

# Addendum to the Fourth Power Plan

## document 98-23

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## INTRODUCTION

**W**hen the Draft Fourth Northwest Conservation and Electric Power Plan (draft 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.

This addendum, in combination with the original draft power plan, accomplishes that goal. The two taken together constitute a revised Draft Fourth Northwest Power Plan. The Council will accept public comment on the revised draft until October 31, 1997. Public hearings will be held in each of the states during September and October. The final plan is scheduled for adoption in December 1997.

This addendum has two principal objectives. First, it reviews important developments since the release of the draft power plan. These developments include what has happened with respect to: generation and conservation resources, gas and electricity markets, electricity loads, institutions, and policies. While there have been significant developments in the electricity industry since March 1996, none of them invalidates the analysis contained in the draft power plan. The more important developments include the creation of new institutions in response to the increasingly competitive utility industry, and the continued evolution of policies at the state and federal levels designed to facilitate competitive electricity markets.

The second purpose of the addendum is to examine the relationships between the analysis contained in the draft power plan and the recommendations from the Comprehensive Review's Steering Committee. In several instances, this addendum suggests approaches that would help move the Northwest from the usually general nature of the Steering Committee's recommendations to the specifics that will have to be addressed by legislatures and state and local regulators.

The draft power plan focused primarily on issues raised by the transition to competitive electricity markets and highlighted, 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 draft 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 are specific in intent but, of necessity, lacking in detail. For example, one recommendation is that provisions for recovering stranded investments be made as part of opening retail electricity markets to competition. However, the recommendation provides little guidance regarding how stranded investment recovery might be structured and why. This addendum builds 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.

This addendum also describes potential new roles for the Northwest Power Planning 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 is made up of the four governors' representatives that served on the Steering Committee: Northwest Power Planning Council Chair John Etchart of Montana, Council Member Todd Maddock of Idaho, Council Member Mike Kreidler of Washington and Roy Hemmingway of Oregon. Council staff are supporting the work of the Transition Board. During the transition to a more competitive electricity market, the Council has been 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**

The Fourth Northwest Power Plan explores key issues this region must address as the electricity industry becomes more competitive. As noted above, many of these issues are being reckoned with by the Northwest Energy Review Transition Board. For example, the Transition Board has 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. Both of these efforts are aimed at securing for this region the future benefits of the federal power system while encouraging open and equitable competition in the utility industry. Because the work groups have not concluded their efforts, this power plan does not offer recommendations for how these questions could be answered. The Council is closely engaged in the work group efforts both through the Transition Board, on which three Council members serve, and through staff analysis and support for the work groups.

Most of the other issues 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. The analysis in the draft plan and the recommendations from the Comprehensive Review are described in this addendum. In many instances, however, the Comprehensive Review Steering Committee's recommendations are, of necessity, general in nature. They provide little detail or guidance on how to address the challenges and conflicts inherent in implementing many of those recommendations. In this section, the Council summarizes its own recommendations for addressing the problems of implementing the recommendations of the Comprehensive Review. The Council's recommendations are intended for state and local policy-makers.

## **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*

- 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*

- 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 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*

- 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*

- 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**

## **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 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 carryout 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.

## **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*

- 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 (Appendix B).
- 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*

### 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 (Appendix C).

### 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.

### 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.

### 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*

- 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.

### *Recommendations*

#### 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.

### [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.

### [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.

### [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.

### [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.

- Recommendations for specific renewable resource research, development and demonstration activities are contained in Appendix D.

## 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.

### **NEW DEVELOPMENTS SINCE THE 1996 DRAFT**

## **Forecast Status**

A review of recent trends in electricity demand and its major determinants shows that both the economic and energy use forecasts included in the draft power plan remain appropriate as a basis for the final plan. In the time since the draft power plan was published, the regional and national economy have experienced continued healthy growth. Aggregate employment and population remain close to the forecast levels in the draft. Non-manufacturing employment, which accounts for about 85 percent of the total, was just 0.6 percent above the medium forecast for 1996. Manufacturing employment has grown more rapidly than the forecast, primarily as a result of strong cyclical growth in the aerospace and electronics industries.

The other major determinants of electricity demand are fuel and electricity prices. Fuel prices, and especially natural gas prices, are an important assumption, not only for demand forecasting, but also for determining electricity generation costs and analyzing competitive pressures. In general, oil prices have been lower than the draft power plan forecasts, while natural gas prices have been higher. However, both prices are highly cyclical, and there is no indication that the expected long-term trends embodied in the draft power plan have changed. An updated comparison of the Council's forecasts of natural gas prices with those of other organizations shows that most organizations' gas price forecasts have been reduced since the draft power plan was developed. When the draft power plan was published, the Council's forecast range was lower than most other forecasts (see page C-7, Figure C-5, in Volume II of the draft power plan). However, an updated comparison in Figure 1 shows that the same organizations' forecasts are now tending to fall into the middle and lower portion of the Council's forecast range.

### **Figure 1**

### **Natural Gas Price Forecast Compared to Council Forecasts**

(Council Forecasts Range = Solid Lines)

[figure not available]

AGA: American Gas Association AGA-TERA Base Case, August 1996.

CEC: California Energy Commission "Staff's Preliminary Forecast of Natural Gas Production and Wellhead Prices," April 9, 1997.

DRI: Data Resources Incorporated/McGraw-Hill, World Energy Services: U.S. Outlook, Spring/Summer 1996.

EIA: Energy Information Administration, AEO (Annual Energy Outlook) 1997, December 1996.

GRI: Gas Research Institute "GRI Baseline Projection of U.S. Energy Supply and Demand," 1997.

WEFA: WEFA Group, U.S. Energy Report, Spring/Summer 1996).

In the draft power plan, electricity price forecasts were partially adjusted to account for growing competition. However, the ultimate effect of restructuring on retail electricity prices is difficult to predict at this time. Much will depend on decisions that are made about stranded investment recovery. It is likely that electricity prices will be lower in a restructured industry in the long term, but the decrease will be smaller in the Pacific Northwest where electricity prices are already low.

There is only one year of additional energy use data available since the draft power plan. It does appear, however, that actual sales are staying close to the demand forecasts. Given that there is no evidence of changes in long-term trends since the draft power plan forecasts, the forecasts will not be changed for the final plan. In any case, long-term demand forecasts and resource planning are far less important in a more competitive electricity market because consumers and power brokers will dictate resource decisions. The decisions the region is facing have more to do with ensuring effective competition and continued reliability in the electricity market and securing public benefits. These new concerns are the subject of this power plan.

## Western Power Markets

The draft power plan described a study of the potential power supply available to the Northwest from California and the inland Southwest. That study indicated that utilities could expect to purchase power from a Westwide market. Power from this western market is expected to be widely available and relatively low in cost into the next decade compared to the full cost of investing in new generation. During certain peak load periods, however, power would likely become increasingly expensive on a spot basis. The study noted that reliability could also be a concern with substantial power imports using the interties between California and the Northwest.

Since the study was completed, the western power market has developed further. The Federal

Energy Regulatory Commission (FERC) has published its final Orders 888, 888A and 889, which mandate open, comparable and non-discriminatory access to transmission systems and standards of conduct to ensure that utilities' day-to-day operations support that access, as well as, the creation of an electronic trading system for transmission capacity. The New York Mercantile Exchange (NYMEX) has offered futures contracts at the California /Oregon border and at the Palo Verde substation in Arizona.

Generally, the experience of utilities receiving intermediate-term (up to five year) offers, which appear to be the bulk of the offers, from power marketers has been consistent with the perspective offered by the study. It is difficult to compare the study and real experience directly because the study included only California and the inland Southwest. The California/Oregon border and Palo Verde prices of the last two years were affected by both extreme temperatures and substantial nonfirm energy availability from the Northwest.

For instance, the current 12-month (May 1997 to April 1998) average of futures prices at the California/Oregon border is approximately 17 to 18 mills, but this includes the known effects of a high runoff forecast in the Northwest and, presumably, expected hydropower conditions during the August through May period. This price is generally consistent with the study results for a comparable calendar year, which included only the effect of average hydropower conditions in Northern California and excluded the effect of Northwest power supplies.

During the summer of 1996, there were two major power outages in the West involving the interties. These outages resulted in significant losses of load, particularly in areas that were importing power at the time, California and the inland Southwest. Similar outages during the winter, with a similar level of transfers occurring into the Northwest would have likely led to similar load losses across the Northwest. These outages drew attention to transmission reliability issues in an environment of increasing competition and with an increasing number of non-traditional actors. The Western Systems Coordinating Council (WSCC), under the auspices of its parent body, the National Electric Reliability Council (NERC), and in coordination with the western states, has embarked on an effort to define and enforce mandatory reliability standards for all participants in the western power market. The Council is monitoring these efforts.

## **Resource Development Activity**

The draft power plan (Section 4-A) noted that power plant development, which had been very active since the late 1980s, was declining. Though several hundred megawatts of new capacity were under construction, no solicitations for new power plants were issued in 1995. The draft attributed this trend to low natural gas prices (which increases the competitiveness of existing natural gas-fired capacity) and an increasingly active wholesale market resulting in more efficient use of generating capacity on the interconnected western systems.

The pace of resource development continues to decline. New generating projects capable of

producing approximately 495 average megawatts were placed in service during 1996. In addition, energy-efficiency measures capable of conserving approximately 85 average megawatts of electric energy were installed in 1996. The total 1996 conservation and generation development of 580 average megawatts was down from the 715 average megawatts placed in service during 1995 (Figure 2).

Approximately 370 average megawatts of new energy-efficiency measures and generation are expected to enter service in 1997, continuing the downward trend observed in the draft power plan. Figure 2 illustrates the increased development activity of the mid-1990s, followed by the more recent decline.

**Figure 2**  
Electric Energy Resource Development Trends  
[figure not available]

Changing technologies and industry structure have improved the industry's ability to respond to changing market conditions. The short construction lead time of gas-fired combined-cycle power plants, greater access to wholesale price information and concerns regarding stranded investments have accelerated the current downturn compared to past instances following appearance of overcapacity. Furthermore, although the latest downturn is not completely free of stranded costs, the short-lead times, low capital cost and relatively small unit sizes of gas-fired combined-cycle power plants appear to have far less potential for creating stranded capital than was the case in earlier downturns, which involved large, capital-intensive nuclear and coal plants.

As evident in Figure 2, the role of natural gas in power generation continues to increase. Natural gas generation comprised 86 percent of generating capacity additions in 1996, compared to 65 percent of all generating capacity additions over the five-year period from 1992 through 1996. At the end of 1996, natural gas provided 7 percent of the firm electric energy potential of Northwest plants. Scheduled completions will increase this to 8 percent by the end of 1997.

Though little new construction is under way, prospective plant developers continue to seek permits for new projects in anticipation of stronger future electricity prices. While 444 megawatts of capacity are under construction, an additional inventory of 3,590 megawatts of capacity is permitted, but not under construction. Prospective developers are seeking permits for about 2,370 megawatts of capacity (Figure 3).

**Figure 3**  
Power Plant Development Status, December 1996  
[figure not available]

## **New Generating Resource Potential**

The resource assessment of the draft power plan concluded that combined-cycle power plants using natural gas fuel constituted the most cost-effective new source of bulk power for the

Northwest. Natural gas supplies appear to be abundant. Suitable sites appear to be available for new plants sufficient to produce more than 7,000 megawatts of energy.

The draft power plan also concluded that a diverse and reasonably large inventory of renewable resources is available for development, although most are not cost-effective at this time. Solar, wind and geothermal resources are potentially available in large quantities, and biofuels could be produced in large quantity. Forest residues are widely available, and other biomass residues suitable for fuel, including landfill gas, clean municipal solid waste and miscellaneous agricultural wastes, are available in smaller, but significant quantities. Modest amounts of energy are thought to be available from undeveloped hydropower and upgrades to existing hydropower and biofuel plants. Ocean energy potential is very small.

Nearly all new renewable resource development opportunities are more expensive — frequently several times more — than current wholesale energy prices. Moreover, most renewable resources are more expensive than power from new gas-fired combined-cycle power plants. Exceptions might include upgrades to existing hydropower and biomass power plants and specialized projects using biomass residues. Technology improvements and economies of scale are expected to continue to reduce the cost of many renewable resources. Over the past several years, however, declines in the price of natural gas and improvements to combustion turbine technology have resulted in declines in the cost of electricity from gas-fired power plants that have outpaced cost declines among renewable resources.

The conclusions of the resource assessment of the draft power plan remain generally valid. The following events, however, may affect the cost or availability of wind, geothermal and natural gas resources. Wind turbine performance and costs used in the draft were based on the Kenetech KVS-33 turbine. The technical failures of Kenetech's KVS-33 variable-speed turbine and the subsequent bankruptcy of Kenetech Windpower suggest that these assumptions were optimistic. Unsuccessful geothermal production wells and cessation of exploration at Newberry Volcano suggest that the electric generating potential of Northwest geothermal resources may be more limited than was estimated in the draft power plan. Finally, some evidence has surfaced of continued and significant decline in combined-cycle combustion turbine power plant capital costs. The latter is being investigated by Council staff.

## **Global Climate Change Considerations**

The draft power plan (Section 6-C) assess the potential economic risk to the power system of global climate change — potentially the most significant power system externality. The assessment examined the effects of efforts to control greenhouse gas production on power system cost, resource cost-effectiveness, the value of conservation and the value of renewable resources. Taxes on carbon emissions were used to represent the economic impact of greenhouse gas control measures.

Carbon taxes equivalent to \$10 and \$40 per ton of carbon dioxide emitted would increase the regional cost of providing power by an estimated 3.7 to 14.7 percent, respectively. These carbon tax levels are in the range of estimated environmental damage values attributed to climate change. Carbon taxes would increase the cost-effectiveness of conservation and renewable resources relative to new and existing fossil fuel resources, and would increase the cost-effectiveness of new gas-fired power plants relative to existing fossil fuel resources. Carbon tax levels of \$10, \$20 and \$40 per ton would increase the discounted present value of conservation opportunities in the Northwest from an estimated \$2.3 billion to \$3.2, \$4.6 and \$6.1 billion, respectively. Potential renewable resources would increase in value from an estimated \$28 million to \$86, \$226 and \$997 million, respectively. Though insufficient information was available for a quantitative analysis, domestic and overseas greenhouse gas controls in other economic sectors, carbon sequestration and other non-power measures might prove to be more cost-effective than the power-related measures considered in this analysis.

The draft power plan offered the region the following recommendations:

- Avoid investments in vulnerable energy resources;
- Recognize risks associated with investments in new and existing resources;
- Secure cost-effective conservation; and
- Gain experience in greenhouse gas offsets.

Since preparation of the draft power plan, the Intergovernmental Panel on Climate Change (IGCC), an international assemblage of scientists convened by the United Nations to study the matter of global climate change, released its final 1995 report. In this report, the IGCC concluded, for the first time, that "the balance of evidence suggests that there is discernible human influence on climate."

Following the conclusions of the 1995 IGCC report, and with increasing evidence that voluntary efforts to reduce emissions of greenhouse gasses are unlikely to meet target levels, the parties to the United Nations Framework Convention on Climate Change issued a Ministerial Declaration at the Second Conference of the Parties, held in Geneva in July 1996. This declaration states that the governments present would accelerate negotiations on the text of a legally binding protocol, to be completed for adoption at the Third Session of the Conference of the Parties. The Parties recommended that that protocol include "quantified legally binding objectives for emission limitations and significant overall reductions within specified timeframes, such as 2005, 2010, 2020" of human-caused emissions of greenhouse gasses. This recommendation has been controversial, spurring a great deal of opposition. The Third Session is scheduled for December 1997, and the outcome is unclear.

