flood control, irrigation or other water management activity.

**economic feasibility**

The Northwest Power Act requires all conservation measures to be "economically feasible" for consumers. The Act does not define this concept. In this plan, the Council considers a program or measure to be economically feasible if the measure or program results in the minimum life-cycle costs to the consumer, taking into account financial assistance made available pursuant to other provisions of the Act.

**end use**

A term referring to the final use of energy. In the aggregate, it is used the same as “energy demand.” In a more detailed use, it often refers to the specific energy services (for example, space heating), or the type of energy-consuming equipment (for example, motors).

**energy**

That which does, or is capable of doing, work. Energy is measured in terms of the work it is capable of doing. Electrical energy is commonly measured in kilowatt-hours, or in average megawatts (8,760,000 kilowatt-hours).

**energy services**

The actual service energy is used to provide (for example, space heat, refrigeration, transportation).

**equity**

Investment funds raised through the sale of shares of company ownership.

**equivalent availability**

The ratio of the maximum amount of energy a generating unit can produce in a fixed period of time, after adjustment for expected maintenance and forced outage, to the maximum energy it could produce if it ran continuously over the fixed time period. This represents an upper limit for a long-run (annual or longer) capacity factor for a generating unit. For example, a unit with an equivalent availability of 70 percent and a capacity of 500 megawatts could be relied on to produce 350 average megawatts of energy over the long term, if required.

**externality**

Any costs or benefits of goods or services that are not accounted for in the price of the goods or services. Specifically, the term given to the effects of pollution and other environmental effects from power plants or conservation measures.

**Federal Base System**

The system includes the Federal Columbia River Power System hydroelectric projects, resources acquired by the Bonneville Power Administration under long-term contracts prior to the Northwest Power Act, and resources acquired to replace reductions in the capability of existing resources subsequent to the Act.

**Federal Energy Regulatory Commission (FERC)**

A federal agency that regulates interstate aspects of electric power and natural gas industries. It has jurisdiction over licensing of hydropower projects and setting rates for electricity sold between states. FERC was formerly the Federal Power Commission.

**firm capacity**

That portion of a customer’s capacity requirements for which service is assured by the utility provider.

**firm energy**

That portion of a customer’s energy load for which service is assured by the utility provider. That portion for which service is not assured is referred to as “interruptible.”

**firm energy load carrying capability (FELCC)**

The amount of firm energy that can be produced from a hydropower system based on the system's lowest recorded sequence of streamflows and the maximum amount of reservoir storage currently available to the system.

**firm surplus**

Firm energy in excess of the firm load.

**fuel cycle**

The series of steps required to produce electricity from power plants. The fuel cycle includes mining or otherwise acquiring the raw fuel source, processing and cleaning the fuel, transporting, generating, waste management and plant decommissioning.

**generation**

The act or process of producing electricity from other forms of energy.

**geothermal**

Useful energy derived from the natural heat of the earth as manifested by hot rocks, hot water, hot brines or steam.

**head**

The vertical height of water in a reservoir above the turbine.

**heat engines**

Devices that convert thermal energy to mechanical energy. Examples include steam turbines, gas turbines internal combustion engines and Stirling engines.

**heat rate**

The amount of input (fuel) energy required by a power plant to produce one kilowatt-hour of electrical output. Expressed as Btu/kWh.

**heating degree days**

A measure of the amount of heat needed in a building over a fixed period of time, usually a year. Heating degree days per day are calculated by subtracting from a fixed temperature the average temperature over the day. Historically, the fixed temperature has been set at 65 degrees Fahrenheit, the outdoor temperature below which heat was typically needed. As an example, a day with an average temperature of 45 degrees Fahrenheit would have 20 heating degree days, assuming a base of 65 degrees Fahrenheit.

**hydroelectric power (hydropower)**

The generation of electricity using falling water to turn turbo-electric generators.

**independent power producer (IPP)**

An independent power producer is a power production facility that is not part of a regulated utility. Power production facilities that qualify under PURPA (see "qualifying facility") are considered independent power producers, together with other independent power production facilities, such as independently owned coal-fired generating plants.

**infiltration control**

Conservation measures, such as caulking, better windows and weatherstripping, which reduce the amount of cold air entering or warm air escaping from a building.

**insolation**

The rate of energy from the sun falling on the earth's surface, typically measured in watts per-square meter.

**integrated resource planing** See "least-cost planning."

**interruptible power**

Power that, by contract, can be interrupted in the event of a power deficiency.

