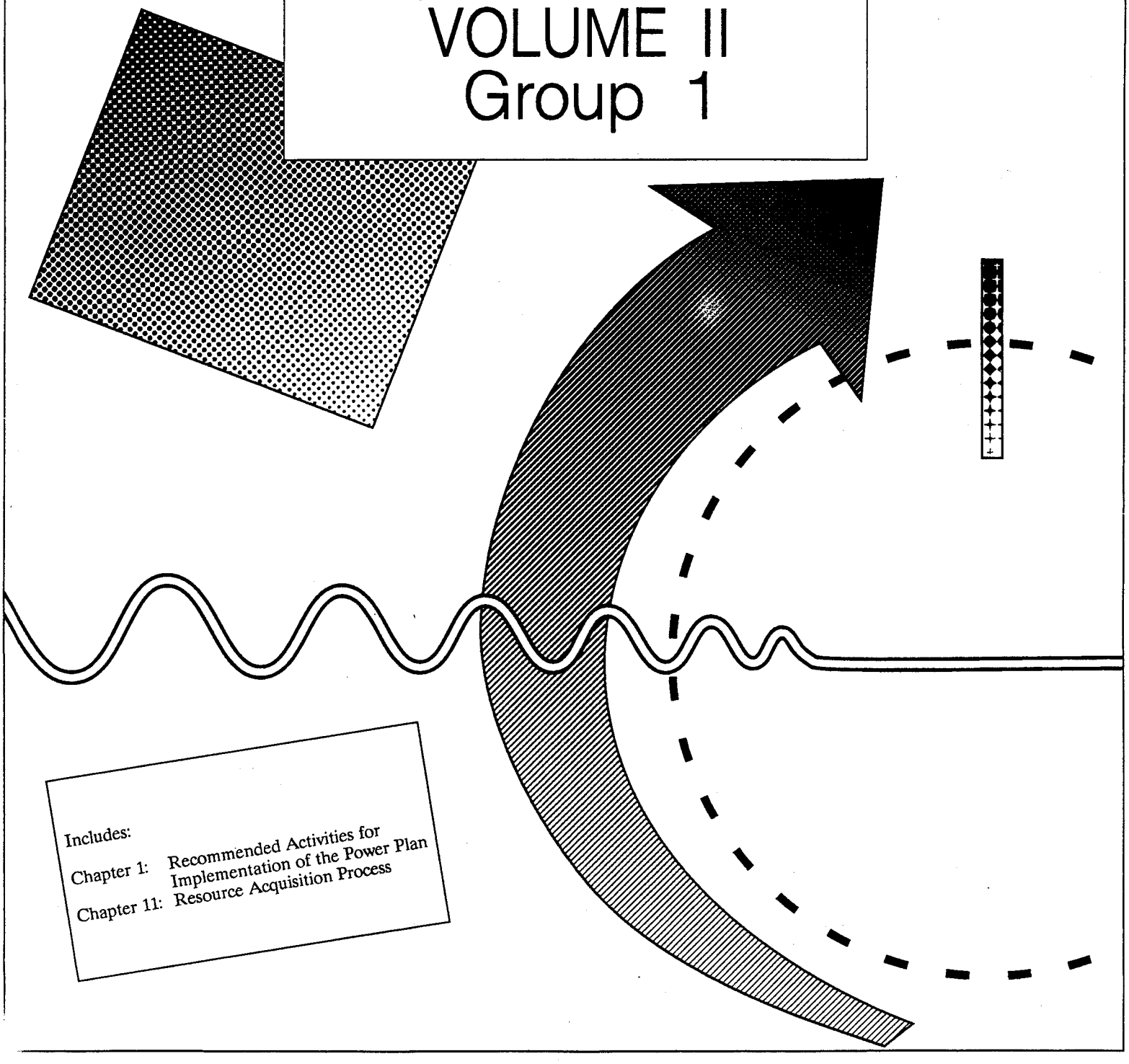
90-18A

Draft

1991 NORTHWEST CONSERVATION and ELECTRIC POWER PLAN

VOLUME II

Group 1



Includes:

Chapter 1: Recommended Activities for Implementation of the Power Plan

Chapter 11: Resource Acquisition Process

CHAPTER 1

RECOMMENDED ACTIVITIES FOR IMPLEMENTATION OF THE POWER PLAN

Chapter 1
Table of Contents

Purpose and Effect

The Action Plan in Volume I states the goals and objectives and in broad terms the actions necessary to give effect to this power plan. Implementation of those actions will require the region's utilities and other affected parties to fill in the details necessary to achieve the objectives set forth in the Action Plan.

The Council recognizes that the objectives of the Action Plan can be achieved in a variety of ways and intends for each implementor to have a full opportunity to reach these objectives in the manner of its own choosing. However, the Council believes that the activities recommended in this chapter are a good starting point for further action.

The recommended implementation activities which follow show one way to achieve the objectives of the Action Plan and are not intended to be exclusive. The Council will support other activities that it believes are better at achieving the goals and objectives of this plant. The Council looks forwards to discussing alternative actions with implementing entities and interested public groups.

Introduction

This chapter builds on the foundation already laid throughout the region. It explicitly recognizes the actions already taken to develop conservation and explore other resources. These actions are crucial, pertinent and should be continued. What this chapter attempts to do is identify those areas where further action should occur or ongoing efforts should be revised.

Three important themes that thread through various resources are acquisition activities, activities to reduce lead times, and resource confirmation activities (considered to be research, development and demonstration activities). Any resource that is acquired should be done in a manner that is consistent with the acquisition principles found in Volume II, Chapter 11. Similarly, confirmation activities conducted on any resource should be consistent with the principles governing resource confirmation found in Appendix 1-A.

This plan calls for acquisition of cost-effective resources. The determination of cost-effectiveness is a complicated analytical process, described in detail in Volume II, Chapter 14. As a general guide, generating resources costing less than 7 cents per kilowatt-hour are cost-effective. Incremental conservation measures are cost-effective as long as they are less than 10 cents per kilowatt-hour, the approximate cost of electricity from new coal plants. The average cost of conservation purchases should not exceed 7 cents per kilowatt-hour.

These general guidelines should be used with caution since characteristics of specific resources may not fit the general rule.

In conservation, the recommended activities tend to be revisions to current efforts to improve the region's ability to acquire cost-effective conservation. In renewable and high-efficiency generating resources, such as cogeneration, there has

been less acquisition and development effort. For these latter resources, the recommended activities reflect detailed actions developed after significant regional discussion that will help bring these resources to fruition. The activities in this chapter are organized by resource, with a section on supporting activities that cut across resources appearing at the end. The resources appear in the following order: conservation, hydropower, geothermal, wind, solar, biomass, ocean, cogeneration, hydropower firming strategies, coal, nuclear and supporting activities.

Conservation

The acquisition of efficiency improvements is the highest priority activity during the next decade. Over the next 10 years, our collective actions must acquire over 1,000 average megawatts of savings. This cannot be accomplished without long-term, stable and aggressive conservation efforts in all sectors. In addition, these acquisition efforts must include cost-effective efficiency improvements on hydropower and thermal plants, and the transmission and distribution system.

There are three key steps to achieving the objective of securing all efficiency improvements, and these steps reflect how the following recommended activities are organized. The three steps are depicted in Figure 1-1.

Efficiency Improvements

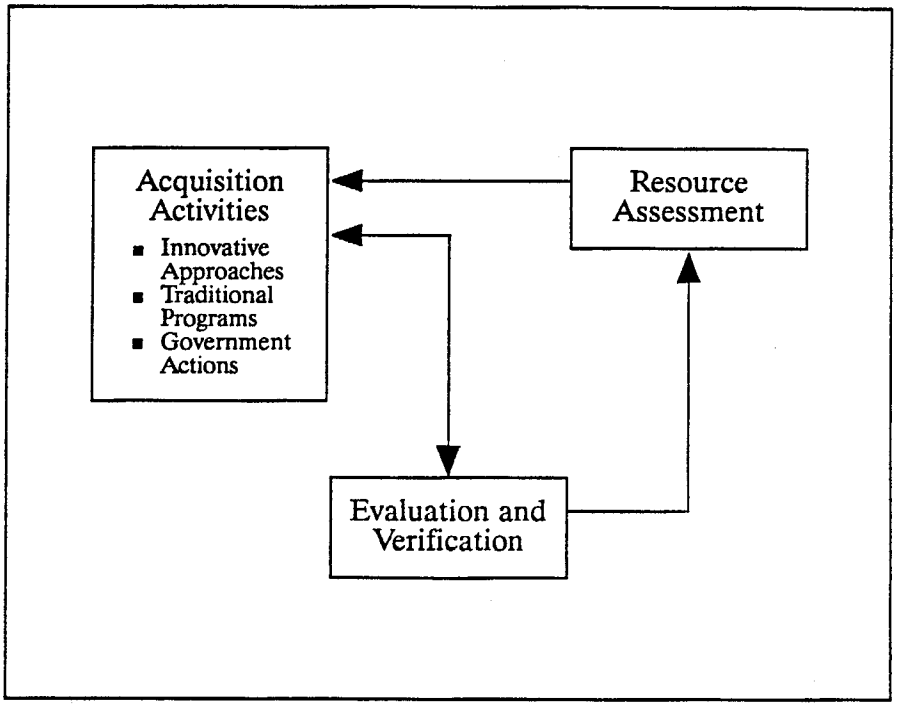


Figure 1–1
Iterative Steps for Acquiring Efficiency Improvements

The first group of activities involves acquisition efforts. Conservation acquisition will use a variety of methods. These methods have been grouped into innovative acquisition approaches, which includes billing credits, bidding and targeted acquisitions, traditional programmatic acquisition, and acquisition activities that need to be taken by federal, state and local governments. The second group of activities includes evaluation and verification. In order to ensure that the resource being acquired is reliable and cost-effective, the acquisition activities must be evaluated and verified. Evaluations and verifications must be conducted on both the process used to acquire the resource and the overall impact or resulting efficiency improvements of the actions. The third group of activities are support

activities to further explore the promise of additional cost-effective measures and to help define the remaining conservation potential. This step is called resource assessment.

None of these three steps occur in isolation. There is a continual circle of activity iterating among them. Each step helps support success and gives direction to activities in the other two steps. For these reasons, action must continue in all three areas at once.

Conservation: Acquisition

Many diverse methods will be used to secure the conservation resource. All these acquisition approaches should be consistent with the long-term goals of the region's electrical power system, and, therefore, follow the acquisition principles[1] for conservation that are fully described in Volume II, Chapter 12.

The acquisition efforts that follow have been grouped into three general categories: innovative alternative approaches, traditional programmatic acquisition, and federal, state and governmental actions. Current actions are ongoing in all three of these categories by many of the utilities and other institutions. What follows generally are recommended revisions to ongoing efforts so those efforts will achieve the key objective of acquiring all cost-effective conservation more efficiently and successfully.