An important regional development relative to greenhouse gas control is the Oregon carbon

dioxide standard. Legislation that would revise the Oregon power plant permitting process has passed the legislature and has been signed by the governor. This revision includes the requirement that power plant developers offset a portion of the carbon dioxide production of new fossil-fuel plants. The law requires net carbon dioxide production be limited to 83 percent of the carbon dioxide production of a state-of-the-art combined-cycle plant fueled by natural gas. The developer is generally free to choose how the reductions in carbon dioxide production will be achieved, whether by advanced technology, sequestering, or other means, providing the approach used is verifiably effective. The estimated cost of complying with this proposal at the present time is \$0.57 per ton of carbon dioxide reduction (approximately a quarter of a mill per kilowatt-hour). This figure does not represent an estimate of the potential damage attributable to climate change, which is frequently much higher, but an estimate of the current cost of achieving carbon dioxide offsets. At this level, the proposal is not expected to substantially affect resource selection. Rather, project developers will seek compliance through low-cost carbon offset measures.

Because the analysis of the draft power plan was based on examples of possible climate control measures, rather than a specific forecast of the magnitude and timing of climate control measures, the subsequent events described above do not change the findings of the plan's analysis. However, these events do suggest that the probability of climate control measures being needed and enacted has increased somewhat. In this environment, it is important that all cost-effective conservation be secured. The climate control and renewable resource recommendations of the draft power plan also become more important, as do the recommendations regarding the preferred form of climate control measures:

- Measures should motivate reduction in the production of carbon dioxide and other greenhouse gasses from all major sources;
- Measures should encourage the adoption of the most cost-effective greenhouse gas control and offset measures, whether international or domestic and across all economic sectors; and
- Measures should preferably be enacted at the federal or international level, so they do not advantage or disadvantage competition among owners of similar power plants located in different geographic areas.

As stated in the draft power plan, the Northwest, by its own actions, is unable to significantly affect global climate. However, actions such as the Oregon carbon dioxide standard and continued efforts to improve energy efficiency and develop renewable resources can signal political support for greenhouse gas control measures at the federal and international level.

## **Policies and Institutions**

### **Policies**

There have been no major changes in policy that would alter the analysis of the 1996 draft power plan. If anything, policy developments since the release of the draft have confirmed the major thrust of the draft, namely, the movement of the electricity industry toward competition. The Federal Energy Regulatory Commission (FERC) released its Orders 888, 888A and 889, providing for open, non-discriminatory transmission access and wholesale stranded cost recovery.

Many of the states have been moving relatively quickly to open their retail electricity markets to competition. The California Legislature passed legislation that fundamentally enacts the recommendations of the California Public Utilities Commission calling for opening of retail access by 1998. The California legislation also provided for stranded investment recovery and support of conservation and renewable resources through a "transition charge." California is well on its way to establishing the power exchange (pool) called for by its Public Utilities Commission, as well as an independent system operator. Pennsylvania, New Hampshire and Rhode Island have also passed legislation opening their retail markets, and legislation is pending in many other states. In the Northwest, legislation opening retail competition in Montana was signed into law early in 1997. Oregon and Washington legislatures both worked on legislation in 1997, but did not pass bills. Washington, Oregon and Idaho all have interim activities planned to look at restructuring legislation. As of late spring 1997, the regulatory commissions of nine states have issued final restructuring orders for their investor-owned utilities, and 11 states have retail access pilot programs or experiments under way. The foregoing does not include whatever actions individual consumer-owned utilities may have taken on their own.

At the national level, several pieces of legislation have been introduced to hasten the move to retail competition. They range from legislation that would preempt state authority by requiring open access in the states by a certain date and stipulate at least some of the conditions to legislation that leaves most decisions to the states. While it is considered unlikely that federal legislation on retail competition can be passed this year, many observers expect action in the next two to three years.

There has also been legislation introduced to privatize the federal power marketing agencies. While there appears to be little weight given to this legislation, it is apparent that the role of the federal power agencies will be under scrutiny as the utility industry restructuring efforts at the federal level proceed.

## **Institutions**

Within the region, there has been considerable institutional evolution as the electricity industry moves toward competition. Some of the more important actions include efforts to form an independent grid operator, the formation of the Northwest Energy Efficiency Alliance and the continuing trend of mergers and strategic alliances in the industry.

### *Independent Grid Operator*

The effort to form an independent grid operator, called IndeGO, began with the Northwest investor-owned utilities. IndeGO's participants have subsequently expanded to include the major transmission owners in the West outside of California, Arizona and New Mexico. The Bonneville Power Administration, the Northwest's federal power marketer, will require legislation to allow it to turn federal facilities over to a non-federal entity for operation if it is to be a member of IndeGO. However, Bonneville has been participating fully in the formation efforts. The formation of IndeGO was given additional impetus last summer by major power outages on the western system. These events underscored the stress that the existing management of transmission was experiencing under the demands of competition and the need to develop new institutions better suited to the new industry environment.

Under IndeGO, scheduling of all transmission would be turned over to the grid operator. Pricing of transmission services would also be governed by IndeGO, subject to regulation by the Federal Energy Regulatory Commission. As of this writing, IndeGO appears headed toward a pricing policy in which most of the cost of transmission would be recovered in access fees. This policy is based on the assumption that most of the costs of transmission were committed in the past and are not dependent on the amount of electricity being transmitted. That is, the cost of transmitting the marginal kilowatt-hour is essentially zero. Congested transmission paths would be treated differently to create an economic incentive for relieving congestion. This kind of pricing eliminates the "pancaking" of transmission charges that characterized transmission across several different transmission systems. The policy would mark a significant improvement in terms of economic efficiency.

For the independent grid operator concept to work, the operator must be truly independent. IndeGO directors will be independent of all parties significantly affected by IndeGO. Indeed, in public meetings, IndeGO representatives have proposed that IndeGO organizational documents have explicit provisions barring election of directors with ties to organizations that could have conflicts of interest. The independent directors would be elected by a plurality of the membership in IndeGO from different classes. If IndeGO follows the membership classes established by the Northwest Regional Transmission Association, it would include: 1) transmitting utilities; 2) transmission-dependent utilities; 3) non-utility entities, which are energy marketers (but not brokers or retail customers); and 4) commissions, which are state and provincial utility regulatory commissions, state energy commissions, and regional, state or provincial agencies with rate-making, siting, or resource-planning authority in regard to electrical energy. As of this writing, the plan is to not allow the commission class to elect directors, but to give them the power to reject directors that are elected by the other three classes.

IndeGO is aiming for a submittal to FERC by September of 1997 that proposes IndeGO take responsibility for transmission scheduling in July 1999 and responsibility for system security in July 2000.

*Northwest Energy Efficiency Alliance*

The draft power plan highlighted some of the difficulties facing the development of conservation in a competitive environment. One promising avenue appears to be market transformation, which aims to increase the long-term market for efficiency products and services through targeted efforts with manufacturers, retailers and others. An example of market transformation is the Northwest's Manufactured Housing Acquisition Program. Under this program, significant payments were made to manufacturers for producing factory-built homes that meet high levels of energy efficiency. The utility payments resulted in lower purchase prices for consumers, so far more of the energy-efficient homes were sold. The payments were subsequently phased out, and only minor marketing assistance continued. Market penetration has fallen, but has continued at a much higher level than the pre-program level.

Because most markets cut across utility service territories, successful market transformation typically requires cooperation on at least a regional scale. Over the past year, the Northwest Energy Efficiency Alliance was formed as a non-profit corporation with roughly proportional funding from Bonneville customers and the region's six investor-owned utilities. The funding amounts to approximately \$13 million in 1997 and \$26 million in 1998 and 1999. The Alliance has a board of directors with six representatives from Bonneville and the public utilities, six from the investor-owned utilities and six from the states, public interest and efficiency industry groups. The regulatory commissions are ex-officio members. The Alliance has taken over funding and management of several market transformation efforts that were in the formative stages (e.g., efficient clothes washers) and has initiated efforts to identify and develop additional market transformation opportunities. Funding after 1999 is uncertain. The Comprehensive Review recommended that \$30 million per year be allocated to this effort regionally. This is dependent on implementation of the recommended funding levels for conservation in state utility industry restructuring legislation and the allocation of that funding to the Alliance or some other regional body for market transformation efforts.

## *Alliances and Mergers*

An expected response to the prospect of competition is the growing trend for utilities and others in the industry to seek cost-reduction opportunities and/or market advantages through strategic alliances and mergers. Two mergers have dominated regional attention. One has been the merger of Puget Sound Power and Light and Washington Natural Gas to form Puget Sound Energy. This merger, promises greater efficiency through consolidation, and the strategic advantage of positioning the new company as a major supplier of both gas and electricity.

More intriguing is the acquisition of Portland General Corporation, the parent company of Portland General Electric, by Enron Corporation, the natural gas pipeline and marketing company. This merger would not appear to offer a lot in the way of consolidating functions. Enron, however, is working to position itself as a national marketer of electricity at the wholesale and retail levels. The acquisition of Portland General will give the company first-hand experience in the retail electricity market, as well as a strategic location within the West Coast electricity

market.

While not as dramatic, there are also numerous strategic alliances forming. These range from an alliance between Puget Sound Energy and Duke Power, to smaller-scale alliances that include utilities such as Washington Water Power, Chelan Public Utility District and Tacoma Public Utilities. These alliances are intended to take advantage of unique skills or resources that each partner brings to the alliance.

The most important question for regional power planners and consumers is what effect these activities will have on the electricity market. If the effect is the intended reduced costs and improved products and services, the mergers will be welcomed. If, however, the effect is the ability of some market participants to exert market power, there could be cause for concern.

### **ANALYSIS, RECOMMENDATIONS AND IMPLEMENTATION**

The Comprehensive Review Steering Committee recommended that the governors of the Northwest states name a "Northwest Energy Review Transition Board" to oversee implementation of a number of the Committee's recommendations, focusing particularly on those affecting Bonneville, such as subscription sales of federal power and Bonneville's competitive role. The governors appointed their representatives from the Steering Committee to serve as the Transition Board. Three of the four Transition Board members are Power Planning Council members, and the Council also provides staff support for the Board. The governors also asked the Transition Board to keep the Northwest congressional delegation informed on these issues.

Two implementation work groups broadly representative of the interests in the region have been formed to work toward implementation of the Steering Committee's recommendations for Bonneville. The first, on federal power subscriptions, was formed by Bonneville and the Pacific Northwest Utilities Conference Committee, which represents Bonneville's customers. This work group reports regularly to the Transition Board. The second, on separation of Bonneville's transmission and generation functions, was formed by the Transition Board. Both work groups are actively working through the details of how to implement these recommendations. Because federal power marketing and transmission issues are being addressed in public processes through the work groups, this addendum does not provide the additional analysis that it provides on the recommendations regarding customer choice, conservation and renewable resources.

## **Federal Power Marketing - the Role of the Bonneville Power Administration**

### **Analysis in the Draft Power Plan**

The Council's draft power plan raised several key issues about the future role of the Bonneville Power Administration in a competitive market. These issues were divided into three main areas:

1) the consistency of various aspects of Bonneville's status as a federal power marketer with a competitive market, including separation of transmission and generation, market power, and risk and reward trade-offs; 2) the allocation of the benefits of the federal hydropower system; and 3) future support for the various public purposes that Bonneville historically supported.

The draft power plan discussed some key characteristics of competitive markets and suggested that Bonneville, because it controlled large portions of both the region's transmission and generation capability, has the potential to exercise too much control over the power market. That would be inconsistent with open and fair competition. Furthermore, as a federal agency, Bonneville is limited in its ability to deal with the risks and rewards that are essential aspects of a competitive market.

The draft power plan discussed several alternative approaches to the separation of Bonneville's generation and transmission functions. The plan also examined different approaches to the disposition of federal power marketing rights that would better balance risk and reward, and be more consistent with a competitive power market.

The draft power plan also examined the allocation of historic and expected future regional benefits of the federal hydropower system operated by Bonneville, including future mechanisms that would retain those benefits for the region while being more consistent with a competitive market and the risk and reward balancing that it implies.

Finally, the draft power plan suggested that several of the public purposes that Bonneville had historically supported, such as funding energy-efficiency programs and renewable resources, and special rates for certain classes of customers, could be inconsistent with a competitive power market and would be unlikely to be the kinds of things that Bonneville would be able to support in the future.

## **Recommendations from the Comprehensive Review**

The Comprehensive Review Steering Committee also concluded that the issues identified in the draft plan were critical and addressed them in its deliberations. The Steering Committee's conclusions on separation of transmission and generation are reviewed in the following section of this addendum. The Steering Committee recommended that Bonneville's role in a competitive market, particularly its potential market power, be limited by selling Bonneville's power, to the extent possible, under longer-term subscriptions. The recommendations also called for a more limited Bonneville role in resource acquisition. These limitations would tend to minimize the political exposure of Bonneville as a government-owned supplier in a competitive market. The recommendations also limited the market risk that Bonneville could take on, given that, as a federal agency, it lacks risk-taking owners, the means by which typical participants in competitive markets deal with risk and absorb losses.

The Review's final report summarized this issue as follows:

*The recommendations would have the effect of disposing of much if not all of the firm power available from Bonneville on a long- or intermediate-term basis. The fact that most of Bonneville's power would be subscribed at cost would limit Bonneville's market role. Any remaining firm power and other power products would be sold at Federal Energy Regulatory Commission (FERC)-regulated prices or at competitive prices, where FERC determines that competitive markets exist. To the extent consistent with its obligation to repay Treasury, Bonneville should return to its historic role of marketing power generated by the Federal Columbia River Power System, rather than becoming an aggressive marketer of products and services in the emerging competitive power market.*

*In addition, it is recommended that Bonneville would not acquire resources to serve its customers' load growth except on a direct bilateral basis where the customer takes on all the risk of the acquisition. Similarly, it is proposed that Bonneville would not sell directly to new retail loads, beyond the existing direct service industry loads, although it may sell through intermediaries whose transactions would be subject to state or local jurisdiction.*

The related questions of balancing risk and reward and of allocating the benefits of the federal hydropower system were central to the deliberations of the Comprehensive Review. The Steering Committee summarized its goals for federal power marketing:

*1) align the benefits and risks of access to existing federal power; 2) ensure repayment of the debt to the U.S. Treasury with a greater probability than currently exists while not compromising the security or tax-exempt status of Bonneville's third-party debt; and 3) retain the long-term benefits of the system for the region. The recommendation is also intended to be consistent with emerging competitive markets and regional transmission solutions.*

The Steering Committee chose a solution that favored long-term subscriptions to federal power that would be sold at cost. Cost might be somewhat higher than market prices in the near term, but is expected to be lower in later years. This scheme aimed at having the subscribers take on more of the current business risk of Bonneville, in return for an assured ability to buy electricity at below-market prices in the future. Some customers might wish to limit their exposure to Bonneville's costs being at above-market prices by deferring making longer term commitments until the risk has been reduced by the passage of time and by the consequent better knowledge. Those wishing to make short-term purchases would have to pay a premium, in the form of an option payment, to renew the contracts at cost at a later time.

Finally, the draft power plan raised the issue of the potential inability of Bonneville, in a competitive market with relatively low market prices, to support all of the public purposes that extended beyond selling power at cost to utilities. The discussion of this problem, and of potential replacements for historic utility support, was an important part of the Steering Committee's effort. The solution for the most prominent of these purposes, conservation, renewable resources and

low-income energy assistance, goes beyond Bonneville to encompass all the electricity providers in the region and is described later in this addendum.

## **Implementing the Recommendations from the Comprehensive Review**

Bonneville and the Pacific Northwest Utilities Conference Committee have formed a subscription work group open to all regional interests to implement the federal power marketing recommendations from the Comprehensive Review. The work group reports regularly to the Transition Board.