**intertie**

A transmission line or system of lines permitting a flow of electricity between major power systems.

**investor-owned utility**

A utility that is organized under state law as a corporation to provide electric power service and earn a profit for its stockholders.

**ISAAC**

A computer model used by the Council to simulate system operation, decisions to option and build resources, and the associated costs of providing power across a large number of possible load forecasts. ISAAC accounts for the effects of uncertainty on the load forecast variations in hydropower availability for analyzing various resource strategies. The Council uses the model to help choose the best mix of resources and to establish the power plan Action Plan.

**kilowatt (kW)**

The electrical unit of power that equals 1,000 watts.

**kilowatt-hour (kWh)**

A basic unit of electrical energy that equals one kilowatt of power applied for one hour.

**lead time**

The length of time it takes to move a resource from concept to completion.

**least-cost planning**

Least-cost planning or, as it is often called, "integrated resource planning," is a name given to the power planning strategy and philosophy adopted by the Council. This strategy recognizes load uncertainty, embodies an emphasis on risk management, and reviews all available and reliable resources to meet current and future loads. The term "least-cost" refers to all costs, including capital, labor, fuel, maintenance, decommissioning, known environmental impacts and difficult-to-quantify ramifications of selecting one resource over another.

**levelized life-cycle cost**

The present value of a resource's cost (including capital, financing and operating costs) converted into a stream of equal annual payments. This stream of payments can be converted to a unit cost of energy by dividing them by the number of kilowatt-hours produced or saved by the resource in associated years. By levelizing costs, resources with different lifetimes and generating capabilities can be compared.

**life-cycle costs** See “levelized life-cycle cost.”

**load**

The amount of electric power required at a given point on a system.

**load forecast**

An estimate of the level of energy that must be generated to meet a need. This differs from a demand forecast in that transmission and distribution losses from the generator to the customer are included.

**load path**

One future scenario for electric load growth, as opposed to a range that accommodates multiple forecasts of future load growth.

**lost-opportunity resources**

Resources that, because of physical or institutional characteristics, may lose their cost-effectiveness unless actions are taken to develop these resources or to hold them for future use.

**major resource**

According to the Northwest Power Act, a resource with a planned capability greater than 50 average megawatts and, if acquired by Bonneville, acquired for more than five years.

**manufactured home**

A structure, such as a mobile home, that is transportable in one or more sections, and that is built on a permanent chassis and designed to be used as a dwelling, with or without a permanent foundation, when connected to the required utilities. These homes must comply with the Manufactured Home Construction and Safety Standards issued by the U.S. Department of Housing and Urban Development.

This does not include other categories of homes whose components are manufactured, such as modular, sectional, panelized and pre-cut homes. These homes must comply with state and local building codes.

**marginal cost**

The cost of producing the last unit of energy (the long-run incremental cost of production). In the plan, “regional marginal cost” means the long-run cost of additional consumption to the region due to additional resources being required. It does not include consideration of such additional costs to any specific utility due to its purchases from Bonneville at average cost.

**measure**

In the power plan, a measure refers to either an individual conservation measure or action or a combination of actions.

**megawatt (MW)**

The electrical unit of power that equals one million watts or one thousand kilowatts.

**mill**

A tenth of a cent. The cost of electricity is often given in mills per kilowatt-hour.

**model conservation standards**

Any energy-efficiency program or standard adopted by the Council, including, but not limited to: 1) new and existing structures; 2) utility, customer and governmental programs; and 3) other consumer actions for achieving conservation. The most well-known are the energy-efficient building standards developed by the Council for new electrically heated buildings.

**Monte Carlo simulation**

The mathematical simulation of uncertain events having known probability characteristics by random sampling from a known probability distribution function.

**municipal solid waste (MSW)**

Refuse offering the potential for energy recovery. Technically, residential, commercial and institutional discards. Also included in the definition of municipal solid waste for purposes of this plan are non-hazardous processable byproducts from manufacturing activities. Not included are combustible byproducts of the lumber, wood products, paper and allied products industries. These are considered separately as mill residue.

**net billed plants**

Refers to the 30 percent share of the Trojan Nuclear Plant, all of Washington Public Power Supply System's nuclear project 1 (WNP-1) and WNP-2, and 70 percent of WNP-3.

**net billing**

A financial arrangement that allowed Bonneville to underwrite the costs of electric generating projects. Utilities that owned shares in thermal projects, and paid a share of their costs, assigned to Bonneville all or part of the generating capability of these resources. Bonneville, in turn, credited and continues to credit the wholesale power bills of these utilities to cover the costs of their shares in the thermal resources. Bonneville then sells the output of the thermal plants, averaging the higher costs of the thermal power with lower-cost hydropower.