Innovative Alternative Approaches

There is a need for a diverse set of approaches to resource acquisition. It is important that each utility and Bonneville develop a set that works best for their specific circumstance and sector.

Traditionally, the region has relied upon Bonneville and utility programs to secure conservation savings. The region's state and local governments, by taking actions such as adopting more energy-efficient building codes, also have played an important role in conservation development. However, our experience over the past decade in acquiring conservation has also taught us that additional mechanisms will be needed to effectively and efficiently tap the region's full conservation potential. Bonneville and the region's utilities are beginning to test and refine a wide range of promising approaches to acquiring conservation, including competitive acquisitions (i.e., bidding), targeted acquisitions, billing credits and unsolicited proposals. These approaches generally envision more decentralized program design and non-utility allocation of both risk and responsibility than current programs. If these mechanisms are to be successful, they must create an active (and economically attractive) market for conservation savings. The following recommended activities are offered to enhance efforts already under way to test and refine these conservation acquisition mechanisms.

1./ Broader acquisition principles, of which the conservation principles are a subset, are in Volume II, Chapter 11.

Conservation-1

Efforts to acquire conservation through targeted acquisitions should first focus on sectors and end uses that have large conservation potential and concentrated/centralized decision-making structures. One of the most attractive features of acquiring conservation resources through targeted acquisitions is that a utility can instigate and create action in business, homes and manufacturers where conservation resources may not be recognized. Consequently, this mechanism should be designed to take advantage of situations that the more passive request for resources, such as billing credits or competitive acquisitions, cannot. There are at least seven sectors or end uses that are prime candidates for targeted acquisitions, given the present market environment. These are:

Conservation-1.1

Large commercial and industrial customers. Large commercial enterprises, such as chains and franchises, present a particularly large and easily acquired conservation resource. Many decisions are centralized, and convincing one to implement a successful conservation effort could easily lead to implementation in the remaining buildings in the chain or franchise.. A relatively few number of industries consume a large amount of the electricity in the industrial sector. These most likely will represent the largest conservation opportunities and should be explicitly targeted during acquisition efforts.

Conservation-1.2

Manufactured housing. Almost all of the manufactured housing sited in the region is produced by only 18 manufacturers. This presents an obvious opportunity to get high participation through a program directed at the manufacturers, rather than targeting thousands of consumers. In addition, conservation in manufactured housing can be less costly if it is purchased before retail mark-ups add to the cost.

Conservation-1.3

Electrical appliances and equipment (particularly refrigerators, freezers, water heaters and lighting). Consumers cannot purchase equipment that is not produced and stocked in the stores. Targeting the manufacturers of these products to produce efficient units beyond applicable codes and then encouraging their purchase may be the only way of achieving more efficient units. This effort may be implemented best by creating large unified markets for appliances meeting certain efficiencies. This can be accomplished through such items as rebate tickets, or other financial incentives that would apply throughout a utility service territory. This approach will be most successful if coordinated with utilities in California and other western states outside the region.

Conservation-1.4

Institutional facilities (particularly state and local government and school district buildings and facilities). By working jointly with state and local governments, including state energy offices, utilities will be more likely to achieve savings in these buildings. Recent experience suggests that this may be the only way to achieve significant penetration in this sector. In addition, because of state and local bond issuing abilities, efforts in this sector may be fruitfully accomplished through shared financing.

Conservation-1.5

Federal buildings and facilities (working through the Federal Energy Management Program). Conservation efforts in federal buildings and facilities must comply with federal regulations regarding procurements. Mechanisms need to be developed for utilities to secure conservation through normal federal channels. Tacoma City Light is in negotiations with Fort Lewis. The experience gained in this negotiation should be used to effect efficiency changes in other federal facilities in the Northwest.

Conservation-1.6

Transmission and distribution system efficiency improvements. Savings in the transmission and distribution of electricity are extremely attractive because they are generally low cost, have no lost revenue component, may save both energy and capacity, and have few, if any, environmental impacts. All savings costing less than the regional cost-effectiveness cutoff should be secured from all transmission and distribution systems.

Conservation-1.7

Efficiency improvements to and expansion of generating capability of existing electricity generating facilities. Considerable study has already concluded that very low-cost savings can be derived from efficiency improvements to hydropower facilities. Based on the experience of some utilities, it appears certain that gains can be made to most operating power plants at or below cost-effective levels.

Traditional Programmatic Acquisition

While alternative acquisition approaches probably will increase in importance over the next few years, there is still an important role for traditional programs to play in the conservation acquisition effort. A number of programs are being operated in a manner that will achieve the objective of securing all cost-effective conservation in a given end use or sector. Those programs and efforts should continue. The following recommended activities simply indicate areas where the effectiveness and/or efficiency of current programs could be enhanced.

Buildings and Appliances

Conservation-2

Residential weatherization programs should be expanded to acquire conservation in all appropriate end uses during normal weatherization efforts. The key reason for a comprehensive program is to minimize administrative costs by capturing as much cost-effective conservation as possible during a single visit. This is a "one-stop shopping" approach to acquiring conservation resources in existing residences. In addition to traditional building-shell measures, financial assistance should be offered for cost-effective, energy-efficient lighting; energy saving water appliances, such as low-flow showerheads; as well as other water heating energy saving measures, as appropriate (e.g., thermal traps, tank wraps and bottom boards). When appropriate, other appliances, such as efficient refrigerators and freezers, also should be encouraged by the program.

Conservation-3

Modify currently operating financial and technical assistance marketing programs in new residences (e.g., Super Good Cents or Comfort Plus) to include all cost-effective measures in electric space heating water heating, and appliances. The goal of this program is to secure all of the savings that would be achieved if all new electrically heated residences included all regionally cost-effective space heating, water heating and appliance energy savings. There are regionally cost-effective space heating conservation measures that are not captured by current programs such as Super Good Cents and Comfort Plus. These measures need to be introduced to the building community and support given for increasing their penetration. In addition, there are regionally cost-effective conservation opportunities in other end uses, such as water heating, lights, refrigerators and freezers that could be secured when the building is first constructed. Current programs need to be changed into full spectrum conservation programs. The proposed programs should continue to demonstrate the feasibility of improving energy efficiency and increase the likelihood of adopting measures into code. It should continue as long as it remains regionally cost-effective. Financial assistance is an essential element of these programs, in order to achieve significant penetration. In addition to the financial assistance offered by Bonneville under this program, the servicing utility may find it necessary to make higher acquisition payments to consumers to encourage greater market penetration. An alternative approach for securing high penetration rates without significant utility financing is to ensure that lenders incorporate the value of efficiency in their mortgage calculations so homebuyers can finance the efficiency measures (see Conservation-7).

Conservation-4

Design and implement programs or methods to acquire conservation in electric appliances in new and existing houses that are not heated with electricity. It is important to achieve cost-effective electrical appliance savings in houses that are not heated with electricity. The recommended revisions to residential weatherization and new housing programs only reach those houses with electricity

as their primary heating source. The region needs to acquire electricity savings in other houses as well. Some of these efforts will need to dovetail with acquisitions targeted at manufacturers (see Conservation-1.3).

Conservation-5

Modify programs to secure all regionally cost-effective savings in new commercial buildings and existing commercial buildings. Modification of Energy Smart Design to target all cost-effective savings in new and existing commercial buildings, is an example of such an activity. The goal of such a program is to secure all of the savings that would be achieved if all new and existing commercial buildings were constructed or improved to include all regionally cost-effective electricity conservation measures.[2] This program must secure conservation savings now being lost because new commercial buildings, even those built to recently revised energy codes, leave out cost-effective measures. Both technical and financial assistance will be needed to spur conservation investments in new commercial buildings. Financial assistance is an essential part of this program, in order to achieve significant penetration.

Conservation-6

Develop an energy code adoption program including technical and financial assistance for the commercial sector. Energy code adoption is the foundation of the strategy to acquire cost-effective conservation resources from new buildings. The model conservation standards envision state and local building codes to incorporate at least those savings that minimize the building's life-cycle cost of construction and operation. Financial assistance should be offered to reimburse builders for incremental costs that are beyond those required to meet enhanced energy codes and that are at or below the regionally cost-effective level.

Conservation-7

Continue and expand the lender and appraiser program so credit is given in mortgage calculations for energy efficiency in new and existing houses, and commercial buildings, if appropriate. Conservation can be encouraged, if lenders recognize that more money will be available to the purchaser of a new or existing building on a monthly basis to meet mortgage payments, if the building is energy efficient. Great strides already have been made in securing such lender policies in new housing. The current Bonneville program should be expanded to include existing houses, and new and existing commercial buildings, if appropriate. The utility community should continue to work in cooperation with Bonneville, the Council state energy offices, and the lending institutions.

2./ These programs ensure compliance with the model conservation standard for utility conservation programs for new commercial buildings (see Volume II, Chapter 12).

Other

Conservation-8

Continue and expand education, and professional and vocational training for all parties involved in the design, purchase and construction of new buildings. It is crucial to develop an infrastructure of trained professionals and educated public who understand and can implement conservation successfully. Education and training are necessary to support these emerging energy professionals. This is a long-term effort. Examples of facilities that should be supported are the lighting design laboratory already established in Seattle and Portland General Electric's Energy Resource Center in Tigard, Oregon. In addition, support should be provided for information programs, such as the Electric Ideas Clearinghouse, which should be expanded to cover all sectors and end uses, and efforts to develop education programs in lighting, such as those initiated by the California Energy Commission.

Conservation-9

Aggressive programs need to be developed to ensure adequate enforcement of all energy codes aimed at saving electricity. These should include financial assistance, where necessary, and should continue as long as it remains cost-effective to do so. Bonneville, the utilities and the region's PUCs should work together to secure successful programs. Codes must be enforced to achieve energy savings and to be a reliable resource. It is important to improve activities aimed at inspection of completed structures, to be sure the resource is actually acquired. Local building inspection offices often focus on issues of health and safety as a higher priority than energy codes, because of heavy work loads. All parties must work together to ensure enforcement, even if this means an active role for the utilities in inspecting new buildings. The PUCs should provide appropriate rate treatment for enforcement actions and programs operated by regulated utilities.

Federal, State and Local Government Actions

Governmental actions will be crucial to securing conservation over the next decade. As discussed in the Action Plan in Volume I, federal, state and local actions are needed to adopt efficient energy codes and standards in multiple end uses. State regulatory authorities will be key in helping to adopt policies that will remove the regulatory barriers to conservation acquisition. The following are activities that should be pursued to help secure conservation.

Conservation-10

Utility regulatory authorities should establish policies that reward aggressive conservation acquisition. Currently, utility profits are tied to kilowatt-hour sales. Since conservation reduces kilowatt-hour sales, profits are reduced. Unless this condition is changed, utilities have a disincentive to conserve energy. A partial solution is to decouple profits from kilowatt-hour sales. Additional conservation acquisition could be fostered by providing positive reinforcement to aggressive conservation acquisition. Profits could be related to a utilities' performance in

conservation acquisition, thus producing a situation that rewards successful and aggressive acquisition of conservation measures. The Council intends to work with regulators and utilities in solving this problem.