The subscription work group has set out a multiyear work plan for implementing the Steering Committee's recommendations and permitting the signing of new Bonneville power sales contracts in advance of the termination of current contracts. During Phase 1 of the workgroup's effort, through mid-1998, the group is addressing business interests, product definition, pricing principles and potential legal issues. Phase 2, mid-1998 through mid-2000, is expected to be devoted to a rate case and final contract negotiations. Currently, the work group is well ahead of schedule in its Phase 1 work, having explored the business interests of potential subscribers and the definition of the products they are interested in buying from Bonneville. Alternatives for an overall contractual relationship with Bonneville and more detailed definition of products are the current focus of the work group.

## **Transmission**

### **Analysis in the Draft Power Plan**

The draft power plan summarized recent developments in national policy related to electricity transmission. The Notice of Proposed Rulemaking issued by the Federal Energy Regulatory Commission (FERC) in March 1995 indicated that the Commission's implementation of the National Energy Policy Act of 1992 would require several things of utilities under its jurisdiction: 1) "unbundling" of the costs and operation of transmission from those of generation; 2) transmission tariffs that offered transmission service to other parties on the same terms as the utility applies to itself; and 3) providing timely information about availability and costs of transmission. The goal of these requirements was a transmission system that would be open to all competitors in the generation market on equal terms, and would make possible effective competition in the wholesale market for electricity.

The draft power plan described alternatives for separation of transmission and generation, and it described the alternatives' relative effectiveness in reducing the opportunities and temptation to use control of transmission to benefit a utility's generation business. The alternatives (listed in order of increasing certainty that effective open access to transmission will be achieved) are: 1)

functional separation within the utility; 2) spinning off generation and transmission subsidiaries within an existing corporation; 3) turning over control of transmission assets to an independent operator; and 4) divestiture — selling off the generation or transmission assets to new owners. Unfortunately, the more certain alternatives are also the most complex to implement.

## **Recommendations from the Comprehensive Review**

The Steering Committee stated that its primary goal for transmission was "a transmission system whose structure and operation help ensure a fully competitive generation market." It recommended the formation of an independent grid operator to operate the region's transmission system, including Bonneville's assets. It recommended that "Bonneville's generation and transmission functions should be fully and legally separated (including separated funds)" and that the separation "be achieved in such a way that it does not jeopardize or diminish the legal obligation and ability of Bonneville to meet fish and wildlife and other obligations." The Steering Committee also recommended that Bonneville's transmission be subject to FERC regulation "that is equivalent to FERC regulation of investor-owned utilities."

## **Implementing the Recommendations from the Comprehensive Review**

As noted earlier, the formation of an independent grid operator along the lines of the Steering Committee's recommendations (IndeGO) was begun in July 1996, and is making progress toward filing a proposal with FERC in September 1997. The group of participants, initially seven investor-owned utilities, had grown to 21 by March 1997, including Bonneville and utilities with assets in eight states. Bonneville is participating in the group's discussions, but Bonneville has expressed the opinion that it will not be able to turn over control of its assets until a number of issues are resolved and necessary legislation adopted.

The governors' Transition Board formed a transmission working group to discuss how best to accomplish the separation of Bonneville generation and transmission. That workgroup has been meeting since April 1997. One of the major issues the group is examining is how to effectively separate generation and transmission without threatening the security of bonds issued by the Washington Public Power Supply System (WPPSS), and without compromising the ability of Bonneville to mitigate the effects of the power system on the region's fish and wildlife. If the separated power marketing organization has trouble meeting its revenue requirements, should it be able to call on the separated transmission organization for financial support? Holders of WPPSS bonds, fish and wildlife advocates and the federal treasury are likely to resist a separation that appears to threaten their interests. On the other hand, prospective users of the separated transmission system and competitors of the separated power marketing organization will not be satisfied with an arrangement that leaves Bonneville with significant incentive and ability to use the transmission system to benefit its power marketing revenues.

Another of the Steering Committee's recommendations that the working group is discussing is regulation of Bonneville's transmission by the Federal Energy Regulatory Commission that is equivalent to its regulation of investor-owned utilities. The work group has made progress toward definition of "equivalent" regulation of Bonneville's transmission. Next, the group intends to consider to what extent, and in what areas, it would be appropriate for FERC regulation of Bonneville to depart from "investor-owned equivalent."

## Competition and Consumer Choice

### Analysis in the Draft Power Plan

The Council addressed the issue of competition and consumer choice in Chapter 3 of the draft power plan, entitled "Capturing the Benefits of Competition." That Chapter described the potential benefits of a competitive electricity market, but also discussed the risks and limitations of such markets. As the title implies, the chapter focused on the conditions necessary for effective competition and methods of pursuing non-market objectives within the context of a competitive market. It also raised some transitional issues as the region moves toward a competitive electricity market. It was clear that the Council expected transmission and distribution to remain regulated monopoly functions while electricity generation and marketing would move toward an unregulated competitive structure. Some of the key recommendations addressed the uneasy coexistence of regulated and competitive markets in providing electricity services.

An important concern in the draft power plan was to foster and protect a competitive electricity market. The critical condition necessary to have a truly competitive market is absence of market power for any of the participants in the market. The role of open market access in ensuring adequate competition was discussed. Without open non-discriminatory consumer access to electricity suppliers, and electricity suppliers' access to consumers, consumer's choices would be limited. Without consumer choice, there can be no competitive retail market. Since the transmission and distribution system are the means of access to the market, the draft power plan concluded that it is important that these regulated functions be carefully separated from the competitive components of the industry. If actual divestiture was not undertaken, then either additional structural and institutional changes, such as the independent grid operator, or additional regulatory attention would be required to ensure against anti-competitive behavior. In addition, different rules and regulations among market participants, including different tax treatments, can turn into competitive advantages or disadvantages and may lead to market power for some participants.

The draft power plan discussed the characteristics of competitive markets and pointed out the particular difficulties faced by federal or public agencies competing in such markets. The key problem is how difficult it is for such institutions to absorb profits and losses that are inherent in competitive markets. This poses a challenge for this region's transition to competitive electricity

markets because of the importance of the Bonneville Power Administration and its public utility customers in the regional power system.

The draft power plan acknowledged that few industries match the economist's ideal structure for competitive markets. Important concerns for the electricity industry include environmental costs that are not reflected in market prices, inadequate information on alternatives and their costs, and average cost pricing through regulation, instead of the marginal cost pricing that characterizes competitive markets. The last issue will be addressed by the deregulation of electricity markets. Many unregulated industries have environmental consequences and do not provide sufficient consumer information. But such shortcomings may be more important in the electricity industry, especially during the transition from full regulation to a mixed competitive and regulated industry.

Providing adequate information is critical to fostering competitive markets because it allows consumers to exercise their market choices intelligently. The lack of adequate consumer information can be a barrier to efficient market operation. The importance of price and service information was discussed in the draft power plan, including the unbundled pricing of the components of electricity service.

Environmental protections, along with other social objectives such as low-income or rural support, have been addressed successfully in the past through the regulated electricity market, and the costs have been included in electricity prices. However, in a competitive market these costs cannot simply be added to the price of electricity. The draft power plan points out that transfers or subsidies cannot be sustained in a competitive electricity market unless they are equally applicable to all market participants. If these purposes are to be maintained, other mechanisms must be found.

The draft power plan identified stranded costs as a key issue to be addressed during the transitional period. There is a risk that some consumers may gain early access to other suppliers, leaving behind costs that would be borne by remaining captive customers. An effective stranded cost recovery program could help prevent such cost shifting and provide a fair transition for regulated utilities. The draft power plan identified some principles for recovering stranded costs, while pointing out that these costs were not likely to be as large in this region as in some others:

- Stranded costs should be calculated on a utility-system basis, not an individual-resource basis.
- Recovery mechanisms must contain strong incentives for the mitigation of stranded costs by utilities.
- Some sharing of stranded costs between consumers and utility shareholders is reasonable and provides an incentive for mitigation.
- For utilities whose resource costs turn out to be below the market price of power, a plan for

sharing profits with the historical customer base, that parallels the stranded cost recovery methods, should be put in place.

## Recommendations from the Comprehensive Review

The Steering Committee addressed the issues of ensuring competitive conditions in regional electricity markets and the transition to those markets in its section entitled, "Consumer Access to the Competitive Market — Ensuring the Benefits of Competition for All." Support for environmental protections and other public purposes were addressed in the section on "Conservation, Renewable Resources and Low-Income Energy Services — Reflecting the Values and Meeting the Needs of Northwest Citizens."

The Steering Committee concluded with recommendations to ensure competitive conditions in the electricity market and, in addition, addressed consumer protection policies and changes in regulatory practices. It also identified a number of transitional steps that included unbundling of both consumers' bills and of vertically integrated utility structures, open access to transmission and distribution systems, pilot retail access programs for small consumers, establishing a "provider of last resort" to ensure continued affordable service for all consumers, and establishing a method to deal with stranded costs.

To ensure that competitive conditions exist in the electricity generation and marketing industry, the Steering Committee recommended several actions. Market access should be ensured by providing open non-discriminatory access to transmission and distribution systems. Further, the Steering Committee recommended that the generation and marketing of electricity be separated from its distribution and transmission. Similarly, consumers need access to education and information to inform their market choices. Unbundling of electricity bills into the components of service is part of this requirement, but general consumer education programs are also needed initially to help the retail market develop.

Protection of small consumers was an important concern of the Comprehensive Review. To promote this, the recommendations included ensuring that consumer protection laws were extended to unregulated electricity markets, establishing registration and licensing standards for energy service providers, and establishing a consumer complaint and arbitration process. An important part of protecting small consumers was the resolution of the stranded investments issue, although the Steering Committee made no specific recommendations on how this should be done.

Funds to support the actions recommended in the section on conservation, renewables and low-income support were to be collected by the regulated portions of the industry in a manner consistent with competition in electricity generation and marketing. That is, the funding mechanism should be competitively neutral.

Most importantly, the Steering Committee set a timetable for these changes. It recommended that choice of suppliers be available to all consumers by July 1999. Further, it linked market access to the funding and implementation of the public purpose aspects of its recommendations.

## Implementing the Recommendations from the Comprehensive Review

The Comprehensive Review achieved a great deal toward developing a consensus about changes in the regional electricity system. The proposed changes are important and far reaching. The recommendations, however, lack many implementation details. In addition, some of the recommendations seem inconsistent with other recommendations. This section describes and expands on these issues.

### *Separation*

Perhaps the most important dilemma raised in the recommendations from the Comprehensive Review is the suggestion that utilities' distribution functions be separated from their electricity marketing functions. The Comprehensive Review recommendations and the Council's draft power plan are both very clear that separation is a necessary condition for a competitive market to develop in retail electricity supply. Without separation, there is a great potential that too much market power will be vested in the incumbent electric utilities or their future marketing affiliates. The final report from the Comprehensive Review described in some detail a new distribution entity and a new power marketing entity. The required separation of these entities was discussed in the recommendations as well as in the draft power plan. Both documents stopped short of recommending legal divestiture, but the difficulty of regulating affiliate transactions was recognized.

In the case of investor-owned utilities, there is an established, independent regulator that could enforce an administrative separation of generation and marketing from distribution. Such regulation may prove difficult and will create new regulatory responsibilities and costs. The difficulties of separating regulated from competitive aspects of existing utilities were well illustrated by the Portland General and Enron merger proceedings at the Oregon Public Utility Commission. It is very difficult, for example, to allocate a utility's value between stockholders and ratepayers.

In the case of publicly owned utilities, the regulator is the locally elected board or commission. The board is responsible to the ratepayers for the activities of the generation and energy sales parts of the utility, which should be competitive functions, and the distribution function, which will likely continue to be regulated. In a competitive electricity supply market, these boards are confronted with built-in conflicts of interest. On the one hand, the board is responsible for seeing that the energy sales part of the utility is an effective competitor able to cover its costs. On the

other hand, the board is responsible for seeing that the distribution function offers open, non-discriminatory access to competing electricity suppliers. The Steering Committee offered no solution to this problem, but it is important that the problem be addressed before retail competition can be achieved.

One solution to this problem is actual separation of the utility. The distribution or wires part of the utility could become a publicly owned entity that has as its main focus providing safe and reliable distribution services and facilitating open market choices for all consumers. The generation and marketing portion of the current utility could become a customer aggregator without special access to customers, customer information, or any ability to restrict electricity trade. The latter entity needs to be equipped to compete in the electricity supply and services market.

There are other unique problems that governments and publicly owned institutions face in a market environment. Regulated monopoly utilities were able to share many risks with their customers, in exchange for limitations on their allowed profits. Utilities facing competition will inevitably experience both profits and losses as their business decisions result in costs that are below or above market prices, respectively. The stockholders of investor-owned utilities will be the clear recipients of profits and the clear bearers of losses. The customers/owners of a publicly owned utility do not have such clearly defined responsibility for the utility's losses as have the stockholders of an investor-owned utility. When the publicly owned utility's costs are below market prices, its customers will happily accept discounts. But when the costs are above market, those customers with options will exercise them through such measures as self-generation, fuel-switching, relocation or, in a competitive market, purchasing from other suppliers. This will leave the above-market costs for the utility to recover through other means. The above-market costs could be concentrated in the bills of remaining consumers or, more appropriately, they could be recovered through a stranded-cost recovery mechanism. In summary, public utilities currently have no one who has signed up to bear the potential risks of competition. They are, therefore, ill-suited to entrepreneurial activities.

## *Pricing*

The Steering Committee's recommendations include some general pricing guidelines. These include unbundling of prices and collection of public purpose funds or stranded investment recovery costs through competitively neutral charges on distribution access. The recommendations did not elaborate on what level of unbundling should be pursued or what constitutes a competitively neutral collection of funds. This section elaborates on the issue of electricity pricing because prices are the key piece of information that makes the market an effective allocator of resources. Regulated prices frequently have failed to provide the cost signals needed for consumers and producers of electricity to make efficient decisions. As the region ventures into restructuring, it is important to understand what role prices play in resource decisions, and it is important to ensure that regulation and competition are blended in a way that

permits prices to play an effective role in efficient resource allocation.

The efficiency of competitive markets is dependent on marginal cost pricing. That is, products and services are priced at the cost of producing one additional unit of the product or service. When commodities and services are priced at their marginal costs, consumers and producers are led to efficient consumption and production decisions. This has been the basic tenet of economic theory and practice for a hundred years or more. In the short run, effective competition in electricity generation, for example, would drive electricity commodity prices toward the operating cost of the last generating unit needed to meet demand. In the long run, prices would tend toward the capital and operating cost of the most competitive new generating unit that could be built to meet growing electricity demand.

Regulated electricity prices, in contrast to competitive prices, have typically been set at the average cost of production. Further, several sorts of products and services have been bundled into one price for delivered electricity services. The prices consumers paid, and the prices producers received, did not reflect marginal costs of providing the service. When the Council developed its first three power plans, the costs of adding new generation were far above the average cost of the existing power system, and with few exceptions were also above retail electricity prices. This inaccurate price signal was the primary rationale for programs to secure electricity conservation measures that were lower in cost than the avoided cost of additional electricity generation. By bundling all electricity services, such as transmission, distribution, conservation and reliability, into the commodity price, consumers and producers saw no price information at all about those individual services nor about the commodity by itself. The choices made regarding the composition of electricity and related electricity services were not informed by any market feedback.

Operating decisions should be based on the marginal cost of additional kilowatt-hours of generation. Capacity expansion decisions should be based on the marginal cost of additional capacity. Although energy and capacity costs have often been separated on consumer's bills as a demand charge and a kilowatt-hour charge, the bill shares have not always been an accurate reflection of their respective costs. Often, the kilowatt-hour charge has borne much of the capacity cost as well as the cost of other service components and overhead. The tendency, in this case, is for large consumers to pay a larger share of the capacity costs than may be warranted by their capacity requirements. At the same time, larger consumers tend to pay relatively low prices per kilowatt-hour. Thus, it should be understood that separating bills into their various components may result in a shift in the share of costs that are borne by various types of users. If done correctly, however, those shifts should result in a more equitable allocation of costs.