**nominal dollars**

Dollars that include the effects of inflation. These are dollars that, at the time they are spent, have no adjustments made for the amount of inflation that has affected their value over time.

**non-firm energy**

Energy produced by the hydropower system that is available with water conditions better than critical and after reservoir refill is assured. It is available in varying amounts depending upon season and weather conditions.

**non-utility generator**



A generic term for non-utility power plant owners and operators. Non-utility generators include qualifying facilities, small power producers and independent power producers.

**option**

As used in the power plan, a project that has been sited, licensed and designed, but not yet constructed. Options are held in inventory until new resources are clearly needed.

**overnight cost**

Total of all direct and indirect project construction costs, including engineering, overhead costs, fees and contingency. Exclusive of costs attributable to interest and escalation incurred during construction.

**Pacific Northwest (the region)**

According to the Northwest Power Act, the area consisting of Oregon, Washington, Idaho and Montana west of the Continental Divide, and those portions of Nevada, Utah and Wyoming that are within the Columbia River Basin. It also includes any contiguous areas not more than 75 miles from the above areas that are part of the service area of a rural electric cooperative served by Bonneville on the effective date of the Act and whose distribution system serves both within and outside of the region.

**Pacific Northwest Coordination Agreement**

An agreement between federal and nonfederal owners of hydropower generation on the Columbia River system. It governs the seasonal release of stored water to obtain the maximum usable energy subject to other uses.

**Pacific Northwest Utilities Conference Committee (PNUCC)**

Formed by Pacific Northwest utilities to coordinate policy on regional power supply issues, PNUCC lacks contractual authority, but it does play a major role in regional power planning through its policy, steering, fish and wildlife, and lawyers committees, and the Technical Coordination Group. PNUCC publishes the Northwest Regional Forecast containing information on regional loads and resources.

**peak capacity**

The maximum capacity of a system to meet loads.

**peak demand**

The highest demand for power during a stated period of time.

**penetration rate**

One annual share of a potential market for conservation that is realized, as in “7 percent of the region's homes have been weatherized this year.”

**photovoltaic**

Direct conversion of sunlight to electric energy through the effects of solar radiation on semiconductor materials.

**post-operational capital replacement costs**

The cost of major equipment replacements occurring during the operating life of a project. In practice, these costs generally are capitalized (i.e., financed by debt or equity). For resource cost-effectiveness analyses, these costs are frequently treated as expenses.

**preference**

Priority access to federal power by public bodies and cooperatives.

**present value**

The worth of future returns or costs in terms of their current value. To obtain a present value, an interest rate is used to discount these future returns and costs.

**public utility commissions**

State agencies that regulate, among others, investor-owned utilities operating in the state with a protected monopoly to supply power in assigned service territories.

**Public Utility Regulatory Policies Act of 1978 (PURPA)**

Federal legislation that requires utilities to purchase electricity from qualified independent power producers at a price that reflects what the utilities would have to pay for the construction of new generating resources (see “avoided cost”). The Act was designed to encourage the development of small-scale cogeneration and renewable resources.

**qualifying facility (QF)**

Qualifying facility is a power production facility that qualifies for special treatment under a 1978 federal law—Public Utility Regulatory Policies Act (PURPA). PURPA requires a utility to buy the power produced by the qualifying facility at a price equal to that which the utility would otherwise pay if it were to build its own power plant or buy the power from another source. A qualifying facility must generate its power using cogeneration, biomass, waste, geothermal energy, or renewable resources, such as solar and wind, and, depending on the energy source and the time at which the facility is constructed, its size may be limited to 80 megawatts or smaller. PURPA prohibits utilities from owning majority interest in qualifying facilities.

**quantifiable environmental costs and benefits**

Environmental costs and benefits capable of being expressed in numeric terms (for example, in dollars, deaths, reductions in crop yields).

**quartile**

The direct service industries load is divided into four quartiles. The top quartile is the portion of that load most susceptible to interruption.

**R-value**

A measure of a material’s resistance to heat flow. The higher the R-value, the higher the insulating value.

**real dollars**

Dollars that do not include the effects of inflation. They represent constant purchasing power.

**region**

See “Pacific Northwest.”

**reliability**

The ability of the power system to provide customers uninterrupted electric service. Includes generation, transmission and distribution reliability. The plan deals only with generation reliability.