Conservation-11

Utilities and utility regulatory authorities should consider adopting fees based on the efficiency of the end use connected to the grid, in order to encourage consumer adoption of all regionally cost-effective conservation. In areas or end uses where codes do not include all regionally cost-effective measures or are pre-empted by federal law from doing so, user fees can be a successful way to encourage efficiency and place the cost of inefficiency on the appropriate person. An inefficient house, for example, would have to pay more to get electric service than an efficient house. In this manner, a homeowner has the choice of participating in a utility model conservation standards program or paying the user fee. The user fee charge should reflect the cost to the power system of serving an inefficient load. Charges should be developed for all appropriate sectors and end uses.

Conservation-12

Utility regulatory authorities should provide appropriate rate treatment for conservation assessment, development and acquisition. It is important that utilities be able to recover legitimate costs of developing the conservation resource. This includes the assessment of the conservation resource, research and development of promising conservation, as well as direct acquisition, including code enforcement assistance. The Council intends to work closely with utilities and regulators to achieve this objective.

Conservation-13

Remove barriers to the development of cost-effective conservation in Bonneville's average system cost methodology. In some cases, the current average system cost methodology penalizes utilities for acting consistently with the plan. For example, it does not allow conservation support costs, such as audits and advertising, to be counted as part of the exchangeable costs, although Bonneville incurs such costs for its own programs. Bonneville should do what is necessary to revise the methodology, so all investments to secure cost-effective conservation are allowed. Bonneville should continue to judge whether proposed dollar levels are appropriate, as it does with its own programs.

Conservation-14

Building permitting, zoning and planning agencies should act to foster the development of more efficient buildings with the help of Bonneville and the utilities. Building permitting, zoning and planning agencies are aware of pending buildings very early in the design process. This also is the best time to lay the ground work for incorporating energy conservation measures, especially for new commercial buildings. In addition, these agencies have significant leverage with developers.

Building permitting agencies deal with building developers all the time and know well the types of incentives that motivate developers.

Conservation-15

Responsible state health and environmental agencies should establish adequate health protection criteria that the Council and the region can rely on in its conservation resource decisions. The Council and the region's utilities have tried to maintain or improve the environment when taking conservation actions. This has been most obvious in the area of indoor air quality. However, decisions in this area would be made best by appropriate health and environmental agencies, instead of the utility system. These agencies need to take the lead in setting standards and criteria that the utility system can follow to ensure public health and safety.

Efficiency Improvements: Evaluation and Verification

Conservation-16

All conservation acquisition efforts should be monitored and evaluated to verify the purchase of a cost-effective resource, improve conservation acquisition efforts in the future, and help guide decisions on further acquisition. The data and results of the evaluations and verifications must be made widely available. It is crucial that all efforts to acquire conservation be monitored and evaluated. Impact evaluations are necessary to determine how much was acquired at what cost, and how much of the resource remains. Process evaluations, which examine and critique the effectiveness of various methods of acquisition, are also needed. All of this information should be used to improve acquisition efforts, as the region progresses through the coming decade.

Evaluation and monitoring are the only way the region will know if the resource really is being acquired. The output of generating resources are monitored closely, and the plants are adjusted as problems arise. It is more difficult to measure the output of conservation resources than of generating resources, yet there is just as much need to know its production and if any analogous adjustments need to occur. Failure to monitor and measure performance carefully could result in a resource that is costing too much to acquire or is not performing as well as anticipated.

Conservation-17

In order to facilitate the acquisition of conservation resources, the Council, Bonneville and the region's utilities need to exchange information on the utilities' conservation acquisition plans. These plans should include budgets; time lines; staffing levels; proposed method of acquisition, including payment levels, if any; targeted market sectors; and expected penetration rates for conservation acquisition. In addition, the plans should review estimates of the amount and cost of conservation already acquired. This activity is needed to inform planners on the current status of conservation acquisition, the anticipated schedule for further acquisition and the remaining conservation potential. Where appropriate,

individual utilities may wish to develop these plans jointly with other utilities and/or with the assistance of Bonneville and utility associations.

Conservation-18

Bonneville needs to take the lead in organizing conservation data bases and information in a uniform format so that information collected by all parties in the region can reside in a centralized location and be accessible to all parties for analysis. Learning from our experiences is an essential piece of securing the conservation resource. Unless the data is collected and analysis is conducted to help us understand where to improve future efforts, we will not be successful at acquiring all conservation in a cost-effective manner. This action is intended to be a joint effort by all parties in the region to consolidate data and make it widely available for analysis. Bonneville would take the lead in organizing the effort. It would include the End-Use Load and Conservation Assessment Program data.

Efficiency Improvements: Resource Assessment

While moving ahead on acquiring conservation resources that already are known to be cost-effective, the region needs to continue research and demonstration of promising conservation measures and transmission and distribution system efficiency improvements. These resources promise to supply at least an additional 1,100 average megawatts, if they prove feasible. This could have a significant impact on the resources in the resource portfolio. In addition, ongoing efforts to define the cost and size of the conservation resource in all sectors needs to continue. Cooperation among all utilities in the region should occur in further execution of these actions.

The region also needs to continue investigating characteristics of conservation markets and marketing strategies. These efforts are important for improving methods of acquiring the conservation resource.

Conservation-19

The Council, in cooperation with the region's utilities, and other interested parties inside and outside of the region should join together in research, development and demonstration activities aimed at proving out promising conservation technologies. The Council will convene a committee representing interested parties to help identify and recommend specific actions for cooperative research. These activities are needed to help realize the more than 1,100 average megawatts of promising conservation potential. The activities should include continuation of the Residential Construction Demonstration Program and start up of a similar program in the commercial and industrial sectors. Additionally, the committee should look at the promising resources identified in the plan and design actions to make them viable options in the near future.

Conservation-20

Assess the cost-effectiveness of direct application renewables and on-site application of renewables on a site-specific basis as individual applications become evident. If they are found to be cost-effective, they should be acquired. Because direct application renewables need to be assessed on an individual, site-specific basis, there can be no general statement whether or not to acquire them. However, as individual applications are judged to be cost-effective over the next few years, they should be acquired.

Conservation-21

All utilities should examine the applicability of conservation voltage regulation on their distribution systems and implement it to the extent it delivers cost-effective savings of electricity. Bonneville should assist its customer utilities in this endeavor. It is likely that conservation voltage regulation can save significant amounts of electricity at low cost. Some utilities already have started efforts to secure the resource on their system. These efforts should be monitored closely and used, where appropriate, as a model for other distribution feeders and systems.

Hydropower

An estimated 410 megawatts of firm energy can be obtained by development of new hydropower projects and additions to existing projects. This energy, which excludes new energy from efficiency upgrades to existing hydropower plants, would cost from 4 to 12 cents per kilowatt-hour. Further discussion of new regional hydropower potential is provided in Volume II, Chapter 8.

Environmental impacts pose the greatest constraint to the development of new hydropower projects. Hydropower projects may cause biological, aesthetic, recreational and socioeconomic impacts that may be difficult to mitigate. Compliance with the Council's protected areas policies and other conditions of development set forth in the power plan and the fish and wildlife program should assist in minimizing the environmental impact of new hydropower development. Upgrades, expansions and improvements to the efficiency of existing projects generally pose few environmental problems, and certain cases may even mitigate existing project impacts.

Specific tasks intended to facilitate the acquisition of cost-effective and environmentally acceptable hydropower are as follows:

Hydropower-1

Bonneville and utilities should option and acquire, as needed, cost-effective and environmentally sound new hydropower projects that comply with protected area requirements and the principles adopted for acquisition by the Council. These principles are outlined in Volume II, Chapter 11.

Hydropower-2

Bonneville, in cooperation with the Council and the Corps of Engineers, should continue to maintain the Pacific Northwest Hydropower Data Base and Analysis System, the Rivers Information Systems in each state, System Planning Data, the River Reach File (both tabular and graphic components) and the Anadromous Fish Study. An agreement should be established among participants regarding long-term funding of this effort.

Geothermal

Geothermal exploratory efforts indicate that substantial geothermal resources suitable for generation of electricity may be present in the Northwest. The assessment prepared for this plan suggests that up to 4,600 megawatts of energy could be obtained from Northwest geothermal resources at costs as low as 7.5 cents per kilowatt-hour. The Council has included 350 average megawatts of this potential in this draft power plan. This represents the portion of the total regional potential that is thought to be developable in "Basin and Range" province. The geothermal resource found in the Basin and Range is the same type of resource whose power producing capability has been confirmed in Nevada and elsewhere. The largest regional geothermal potential lies in the Cascades, but the feasibility of generating electricity from this resource has not been demonstrated. An in-depth discussion of regional geothermal potential is provided in Volume II, Chapter 8.

Because of the potential size and cost-effectiveness of the regional geothermal resource, the Council believes that the region should confirm these estimates, monitor the development of geothermal technology and prepare for commercial-scale development of geothermal resources. If the feasibility and cost-effectiveness of commercial-scale geothermal development is confirmed, the region should proceed to option at least 300 megawatts of geothermal resources.

Among the important actions that need to be taken are the following: 1) determination of the feasibility of producing electricity from geothermal resources in the Cascades; 2) demonstration of the technology and site-design measures needed to generate electricity from Northwest geothermal resources in a economic and environmentally sound manner; 3) development of and implementation of approaches to resolve the technical, environmental and institutional constraints to the development of prime geothermal resource areas; and 4) promotion and adoption of sound regulations for the development of geothermal resources.

The Council, with the assistance of its Research, Development and Demonstration Advisory Committee, has identified a package of actions intended to address these problems and to achieve the objectives set forth above. These actions are described briefly below. A more detailed discussion of these actions is provided in Volume II, Chapter 16.

Geothermal-1

Bonneville, the utilities and the Council should monitor geothermal technology and resource development. This data base is intended to provide reliable information on geothermal power plant operating experience and geothermal resources to the power planning community and others. This data base will assist in making better estimates of the cost and performance characteristics of geothermal power plants.

Geothermal-2

Bonneville and utilities should assemble environmental base line data for promising geothermal resource areas. The purpose of this action is to document the pre-development environmental characteristics of geothermal resource areas, identify key environmental issues and facilitate the National Environmental Policy Act (NEPA) process and other environmental assessment work required for geothermal exploration and development.

Geothermal-3

Bonneville and utilities should initiate a process to identify and facilitate resolution of potential environmental and land use conflicts at promising geothermal resource areas. It is clear that the development of some geothermal resource areas will be constrained because of land use and environmental sensitivities. The purpose of this activity is to identify in advance the potential for conflict and possible remedial actions to reduce conflict, litigation and delay when development is proposed. This is expected to reduce lead times for environmentally acceptable projects and minimize expenditures on projects that are not acceptable for environmental or land use reasons.