The Steering Committee's recommendations did not specify the exact form that unbundling should take. To some degree, this is appropriate. The exact form of unbundling will evolve with the market. This is especially true in the large industrial market where the types and numbers of separate competitively priced services will depend on the needs of consumers and the marketing

strategies of suppliers. However, in the case of smaller consumers, some minimum level of unbundling may be desirable in order to highlight the nature of the choices available and to educate consumers about the components of cost they pay. At the very minimum, distribution costs need to be separate from electricity commodity supplies. To choose among commodity suppliers, for example, customers must be able to compare a commodity price to a commodity price. In addition, customers need the pricing information on other service components to estimate the total cost of electricity service. Additional unbundling may be important to highlight specific components of costs, such as peak or capacity electricity supplies, which may affect the capacity charge included in the electricity or the distribution service. Once the small consumer market becomes well established, the unbundling detail will evolve on its own and specific unbundling requirements are unlikely to be necessary.

### *Rate Treatment of Stranded Costs and other Transition Costs*

The Steering Committee recommended that stranded costs and public purpose funds be recovered through competitively neutral means. It did not specify, however, what constituted a competitively neutral recovery mechanism. Recovery of public purpose funds or stranded costs in a competitively neutral manner requires that the price a consumer faces for an extra unit of product or service remain equal to the marginal cost of providing the product or service. An access fee would affect all suppliers equally and would not affect marginal decisions for capacity or energy. It would therefore be competitively neutral. Adding a charge to the variable component of a consumer's price for electricity or distribution services violates this principle because it changes the marginal cost signal. Similarly, adding the costs to a demand charge that is intended to reflect the marginal cost of capacity would distort the price signal for capacity utilization and expansion. Recovering the cost through a system access fee, however, leaves the marginal cost signals unchanged.

### *Market Information*

Both the Council's draft power plan and the Steering Committee's recommendations recognized that information is the lubrication that makes competitive markets work well. This is why prices, as discussed in the previous section, are important. They carry a great deal of information back and forth between consumers and producers. In addition to price, there are other types of information that are important to the market. These include information differentiating among the services suppliers offer and the demands of various consumers. It is useful to distinguish consumers' access to information about suppliers from suppliers' access to information about consumers. The first allows consumers to choose among alternative suppliers and service configurations. The second allows the suppliers to tailor products and services to specific markets. Such information is one of the keys to how markets promote innovation and increased consumer choice.

In the first case, it can be assumed that marketers will readily provide information about their

products and services. It may come in the form of junk mail or phone calls at supper time, but it will be provided. The concern is that the information be reasonably accurate and readily comparable. The Steering Committee recommended that considerable information be required on consumers' electricity bills, including sources of power, costs and a consumer satisfaction index. It would be more valuable to consumers if such information were readily available before they made their choice of electricity supplier. For example, a service that compiled information about prices, service choices and special electricity characteristics for various providers would be valuable. Information arrayed in a way that promotes comparisons of the key characteristics of products and services offered by various suppliers would be particularly effective in aiding consumers with their choices. The more accurate and easily compared supplier information is, the more effective consumer choices will be in promoting innovation and efficiency. Unbundling of the various components of service will help consumers make comparisons among offerings of alternative suppliers. The information needs to be clear about which services are provided in the package and which may need to be acquired from another source or at extra cost.

A special area of concern is where efforts are being made to bring consumer choice and markets to bear on specific public goals. An example is green marketing. It will be important that electricity marketed to consumers as green power meets public policy objectives and provides enough information to allow consumers to exercise their particular preferences about sources of renewable or clean energy. This is discussed further in the section of this plan dealing with conservation and renewable resources.

The second type of information, market information about consumers, has received less attention in restructuring discussions. It is complicated by the fact that the existing electric utility has a near-monopoly access to such information as levels and patterns of consumption for individual consumers or small market areas. They come by this information naturally as the utility that sells and delivers the electricity to consumers. Release of this information faces confidentiality issues. At the same time, however, possession of such information in a restructured environment could give the marketing affiliate of the existing utility a distinct advantage in a competitive electricity services market. If excess market power problems are to be avoided, this information must be available to an equal degree to all electricity marketers.

For various reasons, the collection and dissemination of information about consumers may need to be centralized within service areas. The entity that is doing the metering and billing is the most logical choice, but there is no reason for metering and billing to be monopoly functions. These services could be provided by the distribution utility, but they don't need to be. Ideally, one would like to see an incentive for innovation and efficiency in metering, billing and information compilation. New types of information about consumers may prove very valuable in a competitive energy market, and these new types of information may require changes in metering technology. A competitive market can readily determine whether more sophisticated metering technology is worth the extra cost it may involve.

Another information need that may be important, especially during the transition, is aggregate consumption and price information. That is, information on trends in total electricity consumption, average prices paid by consuming sector, and the composition of demand. Such information will be needed during the transitional period to judge the degree and effectiveness of competition, whether costs have been shifted among consumer groups, and whether public policy goals are being met. However, without some specific reporting requirement to a responsible entity, such information will not be made readily available in a competitive environment, especially if the metering and billing are carried out by various competing entities. As the market develops, central collection of such information may become less important and private entities may take over the collection and sale of information that the market itself finds valuable.

## *Accountability and Administration*

The Steering Committee's recommendations include a number of new public responsibilities, but there is little direction regarding how those responsibilities would be administered or supported. Some of these responsibilities in the area of competition include providing consumer information services; monitoring and enforcing competitive conditions; developing and evaluating pilot programs; ensuring reasonably consistent market conditions and requirements for all participants and states; devising consumer protection laws and their enforcement; registering and licensing energy service providers; implementing a consumer complaint and arbitration process; and creating and administering a universal service fund.

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. The funds should be allocated to accountable public bodies for administering these programs. Some of these functions could be carried out by public utility commissions or by the boards and commissions of publicly owned utilities when they have been converted to distribution-only entities. Others could be carried out by existing public agencies. Public agencies could include state consumer protection and business licensing agencies, the Federal Energy Regulatory Commission, the Federal Trade Commission, or the Northwest Power Planning Council.

These types of accountability and administration problems should be addressed in the funding of conservation, renewable resources and low-income efforts as well.

## *Stranded Costs*

The Steering Committee recognized the importance of addressing stranded costs, but it included little discussion of stranded costs or guidance on how they should be recovered. The term "stranded costs" is often used rather loosely, and discussions reveal that there is not a good understanding of what stranded costs are, how they could be evaluated, or how to provide an equitable recovery of such costs. This section explains what stranded costs are and discusses the reasons for the recovery principles that were included in the Council's draft power plan.

When the electricity industry was more regulated, recovery of costs was assured by setting electricity prices at a level that covered variable costs and allowed a specified rate of return on invested capital. In a competitive industry, prices are set by the market. Market prices may or may not be adequate to cover a utility's full investment and operating costs. Stranded costs include capital or sunk costs that cannot be recovered in the competitive market. Stranded costs may also include some regulatory assets, such as qualifying facility contracts under PURPA and capitalized conservation costs. Some other unavoidable costs, for example, required environmental mitigation, may also become stranded.

By definition, variable or operating costs can be avoided if generation is not operated. Therefore, these costs cannot be stranded.

The amount of a generating plant's cost that is stranded only becomes clear over time. In each year, the stranded cost is the difference between the year's payment on the plant's total investment cost (including the allowed return on investment), minus the year's "operating profit." Operating profit is the difference between the market price of power and the plant's operating costs. Stranded costs, as calculated above, can be either positive (stranded cost) or negative (windfall profits).

If the market price of power is enough higher than operating costs to recover the investment plus a reasonable rate of return, then there would be no stranded cost. Stranded costs would occur when the market price of power is not sufficient to allow for recovery of capital plus a rate of return comparable to that received under regulation. If, on the other hand, the market price was high enough to create a rate of return of invested capital that is higher than the regulated rate, the utility will receive windfall profits.

Stranded costs cannot be known with certainty now because neither future operating costs nor future market prices are known. Recovery of stranded costs could be based on a one-time estimate of future stranded costs, or recovery could be based on a series of one-year determinations as each year's stranded costs are revealed. Most discussion has focused on the one-time estimation approach. Two types of estimation could accomplish this. One is to estimate future costs and prices based on either current prices and costs or on modeling and forecasting of their future values. A comparison of the estimated operating profit to sunk costs, which are reasonably well known, [ The exception is some special circumstances such as nuclear plant decommissioning costs or fish and wildlife mitigation. These are sunk costs, but the amount is still unknown.] would provide an estimate of stranded costs. The second approach is to allow the market to place a value directly on the generating asset and compare this market value to the regulated book value of the asset. This would require a sale of the generating plant or an independent assessment of its value.

The discussion above has been about individual plants for the purposes of illustrating the stranded cost concept. But this is not the way that stranded cost recovery should be implemented. Most utilities have more than one generating asset. Some of those generators may prove to have stranded costs, others may earn extra profits beyond what would have been allowed under rate-of-

return regulation. Shareholders and customers have a stake in the entire utility, not in specific generating plants. Therefore, it should be clear that stranded costs, for the purposes of recovery, should be assessed at the utility level, not the generating plant level. A utility's stranded costs should be the net-stranded cost of all of its generating assets. The methods of estimating stranded costs discussed above still apply at the utility level. However, some other alternatives for market valuation of assets, for example a stock re-issuance or similar scheme, may become possible at the utility level.

As in the case of individual plants, this amount may turn out to be positive or negative (windfall profits). If consumers are going to help pay stranded costs, they should also share in windfall profits. The two measures are exactly analogous and are computed by exactly the same formula. Thus, any stranded cost recovery proposal should apply equally to positive or negative stranded costs.

Once stranded costs or windfall profits are determined, their recovery or sharing should follow the principles of competitive neutrality, accountability and efficiency incentives discussed above for public purpose programs. Since operating costs are to some degree under the control of the generation operator and owner, care needs to be taken to keep incentives in place to control and reduce operating costs. If the owner were guaranteed recovery of capital costs on an ongoing basis, even if he operates his plant in an inefficient manner, there would be little incentive to compete, and consumers would be stuck with higher than necessary costs. If, on the other hand, a portion of the stranded cost or windfall profits stays with the owner, or if the amount of stranded cost recovery is set once and has no further effect on owner operating decisions, then the owner has an incentive to keep operating costs as low as possible. Since utility investments, even under regulation, were never considered completely risk-free to investors, it can be argued that some sharing of stranded costs or windfall profits between consumers and shareholders is appropriate.

Stranded cost recovery is probably a fair and necessary transitional policy. However, it is important to understand that if not implemented correctly, stranded cost recovery could dampen the incentives of businesses to create consumer benefits through aggressive competition. Even if done correctly, stranded cost recovery could offset some of the flow of benefits to consumers as they help pay off the stranded investments. The policy objective should be to make a firm determination of stranded costs, which will not be affected by future utility market decisions, to provide for the recovery of those costs in a market-neutral manner, and to limit the duration of the recovery period. The sooner these holdovers from the regulated era are resolved, the sooner the benefits of competition will be realized.

## **Conservation and Renewable Resources in a Competitive Electricity Market**

The Council has traditionally addressed conservation and renewable resources independently of one another because the concern was their relative contributions to an integrated resource

portfolio. However, in the Draft Fourth Northwest Power Plan and during the Comprehensive Review of the Northwest Energy System, conservation and renewable resources, along with low-income energy services, were addressed together because they raise similar issues in a competitive industry.

## Analysis in the Draft Power Plan

### *Conservation*

In Chapter 6 of the draft power plan, the Council identified 1,535 average megawatts of conservation potential in the region that could be cost-effectively developed over the next 20 years. The Council's draft power plan estimated that the Northwest could reduce the present-value cost of meeting its need for electricity by roughly \$2.3 billion if these energy-efficiency opportunities were fully exploited. In addition, these efficiency gains could reduce the emission of carbon dioxide into the atmosphere by approximately 80 million tons. While the draft power plan acknowledged some uncertainty in the conservation analysis, sensitivity tests indicated that there was substantial long-term value in securing the remaining efficiency improvements over a wide range of conditions.

The Council observed that the implementation of conservation resources faces a radically different environment today than in the past. Specifically, the Council noted that alternative resource costs avoided by conservation are about 50 percent lower than they have been in more than two decades. In addition to reducing the relative cost-effectiveness of conservation measures, this situation now means that some consumers' retail electricity rates are higher than the cost of developing new power plants. The Council also anticipated that competition will result in a trend toward unbundling of electricity rates — separating the costs of the kilowatt-hours delivered from the fixed costs of delivering the electricity and thereby lowering the apparent price of the kilowatt-hours. Such unbundling will permit consumers to compare their supply alternatives, including conservation, on an "apples-to-apples" basis. These lower prices and unbundling will reduce the disincentive utilities experience when conservation cuts into their recovery of fixed costs. On the other hand, it will also reduce the consumer's economic incentive to conserve because their rates will likely be lower.

The Council further observed that in the past, Bonneville and the region's utilities were well positioned both economically and institutionally to acquire all cost-effective conservation. It also noted that competitive pressures, as well as lower avoided costs, are quickly changing this situation. Bonneville has already reduced its conservation investments because it must compete in an "open" wholesale power market and in light of lower avoided costs. It is difficult to compete on the basis of the price of the electricity commodity if that price includes additional costs, such as systemwide conservation funding, which competitors' prices do not include. As competitive pressures increase in retail power markets, both public and investor-owned utilities can be

expected to reduce their efficiency efforts in a similar manner.

The Council anticipated that these changes in the electricity industry will lead to the development of only about one-third of the regionally cost-effective conservation potential — those savings obtained as a result of market-induced conservation and existing utility conservation commitments. Therefore, the Council estimated that of the \$2.3 billion in savings that can be expected if all cost-effective conservation is developed, approximately \$1.7 billion falls into the category of savings that seem unlikely to be produced through near-term utility commitment or, in the long run, by a competitive electricity market.

Based on its analysis, the Council outlined two alternative policies for the region to consider. Under the first option, the Northwest could focus its efforts on developing more competitive electricity markets and wait to see what the effect is on conservation acquisition. Conservation acquisition over the next three to four years is likely to be relatively substantial because many utilities still intend to pursue conservation development, there is still some carry-over funding for conservation acquisition from previous years, and some government programs also will garner energy savings. In the longer term, this policy option presumes that a portion of the region's existing conservation industry will develop viable business strategies that do not rely on continued utility or other public investments.

The second policy option assumes a more aggressive response is needed to ensure that conservation's potential economic and environmental benefits are captured. Under this option, the region would establish alternative mechanisms for developing conservation in an increasingly competitive electricity market. The Council suggested that the Comprehensive Review and appropriate state forums evaluate the costs and benefits of potential mechanisms to acquire conservation beyond what will be developed in the market. The Council recommended that the goal of these activities should be to establish a competitive market for electricity services that preserves as much of the net conservation benefit as possible.

Specifically, the Council recommended that these alternative mechanisms reflect the six principles outlined below.

- Any intervention should be competitively neutral, and not give one energy resource provider an advantage relative to another. Intervention should not interfere with the market pricing of electricity and the operation of a competitive electricity market. For example, use of a non-bypassable charge on distribution minimizes the ability of competitive electricity suppliers to avoid the charge. At the same time, the magnitude of the charge must not upset the competitive balance between electricity and natural gas or other fuel suppliers.
- Any intervention should complement the competitive market for energy services that might emerge. This might include a strategy for conservation actions that need initial support, but that can eventually be handed over to the competitive market. In this case, the strategy should include signals for when to cease the intervention.