**renewable resource**

Under the Northwest Power Act, a resource that uses solar, wind, water (hydro), geothermal, biomass or similar sources of energy, and that either is used for electric power generation or for reducing the electric power requirements of a customer.

**reserve capacity**

Generating capacity available to meet unanticipated demands for power, or to generate power in the event of outages in normal generating capacity. This includes delays in operations of new scheduled generation. Forced outage reserves apply to those reserves intended to replace power lost by accident or breakdown of equipment. Load growth reserves are those reserves intended for use as a cushion to meet unanticipated load growth.

**resource**

Under the Northwest Power Act, electric power, including the actual or planned electric capability of generating facilities, or actual or planned load reduction resulting from direct application of a renewable resource by a consumer, or from a conservation measure.

**retrofit**

To modify an existing generating plant, structure or process. The modifications are done to improve energy efficiency, reduce environmental impacts or to otherwise improve the facility.

**sectors**

The economy is divided into four sectors for energy planning. These are the residential, commercial (e.g., retail stores, office and institutional buildings), industrial and irrigation sectors.

**simple payback**

The time required before savings from a particular investment offset costs. For example, an investment costing \$100 and resulting in a savings of \$25 each year would be said to have a simple payback of four years. Simple paybacks do not account for future cost escalation, nor other investment opportunities.

**siting agencies**

State agencies with the authority for issuing permits to locate generating plants of defined types and sizes to utilities at specific locations.

**siting and licensing**

The process of preparing a power plant and associated services, such as transmission lines, for construction and operation. Steps include locating a site, developing the design, conducting a feasibility study, preliminary engineering, meeting applicable regulatory requirements, and obtaining the necessary licenses and permits for construction of the facilities.

**space conditioning**

Controlling the conditions inside a building in order to maintain human comfort and other desired environmental conditions through heating, cooling, humidification, dehumidification and air quality modifications.

**sunk cost**

A cost already incurred and therefore not considered in making a current investment decision.

**supply curve**

A traditional economic tool used to depict the amount of a product available across a range of prices.

**surcharge**

Under the Northwest Power Act, an additional sum added to the usual wholesale power rate charged to a utility customer of Bonneville to recover costs incurred by Bonneville due to the failure of that customer (or of a state or local government served by that customer) to achieve conservation savings comparable to those achievable under the Council's model conservation standards. Surcharges can range from 10 to 50 percent of a customer's bill.

**System Analysis Model (SAM)**

A computer model used by the Council to determine resource cost-effectiveness. SAM performs a detailed simulation of the Northwest generating system to estimate the cost associated with a specific set of loads and resources. It incorporates uncertainty associated with hydropower, thermal availability, resource arrival and load fluctuation due to economic cycles.

**system cost**

According to the Northwest Power Act, all direct costs of a measure or resource over its effective life. It includes, if applicable, distribution and transmission costs, waste disposal costs, end-of-cycle costs, fuel costs (including projected increases) and quantifiable environmental measures. The Council is also required to take into account projected resource operations based on appropriate historical experience with similar measures or resources.

**thermal resource**

A facility that produces electricity by using a heat engine to power an electric generator. The heat may be supplied by burning coal, oil, natural gas, biomass or other fuel, by nuclear fission, or by solar or geothermal sources.

**tipping fee**

The fee assessed for disposal of waste. This fee is used when estimating the cost of producing electricity from municipal solid waste.

**transformer**

A device for transferring energy from one circuit to another in an alternating-current system. Its most frequent use in power systems is for changing voltage levels.

**transmission**

The act or process of long-distance transport of electric energy, generally accomplished by elevating the electric current to high voltages. In the Pacific Northwest, Bonneville operates a majority of the high-voltage, long-distance transmission lines.

**U-value**

The measure of a material's ability to conduct heat, numerically equal to 1 divided by the R-value of the material.

**Washington Public Power Supply System (WPPSS)**

Municipal corporation and joint operation agency in Washington comprising representatives of public utility districts and municipal utilities. Based on power purchase contracts of its members or other utilities, WPPSS has the power to acquire, construct and operate facilities for the generation or transmission of electric power.

**water budget**

A means of increasing survival of downstream migrating juvenile fish by increasing flows during spring and early summer migrations. The water budget was proposed by the Council and is overseen by it in conjunction with the U.S. Army Corps of Engineers, the fishery agencies and Indian tribes, the Bonneville Power Administration and the Bureau of Reclamation

**watt**

The electrical unit of power or rate of energy transfer. One horsepower is equivalent to approximately 746 watts.