Geothermal-4

Bonneville and utilities should initiate a geothermal resource confirmation program to demonstrate the feasibility of electric power generation using Northwest geothermal resources and to secure options for the commercial-scale development of geothermal resources. Each major geothermal resource area of the Cascades is thought to have the potential to generate more than several hundred megawatts of energy. But each area is thought to have somewhat unique geothermal characteristics and none is well enough understood to confidently predict the feasibility and costs of development. Nor is it known what technology and environmental control measures may be required to develop these resources in a cost-effective and environmentally acceptable manner. Geothermal demonstration projects (10 megawatts, or larger), located at promising resource areas can confirm the cost and feasibility (or lack thereof) of using the geothermal resources of that particular resource area to generate electric power.

Demonstration projects also can accelerate the refinement of geothermal technology to suit specific resource characteristics, identify and test environmental mitigation measures, provide a basis upon which to judge environmental and land use concerns, reduce the risk of further investment in the demonstrated area, and lower the cost of commercial-scale development that might follow. A demonstration project also can be used as a vehicle to help confirm the amount of additional resource potential at the site. All this can provide improved planning certainty and shorten the lead time for follow-on commercial-scale development.

Geothermal-5

Washington state should complete its administrative rulemaking and adopt final rules for geothermal leasing and development. Idaho, Montana and Oregon have already completed these activities. Completion in Washington will ensure that a regulatory framework promoting sound development of geothermal resources is in place throughout the region. Geothermal "pooling" or "unitization" laws promote integrated management of geothermal resource areas and prevent unscrupulous operators from overproducing their wells without regard for the interests of other operators or the long-term management of the resource. Overproduction of a geothermal resource area could lead to premature depletion or loss of productive capacity. This situation has occurred at the Geysers area in Northern California.

Wind Power

The Pacific Northwest is endowed with favorable wind resources, yet development of wind power in the Northwest has been limited because of the past surplus of generating capability and the availability of lower-cost generating alternatives. Regional wind power could potentially supply as much as 4,500 average megawatts of energy at costs ranging from 7.5 to 15 cents per kilowatt-hour. Of this potential, 400 average megawatts of energy is considered for the Draft 1991 Power Plan's resource portfolio. An in-depth discussion of regional wind power potential is provided in Volume II, Chapter 8.

Because of the size of the regional wind resource potential and expectations that the performance of wind turbines will continue to improve and costs will decline, the Council believes that the region should confirm these estimates of the Northwest wind power potential, monitor the development of wind power technology, and prepare for commercial-scale development of wind resources.

Among the important problems that need to be addressed to achieve these objectives are the following: 1) Additional wind resource data should be collected to improve confidence in the current estimates of regional wind power potential and to provide a sound basis for wind resource developers to proceed with the design of wind projects. Particular needs include data regarding interannual variation, long-term trends, turbulence, shear and the spatial extent of prime wind resources. 2) The technical, environmental and institutional constraints to the development of prime wind resource areas need to be identified. Plans need to be prepared and implemented for resolving these constraints. 3) Experience is needed with development and operation of wind power plants in the Northwest. 4) Finally, wind turbine designs need to be proven under cold climate conditions.

The Council, with the assistance of its Research, Development and Demonstration Advisory Committee, has identified a package of actions intended to address these problems and to achieve the objectives set forth above. These actions are described briefly below. A more detailed discussion of these actions is provided in Volume II, Chapter 16.

Wind Power-1

Bonneville and the utilities should continue and expand the collection of long-term wind resource data. The purpose of this action is to gain a better understanding of the interannual variation and possible long-term trends of regional wind resources. Wind resources are subject to variations over periods of many years and can only be understood through long-term measurements. Knowledge about interannual variation will reduce project risk, enhance the quality of energy production estimates and facilitate resolution of questions regarding interaction of large-scale wind power development with the regional electric power system.

Wind Power-2

Bonneville, the utilities and the Council should monitor wind power technology development and application. The purpose of this effort is to provide reliable information to the power planning community and others on wind power technology and its application. This will assist in improving estimates of the cost and performance characteristics of wind power development and improve understanding of the capabilities and status of this resource.

Wind Power-3

Bonneville and the utilities should assess the feasibility of developing promising Northwest wind resource areas. The purpose of this action is to identify wind resource areas having the greatest promise for development by eliminating sites with "fatal flaws." This review will allow better definition of the institutional, environmental and technical feasibility of developing the Northwest's best wind resource areas, and will guide follow-on actions. An important element of this effort is assessment of transmission interconnection requirements for large-scale development of Rocky Mountain Front wind resources.

Wind Power-4

Bonneville and the utilities should measure the spatial extent and wind resource quality, including shear and turbulence characteristics, of the better wind resource areas. The purpose of this action is to obtain better information about the quantity and quality of wind resources at resource areas identified in activity Wind Power-3 as showing the greatest promise for development. This action is expected to better define developable land area and wind resource characteristics, and thereby allow better estimates to be made of the energy potential and boundaries of prospective wind resource developments. This action also will provide needed resource data for commercial wind power development, reducing development risk and site development lead time. Lastly, this action should provide better information about the boundaries of the resource areas for agencies and others responsible for permits and siting standards.

Wind Power-5

Bonneville and the utilities should prepare wind resource area development plans for important wind resource areas. The purpose of this action is to identify the key technical, environmental and institutional problems confronting the potential development of important wind resource areas, and to prepare plans for resolving these. Wind resource area development plans can help achieve best resource use with minimum environmental impacts, and can reduce planning uncertainty, site development lead times and project investment risk, and result in cost savings and improved wind farm performance. The need for and scope of this action will be determined by the findings of the area feasibility study (see Wind Power-3) and the spatial extent and quality studies (see Wind Power-4).

Wind Power-6

Bonneville and the utilities should construct and monitor a cold-climate wind turbine pilot facility. The purpose of this action is to develop and demonstrate wind turbines capable of reliable year-round operation in the environment of the Rocky Mountain Front. Development of this facility would proceed if the assessment of action Wind Power-3 found large-scale development of the wind resources of the Rocky Mountain Front to be feasible. Successful completion of this action, plus actions Wind Power-3, 4, 5, 6 and 7 should open the way for large-scale commercial development of the wind resources of Montana's Rocky Mountain Front, when needed and cost-effective.

Wind Power-7

Bonneville and the utilities should sponsor a commercial-scale wind demonstration project in areas where wind power may not be cost-effective, but where it is promising for future development. The purposes of this activity are to gain useful information about areas with large resource potential and challenging operating conditions, to gain experience in integrating the output of a commercial-scale wind farm with the regional power system, to confirm the cost and performance of wind power plants, to better understand the physical and environmental consequences of wind project construction, and to test wind power plant siting and licensing procedures. The demonstration project(s) should be of sufficient size to secure available economies of scale in equipment purchase and installation, project operation and maintenance. The size also should be adequate to test system integration equipment and procedures for typical commercial-scale development. To minimize risk, the project might be secured on an output contract. Although wind turbine costs are expected to continue to decline and performance is expected to improve, the cost of energy from this project is expected to exceed avoided resource costs for the next several years. Nevertheless, the offer for this project should be extended, as soon as possible. To minimize cost exposure, the power purchase price should not exceed the expected cost of the power from the geothermal pilot projects. This price premium should be paid for only the first 30 megawatts of capacity.

Solar

Solar energy is plentiful and can be converted to electric energy reliably and with relatively few environmental concerns. However, in this region, neither solar thermal nor photovoltaic technologies can compete currently with more conventional resources as stand-alone generators, because the costs are still too high.

The costs and performance of both solar thermal and photovoltaics have been improving rapidly, and both could be cost-effective in the not-too-distant future. For example, in California, there are over 200 megawatts of solar capacity with gas back up online in the Mojave desert, with over 600 megawatts scheduled by 1992. This is a clear manifestation of solar energy's ability to contribute electricity to the grid. Also, the costs of competing resources could change rapidly, because of events outside the region's control, such as concerns about global warming and other environmental impacts from power generation. Undertaking limited actions now will put the region in position to make the best decisions, if conditions change.

Perhaps the most exciting improvements in solar technology is the rapid improvement in the performance of photovoltaic cells. Photovoltaic cells are being marketed commercially today for remote and specialized consumer applications. Further discussion of solar resource potential is provided in Volume II, Chapter 8.

Before solar technologies can make a significant contribution to the region's power system, several goals need to be achieved: 1) a better understanding of the spatial distribution and the intensity of solar insolation throughout the region is needed, 2) the cost of electricity generated with solar technologies has to be reduced, 3) utility operators will have to gain an understanding of how solar technologies will "fit" with the existing system, and 4) utilities must be allowed and be willing to pay for solar-generated electricity the same as they would pay for an equivalent product from another new source.

The activities listed below are those that the Council or its Research, Development and Demonstration Advisory Committee have determined to be important in the development of solar resources in the Northwest. In-depth discussion of these actions is provided in Volume II, Chapter 16.

Solar-1

Bonneville and utilities should re-establish a long-term solar insolation data collection program. Better insolation data, including finer spatial resolution, information on both global and direct beam radiation, and longer-term records, will support the design and analysis of future solar generating applications, provide better information regarding the possible future contribution of solar-electric power, and help identify sites for future solar-electric installations.

Solar-2

Bonneville, the utilities and the Council should monitor solar-electric technology development. The purpose of this action is to provide reliable information on solar-electric technology to the power planning community and others. This should assist in early identification of promising Northwest applications of solar-electric technologies and in better estimations of the cost and performance characteristics of solar technologies.

Solar-3

Bonneville and the utilities should conduct a thorough assessment of potential future applications of photovoltaic technologies. There is a need to identify promising applications of photovoltaic technologies in the Pacific Northwest and key constraints to these applications. Because of good prospects for cost reductions and a wide diversity of potential applications, it is important to gain an understanding of potential solar photovoltaic applications in the Pacific Northwest. This will allow the region to focus on the technologies and applications showing the greatest promise for this region. If any of these applications are already cost-effective, they should be acquired.

Solar-4

Constraints to the widespread use of photovoltaics technologies should be identified and resolved. The purpose of this action is to resolve constraints to promising regional applications of photovoltaic technology. The timing and need for this task will be conditioned on the findings of the assessment of regional applications of solar photovoltaic technology (see Solar-3) and the progress of technological improvements identified in action Solar-2.

Biomass

Biomass fuels are defined as any organic matter that is available on a renewable basis. They include: forest residues, wood product mill residues, agricultural field residues, waste products from animals and food processing, agricultural and forest crops grown for fuel and municipal solid wastes (i.e., garbage collected from residences, commercial buildings and industrial firms). The heat content, moisture levels and other physical characteristics of biomass resources differ widely.

The total production of electricity from biomass could be as high as 2,700 megawatts, but competing uses, collection costs and seasonal variations in supply result in a much lower estimate of availability. Activities aimed at a better understanding of these issues could increase the amount of power derived from biomass-fired resources.