- Any intervention should provide some symmetry between those who pay for the intervention and those who receive its benefits.
- Any intervention should be administratively efficient to gain the greatest net benefits possible.
- Any intervention should use competitive mechanisms to the greatest extent possible when acting to secure the conservation resource.
- Any intervention should incorporate performance-assurance mechanisms to secure the savings.

## *Renewable Resources*

Unlike conservation, the draft power plan found that few renewable resources are economically competitive with new natural gas fired, combined-cycle combustion turbines, and virtually no renewable resources can compete with current wholesale electricity prices. Consequently, little market-driven development of renewable resources can be expected for the next five to 10 years.

An analysis of the value of preserving renewable resources confirmed that few renewable resources are likely to be cost-effective in the near-term. However, as described in the Global Climate Change Considerations section of this Addendum, the value of renewable resources is very sensitive to the cost of possible climate change control measures.

A second analysis, of the economic merits of a sustained renewable resource development policy, concluded that there is little economic value in augmenting market-driven renewable resource development, even considering the economic risk associated with global climate change. Renewable projects developed in advance of need and cost-effectiveness might accelerate the improvement of resource cost-effectiveness, but would require a significant subsidy. From an economic point of view, the most prudent approach is to defer renewable resource development until the nature and extent of climate control measures are clear. Underlying this conclusion is the assumption that we will not lose the ability to develop renewable resources rapidly and efficiently if the industry in this country is allowed, in effect, to go dormant for several years.

The draft power plan proposed the following general renewable resource actions as suitable for the current environment of surplus capacity and low electricity prices. These actions are intended to support the renewable resource objective of the Northwest Power Act [ "To encourage the development of renewable resources in the Pacific Northwest." ] while maintaining the principle of developing resources only as they become cost-effective:

- Ensure that the restructured electric power industry provides equitable opportunities for the development of cost-effective renewable projects.
- Ensure that the renewable resource potential of the Northwest is adequately defined and that prime undeveloped resources remain available for development.

- Support research and development efforts to improve renewable resource technologies (More specifically set forth in Appendix K of the draft power plan).
- Offer green power purchase opportunities to consumers.
- Monitor fuel prices, the global climate change issue and other factors that might influence the value of renewable resources.

## Recommendations From the Comprehensive Review

The Comprehensive Review Steering Committee addressed the issue of how cost-effective conservation and renewable resource (and other public purpose) goals could be sustained both during and after the transition to a competitive electricity market. The Steering Committee acknowledged that the market for energy-efficiency services may not capture all cost-effective conservation. Similarly, the Steering Committee concluded that potentially valuable renewable resource technologies, which are not economically competitive in today's electricity market, may benefit from regional investments that reduce their future costs. The Steering Committee also recognized that competitive markets are unlikely to provide low-income households the means to meet their basic electricity needs at the same level and quality they currently enjoy.

To ensure that cost-effective conservation, renewable resource development and energy services for low-income households are sustained during the transition to competition and beyond, the Steering Committee recommended that by July 1, 1997, and annually thereafter for a period of 10 years, 3 percent of the revenues from the sale of electricity services in the region (\$210 million, based on 1995 revenues) be dedicated to those purposes. These funds were to be collected either voluntarily by local utilities or as a result of state action establishing a non-bypassable, local distribution system access charge. In either case, it was intended that funds be collected in ways that do not distort the competitive balance between competing suppliers. The Steering Committee recommended that this commitment should be re-evaluated after 10 years.

The Steering Committee also recommended that a regional technical forum be established to track progress toward the achievement of regional goals, and provide feedback and suggestions for improving the effectiveness of conservation and renewable resource development programs. This forum would also conduct a review of the region's progress at least every five years and report its findings to the region's decision-makers.

The Steering Committee expressed a preference for using methods that rely on market forces wherever possible to achieve the region's goals for developing cost-effective conservation and renewable resources. Implicit in this preference is the principle that the funding dedicated to conservation and renewable resources should, to the greatest extent possible, be used in ways that foster and/or complement the development of competitive markets for energy-efficiency services and renewable resources. In addition, the Steering Committee's recommendations regarding

consumer access to competitive electricity markets are intimately related to the achievement of its public purpose goals. Specifically, the Steering Committee recommended that tariffs, rates or other fees imposed to collect the funds to be used to support conservation, renewable resources and low-income energy services be implemented simultaneously with implementation of open retail access. This relationship between the timing of open retail access and the collection of funds was deemed an essential element in the strategy to ensure a smooth transition to a more competitive electricity industry. Key recommendations specific to conservation and renewables are described below.

## *Conservation*

Approximately 70 percent of the total funds to be collected for public purposes (\$170 million, based on 1995 revenues) was to be directed toward conservation and low-income weatherization. The Steering Committee's recommendations attempt to provide for maximum local control in the implementation of conservation and low-income energy services, while establishing an effective minimum standard that ensures stable funding for these purposes. Specifically, the Committee recommended that more than 80 percent of the funds be retained by local distribution utilities to carry out locally initiated cost-effective conservation and low-income weatherization and energy-efficiency services. To encourage consumers to adopt energy-efficiency technologies and/or practices on their own, the Steering Committee recommended that conservation projects implemented and funded by consumers of large amounts of electricity, such as industries, should be credited against local conservation targets. [ The Steering Committee recommended that the amounts credited in these circumstances should exclude that portion of the revenues collected for regional market transformation, renewable resource research and demonstration efforts, and low-income weatherization and energy-efficiency service costs.]

The Steering Committee recognized that some conservation strategies benefit from regionwide planning and coordination. Consequently, the Steering Committee recommended that almost 18 percent of the funds (\$30 million, based on 1995 revenues) be used by a regional non-profit entity with utility, government, consumer and public interest membership. This organization's function would be to expand the long-term market for targeted energy-efficiency products and services.

## *Renewable Resources*

The Steering Committee's findings with respect to the current renewable resource situation are consistent with those of the draft power plan:

*Though few renewable resources are cost-effective in the near-term, ensuring that renewable resources are available for future development may have appreciable economic value. An unexpectedly rapid rise in natural gas prices and/or adoption of carbon dioxide control measures could favorably alter the economics of renewable resources. For instance, although such estimates are inherently uncertain, it has been estimated that imposition of a carbon tax of*

*\$40 per ton in the year 2005 could increase the lifetime benefits of developing renewable resources in the Northwest to just under \$1 billion compared to \$28 million in the no-carbon-tax case.* [ Comprehensive Review of the Northwest Energy System Final Report, Toward a Competitive Electric Power Industry for the 21 st Century. p.21. December 1996, document #96-CR26.]

However, the Steering Committee adopted a more aggressive renewable resource goal than that of the Northwest Power Act. Implicit in the Steering Committee's recommendation is the assumption that a minimum level of sustained renewable resource development is necessary to ensure the future ability to develop renewable resources quickly and efficiently. Consequently, whereas the renewable resource goal of the Northwest Power Act is "to encourage the development of renewable resources in the Pacific Northwest," the Committee adopted the goal "to continue to develop renewable resources in the region."

Consistent with this goal, the Steering Committee recommended not only continued research, development and demonstration of renewable resources, but a market transformation effort of sustained development of renewable projects in excess of market-driven levels. Of the 3 percent of regional electricity revenues to be dedicated to conservation, renewables and low-income energy services, approximately 30 percent (\$40 million, based on 1995 revenues) was to be dedicated to new renewable resource activities. The Steering Committee's recommendations can be summarized as follows:

*Existing Renewable Resource Projects:* The sponsors of the current wind and geothermal demonstration and pilot projects should complete these projects. [ The costs of these existing projects are not included in the funding proposed for new renewable resource activities.]

*New Renewable Resource Projects:* Approximately 85 percent of the funding for renewables (\$34 million per year, based on 1995 revenues) should be allocated to renewable resource market transformation activities. The focus of these activities is initially to be the development of new renewable technologies, including solar, wind, geothermal, hydroelectric and low-emission organic, non-toxic biomass. These activities should be planned and carried out by the regional non-profit entity charged with conservation market transformation or, at the option of the local retail distribution utilities, the funding could be used by the local utilities.

*Renewable Resource Research:* Approximately \$1 million per year should be allocated to renewable resource research. These funds should be administered by the regional non-profit entity charged with conservation market transformation or a similar regional entity.

*Distributed Renewable Resource Research, Development and Demonstration:* Approximately \$5 million per year should be applied to the development and demonstration of distributed renewable resources. [ Smaller-scale local renewable resource-based generation that gains value by offsetting transmission and distribution costs.] These funds should be administered by the regional non-profit entity charged with conservation market transformation.

*Green Marketing:* Retail distribution utilities should provide green power purchase opportunities to individual consumers in advance of full retail open access.

## Implementing the Recommendations from the Comprehensive Review

While the Comprehensive Review achieved consensus on broad goals for sustaining conservation and renewable resource development in the region and creating a more stable source of funding for low-income weatherization, it was unable to fully explore and resolve some critical implementation issues. Indeed, in some instances, specific recommendations, if viewed independently, appear to conflict with the expressed goals. The intent of the following paragraphs is to set forth what the Council believes are some of the more important considerations involved in moving from the broad policy recommendations from the Comprehensive Review regarding energy conservation and renewable resources to actually implementing those recommendations. This is intended to assist state legislators, regulators and local utility commissions as they wrestle with the details of implementation.

The Council's recommendations address several important implementation issues. First, utilities in the restructured competitive environment will face a different set of incentives and constraints than they do now. If those utilities are to be given responsibilities for conservation, low-income weatherization and renewable resource development, how can those responsibilities best be aligned with the incentives and constraints they will face in the future? Second, if, as the Steering Committee recommended, the region is to rely as much as possible on market forces to develop conservation and renewable resources, what conditions and approaches are most likely to be consistent with a greater reliance on the market? Third, the Steering Committee's recommendations focused on the amount of funding to be allocated to the various public purposes, but gave little guidance to how the money should be used within those broad categories. What criteria should be used to guide implementation? Finally, the Steering Committee's recommendations generally defer to local action to secure conservation and renewable resources. There were, however, specific activities that the Steering Committee recommended be carried out at a regional level. There are other areas that might well benefit from at least regional coordination. Supporting these activities will require a commitment of resources from the local and state levels

### *Aligning Responsibility with Business Interests*

The Steering Committee recommended that local distribution utilities collect and administer most of the funding for conservation and low-income weatherization. The local distribution utility should have the option of retaining the funding for new renewable resource projects for use in local projects. The Steering Committee, in its recommendations for competition and consumer access, also made a number of recommendations for restructuring of retail electricity markets.

These included recommendations for separating, at least functionally, electricity distribution from energy marketing and services; unbundling utility rates to, at a minimum, separate costs of the energy commodity from the costs of distribution and other relatively fixed costs; and collecting funding for public purposes in ways that are, to the greatest extent possible, competitively neutral. These recommendations change the structure of the industry and the incentives and constraints facing the restructured utilities. The success the region is likely to experience in implementing the recommendations from the Comprehensive Review for conservation and renewable resources is linked to these recommendations for competition and consumer choice. Competition and consumer choice determine how well the utilities' responsibilities for conservation and renewable resources are aligned with their business interests.

## Conservation

There is no perfect way to align the responsibility for conservation with the pressures utilities are likely to be exposed to in an increasingly competitive, open access environment. The degree to which utilities actually separate their distribution and energy marketing functions will have a large bearing on conservation acquisitions. Utilities that continue to link distribution with marketing will have an interest in maintaining and increasing electricity sales. If provision of conservation services proves to be an effective marketing tool, allowing only the incumbent utility access to public purpose conservation funding will be anti-competitive. If conservation is not an effective marketing tool, conservation that reduces sales could be perceived as counter to the utility's interests. This is particularly so if the charge for the electricity commodity includes some of the utility's fixed costs or unavoidable commodity costs, as could be the case if the utility's supply contract were "take or pay." Unbundling the utility's rates, as the Steering Committee recommended, can avoid the problem of under-recovery of fixed costs, but not the problem of unavoidable commodity costs. In fact, there may be an incentive for the vertically integrated utility to use conservation funds to increase electricity sales by promoting electricity-using appliances or services, rather than increasing efficiency.

How the utility that retains an energy marketing function collects the funds for conservation is also important. If it is collecting those funds primarily through the commodity charge, it is putting itself at a disadvantage. In an open market, energy service providers who do not invest in conservation will be able to offer lower rates than the local utility. This underscores the importance of the Steering Committee's recommendation that the funding of conservation and other public purposes be competitively neutral.

If separation of the distribution and energy marketing functions is relatively complete, these disincentives need not exist. If the distribution utility has unbundled its rates so that it is not recovering fixed costs in a kilowatt-hour based charge, it will not be adversely affected if customers reduce their electricity use through conservation. [ To the extent that conservation significantly reduces peak demands, and distribution utilities collect fixed costs in a demand related charge, there will be a disincentive to that distribution utility engaging in conservation.] At

the same time, however, the utility that only distributes electricity has little intrinsic reason to promote conservation other than as a public service. The exception is where conservation investments can be targeted to reduce distribution system costs. However, it is not unreasonable to expect the distribution utility, which will remain a state or locally regulated entity, to undertake conservation as a public service required by its regulators or governing board.

## Renewable Resources

Aligning responsibilities with a utility's business interests is also important for renewable resources. Again, the degree of separation of the distribution and energy marketing functions, the unbundling of rates and the means of collecting funds for renewable resource development are important issues.

The Steering Committee suggested that new renewable resource development efforts be administered by the regional entity charged with conservation market transformation or a similar regional entity. However, the Steering Committee gave retail distribution utilities first right of refusal on renewable resource development efforts. If the recommendations to separate utilities' distribution and energy marketing functions are implemented fully, retail distribution utilities would not have a direct interest in the development of generation, other than for the system benefits of distributed generation. Distributed generation can offset expensive distribution system investments. As in the case of conservation, if the utility has adequately unbundled its rates so that fixed costs are not being recovered in a kilowatt-hour charge, the distribution utility will be indifferent to potential load loss resulting from distributed generation installed on the customer's side of the meter.

However, while renewable distributed generation could have important local benefits, it is unlikely to make a significant contribution to the region's power supply. The nature of the major renewable energy resources in the Northwest (Appendix A) is such that bulk renewable power generation will have to be the focus of development if significant increases in renewable resources' market share are to be achieved. Moreover, if a distribution utility develops renewable resources for bulk power, it has taken on the energy marketing role and is no longer the neutral provider of distribution services. There are several ways a distribution-only utility can positively influence renewable resource development as part of its public service responsibility. These will be discussed later. But direct involvement in the development of renewable bulk power resources by distribution-only utilities is not recommended.

The energy marketing function of local utilities can have a business interest in the development of renewable bulk power resources. Such utilities are often familiar with project development opportunities in their service territories. In addition, many utilities own hydropower plants that can be upgraded or expanded. Some of the lowest-cost renewable resource development opportunities are upgrades to existing utility-owned renewable resource facilities.

However, most of the promising renewable resources described in Appendix A have costs that are

currently above market and may have greater development risk than conventional generating resources. There is a risk that the amount of renewable resource funding available through the public purposes charge could prove insufficient to cover the above-market portion of the costs of some renewable projects. In a competitive environment, this could result in stranded costs. As a consequence, the energy marketing components of local utilities would want to avoid entering ownership arrangements or power purchase contracts that would expose them to such risk.

There are less risky ways local energy marketers could use the public purpose funds for renewable resources. These include project financing incentives, production incentives and power purchase contracts where the residual risk of above market prices is borne by the developer. These are described in Appendix B.

### *Consistency with the Competitive Market*

As noted earlier, the Steering Committee expressed a preference for reliance on market forces wherever possible to achieve the region's goals for developing cost-effective conservation and renewable resources. Implicit in this preference is the principle that the funding dedicated to conservation and renewable resources should be used in ways that, to the greatest extent possible, foster and/or complement the development of competitive markets for energy-efficiency services and renewable resources. This goal suggests several necessary or, at a minimum, desirable conditions for implementing conservation and renewable resources.