## **VIII. Glossary of Fish and Wildlife Terms**

### **acclimation pond**

Concrete or earthen pond or a temporary structure used for rearing and imprinting juvenile fish in the water of a particular stream before their release into that stream.

### **adaptive management**

A scientific policy that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing program actions as vehicles for learning. Projects are designed and implemented as experiments so that even if they fail, they provide useful information for future actions. Monitoring and evaluation are emphasized so that the interaction of different elements of the system are better understood.

### **adult equivalent population**

The number of fish that would have returned to the mouth of the Columbia River in the absence of any prior harvest.

### **anadromous fish**

Fish that hatch in freshwater, migrate to the ocean, mature there and return to freshwater to spawn. For example, salmon or steelhead.

### **biodiversity**

The variety of and variability in living organisms, with respect to genetics, life history, behavior and other fundamental characteristics.

### **captive brood stock**

Fish raised and spawned in captivity.

### **carrying capacity**

The number of individuals of one species that the resources of a habitat can support.

### **Coordinated Information System**

Still under development, this system is designed to allow interested parties to access technical information about Columbia River salmon and steelhead.

### **deflector screens/diversion screens**

Wire mesh screens placed at the point where water is diverted from a stream or river. The screens keep fish from entering the diversion channel or pipe.

### **demography**

The study of characteristics of human populations, especially size, density, growth, distribution, migration and vital statistics, and the effect of these on social and economic conditions.

### **drawdown**

The release of water from a reservoir for power generation, flood control, irrigation or other water management activity.

**economies of scale**

Reductions in the average cost of a product that result from increased production.

**ecosystem**

The biological community considered together with the land and water that make up its environment.

**embeddedness**

The degree to which dirt is mixed in with spawning gravel.

**escapement**

The number of salmon and steelhead that return to a specified point of measurement after all natural mortality and harvest have occurred. Spawning escapement consists of those fish that survive to spawn.

**evolutionary biology**

The study of the processes by which living organisms have acquired distinguishing characteristics.

**extinction**

The natural or human-induced process by which a species, subspecies or population ceases to exist.

**fish flows**

Artificially increased flows in the river system called for in the fish and wildlife program to quickly move the young fish down the river during their spring migration period. (See “water budget.”)

**fish passage efficiency**

The percentage of the total number of fish that pass a dam without passing through the turbine units.

**flows**

The rate at which water passes a given point in a stream or river, usually expressed in cubic-feet per second (cfs).

**flow augmentation**

Increased flow from release of water from storage dams.

**gametes**

The sexual reproductive cells, eggs and sperm.

**gas supersaturation**

The overabundance of gases in turbulent water, such as at the base of a dam spillway. Can cause a fatal condition in fish similar to the bends.

**genetic conservation refuge**

Reserve area whose goal is to protect genetic diversity and natural evolutionary processes within and among natural populations, while allowing varying degrees of exploitation and modification.

**genetic diversity**

All of the genetic variation within a species. Genetic diversity includes both genetic differences among individuals in a breeding population and genetic differences among different breeding populations.

**genetic integrity**

The ability of a breeding population or group of breeding populations to remain adapted to its natural environment.

**genotype**

The complement of genes in an individual.

**glides**

Stream areas with velocities generally less than one cubic foot per second and with a smooth surface. Water depth generally is less than two feet.

**harvest controls**

Regulations established for commercial and sport fisheries to ensure that the correct proportion of the different stocks escape to spawn.

**impoundment**

A body of water formed behind a dam.

**imprinting**

The physiological and behavioral process by which migratory fish assimilate environmental cues to aid their return to their stream of origin as adults.

**mainstem**

The main channel of the river in a river basin, as opposed to the streams and smaller rivers that feed into it. In the fish and wildlife program, mainstem refers to the Columbia and Snake rivers.

**minimum operating pool**

The lowest water level of an impoundment at which navigation locks can still operate.

**mixed-stock fishery**

A harvest management technique by which different species, strains, races or stocks are harvested together.

**morphology**

A study of the form and structure of animals and plants.

**naturally spawning populations**

Populations of fish that have completed their entire life cycle in the natural environment and may be the progeny of wild, hatchery or mixed parentage.

**naturalization**

The process by which introduced fish successfully establish a naturally spawning population.

**outfall**

The mouth or outlet of a river, stream, lake, drain or sewer.