In this plan, the Council estimates that about 600 megawatts of cost-effective generation fueled by biomass will be available. This estimate includes about 480 megawatts that will be produced in cogenerating facilities (see cogeneration, below), about 90 megawatts of stand-alone biomass-fired plants, and about 30 megawatts of electricity from plants fired with municipal solid waste. An in-depth discussion of biomass fuel availability and prospects for using these fuels for electric power production is included in Volume II, Chapter 8.

The Council considers the following activities to be important:

Biomass-1

Acquire cost-effective resources fueled by biomass.

Biomass-2

Bonneville should continue to participate in the Pacific Northwest and Alaska Bioenergy Program and to look for additional opportunities to take part in nationally funded ventures of this sort. The region has benefitted from participation in this program and can benefit from other programs like it. In general, coordinating the region's activities with those in other parts of the country and world is an effective way to increase our understanding of the potential of all resources.

Biomass-3

The Council's Research Development and Demonstration Advisory Committee should develop a schedule of activities like those developed for other promising renewable resources to foster the orderly development of biomass resources. As indicated, the potential for biomass appears to be much greater than the amounts included in this plan. A detailed plan to address and resolve the issues surrounding competing uses of biomass, biomass collection and storage procedures, and biomass conversion technologies could identify ways to make more of this resource available.

Ocean

The Council has assessed the status of technologies to produce electricity from ocean resources. The Northwest has one of the better locations to take advantage of ocean power, if technological improvements make this resource reliable and cost-effective. However, technologies are at an early stage of development and more research, development and demonstration would have to be done before this resource is a solid candidate for inclusion in the region's resource mix. The most promising of the Northwest ocean resources is ocean wave energy, the energy embodied in ocean waves. Other sources of energy from the ocean include tidal power, ocean currents, marine biomass, and energy that can be captured by exploiting temperature and salinity differences in the ocean's layers. Additional discussion of ocean energy resources is provided in Volume II, Chapter 8.

Although ocean power might eventually provide a sizeable resource, it probably will not be available for some time. Therefore, the Council, on the recommendations of its Research, Development and Demonstration Advisory Committee, has limited the activities to a periodic view of the developments in ocean resources. A more detailed discussion of this activity is provided in Volume II, Chapter 16.

Ocean-1

Bonneville and utilities should monitor the development of ocean energy conversion technologies to determine when actions should be taken in the Northwest to facilitate the development of ocean energy resources. The next review of ocean energy technologies should be conducted no later than in conjunction with the next general revision of the Northwest Power Plan. This action would involve preparation of a periodic assessment of the status of ocean power technologies, emphasizing the technologies with greatest promise to the Northwest.

Cogeneration

Since 1978, cogeneration has been specifically encouraged by the Public Utility Regulatory Policies Act (PURPA), various tax provisions, and fuel use restrictions in the Powerplant and Industrial Fuel Use Act. PURPA requires utilities to purchase electricity from qualifying cogeneration facilities at the utility's avoided cost for new generating capacity and to provide back-up electricity and supplemental power to cogenerators at fair rates. The relevant portions of the Fuel Use Act and the tax provisions have been repealed or weakened recently, but PURPA remains in effect. These conditions have fostered the development of standardized, reliable and inexpensive cogeneration systems of different sizes. This, in turn, has made cogeneration economically attractive in a much wider range of applications.

Recent estimates show that more than 40,000 megawatts of cogeneration capacity currently exist in the United States. According to recent data collected by the Bonneville Power Administration, there is approximately 900 megawatts of existing cogeneration capacity in the Pacific Northwest. This capacity is concentrated in the pulp and paper and lumber and wood products industries (85 percent). There is some uncertainty in the exact amount of existing cogeneration. A large portion of this capacity does not show up in utility generation statistics, because of a number of reasons: 1) the cogeneration plant is being run to serve the owner's needs and little, if any, electricity is being sold to the grid; 2) several installations currently are not being operated; and 3) some of the capacity is too new to show in utility statistics.

Future cogeneration potential in large industrial applications is largely a question of economics, rather than technology. The region's industries hold a fairly large potential for cogeneration, but the low electricity rates and ample, reliable supplies of electricity have discouraged cogeneration development.

The integration of cogeneration into the electric utility system requires some changes in the way utilities have typically done business. In the past decade, PURPA provided the stimulus to address these changes. Further encouragement for cogenerators, as well as other independent power producers, is coming from changes in the utility regulatory environment, as discussed in the Council's staff briefing paper 89-31, "The Changing Utility Environment."

The Council estimates that over 1,700 megawatts of cost-effective power will be available from natural gas-fired cogeneration plants. An additional 480 megawatts of cost-effective power is available from biomass-fired cogeneration plants. An in-depth discussion of regional cogeneration potential is provided in Volume II, Chapter 8.

The Council considers the following activities to be important.

Cogeneration-1

Bonneville and utilities should acquire or option cost-effective cogeneration.

Cogeneration-2

Cogeneration is often developed by non-utility developers. There are several activities, the completion of which can remove obstacles facing most resources developed by non-utility resource developers. These activities are included in the final section of this chapter, entitled, "Supporting Activities."

Hydropower Firming Strategies

The Northwest hydropower system produces on average about 4,100 megawatts of nonfirm energy per year, mostly between January and July. That nonfirm energy serves the top or interruptible quartile of the Bonneville Power Administration's direct service industries and displaces the output of Northwest thermal plants or thermal plants in the Southwest, primarily in California.

Northwest nonfirm energy, in conjunction with a back-up resource, can meet firm loads in the Northwest cheaper than many alternative resources can. This combination resource has been characterized in the past as "firming nonfirm" or "nonfirm strategies." Although the Council's analysis has focused on the use of simple and combined-cycle power plants as back-up resources for nonfirm hydropower, there are other alternatives for the back-up resource, including purchased power, interruptible contracts and contracts for use of energy from out-of-region thermal plants.

The Council has explored higher valued uses for this nonfirm energy. The Council treats flows to improve the survival of fish and wildlife as a firm constraint. The Council has begun a review of the water budget and other flow requirements for the Columbia River Basin Fish and Wildlife Program, and will change them if they are determined to be inadequate. The Council expects the flow levels in the Fish and Wildlife Program, or any flow levels determined to be appropriate under the Endangered Species Act, will continue to be firm constraints on hydropower system shaping. If additional fish flow requirements convert firm hydro energy to nonfirm energy, they will increase the amount, on average, that turbines can be displaced, and thus increase the relative cost-effectiveness of the various firming strategies.

The Council recommends that the region proceed to use more of its nonfirm hydropower to meet firm regional loads, with consideration of the various approaches that might be used to accomplish this, and with consideration of the risks, especially that of gas price volatility, that may be associated with development of this resource. The following actions are called for:

Hydropower Firming Strategies-1

Bonneville and utilities should secure options to develop up to 1,000 megawatts of hydrofirming options. The purpose of this activity is to confirm the feasibility of alternative strategies for backing up the region's nonfirm hydropower and to improve understanding of the ultimate potential of the hydrofirming resource. This effort should consider extraregional transactions and increased interruptible loads as possible alternatives to combustion turbine firming strategies. One alternative approach would be to issue a request for proposal targeted at backing up nonfirm hydropower.

Because most alternatives for backing up nonfirm hydropower likely will require irregular and occasionally very significant revenue requirements to cover the costs of securing power from the back-up resource, the options for backing up nonfirm hydropower should include procedures to smooth out the annual fluctuations in revenue requirements.

Coal

Because of the abundance of low-cost coal available to the region, coal could conceivably meet all future electrical needs of the region. But the extent to which coal plays an expanding role in meeting future electrical needs will be governed by the resolution of concerns associated with continued large-scale development of coal-fired power plants. These concerns include the effect of strip mining on land, water and biological resources; the effects of atmospheric releases of sulfur dioxide and oxides of nitrogen; the contribution of carbon dioxide releases to possible global warming; the siting of transmission lines necessary to integrate coal-fired units into the regional grid; impacts of rail transportation of coal; and disposal of ash and sludge from coal-fired power plant operations. The cost and availability of new coal-fired power plants and issues associated with the development of these plants are discussed further in Volume II, Chapter 8.

Because of the financial and environmental risks and questions of public acceptance presented by these issues in addition to the likely availability of lower-cost alternatives to meet expected near-term needs, the Council is not recommending construction of new coal-fired power plants in the near-term. However, because additional information and further technological development may reduce current assessments of risk associated with large-scale development of coal, and because continued load growth or the failure of alternative energy sources to prove cost-effective may dictate the need to develop proven energy resources such as coal by 1998, the Council recommends that actions be taken to prepare for the development of new coal-fired power plants, if needed.

Among the important problems that need to be addressed to achieve this objective are the following: 1) Sites for the possible development of new coal-fired power plants need to be identified, secured and licensed. 2) Transmission interconnections to the grid from these sites need to routed, and right-of-ways secured and licensed. 3) Finally, the status, performance and cost characteristics of coal-fired power plant technologies need to be monitored. Actions intended to address these problems are described below.

Coal-1

Within the next five years, Bonneville and the utilities should identify, secure and license three sites for possible future construction of new coal-fired power plants. The purpose of this activity is to determine if utilities or other developers will prepare for the development of coal-fired power plants, if needed, to meet future needs. Each site should be capable of supporting multiple units, totaling at least 500 megawatts of generating capacity. Transmission corridors for interconnecting plants at these sites to the regional grid should be identified, secured and licensed. Possible fuel supplies should be identified and plans prepared for the development, as required, of any necessary fuel transportation facilities. Power plant feasibility studies should be completed for these sites, focussing on technologies featuring high-efficiency, low emissions, short lead time and modular development. Consideration should be given to phased development of integrated coal-gasification, combined-cycle power plants.

One site that should be considered is that of the proposed Creston Generating Station. Washington Water Power has available a licensed site for future construction of coal-fired generating units located four miles southeast of Creston, Washington. Land options, licensing permits and a state Site Certification Agreement are being maintained by the company, in order to keep this site available for future resource needs The company worked with the Washington Energy Facility Site Evaluation Council to extend the Site Certification Agreement for five years. The company has received extensions to the Prevention of Significant Deterioration Permit for Creston. To accommodate Creston's Air Contaminant Permit, Washington Water Power will provide new "Best Available Control Technology" analyses to be approved by the Site Evaluation Council at the time a decision is made to construct the project. The license for Creston could be amended to accommodate new technologies such as coal gasification or fluidized bed designs. This would position Creston to be a more environmentally acceptable energy resource within the region.

Nuclear

Although in theory nuclear power plants could supply electricity without the fuel supply risks and many of the environmental impacts of fossil fueled power plants, additional orders for nuclear units in the United States in the near-term are believed unlikely. This condition will continue, until the development and commercial demonstration of proposed advanced plant designs intended to alleviate perceived financial and safety risks associated with current designs. Moreover, it may be necessary for the United States to establish facilities for the disposal of high-level and transuranic nuclear wastes, before the licensing of additional plants is politically acceptable.