### [Access to Consumer Information](#)

In the current market structure, distribution utilities have access to their customers' historical energy use patterns. As noted in the section on competition and consumer access, access to this information is essential if other energy suppliers are to compete on an equal footing. This information can also be extremely useful for targeting potential customers who might benefit from specific demand-side management and other energy-efficiency services. Marketers of renewable resources could also use the information to better match the output characteristics of their resources with certain consumers' load characteristics. If local utilities restrict access to customer information, it could have an adverse effect on the development of an active competitive market for energy-efficiency services and renewable resources. By placing new power marketers at a disadvantage relative to the incumbent utility, it may result in fewer new market entrants in these businesses and, therefore, less competition in the long run.

### *Access to Supplier Information – Green Marketing*

As noted in the section on competition and consumer access, consumers must have access to adequate information about competing suppliers and the products they are marketing. Consumers need consistent information to compare competitors, whether the competition is to sell electricity, energy-efficiency services or green power. Consistent consumer information will be

essential if green power marketing is used to achieve the Steering Committee's renewable resource goals.

With open retail access, the end-use customer can play a much more direct role in furthering the development of renewable resources than was previously possible. Customers can choose their preferred sources of energy. Many industry observers believe that some consumers will express their environmental preferences by purchasing green power — generally power from renewable and environmentally benign resources. The Steering Committee recommended that all end-use customers be provided green power purchase opportunities in advance of full retail open access. Once open access is established, marketers of green power products would have access to consumers on the same basis as other power marketers.

The definition of "green" power has been controversial, as different objectives underlie advocacy of greater development of green power sources. Because of this diversity of objectives, it appears best, where possible, to avoid defining green power. Rather, the objective should be to strive for a diversity of product offerings, coupled with sufficient product disclosure, consumer education and product verification to support informed consumer decision-making.

However, because the Steering Committee recommended that access to green power products be opened before more general open access, a definition of green power is needed for the transition period. The Council recommends that the definition of green power adhere to the general criteria established by the Steering Committee for renewable resources eligible for market transformation support. These criteria have been expanded where necessary to achieve the degree of clarification likely to be required for defining a power product. The primary definition of a green power product would be one that obtains half its minimum average content of energy from *new* renewable resource projects. This will encourage the development of new renewable resources, yet will provide the flexibility to meld in services that ensure reliability [ Firming, reserve and other services required to provide an acceptably reliable power product.] and low-cost power that brings down the price of the green power product. New projects are those brought into service the year before the year of sale. [ Alternatively, "new" projects could be those brought into service following some given date, for example January 1, 1997.] "New projects" may include upgrades or additions to existing projects that result in net increases in average energy production, re-commissioned projects idled for economic reasons, and modifications to the dispatch of existing projects that result in net increases in average energy production. Projects must be undertaken for the primary reason of either producing additional energy or reducing environmental impacts. Power from any geographic location should qualify.

Renewable resources include those fueled by solar, wind, geothermal, hydro (outside of protected areas as defined by the Council, and other federal or state agencies and statutes) and low-emission organic, non-toxic biomass resources. Biomass resources include those produced primarily for their energy content, as well as renewable organic byproducts of non-power-related processes. The latter includes landfill gas, wastewater treatment byproduct gas, renewable organic municipal

solid waste and spent pulping liquor. Any project for which permits are successfully secured should be considered "non-toxic." [ This approach is consistent with the overall thrust of deregulation in which the environmental characteristics of power projects increasingly will be determined by environmental standards, rather than economic regulation.]

Once general open access is established within a utility, a definition of the "contents" of green power products will be less necessary, as long as product disclosure and verification are provided. In addition to consumer choice of energy supply, an efficient and legitimate green power marketing effort requires adequate product information in advance of purchase, retrospective information about the product actually produced and verification that the price premium is applied to the project or resource of choice. These information requirements are described in Appendix C.

### [Securing Energy Efficiency and Renewable Resources Through More Market-Oriented Actions](#)

Adequate access to information about consumers and suppliers will not, by itself, ensure the development of competitive markets for conservation and renewable resources. How the conservation and renewable resource funding called for by the Steering Committee is used can either stimulate a competitive market or perpetuate the "old system" of utility acquisition programs. What follows is an examination of some ways these funds can be used that are more consistent with the development of competitive markets.

*Leveraging consumer investment in conservation:* The Steering Committee recommended that customers that use large amounts of electricity should be credited for documented cost-effective conservation investments made in their facilities. [ Such credits are not to include their contribution to regional market transformation and renewable resource research and demonstration efforts and low-income weatherization and energy-efficiency service costs. The Steering Committee discussed extending the option of crediting any consumer investments in conservation, but determined that the administrative burden of documenting and tracking small consumer investments would outweigh the benefits.] In effect, this recommendation leverages the customers' contribution and encourages customers to make their own market decisions about the energy-efficiency services that best meet their needs, as opposed to utility-designed programs. What constitutes a "large" energy customer was not defined, although the context of the debate suggests that the Steering Committee had industrial and perhaps large commercial customers in mind. There are two potential conflicts between this limitation and the desire to rely on market forces to achieve cost-effective conservation and renewable resources.

First, any customer that does not qualify as a "large" customer will have a disincentive to cut energy use because they will still pay a charge equivalent to 3 percent of their electricity bill to satisfy the Steering Committee's recommendations, but they will receive no credit for conserving. If their distribution utility spends the funds collected under the 3-percent charge on conservation

in some other consumers' homes or businesses, those customers that took action on their own end up paying twice. Customers that take no action on their own are rewarded while those who trimmed their energy use pay twice.

The second conflict between the Steering Committee's recommendation and its intent to rely on market forces occurs because only the utility's investments can be credited, not those made by customers as part of a utility leveraging effort. For example, if a distribution utility is able to arrange for a customer to borrow funds to retrofit their building's lighting system, and the utility could claim credit for both the amount it spent and the amount the customer borrowed, the utility would be, at a minimum, indifferent about the level of cost sharing. On the other hand, if the distribution utility could only claim credit for what it spent, it would have no incentive to find ways to leverage its conservation dollars with those of other parties. As a result, there would be little fostering of the consumer market for energy-efficiency services except through utility programs.

The Steering Committee discussed extending the option of crediting any customer investments in conservation, regardless of the level of their electricity use, but concluded that the administrative burden of documenting and tracking investments by small customers would outweigh the benefits. Nevertheless, in implementing the recommendations, it will be important to adopt mechanisms that encourage customers to be more responsive to the economic and other benefits of investing in energy efficiency or renewable resources rather than discourage such investments.

*Broadening access to public purpose funding:* There is another way that utility programs, through public purpose funding, might restrict the development of an active market for energy-efficiency services and renewable resources. As noted previously, the Steering Committee recommended that local distribution utilities collect and administer the funding for conservation and renewable resource development and low-income weatherization. Responsibility for local implementation of conservation was left to the retail distribution utilities because they have historically been the principle conservation service providers in this region. However, when customers can choose who provides them with energy services, the distribution utility will no longer have a monopoly on the provision of energy-efficiency services. Therefore, as retail access occurs, it will be essential to ensure that other qualified entities are offered the opportunity to compete for the use of public purpose funds to secure conservation and renewable resources. This will both promote competition and potentially create opportunities to leverage these funds.

*Customer-directed renewable resource incentives:* Green power purchases are likely to favor the lowest cost renewable resources — hydropower upgrades, landfill gas recovery, upgrades to existing biomass facilities and possibly some localized high-value wind. While there is merit to these projects, they represent resources that are quite limited in the Northwest. The development of these types of projects is unlikely to result in enduring changes in the market for renewable resources. The cost of power from resources offering greater promise in the longer term (Appendix A), however, is currently well above market rates. Consequently, these resources are

unlikely to benefit significantly from a green power marketing effort unless the public purposes funding for new renewable resources is used to reduce the above-market costs.

In the spirit of competition and greater customer choice, a utility may wish to use renewable resource development funds to encourage customer-directed purchases of energy from renewable resources. One approach, explored by the Oregon Office of Energy, is renewable power purchase credits. The distribution utility would use revenue from renewable resource development funds to provide billing credits to end-use customers desiring to purchase energy from renewable resources. To encourage conscientious use of purchase credits and cost-sharing by customers, the credit would be set at less than the difference in price between any qualifying renewable portfolio and a reference base price. Purchase credits could be limited to certain types of resources or differentiated by resource. This would provide some ability to target specific types of projects for market transformation purposes. Overall program expenditures and the degree of customer cost-sharing could be controlled by adjusting the amount of the credit.

### *Establishing the Implementation Objective*

As noted previously, the recommended that to ensure that cost-effective conservation, renewable resource development and low-income weatherization are sustained, 3 percent of the revenues from the sale of electricity services in the region should be dedicated in aggregate over the region to those purposes for a period of 10 years. The Steering Committee did not elaborate on how much energy efficiency it anticipated would be developed by an annual investment of this magnitude. It did not specify the amount of new renewable resources that would be installed in the region. Nor did the review set any target for the number or proportion of low-income homes that would be weatherized annually. As a consequence, the determination of whether the region is meeting its conservation, renewable resource and low-income weatherization goals gives the appearance of being focused on meeting a funding target, as opposed to achieving cost-effective energy savings, developing renewable resources or weatherizing homes of low-income customers.

The real task should be ensuring that whatever revenues are dedicated to these purposes are appropriately targeted and effectively spent. For example, the Steering Committee recommended that as much as five-sixths of the funds may be invested by local distribution utilities. As noted above, the distribution and energy service functions of utilities should be separated to ensure that they do not have conflicting public purpose and business objectives. However, how complete the separation will be is unclear, and separation alone may not provide distribution utilities with sufficient guidance to implement the Steering Committee's recommendation prudently. This is due to the fact that these utilities are economically indifferent to the level of efficiency or the amount of renewable resources purchased by their system's end-use consumer. Consequently, there is no intrinsic reason for a distribution utility to focus on the most effective and efficient investment opportunities. Nor is there any reason why the distribution utility might allocate its investments so they are consistent with other potentially important public policy objectives, such as environmental objectives that might arise in the future.

Therefore, the Council recommends that legislation and or implementing rules and regulations should address not only how much money is to be collected, but how best to invest it. This does not mean specific directives regarding what particular efficiency measures should be undertaken, but criteria that spell out the parameters under which efficiency measures and programs should be selected would be valuable. Such criteria can be flexible enough to encompass differences in local conditions while giving assurances that customer resources are being used effectively. The Council recommends that at least the following three policy criteria be considered:

- "Public interest" energy-efficiency investments should focus on those conservation opportunities that are the least likely to be developed by market forces. For example, residential rental property owners rarely pay the electricity bills of their tenants. Consequently, they have little economic incentive to invest in conservation improvements.
- The cost-effectiveness criteria used to determine whether particular investments are economically prudent should take into account environmental externalities and non-electric energy and/or non-energy benefits (e.g., natural gas savings, water savings, increased productivity, reduced expense for low-income households, etc.). In a competitive electricity market, consumers are more likely to face retail electricity prices that reflect the marginal cost of producing electricity. However, under current environmental regulations, the potential cost of emissions of carbon dioxide and other environmental impacts of electricity production may not be fully captured. For example, pursuant to the Rio Accord, the U.S. government committed to reducing its carbon emissions to 1990 levels by the year 2000. Until the costs of meeting this commitment are reflected in electricity rates, the cost of electricity to consumers will not capture its total cost of production to society.
- The lowest cost conservation and potential "lost-opportunity" resources warrant priority investments. These opportunities should be secured first to maximize the effectiveness of public investment. In addition, minimum consumer contributions or matching requirements might be established to effectively leverage private investments with public purpose funding.

## *Regional Action and Coordination*

The recommendations from the Steering Committee generally give preference to local implementation of conservation, renewable resource development and low-income energy services. However, the Steering Committee did recommend several areas where action at the regional level would be appropriate. There are other areas where regional coordination could improve the effectiveness of local actions. However, action at the regional level will not occur unless explicit steps are taken at the state and local levels to support these activities.

## [Responsibility for Oversight and Reporting](#)

The Steering Committee, recognizing the need for some oversight, recommended that a regional technical forum be established to track progress toward achievement of the region's goals for

conservation and renewable resource development, and provide feedback and suggestions for improving the effectiveness of conservation and renewable resource development programs. Although the Steering Committee recommended that the regional technical forum be composed of representatives of utilities, other electricity service providers, government and public interest groups, it did not suggest how this forum should carry out its work. For example, the Council has historically tracked only Bonneville and utility progress on conservation because they were the dominate players in the conservation market. Over the next 10 years, it is anticipated that new market entrants will offer energy-efficiency services along with other energy services in an increasingly competitive electricity market. Should (or can) the regional technical forum attempt to track the activities of these firms? Is it reasonable to expect that an organization whose membership is purely voluntary will be able dedicate the resources necessary to carry out its tracking function over a 10-year period? The Council believes that the regional technical forum, in order to provide effective and regional oversight and feedback to the region's decision-makers, will need sufficient resources and authority to carry out these tasks. Therefore, the Council intends to develop alternative approaches to supporting the activities envisioned for the regional technical forum, solicit public input on these alternatives and work to implement the preferred alternative.

### [Adjusting the Region's Resource Portfolio to Reflect Changing Market Conditions](#)

The Steering Committee provided specific recommendations regarding the allocation of regional investments among local and regional conservation, renewable resource research, demonstration and development, and low-income weatherization. However, the Steering Committee also recommended that the regional technical forum conduct periodic reviews of the region's progress toward meeting its conservation and renewable resource goals at least every five years. These periodic reviews are to acknowledge changes in the market. Any recommended changes for improving the effectiveness of conservation and renewable resource programs are to be communicated to the appropriate decision-makers.

The rationale behind the recommendation to conduct periodic reviews is an acknowledgment of the impossibility of accurately forecasting the future. One need only consider the difference between the Council's forecast of new power generation costs in its 1991 Power Plan and its forecast in the Draft Fourth Power Plan to ascertain just how rapidly and significantly the environment can change. Natural gas-fueled power generation is now about half the price it was in 1991. Legislation or regulations that specify a rigid allocation for regional investments run the real risk of rapidly becoming out of date. This is especially likely during a time of acknowledged dramatic change in the electricity industry in general and the energy-services market in particular. Therefore, in implementing the Steering Committee's recommendation, it would be desirable to make provisions for balancing the need for sustained investments in some areas (e.g., conservation or renewable resource market transformation efforts) with the need to adjust the region's resource investment portfolio to reflect changing market conditions. This may require more frequent reviews than once every five years. Provision should be made in state legislation

and/or regulations to permit adjustments to regional conservation and renewable resource investments that reflect changes in conditions, such as changes in technology, energy prices and energy service markets, public goals and objectives.

### Conservation Market Transformation

The Steering Committee recommended that conservation market transformation activities — activities explicitly designed to effect positive and long-lasting changes in the markets for energy-efficient products and services — be carried out by a regional non-profit entity. The Committee recommended that approximately 18 percent of the funds for conservation and low-income weatherization (\$30 million, based on 1995 revenues) be allocated to this regional entity for market transformation. The Steering Committee made this recommendation because the markets for these products and services typically cut across utility service territory boundaries. Over the past year, such an entity, the Northwest Energy Efficiency Alliance, has been established with voluntary funding through 1999 from Bonneville and investor-owned utilities. The long-term viability of this organization requires that either all local utilities continue to provide support or that the state legislation establishing public purpose funding provide for allocations to this entity. If this entity is funded through public purpose funding, the structure and membership of its board of directors should be changed to reflect the more "public" nature of its funding.