**PIT tags**

PIT tags are used for identifying individual salmon for monitoring and research purposes. This miniaturized tag consists of an integrated microchip that is programmed to include specific fish information. The tag is inserted into the body cavity of the fish and decoded at selected monitoring sites.

**plume**

The area of the Pacific Ocean that is influenced by discharge from the Columbia River, up to 500 miles beyond the mouth of the river.

**population**

A group of organisms belonging to the same species that occupy a well-defined locality and exhibit reproductive continuity from generation to generation.

**population vulnerability analysis**

A systematic process for estimating species, location and time-specific criteria for persistence of a population.

**redd**

A spawning nest made in the gravel bed of a river by salmon or steelhead.

**reproductive isolating mechanisms**

Mechanisms that retain genetic diversity among populations. The primary reproductive isolating mechanism for anadromous fish is accuracy of homing, which can be reduced by improper hatchery operations. Stock transfers also reduce reproductive isolation.

**resident fish**

Fish that spend their entire life cycle in freshwater. For program purposes, resident fish includes land-locked anadromous fish (e.g., white sturgeon, kokanee and coho), as well as traditionally defined resident fish species.

**riffle**

A shallow extending across the bed of a stream over which water flows swiftly so that the surface of the water is broken in waves.

**riparian habitat**

Habitat along the banks of streams, lakes or rivers.

**rule curves**

Graphic guides to the use of storage water. They are developed to define certain operating rights, entitlements, obligations and limitations for each reservoir.

**sinuosity**

The amount of bending, winding and curving in a stream or river.

**smolt**

A juvenile salmon or steelhead migrating to the ocean and undergoing physiological changes (smoltification) to adapt its body from a freshwater to a saltwater existence.

**spill**

Releasing water through the spillway rather than through the turbine units.

**spillway crest elevation**

The point at which the reservoir behind a dam is level with the top of the dam's spillway.

**stream morphology**

The study of the form and structure of streams.

**supplementation**

The release of hatchery fry and juvenile fish in the natural environment to quickly increase or establish naturally spawning fish populations.

**tailrace**

The canal or channel that carries water away from the dam.

**velocity**

The speed of water flowing in a watercourse, such as a river.

**velocity barrier**

A physical structure, such as a barrier dam or floating weir, built in the tailrace of a hydroelectric powerhouse, which blocks the tailrace from further adult salmon or steelhead migration to prevent physical injury or migration delay.

**water budget**

A means of increasing survival of downstream migrating juvenile fish by increasing Columbia and Snake river flows during the spring migration period. The water budget was developed by the Council, which oversees its use in conjunction with the fish and wildlife agencies and Indian tribes, the U.S. Army Corps of Engineers, the Bonneville Power Administration and the Bureau of Reclamation.

**watershed**

The area that drains into a stream or river.

**weak stock**

Listed in the Integrated System Plan's list of stocks of high or highest concern; listed in the American Fisheries Society report as at high or moderate risk of extinction; or stocks the National Marine Fisheries Service has listed. "Weak stock" is an evolving concept; the Council does not purport to establish a fixed definition. Nor does the Council imply that any particular change in management is required because of this definition.

**wild populations**

Fish that have maintained successful natural reproduction with little or no supplementation from hatcheries.

## **IX. Directory**

### **1. Central staff directory**

#### **Director's Office**

Steve Crow — Executive Director  
Judi Hertz — Executive Assistant

#### **Legal Division**

John Shurts — General Counsel  
Bill Hannaford — Senior Counsel  
John Ogan — Senior Counsel  
Judi Hertz — Legal Assistant

#### **Administrative Division**

Jim Tanner — Director, Finance & Admin  
Sharon Ossmann — Business Manager  
Cindi Schulke - Assistant Business Manager  
Nora Miller — Information Systems Manager  
Bud Decker — Assistant Systems Mgr.  
Beata Hartman — Admin Support Assistant  
Denise Bennett — Purchasing Agent/Spt Svcs  
Marte Lamb — Receptionist

#### **Public Affairs Division**

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John Harrison — Communications Manager  
Stephen Sasser — Art Director/Web Site Mgr  
Carol Winkel — Communications Specialist/Web Editor  
Wendy Koch — Public Affairs Assistant

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Mark Fritsch – Fish Production Coordinator  
Doug Marker — Senior Policy Coordinator  
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Lynn Palensky — Subbasin Planning Coordinator  
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Bruce Suzumoto — Manager, Special Projects  
Kendra Phillips — Administrative Assistant

**Power Planning Division**

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