In the Northwest, two nuclear units of conventional design--Washington Public Power Supply System nuclear projects 1 and 3 (WNP-1 and WNP-3)--are partially completed and are being preserved. These units could produce about 1,680 average megawatts of energy. Additional discussion of the cost and availability of WNP-1 and WNP-3, the issues associated with preservation, completion and operation of these plants, and the status of advanced design efforts are provided in Volume II, Chapter 8.

Although the completion of WNP-1 and WNP-3 is estimated to require about five years of construction effort, numerous issues must be resolved to arrive at a position where construction could be resumed. These issues include: 1) completion of the Bonneville Environmental Impact Statement; 2) possible litigation concerning this environmental impact statement; 3) resolution of some participants' opposition to completion of the plants; 4) initiation and completion of the Washington State Initiative 394 study; 5) modifications to Washington state law affecting construction contracting; 6) resolution of Supply System-Bonneville project management issues; and 7) completion of the Council's 6(c) process for WNP-3.

High-load growth, environmental constraints on the development of new fossil-fueled resources, failure to confirm the feasibility of developing alternative resources, constraints on fossil fuel availability, and other circumstances may lead to a situation where completion of WNP-1 and WNP-3 may be desirable.

It is time to determine whether preservation of these plants is a prudent insurance policy against future uncertainties. Because these plants represent a large, but uncertain resource, the Council has to know whether they can be made operational when needed. This will require the following action:

Nuclear-1

Bonneville and the Supply System should identify all the issues that need to be addressed to determine whether WNP-1 and WNP-2 could be made operational or should be terminated. There are uncertainties regarding the region's ability to complete and operate these plants. For example, there is controversy about the agreements that control financing, budgeting, and management of the projects. Other issues include compliance with the National Environmental Policy Act; the Washington State law requiring cost-effectiveness studies prior to resuming

construction, and licensing by the United States Nuclear Regulatory Commission, as well as public acceptance. (See Volume II, Chapter 8.)

The Council has heard testimony that these issues can be resolved and that the plants can be successfully completed. Other testimony suggests that the problems are insurmountable, and Bonneville should stop spending money to preserve the plants. It is time to determine whether preservation of these plants is a prudent insurance policy. That is, in the event that the plants are needed, will anyone be able to complete their construction and cost-effectively operate them? If not, they should be terminated.

Bonneville and the Supply System should work to resolve these issues in a deliberate way, pursuing the most cost-effective issues first. In most instances, resolving these issues will also reduce lead times for the plants.

This is not a recommendation to resume construction or to change the preservation status of the plants. Rather, the Council is seeking a determination of whether the plants could be completed and successfully operated in the event they are needed.

Supporting Activities

There are a number of activities of a more general nature that support many of the activities listed in earlier sections related to the various resources. These activities are not associated with any specific resource, but rather are needed in general to support resource assessment, development, or acquisition of all resources.

Supporting Activities-1

The region's utilities, Bonneville, the Council and other interested parties should convene on a periodic basis to evaluate success toward coordinated planning and acquisition of resources. All utilities, either independently or under cooperative efforts, should develop least-cost plans. Some already have accomplished this. These plans will help each utility identify the specific actions that the utility will take, and will serve as the basis for reviewing progress toward a least-cost electrical system.

Supporting Activities-2

Bonneville should complete and test the resource acquisition processes now being developed. The effort should determine whether environmental impact statements are needed at the time Bonneville acquires an option or when a decision is made to move into construction, or both. These determinations will be most important if it is anticipated that an option will be held for a lengthy period.

Supporting Activities-3

Bonneville and the utilities should identify potential purchases of resources outside the region that are more cost-effective and environmentally acceptable than the resources included in the Council's plan. The Council supports additional power exchanges with and purchases from out-of-region utilities. These transactions should be consistent with the Act and the Council's plan and should be at least as cost-effective as the resources included in the plan. An ongoing understanding of these opportunities, shared with other regional decisionmakers, can help to minimize uncertainty about the availability of resources to meet load growth. Sources to serve regional load include those in Alberta and British Columbia, Canada; and California, Utah and the Desert Southwest.

Supporting Activities-4

The Council will continue to improve its ability to take account of natural gas in it power planning. The Council recognizes that natural gas plays a vital role in power planning, both because it is used to produce electricity, and because, in many instances, gas and electricity are close substitutes. The Council will initiate

a scoping process to determine how best to integrate natural gas planning into its power planning.

Supporting Activities-5

Bonneville and utilities should jointly sponsor research, development and demonstration activities, since the region ultimately benefits from a more diverse mix of viable resources. An agreement should be established among participants regarding the proper balance for long-term funding of this effort. Joint development is equitable and efficient and is in the best interest of the ratepayers and utilities that will eventually benefit. Both costs and benefits will be shared in this way, but cost per ratepayer will be lower, and benefits per ratepayer would arguably be higher with coordinated activities.

Supporting Activities-6

Regulatory commissions should provide rate treatment encouraging prudent research, development and demonstration activities. As described in the prior activity, it is only through research, development and demonstration that the region will be able to prove out promising technologies that may significantly decrease the costs and/or environmental impacts of the current selection of resources. The Council will work with state legislatures, regulatory commissions, utilities, and others to promote this recommendation.

Supporting Activities-7

The Council will review transmission constraints, transmission and distribution costs, alternative transmission upgrades, and potential environmental hazards associated with reliable delivery of electric power from present and potential sources of generation to the region's load centers. This review will focus on transmission issues that may affect implementation of the power plan. The Council will review: 1) transmission constraints within the region and on interregional interties; 2) the added value of resources that are located near electrical load centers or areas where transmission is constrained; and 3) the transmission costs associated with new resources, especially those that are a long distance from the existing power grid. Based on this review, the Council will work to remove transmission barriers supporting cost-effective intertie expansions and improve its power planning.

Supporting Activities-8

The Council will continue to develop a more complete reflection of environmental uncertainties in its planning. To date, the Council has used its judgment to account for costs incurred by society that are not covered in the costs of electricity (these costs are sometimes referred to as external costs). The Council will work with environmental experts to improve this process, to seek ways to mitigate or avoid externalities, and to select the best mix of resources to meet the plan's multiple objectives. This effort will focus on Council strategies and policies to minimize damage to the environment.

Supporting Activities-9

The Council will work with regulatory commission's, siting agencies, Bonneville, utilities, and other interested or affected parties to evaluate alternative approaches and to identify appropriate methodologies for incorporating quantified estimates of unmitigated environmental pollutants into its planning. As with most commodities, when a price is too low, the commodity is used too much, and economic efficiency suffers. Unfortunately, the price charged to emit unmitigated pollutants to the environment is zero, and it has been virtually impossible to develop accurate estimates of all external costs. This is why the Council has relied on it judgment. However, the Council will continue to look for ways to develop and enhance methodologies for quantifying and incorporating environmental externalities into its planning.

Supporting Activities-10

The Council, in cooperation with Bonneville, the utilities and other regional parties will develop a regional renewable resource forum. This effort should provide information regarding the current status and plans for resource exploration and development in the Pacific Northwest and the status of technology development. This information should be provided to utilities, developers, state and federal agencies, local governments, the environmental community and the interested public. Better information regarding these resources should promote public and utility understanding and acceptance; facilitate resolution of environmental and other concerns; encourage the development of environmental and land use regulations facilitating quality development; and in general, foster the development of these resources when needed. An objective of this effort is to provide current information regarding these resources to utilities engaged in the development of requests for resources to allow fair consideration of these resources in the resource acquisition process.

Supporting Activities-11

Bonneville and its customers should consider a multilevel priority firm rate as an alternative to the billing credits policy. The billing credits policy provides for payment to a utility for energy saved or generated up to the difference between Bonneville's avoided cost and the priority firm rate. The billing credits as published provide utilities developing conservation and generating resources with estimates of Bonneville's avoided cost. Implementation of this policy should help to assure that investments in conservation and resources are made consistent with regional avoided cost. If, for any reasons, billing credits are not as effective as anticipated, a multitiered wholesale rate, with the last tier set at avoided costs, could be employed as an equivalent alternative. In this case, utilities that acquire conservation or build new generation will reduce their bills from Bonneville by the same amount as if they had been paid a billing credit.

Utility regulatory authorities should provide appropriate rate treatment for expenses incurred in optioning resources. It is important that utilities be able to recover legitimate costs of developing resources. These costs include pre-construction expenditures on resources being held as options against future load growth. The Council's analysis has shown that optioning costs are in the best interest of utilities' ratepayers. If utilities must wait for plants to be constructed, used and useful, they will be reluctant to invest in the optioning of resources. The Council will work with state legislatures, regulatory commissions, utilities, and others to promote this recommendation.

APPENDIX 1-A

PRINCIPLES GOVERNING RESOURCE CONFIRMATION ACTIVITIES

The Council has identified several principles to guide activities intended to determine the cost and availability of resources available for future development. These are:

1. Focus on resolution of region-specific problems. Whereas some problems associated with the development of new resources are being addressed elsewhere, the development of photovoltaic technology, for example, other problems are specific to the Northwest. One example is the feasibility of generating electricity from the geothermal resources of the Cascades. Emphasis should be given to addressing regional problems, since it is less likely that national organizations or organizations operating outside the region will support work on these problems. The principal responsibility for addressing region-specific problems lies with the region.

2. Acquire the resource only where necessary to achieve other objectives. Uncertainties regarding new resources can often be resolved through the test development of these resources. But resource development requires engineering and construction--typically a risky and expensive process. Other means of resolving uncertainties associated with new resources should be pursued where available, and acquisition of resources employed only where other, less risky and expensive approaches appear ineffective or not feasible.

3. The costs and risks of resource confirmation activities should be spread, to the extent feasible, among those who will benefit. Ratepayers regionwide will benefit from confirmation of less expensive, more reliable and less environmentally damaging resources. Resource developers will benefit from the availability of expanded business opportunities. No scheme for perfectly equitable allocation of these benefits appears to be achievable, however, reasonable allocation of resource confirmation costs and risks can be promoted by ad hoc partnerships involving Bonneville, investor-owned utilities, consumer-owned utilities, developers and the states.

4. Resource confirmation cost economies can be achieved by designing activities to achieve multiple goals and widespread benefits. For example, this plan proposes the development of several geothermal demonstration projects for the purpose of determining the feasibility of generating electricity from Cascades geothermal resources. As proposed, these projects would determine the feasibility of generating electricity using Cascades geothermal resources at several resource areas, test and refine generating technology and and environmental mitigation methods for Cascades resources and prove-up geothermal resources for further commercial development.

5. Priority should be given to resources promising low or declining costs, abundant quantity; modest environmental effects and favorable development characteristics, including short lead time and modularity.