### Renewable Resource Market Transformation

As noted earlier, the Steering Committee called for market transformation for renewable resources to sustain at least a minimum level of development. Eighty-five percent of the funding for renewable resources (\$34 million, based on 1995 revenues) is to be used for this purpose. The Steering Committee gave "first right of refusal" for new renewable resources to local utilities. If local utilities are not interested, the regional non-profit entity would be called on for market transformation. There are several reasons why regional coordination of new renewable resource development is desirable. First, if the limited funds available for this purpose are used in an uncoordinated fashion, their impact will be greatly reduced. Most renewable resource projects are more expensive to develop than conventional resources. A 25-megawatt wind project, for example, might cost about \$1 million per year more than the current market rate of energy. A 30-megawatt geothermal project might cost \$7 million per year more than current market rates. These costs are cumulative and will quickly exhaust the funding available for market transformation. A sustained market transformation effort will require careful choice of projects and either the maximum level of regional market transformation funding recommended or a high level of coordination with local utility market transformation efforts.

Second, as noted earlier, the most promising renewable resources are site-specific and not uniformly distributed in all utilities' service territories. The greatest impact would be achieved if market transformation efforts by the regional non-profit or by utilities are coordinated to focus on these promising resources.

As discussed earlier, there are difficulties associated with aligning the business interests of local utilities with the development of new renewable resources. If it is determined that market transformation for renewables should be carried out through a regional entity, there are several development mechanisms that entity could employ. These mechanisms include the consumer-directed incentives described earlier as a means of bringing about new renewable resource development in a way consistent with stimulating a competitive market for renewable resources, as well as the financing incentives and production incentives described in Appendix C. The advantage of regional implementation of these mechanisms is that the available funding could be more easily focused on the most promising resources. Implemented regionally, any of these incentives could be designed to encourage the development of specific types of projects.

While a non-profit regional entity has already been established for conservation market transformation, that entity is not constituted to address renewable resource development. Changes in its charter and the make-up of its board would be required. Even if these changes are made, however, explicit steps will have to be taken at the state and local levels to ensure funding for renewable resource market transformation.

## Research and Development

Resource assessment, technology research and development, information compilation, pilot and demonstration projects and other activities of a research and development nature are needed to better understand the renewable resource potential and to improve the cost-effectiveness of renewable resources. Recommended renewable resource research and development activities are described more fully in Appendix D. The Steering Committee recommended that approximately \$1 million per year should be allocated to renewable resource research, and that these funds be administered by a regional entity. The economies of scale and the geographic distribution of renewable resources generally argue for regional administration of renewable resource research and development funds.

Bonneville and several regional utilities are currently supporting regional renewable resource research and development activities, including the Northwest Solar Radiation Data Monitoring Network, the Northwest Hydropower Site Database and the long-term wind monitoring network. Though these projects are probably best administered by a regional entity, such an entity may not be established for several years. It is important for the current utility sponsors of these projects to continue funding these projects until alternative means of support are established.

A regional entity charged with administering renewable resource research, development and market transformation initiatives must have stable and predictable funding. Resource assessment, for example, requires the collection of high-quality data over many years. Project development incentives (other than up-front grants) must be guaranteed for 10 or more years of operation to be considered by project financing institutions as a significant factor affecting project feasibility.

Monitoring and documentation of project development experience and technology performance

have received scant attention in current efforts to develop pilot and demonstration projects. Yet information concerning project performance, environmental impacts, licensing and development experience is crucial to maximizing the benefit of these projects. Efforts to reduce project costs and construction and operation expenses have taken priority over data collection and reporting. Proprietary concerns have further hindered data collection and reporting. Proprietary concerns can be accommodated by securing resource development rights and product licensing agreements. Because the funding that will support the above-market costs of these projects is ultimately public money, the products should be publicly available unless the market transformation benefits of not collecting or withholding information will be greater than the benefits of data publication.

### Distributed Generation Research and Demonstration

The Steering Committee recommended that the equivalent of \$5 million per year (based on 1995 electricity revenues) be dedicated to research and demonstration of renewable distributed generation and administered by the regional entity. As noted earlier, such generation can have distribution system benefits by reducing the need for costly system upgrades or extensions. Local distribution utilities are clearly in the best position to identify opportunities for distributed generation, although not all utilities can be expected to have attractive opportunities in their vicinity. At the same time, there is value in a regional view to focus efforts on the most promising of distributed generation technologies. This suggests that a coordinated regional and local approach will be most productive for distributed generation. The regional entity would identify promising distributed generation technologies and allocate the incentive funding on a competitive basis to local distribution utilities.

## **The Future Role of the Northwest Power Planning Council in Power**

### **Analysis in the Draft Power Plan**

The future role of the Northwest Power Planning Council regarding power-related issues is examined in Chapter 8 of the draft power plan. The draft power plan questioned the need for the kind of long-term, regionwide resource planning that has characterized the Council's work since the early 1980s. The draft power plan noted that in the future, the selection and development of new resources were likely to be functions of an unregulated, competitive generation market. In such a market, the financial risk associated with resource development resides primarily with the investors rather than with customers. This significantly dilutes the rationale for a public, regionwide power planning process. The draft power plan describes functions the Council might perform that would be useful to the region as the market for electricity becomes more competitive. These functions include:

- Providing up-to-date information on future electricity demand, new generating and efficiency technologies, system operations and market forecasts;
- Serving as a broker for exchanging information among utilities and others;
- Working at federal and state levels to resolve legal and institutional barriers to accomplishing regional goals;
- Providing impartial analysis of issues with a long-term regional perspective;
- Serving as a focus for analysis of the interactions between electricity generation and fish survival;
- Representing the interests of states and the public in energy issues; and
- Being a regional convenor of forums to resolve issues.

## **Recommendations from the Comprehensive Review**

The Steering Committee agreed with the view that the market, influenced by environmental and limited economic regulation, not regional planning, will largely determine what power resources are built and what can be charged for their output. The Steering Committee further noted that under its recommendations, Bonneville will no longer play a central role in resource development. Consequently, the Council's conventional regional planning role and oversight of Bonneville's resource acquisitions would no longer be relevant. However, the Steering Committee also confirmed that the remaining goals of the Northwest Power Act — encouraging conservation and renewable resources; helping ensure an adequate, efficient, economical and reliable power system; providing for the participation and consultation of the states, local governments, consumers, users of the Columbia River system and the public at large in providing environmental quality; and protecting, mitigating, and enhancing the fish and wildlife of the Columbia Basin — are goals that are still important to the citizens of the region. The issue is how they are to be achieved in the context of a competitive market.

The Committee noted that how the transition to the competitive future is accomplished is of critical importance to achieving those goals and, more broadly, to the region's economic and environmental interests. The Committee concluded that as the Northwest moves toward a competitive electricity industry, there is a role for a regional body like the Council. This role involves monitoring and assessing the transition to a competitive market and informing regional policy-makers and the public on issues relevant to that transition. This role is important if the transition is to be accomplished efficiently and fairly throughout the region and if the public values the Northwest has sought from its power system are to be protected.

Activities the Council might undertake in fulfilling this new role include:

*Conservation and renewable resources:* working with regional interests to devise ways of overcoming market barriers, participating in market transformation activities, providing guidance in meeting the region's conservation and renewable resource goals and working with the regional technical forum to track regional progress;

*The competitive marketplace:* providing information, evaluation and analysis of the evolving marketplace to ensure full, fair and effective competition throughout the region; and

*Public participation and involvement:* informing and involving interested members of the public on matters that affect them, their environment and their economy.

## **Implementing the Recommendations from the Comprehensive Review**

### *Conservation and Renewable Resources*

*Work with regional interests to identify and overcome market barriers:* The goal is a competitive market in which energy efficiency and renewable resources are developed primarily through market actions. Accomplishing that goal requires identifying and overcoming market barriers that block implementation of cost-effective options. Although the Steering Committee emphasized market barriers, regulatory barriers may also affect the development of promising resources. As states and local jurisdictions move toward opening their retail electricity markets to competition, it will be important that they establish rules that enable efficiency and renewable resources to compete on an even basis and protect the interests of consumers. For example, the states and local jurisdictions could define "green resources" and develop consumer protections to ensure that consumers get the resources they choose.

The Council will continue to work with utilities, other energy service providers, consumers, public interest groups and other regional interests to overcome existing market and regulatory barriers and avoid establishing new ones.

*Support the work of the Northwest Energy Efficiency Alliance:* Over the past year, the Council has been instrumental in bringing about the formation of the Northwest Energy Efficiency Alliance. The Alliance is a non-profit corporation with membership including public and private utilities, Bonneville, state government, the energy-efficiency industry and the public interest community. Its mission is market transformation — effecting permanent improvements in the markets for selected energy-efficiency products, services and practices. The Alliance is funded with roughly proportional funds from Bonneville and the investor-utilities for a period of three years. The Steering Committee endorsed the concept and mission of the Alliance. The Council believes it should continue to work with and through the Alliance to carry out this mission and will also seek to secure the longer-term role for the Alliance as envisioned by the Steering Committee.

*Support the work of an entity to carry out regional renewable resource research, development and market transformation:* The Steering Committee also called for a non-profit entity to carry out regional renewable resource research, development and demonstration and market transformation. The Council proposes to work with regional interests to determine the best means of carrying out this recommendation. Options include expanding the mission of the Alliance or another existing organization, or creating a new entity. The Council is also prepared to assist this organization in fulfilling its mission once established.

*Provide guidance in meeting the region's conservation and renewable resource goals:* The Steering Committee saw continued value in the Council providing guidance and suggesting standards for meeting the region's goals for conservation and renewable resources. To accomplish this, the Council will need to continue to identify promising energy efficiency and renewable resources, evaluate their cost-effectiveness in relation to market alternatives and recommend goals for the development of these resources. Much of this information is also essential to identifying and overcoming barriers to the development of promising energy-efficiency and renewable resources. The Council will make this information available to policy-makers, industry players and the general public.

*Work with the regional technical forum to track regional progress:* In 1996, Congress called upon the Council and Bonneville to establish a regional technical forum — a voluntary association of utilities and other energy service providers — to develop protocols for measuring energy-efficiency achievements. The Steering Committee expanded this mandate to include tracking and reporting on regional progress in implementing conservation and renewable resources. The Council proposes to work with Bonneville and other regional interests to establish the regional technical forum and help it carry out its assigned tasks.

## *The Competitive Marketplace*

*Monitor and evaluate the development of the competitive market:* Competition will create markets that cut across traditional regulatory boundaries and will introduce many new players. Inevitably, the structure and regulation of the markets in the different states will develop along somewhat different paths. The development of these markets needs to be monitored and evaluated for instances of excessive market power and differences in structure, pricing approaches or rules that lead to inefficiencies or inequities. The Council believes it is appropriate to carry out this monitoring and evaluation with the objective of promoting an efficient market consistent with regional environmental and equity goals. The Council should identify market-related issues of regional interest, promote information sharing, prepare recommendations and facilitate resolution of inter-jurisdictional issues.

*Review the market role of the Bonneville Power Administration:* The recommendations from the Comprehensive Review are intended to limit the ability of the Bonneville Power Administration to exert excessive market power. The Transition Board was established by the governors to oversee

implementation of the Comprehensive Review's recommendations, especially those pertaining to the subscription process for allocating the federal generating assets, the separation of Bonneville's generation and transmission, and recommendations regarding Bonneville's market power. The Transition Board is staffed by Council staff. Following termination of the Transition Board, the Council believes it should continue to monitor and assess Bonneville's market role.

*Provide information and analysis relevant to the evolving electricity market:* The efficient operation of the electricity market and the development of relevant public policy require information that is unlikely to be privately produced or disseminated because of diffuse and irregular requests for information or proprietary interest. The Council believes it will need to produce information, such as demand and fuel price forecasts and resource and technology assessments. The availability of such information from an independent and impartial source should be valuable to public policy-makers and the many new market participants produced by the opening of retail competition, at least during the transition.

*Monitor and evaluate the operation and expansion of regional transmission:* The Steering Committee called for administrative separation of generation and transmission by establishment of an independent grid operator with Bonneville as a participant. The Steering Committee also called for financial and legal separation of Bonneville's generating and transmission assets. These actions are expected to promote the goal of a more economically efficient and reliable transmission system. The Council believes it should monitor the administrative restructuring, operation and expansion of the transmission system to help ensure these goals are met.

*Monitor and evaluate the effects of competition on the environment:* Market mechanisms have the potential to be efficient means of minimizing the environmental effects of the power system. However, few markets provide price signals that are adequate to control the adverse environmental effects of their operation. As a consequence, the introduction of greater competition into the power industry has the potential to result in greater environmental impacts from the power system. The Council proposes to monitor and evaluate the effects of competition on the environment and, if necessary, assist appropriate policy-makers in developing corrective mechanisms.

## *Public Participation and Involvement*

In many respects, the competitive market will give consumers a greater say in the decisions of the electricity industry than ever before. Still, the backbone of the Northwest's power system is a public resource. Moreover, the power system has the capacity to profoundly affect the environment and economy of the region. The Council has the responsibility to inform and involve the interested public on issues of public importance. To accomplish this, the Council proposes to employ traditional methods of its public outreach program that have been effective over the years. It will also employ newer, faster-paced methods, including electronic information access on the Internet.

## Other Roles

Additional roles the Council proposes to continue include the following:

### *Analyzing the Interactions Between Fish and Power*

The Council provides the states and the public of the region the independent capability to analyze and evaluate the interactions between the power system and fish and wildlife. Unless new structures are implemented for governing the multiple uses of the Columbia River System, the Council needs to continue to play this role and enhance its capabilities in this area.

In addition, the Council is expanding its ability to evaluate proposed fish and wildlife recovery programs for their cost-effectiveness. This is important to help allocate limited recovery funds most effectively and achieve the maximum benefit for affected fish and wildlife.

### *Providing a Long-Range Perspective*

The competitive market is expected to shorten the traditionally lengthy time horizons of the electric power industry. The effect is already prevalent — the industry that until several years ago thought in terms of 30 to 50 year capital investments is now preoccupied with spot market power transactions. While short-term decisions may provide immediate financial benefits, they may ignore or compromise important long-term societal goals. The Council has historically taken the long view on power issues. There is a continuing need for an impartial body to take the long view, a role the Council proposes to continue. The purpose is to provide additional information that would otherwise not be part of short-term decision-making.

## Priorities and Resource Constraints

The Council is facing significant reductions in its budgets over the next few years. Carrying out the activities outlined above with high quality is unlikely to be fully possible within those constraints. The Council will have to prioritize among the activities proposed by the Comprehensive Review and its other responsibilities in power. The Council is seeking public comment on the priorities among these activities.

### **APPENDIX A**

### **WHAT NORTHWEST RENEWABLE RESOURCES OFFER THE GREATEST PROMISE FOR FUTURE DEVELOPMENT?**

Market transformation efforts should focus on renewable resource technologies having both good potential for improvements in cost and performance, and substantial long-term resource potential. While it is not possible to fully identify in advance the technologies that should be the targets of a 10-year market transformation effort, the following renewable resource technologies

currently show the greatest promise for the Northwest:

*Biogasification:* Biogasification technologies convert solid biomass to gaseous fuel. Biogasifiers, in combination with high-efficiency combustion turbines or fuel cells, could increase the efficiency, reduce the cost and improve the environmental performance of power plants using biomass residues and energy crops. Both biogasifiers and fuel cells require further development and commercialization. Small-scale gas turbines suitable for biomass applications, though commercially available, could benefit from proposed improvements in efficiency and environmental performance.

*Ground and water-source heat pump technologies:* Ground and water-source heat pump technologies use low-temperature energy contained in soil, surface waters and wastewater streams for space conditioning and water heating. Though these technologies are commercially available, capital costs remain high. Improved ground loop technology and installation techniques and economies of mass production could reduce costs and expand economically feasible applications.

*Photovoltaics:* Photovoltaic devices convert sunlight directly to electricity. Though commercially available, photovoltaic costs are high — six to ten times the cost of power from new gas-fired power plants. Cost-effective applications are limited to small, remote loads. Incremental improvements in photovoltaic device design and manufacturing, and economies of mass production promise continued cost reductions of 5 to 10 percent per year, or more. Technological breakthroughs leading to greater cost reductions are possible. Though small-scale distributed applications may remain the norm in the Northwest, the output of central-station photovoltaic plants sited in the prime solar resource areas of the Desert Southwest could supply Northwest loads.

*Solar Thermal:* With some exceptions, solar-thermal technologies largely remain in the developmental stage. Costs are high — three to four times the cost of power from new gas-fired power plants. The appeal of solar thermal lies with the very large resource that would become available for development if costs can be reduced to competitive levels. Unlike photovoltaics, the potential for breakthrough solar thermal technology appears slim. However, steady technological improvements and cost reductions appear likely. Central-station solar-thermal photovoltaic plants may be best sited in the prime solar resource areas of the desert Southwest. Such plants could supply Northwest loads through the western interconnected transmission grid.

*Wind:* Though windpower costs have substantially declined over the past 15 years, the cost of electricity from new installations at the best sites remains about one-and-a-half to two-times as great as the cost of power from new gas-fired power plants. Advanced wind turbine designs promise further cost reduction and reliability improvements. A steady market should encourage production economies. Though the largest Northwest wind resources lie east of the Rockies, prime wind resource areas closer to load centers could supply a moderate amount of electricity. Further resource assessment may confirm the existence of additional wind resources.

## **APPENDIX B**

### **MECHANISMS FOR USE BY LOCAL UTILITIES FOR PROMOTING THE DEVELOPMENT OF RENEWABLE RESOURCES**

Direct utility involvement in the development of new renewable resources that may have above-market costs for some extended period as well as some performance risk poses the potential for stranded investment in a competitive environment. There are, however, approaches that can minimize that risk. One is the consumer directed credits for renewable energy purchases described earlier. Other approaches include:

*Project financing incentives:* Utilities could use renewable resource development funds to provide financing incentives to developers. Recipients would likely be limited to developers selling power to the utility or its customers. Financing incentives include loan guarantees, direct grants, interest rate buydowns and low-cost loans. By reducing capital service costs, these types of incentives can reduce the cost of power to levels that may be attractive in the general wholesale power market or green power market. Some financing incentives provide the additional advantage of permanently reducing costs without continuing payments. This reduces the risk of creating future stranded investment. Financing incentives offer the ability to target specific projects and therefore may be a more effective market transformation tool than some other approaches.

The applicability of certain financial incentives may be limited. For example, federal law requires most of the power from projects receiving tax-exempt financing to be used by publicly owned utilities. Also, the amount of renewable resource development secured by use of financial incentives may be limited because of the high capital cost of many renewable resource projects. The return of incentive payments could be attempted through repayment provisions or equity positions, but is not guaranteed unless future power prices rise or project output is sold at a premium. Finally, financing incentives should not be so generous as to reduce the incentive for efficient and productive project operation.

*Production incentives:* Renewable energy production incentives could be provided by utilities to the operators of renewable power plants to offset the above-market costs of these projects. The utility would pay an established energy-based (per kilowatt-hour) premium for the output of qualifying projects or for energy service portfolios containing qualifying resources. Unlike the federal renewable resource production incentives, or the regional production incentive described below, utility production incentives would not be universal. Instead, they would likely take the form of a power purchase contract premium, applying only to resources supplying power services to the utility.

Unlike financing incentives, production incentives are continuing expenses, and do not necessarily ensure that projects will remain competitive following expiration of the incentives. Because production incentives may flow through market intermediaries, supplier certification and a verification and reporting system would be needed to ensure that the developers of qualifying projects benefit from the incentive. Unless an established supply of production incentives is

available on the market, long-term incentive contracts (i.e., a premium power purchase agreement) might have to be offered in order to provide renewable resource developers sufficient certainty to proceed with project development.

*Power purchase contracts:* A utility that continues to supply power services to its distribution customers can use power purchase contracts to acquire the output of projects using renewable resources. Renewable resource development funds can be applied to the above-market costs of these contracts. Power purchase contracts allow utilities to secure power without the need to assume the capital costs and risks associated with project development. However, because the benefits of utility financing are not available to the project developer, energy costs may be greater than if the project were utility-financed. Power purchase contracts are often front-loaded to enable the developer to secure the lower-interest benefits of shorter-term financing.

Because power may flow through market intermediaries, supplier certification and a verification and reporting system would be needed to ensure that the developers of qualifying projects benefit from contract premiums.

## **APPENDIX C**

### **INFORMATION REQUIREMENTS FOR GREEN POWER MARKETING**

*Product disclosure - prospective information:* An efficient market requires that customers be informed regarding product choices and characteristics in advance of purchase. This is particularly important in the case of green power because the green power premium distinguishes the method of production, not the product

Disclosure needed in advance of purchase includes price, contractual conditions, resource composition (including ancillary services and blending energy) [ Price information should clarify that the price of the power product constitutes only one component of delivered power cost. ], project type and vintage. Documentation of other attributes on which the product may be marketed should also be supplied. Because of uncertainties concerning plant reliability and the performance of intermittent resources, resource composition (and perhaps other information) may have to be supplied in terms of guaranteed percentage ranges. General technical and environmental information concerning the component resources would be useful, particularly when first establishing a green power market. Information regarding other power supply alternatives, or average system characteristics is also needed to establish a basis for comparison.

*Product disclosure - retrospective information:* The kilowatt-hours delivered to a green power customer bear no evidence of origin, and will be a blend of "green" and "non-green" energy determined by system physics, not customer choice. Billing provides a format to report the characteristics of the customer's power resource portfolio. The Steering Committee called for provision of billing information, including the consumer's resource portfolio, environmental characteristics of that portfolio and itemized unbundled charges. More specifically, portfolio information should include energy sources and average energy conversion efficiency by resource

type. Environmental information should include net [ Net emissions would be adjusted for any offset efforts.] unit (kilowatt-hour) emissions of key atmospheric emissions, including sulfur dioxide, nitrogen oxides and carbon dioxide. Benchmarks showing average system values for resource composition, energy conversion efficiency and air emissions should also be provided.

*Verification:* The periodic reporting of the composition, environmental effects and other characteristics of an end-use consumer's resource portfolio will require a tracking and reporting system. The tracking system will collect and aggregate data regarding the performance of the specific power plants receiving revenue from (though not necessarily serving) a given account—the reverse of the billing system. Two general types of tracking systems have been proposed: In the "settlements" system, plant performance parameters are reported from producers to end use customers via market intermediaries.

An alternative to the settlement system is the "tag" system. In the tag system, plant operators would produce two separate marketable products: power, and certificates (tags) verifying production of a given amount of power from a given source. Power and tags (which would likely be electronic) would be independently traded. Tags would be marketed to retail suppliers as evidence of power production by specific sources. Tags thereby could serve as a vehicle to transfer green power premiums to green power sources.

Tags could also serve as a tracking mechanism for transferring air emission and other plant information from the plant to the customer's bill, or for compiling systemwide performance assessments (e.g., carbon dioxide production, for example). This would require universal tagging, whereby all power production would be certified by tags, and all power sales would require tags. Tags could also bear optional information useful for certifying other custom power products, for example "union-made" power.

The original tag proposal called for tags to be issued annually and in advance of the certified generation. This presents a verification problem, since it is not possible to forecast consistently the extent to which a plant (particularly an intermittent renewable plant) will operate over the course of a year. Environmental information carried on the tag would also be speculative. A better approach, particularly if tags were used to track air emissions and other plant characteristics on the basis of which power might be marketed, may be to issue tags upon completing the generation of an increment of power.

## **APPENDIX D**

### **RECOMMENDED RENEWABLE RESOURCE RESEARCH, DEVELOPMENT AND DEMONSTRATION ACTIVITIES**

This appendix provides the Council's recommendations for renewable resource research and development activities. These recommendations are provided in response to Section 4(e).(3).(B) of the Northwest Power Act, which calls for inclusion of recommendations for research and development. The first section describes activities that the Council believes should be continued

or initiated in the near-term. Here, the "near-term" is considered to be the period from the present until such time as the system for funding and administering renewable resource research, development and demonstration activities recommended by the Steering Committee of the Comprehensive Review is in place. The second section describes, in more general terms, activities that appear to be desirable over the longer term - following establishment of stable regional research, development and demonstration funding for renewable resources.

## Near-term Activities

Listed below are the renewable resource research, development and demonstration activities that the Council recommends be continued until the Steering Committee's recommended system is in place.

Most of the recommendations that follow continue activities that are currently under way. The two recommendations relating to documentation of the experience gained from wind and geothermal projects, however, would involve expansion of work already under way. These are included because much of the value of the pilot and demonstration projects lies in the experience gained from their development and operation. Though most of the pilot and demonstration projects appear to be proceeding, little attention is being given to systematic monitoring and reporting of the experiences. This monitoring and reporting can be effectively accomplished at little cost, compared with the incremental cost of developing and operating these projects, and with little or no compromise of proprietary concerns. To the extent that the above-market costs of the pilot and demonstration projects are borne in the general rates of the sponsoring utilities, information resulting from the project should be publicly available.

Most of the activities that follow are currently supported by Bonneville and regional utilities. If the recommendations of the Steering Committee are implemented, the cost of many of these activities (one exception being the pilot and demonstration projects) will shift to a public benefits charge on retail electricity sales. Furthermore, there are substantial economies and other benefits to be gained from regional administration of these types of research and development activities. The Steering Committee recommended and the Council supports regional administration of renewable and distributed resource research, development and demonstration. While there is sufficient merit in the following activities to recommend their continuation during the transition period, the nature and benefits of these activities will be reviewed by the entity responsible for the long-term administration of funding.

As a minimum, these renewable resource research, development and demonstration activities should be continued during the period of transition to a system of stable, long-term funding:

*Solar radiation monitoring:* Continue operation of the Northwest solar radiation monitoring network and associated data analysis and reporting system until long-term regional renewable resource research and development funding is established for this effort. Consider expanding the

geographic coverage of this system if opportunities to do so become available.

***Long-term wind monitoring:*** Continue operation of the Northwest long-term wind monitoring network and associated data analysis and reporting system until long-term regional renewable resource research and development funding is established for this effort. Consider expanding the geographic coverage of this system if opportunities to do so become available.

***Wind pilot and demonstration projects:*** Complete and operate commercial-scale wind pilot and demonstration projects at two wind resource areas, including the Wyoming Wind Plant Project (Foote Creek Rim) cold climate site.

***Wind pilot and demonstration project monitoring:*** Prepare and implement a plan for monitoring, analyzing and reporting the experience gained through development and operation of the wind pilot and demonstration projects.

***Geothermal pilot and demonstration project:*** Complete and operate (subject to satisfactory resource quality and permitting) a geothermal pilot and demonstration project at the Glass Mountain geothermal resource area.

***Geothermal pilot and demonstration project monitoring:*** Prepare and implement a plan for monitoring, analyzing and reporting the experience gained through development and operation of geothermal pilot and demonstration projects.

***Hydropower site data:*** Maintain the Pacific Northwest Hydropower Database and Analysis System with equitable funding contributions from both power and fish and wildlife sources.

***Technology and resource information:*** Continue to compile information on renewable resource technology and resource availability, and issues associated with the development of renewable resources (Council action).

***Photovoltaic development:*** Continue to identify and facilitate development of cost-effective applications of photovoltaic technology. This effort should be integrated into the regional effort for the development and demonstration of distributed renewable resources recommended by the Steering Committee, when that effort is established.

***Advanced hydropower turbine:*** Continue participation in the U.S. Department of Energy effort to develop an environmentally advanced hydropower turbine system design. This effort should be a candidate for long-term regional renewable resource research and development funding.

## **Longer-term Activities**

The research and development activities described below are ones that appear to have the greatest promise of facilitating the production of additional renewable energy over the longer-term.

Included here are "basic" research activities that would be funded by the \$1 million allocation recommended by the Steering Committee, distributed renewable demonstration work that would be funded by the recommended \$5 million allocation, pilot and demonstration power plants currently under development that would be completed by their current sponsors, and new pilot and demonstration projects that would likely be funded from the \$34 million recommended for the development of new renewable generating capacity.

The general recommendations appearing below are based largely upon earlier work by the Council and its advisory committees. Further assessment by the organization established to administer renewable resource research and development funding would be needed to arrive at specific project recommendations.

*Pilot projects:* Pilot projects are the first development at a resource area offering larger potential. A pilot projects leads to better understanding of the energy and environmental characteristics of a promising renewable resource area. Transportation, transmission and other project infrastructure is created, reducing the cost of subsequent "step-out" development. Confirmation of the long-term energy productivity and environmental consequences of resource area development will reduce uncertainties associated with subsequent development, thereby reducing the development and financing costs of subsequent projects. Pilot projects under way in the Northwest include the Columbia Windfarm (Washington), Vansycle Ridge (Oregon) and Foote Creek Rim (Wyoming) wind projects, and geothermal projects at Glass Mountain (California). The Steering Committee calls for completion of these projects by the current sponsors. Future pilot projects could be funded from the \$34 million per year public purposes allocation. Candidates include pilot wind projects at other promising wind resource areas, pilot landfill gas recovery projects at the regional landfills and forest thinning biomass plants in association with proposed eastside forest health recovery efforts.

*Demonstration projects:* Demonstration projects demonstrate the cost, technical and environmental performance of new technologies and applications. These projects offer opportunities to identify and resolve problems and uncertainties associated with new technologies and showcase new technologies to prospective developers. Successful application of the new technology can lower the cost of developing future projects. An example of a renewable resource demonstration project in the Northwest is the Columbia Windfarm — the first domestic application of the AWT-26 wind turbine. Future demonstration projects could be funded from the \$34 million per year public purposes allocation or the \$5 million in funds for distributed resource demonstration. Candidate technologies potentially benefiting Northwest renewable resources include biomass gasification (using energy crops, agricultural wastes or forest thinning residues), fuel cells using biogas fuels, low-temperature hydrothermal and geothermal heat pump technology, "fish-friendly" hydroturbines and novel applications of small-scale photovoltaic generation.

*Resource monitoring and assessment:* The availability of reliable long-term energy resource and

environmental data for promising renewable resource areas will shorten the development lead time for power projects, improve the confidence of project performance estimates and heighten the probability of project success, thereby reducing project development and financing costs. Resource monitoring projects currently under way in the Northwest include the Northwest Solar Radiation Data Monitoring Network and the Northwest Long-term Wind Monitoring Network. Other projects include the Pacific Northwest Hydropower Database and Analysis System and periodic assessments of regional residual biofuels availability that have been conducted in conjunction with the Regional Bioenergy Project. These projects can be sustained and expanded using the \$1 million allocation for renewable resource research. Collection of additional environmental baseline data at promising renewable resource areas would be desirable. Efforts should be made to collect energy and environmental data in conjunction with pilot project development.

*Technology and resource development monitoring and reporting:* Information regarding renewable resource technology status, resource potential and project development provides guidance for renewable resource public policy decisions and for investments in technology research and development and market transformation. Collection, analysis and publication of renewable resource technology and resource development information can be sustained using the \$1 million research allocation and a portion of the \$5 million allocation for distributed resources.

*Renewable technology research and development:* Contributions to basic technology research and development will encourage continuing advances in technology performance and reduction in cost. A portion of the \$1 million research allocation and \$5 million distributed resource allocation should be directed toward participation in Electric Power Research Institute renewable resource technology development and similar efforts, with a focus on promising Northwest renewable resource technologies and applications. Candidate technologies include biomass gasification, fuel cells using biogas fuels, low-temperature hydrothermal and geothermal heat pump technology, "fish-friendly" hydroturbines, photovoltaics, microturbines, wind turbines and geothermal power generation technologies.

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