6. Resource confirmation activities should not primarily focus on problems normally addressed during resource development. Site acquisition, project feasibility studies and licensing activities, for example, are addressed more properly by a resource developer. Occasions may arise, however, when

resource confirmation issues can be most effectively addressed by the acquisition and development of projects.

CHAPTER 11

RESOURCE ACQUISITION

Chapter 11
Table of Contents

Introduction

This chapter addresses a variety of issues that arise in conjunction with both generation and conservation resource acquisition. Most of these issues relate not only to acquisitions by Bonneville but also to acquisitions by other utilities in the region.

Part 1 sets forth some general principles for resource acquisition. The Council believes these principles should be applied in all resource acquisitions, regardless of whether the resource is acquired by Bonneville or another utility.

Part 2 describes a general process for the acquisition of resources. The Council recommends this process as one way of making resource acquisition decisions that will result in a least-cost energy future for the region.

Part 3 states some generally applicable fish and wildlife considerations. While these are primarily directed at hydroelectric projects, they should be taken into consideration in acquiring any resource that has an impact on the natural environment.

Part 4 deals with an acquisition unique to Bonneville, the acquisition of power system reserves through the sale of additional power to existing direct service industrial customers under Section 5(d)(3) of the Act.

Part 1: General Principles Governing Resource Acquisition

In the Northwest Power Act, Congress intended that all of the Bonneville Power Administration administrator's acquisition activities "shall be consistent with the plan," unless specifically exempted under the Act (Section 4(d)(2)). The Council believes the principles set forth below are equally valid for all resource acquisitions, whether made by Bonneville or some other utility.

All resource acquisition efforts must be designed to be consistent with the following principles:

1. Acquisition efforts should not create lost-opportunity resources and should develop as much of a resource as is cost-effective to the region. A lost-opportunity resource is one that, due to physical or institutional characteristics, will become non-cost-effective unless actions are taken now to develop it or hold it for future use. "Cream skimming" is one example of creating a lost-opportunity resource. Installing only the easiest and least expensive conservation measures, for example, often will mean that it is no longer cost-effective to return to install added measures.

2. Acquisition efforts should develop resources in the most cost-effective manner possible. Expenditures for conservation resources should recognize that administrative costs and incentive payments must be balanced to achieve the lowest overall cost for the resource. Under some circumstances, for example, it may be more cost-effective to make 100-percent payments for conservation measures than to incur the administrative costs associated with partial payments. Utilities also should examine approaches to the acquisition of all resources that may reduce transaction costs. It is possible that competitive negotiation could reduce such costs.

3. Acquisition efforts should acknowledge that for certain resources there is a limited "window of opportunity" during which all of a resource that is cost-effective should be secured. It is important to match acquisition activities with the schedules of host facilities, especially in the case of certain conservation acquisitions. In industrial plants, for example, retrofit activities should match a plant's scheduled downtime; in the commercial sector, measures should be installed at the time of renovation; and in all sectors, code efforts should move to the full regionally cost-effective limit whenever the legislative or administrative process addresses energy efficiency.

4. Conservation acquisition efforts should ensure that regionally cost-effective levels of efficiency are economically feasible for the consumer. Payments beyond that level, up to the limit of what is regionally cost-effective, should be made by utilities. An economically feasible conservation investment is one that results in the lowest life-cycle cost to the consumer. Conservation investments beyond that point, as long as they result in savings that are cost-effective for the region, should be paid for by the region's utilities.

5. The benefits of conservation acquisition efforts should be equitably distributed throughout the region.

6. Acquisition efforts should maintain or enhance environmental quality. Acquisitions that lead to environmental degradation should be avoided or minimized.

7. Acquisition efforts should enhance the region's ability to shorten resource development lead times, reduce development costs and increase the variety of available resources. Efforts to shorten the overall lead time required to develop a resource will help reduce the cost of new resources. Completing the preliminary steps required to develop a resource and then holding that project so that the decision to construct may more closely match a demonstrated need for power also will serve to reduce developers' financial risk. Building the capability to acquire conservation resources will ensure that the region is able to capture efficiency savings as the need arises.

8. Conservation acquisition efforts should ensure that resources are reliably producing actual savings, and that the acquisition mechanism is as efficient as possible. These efforts should be evaluated with respect to process and results. These evaluations should provide reliable information that can be used to verify resource cost and output, and to improve future efforts and estimates of resource cost and availability.

9. Conservation acquisition efforts should be restricted to promoting electrical energy efficiency and should not be used to increase the market penetration of electric utilities. Marketing programs may be one effective means of promoting energy-efficient building practices, for example, but efforts should not result in significant fuel switching.

10. Acquisition efforts should give credit for resource characteristics that are not specifically accounted for in the Council's planning models. Certain resources, such as conservation or on-site generation, may avoid the need for reinforcing the region's power system with added line extensions or new transformers. For example, the Puget Sound area is experiencing transmission capacity constraints. If conservation reduces the need to reinforce the system there, it should be given an added credit.

11. Acquisition efforts in conservation should not be reduced simply because some consumers might otherwise have invested their own money in some part of the resource. Utility acquisition of regionally cost-effective conservation may sometimes pay for measures that consumers would have purchased on their own. Concern for this "free rider" potential should not keep utilities from purchasing all regionally cost-effective conservation.

Part 2: A Process for Resource Acquisition

Resource development is a long, costly and risky proposition. Large generating projects can cost hundreds of millions of dollars. If such plants are constructed, but prove unnecessary, utilities face the very expensive prospect of finding public utility commissions unwilling to include their investment in rates. To the extent, then, that the decision to construct a new plant can be moved closer to the actual time of need for additional power, the developer faces substantially less risk.

The Council decided that one way to help reduce this risk was to design an overall approach to acquisition that could accommodate resource development by Bonneville, regional utilities or private developers. A key feature of the resource acquisition process was the introduction of an "option" concept. If the designing, siting and preliminary licensing on a resource could be completed, and then construction is held off until later, a developer would effectively have an "option" on that resource. This approach drew a fundamental distinction between those initial activities that are less expensive, relative to the cost of constructing a large generating plant, and a second stage of resource development activities that commences with the decision to build. If a resource can be held until a subsequent decision to build becomes appropriate, a developer, and the region at-large, can be much more confident that additional load can be served. Both reduced financial risk and added security in being able to meet future load growth both make the options a useful element of regional planning.

The options concept has been widely discussed in the region's utility community and largely accepted. This process to shorten lead times on resources that are included in the plan should receive favorable regulatory treatment so that the region's utilities can meet the range of future load growth at the lowest possible cost.

While the term "option" is used in this chapter to describe actions to shorten lead times, the Council recognizes that shortening lead times also may refer to reducing the overall time required between initial conception and actual operation of a plant. For more information, see Volume I, page 26.

The Council realizes that not all resources will need a waiting period between the preliminary steps and the decision to build. There is no added value in holding an option, i.e., if it is already clear that added demand calls for new resources. In this latter case, the model process outlined below can be telescoped, passing quickly through the steps that relate to acquiring and holding an option.

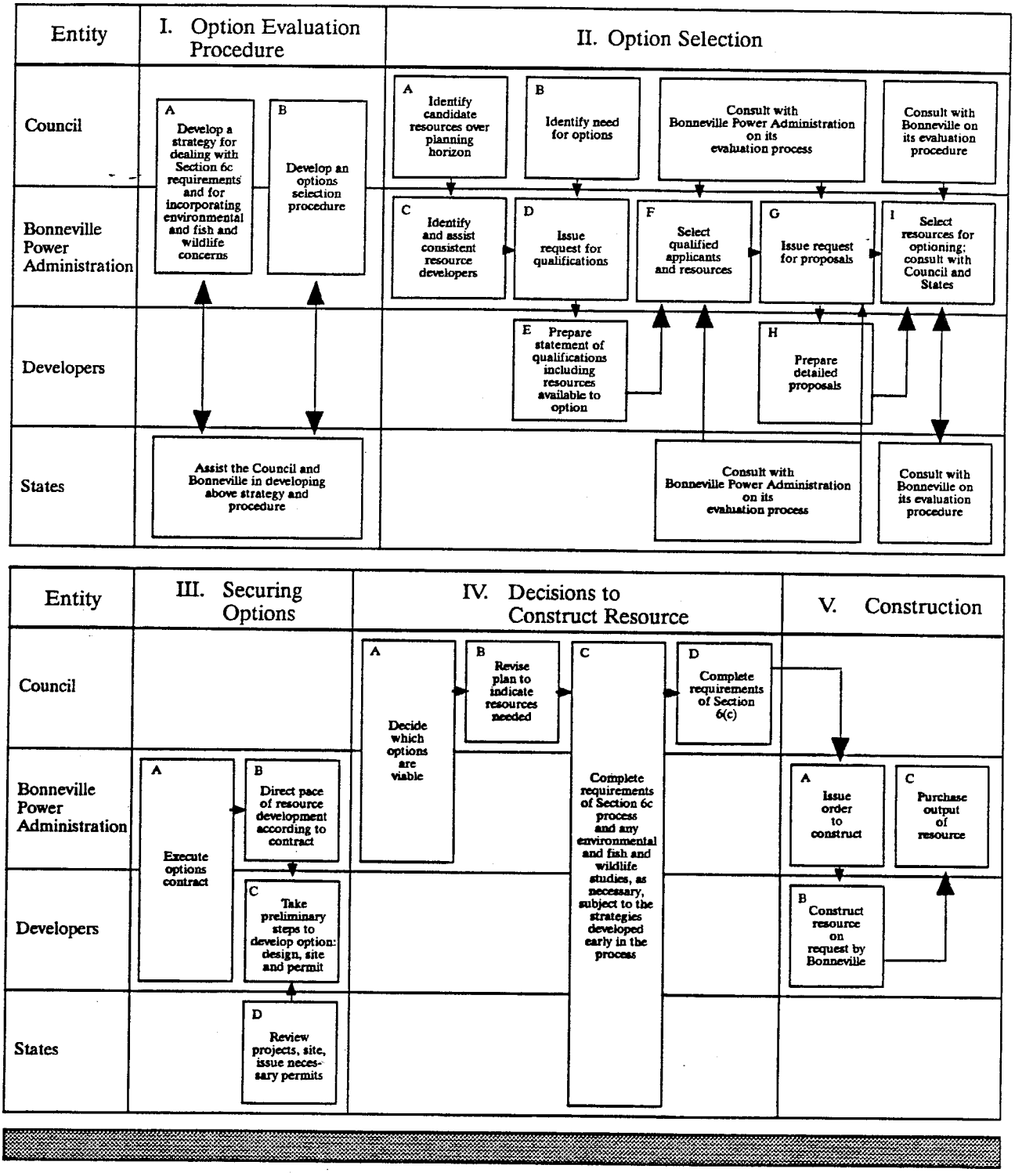
For resources that are not to be kept on hold, the Council recognizes that there are numerous approaches to acquisition that may fulfill the plan's goal of providing a least-cost energy future for the region. Traditional negotiation, competitive acquisition and billing credits are just some of the mechanisms Bonneville and the other utilities may use to acquire resources. Whatever the acquisition mechanism, the resources selected should be consistent with the regional least-cost plan, in the case of Bonneville acquisitions, or with each utility's least-cost plan, in the case of the investor-owned utilities. The Council expects that these individual plans will have been tested by the Public Utility Commissions for consistency with the regional plan.

The model process requires a number of actions by several different entities (see Figure 11-1). The most important actions are described in the discussion that follows. The development of any specific resource may require modification of the steps outlined in the model process presented here.

This process takes as its starting point the Council's plan and its estimated need for new resources, as well as the portfolio of least-cost resources to meet that need. The plan also calls for incorporating options in the Action Plan. Utility selection of specific resources, followed by the state and federal siting and licensing decisions will allow the flexibility to construct the lowest-cost resources. Opportunities for significant public involvement have been included throughout this model process. The various entities involved in taking the steps required to shorten resource lead times and the respective activities of those entities are discussed below.

Acquiring Resources

Figure 11-1
One Approach to Acquiring Resources



I. Develop Option Evaluation Procedure

Before acquiring a resource option, utilities need to develop procedures for evaluating and selecting among candidate options. A procedure is required to assess competing alternatives at various stages of the option process and to identify the best alternatives.

A. Procedure for Council Review and for Addressing Environmental and Fish and Wildlife Considerations

Bonneville and the Council have developed a procedure for complying with 1) the requirements of Section 6(c) of the Northwest Power Act, which provides for Bonneville and Council review of all Bonneville resource acquisitions greater than 50 average megawatts for consistency with the Council's power plan; and 2) the National Environmental Policy Act (NEPA). These procedures identify when major Bonneville decisions will be made and allow for appropriate input from all interested parties. The procedure for Council review will consider whether a specific resource is consistent with the goals and objectives identified in the Council's plan. These reviews would determine the consistency of a proposed resource with the plan and whether the project can be developed in an environmentally acceptable and cost-effective manner. The Council also will review projects to determine their consistency with the Council's Columbia River Basin Fish and Wildlife Program, as noted below.

B. Option Evaluation Procedure

An effective options evaluation procedure should begin with an agreement among Bonneville, the Council, utilities, the host state and appropriate local governments to implement a joint hearings process to complete all NEPA and Northwest Power Act reviews, and to secure all state and local licenses for resource options. This is not the step at which a decision to construct the resource would be made, and further environmental review might be necessary when that decision is made. The procedures for evaluating and selecting projects should appear in the requests for qualifications and requests for proposals that are made to utilities and independent developers.

II. Option Selection

The Council envisions that the selection process will occur during a "window of opportunity" when prospective resource developers will respond to a request for proposal. When options have been secured on a sufficient number of proposed resources to build an adequate inventory of resources "on hold," then the window would close. It would reopen when the inventory has fallen below an established threshold level. The concept of soliciting bids from resource developers is an important part of the selection process, one that will encourage competition and help ensure that low-cost resources are acquired first.

The goal of a procedure to select options should be to minimize overall costs to the region's electrical system and to avoid unnecessarily burdening resource

developers with process. However, for certain resource types, such as cogeneration and hydropower, there may be a large number of potentially acceptable projects within the region. For these resources, it may be desirable to use a preliminary screening process before issuing a formal request for bids.

A preliminary screening may have several benefits. Some projects may be obviously unsuitable for technical, economical or environmental reasons. They can be eliminated at this stage, reducing the time and effort required on the part of the sponsor for proposal preparation and on the part of utilities for proposal review. Furthermore, projects that pass the initial screening are likely to be viewed by their sponsors as having greater potential. As a result, qualifying sponsors are likely to put more effort into development of their proposals, providing better evidence for the selection of prospective options. For resource types with only a few candidates, preliminary screening may not be feasible or desirable, and a pre-bidding conference could suffice.

A. Identify Candidate Resources

In the plan, the Council has identified categories of conservation and generation resources and the order in which they should be acquired to meet the forecast range of future load uncertainty. These categories provide the basis for selecting options that would be consistent with the Council's plan. It is expected that future revisions to the plan will continue to identify the amounts, categories and schedules of conservation and generation resources required to meet future loads.

B. Identify Need for Options

The options concept will significantly alter the region's selection process for new generating resources. The Council will identify categories of resources and call for options to meet a range of load growth projections. The Action Plan specifies the need to acquire options for these resources.

C. Identify Resources and Assist Resource Developers

Utilities will identify specific projects they believe are consistent with the plan and provide technical assistance to developers to assess their resources. Through this effort, Bonneville can help to secure a broad base of option candidates while ensuring against the loss of resource opportunities that are consistent with the Council's plan. Specific resources will be identified for acquisition through a process that begins with a request for qualifications and proceeds through a request for proposals from qualified developers.

D. Issue Request for Qualifications

Utilities may issue a request for qualifications. As a preliminary step, a request for qualifications provides notice of the request for option candidates and asks interested sponsors to submit statements of qualification. The request should provide information on the kinds of options being sought, including the type and size of resource, development time frames and other key conditions and steps in the

option and resource acquisition processes. The request for qualifications may be issued for a specified time period ("window of opportunity") during which any potential developers of resources can respond with a statement of their qualifications. The Council expects that this open request will assist in identifying all of the potential developers with cost-effective resources in the region. This process could produce new information about the cost and availability of resources, which would cause the Council to consider amendments to the power plan.

This step and the next two steps may be reduced to a pre-bidding conference. At this conference, utilities would brief potential resource developers on the characteristics of projects that are to be solicited in the request for proposal. The purpose of the conference would be to indicate the types of projects that are sought and the characteristics of each project that is likely to be optioned.

E. Prepare Statement of Qualification

Interested resource sponsors may prepare statements of qualification for their projects. These statements should be brief and should contain information regarding the qualifications of the project and sponsor regarding the proposed acquisition of options.

F. Select Qualifying Developers and Projects

Utilities will review the statements of qualification and, in consultation with regulators, the Council, and state and local governments, select those that appear to qualify as prospective options.

G. Issue Request for Proposal

Based on the results of the request for qualifications, utilities may issue a request for proposal and invite selected resource developers to enter into options contracts. The request for proposal process will be open for a specified time period or until a specified number of resources are selected. It will set forth in detail the technical, economic, environmental, fish and wildlife and institutional characteristics of the resources sought for optioning, as well as describe the options evaluation process, the process of purchasing options and the overall resource acquisition process. Prior to issuing a request for proposal, utilities need to consult with the various state agencies and the public on the specific types of resource options being requested. This step will ~~ensure consistency~~ with the directions of the plan.

H. Prepare Detailed Proposal

Prospective resource developers interested in entering into an option agreement would prepare a detailed proposal to offer their resource for optioning. This proposal should contain information on the technical, economic, environmental, fish and wildlife, and institutional characteristics of their project in enough detail to permit determination of its suitability as an option.

I. Select Prospective Options

Upon receipt of option proposals from resource developers, utilities will use the evaluation procedure and methods described in the request for proposal. This evaluation will include consultation with the states to address site-specific concerns, and with the Council to ensure that selected options are consistent with the Council's plan. After consultations with the states and the Council concerning the selection of specific resources, utilities will enter into formal negotiations with resource developers to purchase an option on the resource.

III. Securing Options

Option contracts signed at this step will provide for completing all requirements of the pre-construction phase of development. This typically will require that preliminary engineering design and environmental assessment be completed, and that the state and federal permits and licenses required for construction be obtained. Sites will be purchased or options to purchase will be acquired. For this first phase of the acquisition process to work, resource developers' costs must be appropriately compensated by the utilities, and utilities should be granted appropriate rate treatment by the public utility commissions.

A. Execute Option Contract

Based on the expected cost-effectiveness of the project and the negotiations between the utilities and the resource developer, a contract will be offered to purchase an option on the project. This contract will identify the legal rights of the utility and the developer. At a minimum, these rights will include the utility's ability to direct the construction start date and the pace of development.

The Council recognizes that the specific terms and conditions of these option contracts will govern both the cost and viability of this acquisition approach. For this reason, the Council will work with Bonneville, resource developers and utilities to develop viable option contracts.

B. Direction of Resource Development

Utilities will direct the start and pace of project development. This will allow utilities to match the timing of the build decision to the evolving need for resources in the region.

C. Develop Options

Resource developers will secure an option as directed by utilities in the contract and pursuant to state, federal and local licenses and permits. At this point, developers will complete the key steps of siting, licensing and designing the project. The utilities then could decide to complete construction or to hold the option until needs dictated its construction.

Not all projects will successfully complete the option phase of development. The economic attractiveness of some projects may wane as engineering design advances. Other projects may fail to qualify for necessary permits and licenses. Nor is it expected that all projects for which permits and licenses are obtained will necessarily be constructed. For example, following completion of the preliminary steps, utilities may wish to relinquish projects that subsequent analysis indicates are not reliable, are less cost-effective than other potential resources or are environmentally unacceptable. Of course, if the procedures to select options are effective, the failure rate should be low. But it is important to recognize that not all options will ultimately be built.

D. State Review of Projects and Issuance of Necessary Licenses and Permits

In response to material submitted by utilities, the Council and the developer, each state should review the project and decide whether to issue the licenses and permits necessary to complete the project when it is needed. This review will encompass all siting and licensing issues with the exception of the critical determination of the need for power. Final need will be established as part of the "decision to construct" process.

A joint hearings process could be designed, preferably taking the form of a generic "memorandum of understanding" between each state, Bonneville and the Council. Sub-agreements for each proposed option should reflect any unique considerations and incorporate participation of the appropriate local governments and federal agencies. The memorandum of understanding could have the following features:

1. All federal, state and local decision-makers should be explicitly recognized as independent bodies whose authorities will not be abridged, but who have agreed to conduct a single administrative proceeding. In the proceedings, each decision-maker can choose the level of its participation, as long as decisions are made promptly.

2. A single administrative process could be established to meet the needs of all decision-makers. A single notice of hearings, which explains to the public how the process will work, could be used by all decision-makers. Opportunities for legislative and contested case formats could be included to meet all administrative requirements. The scope of issues would be identified by the decision-makers at the outset. The information and evidence requirements of each decision-maker could be identified at the outset, so that the applicant may minimize duplicative studies and reports. The process should have a definite schedule. A single hearings examiner, possibly from the state, would administer the hearings. Each decision-maker would be free to ask questions or to request additional information.

3. There should be a process for holding hearings on specific issues at the decision-to-construct stage. These hearings should address questions of need for power and any new significant information.

It is expected that utilities, Bonneville and the Council will consult with the states in the process of developing these review procedures. It also is expected that

the states will have a significant role in the application of the evaluation procedures.

IV. Decisions to Construct Resources

At this stage, developers would make the decision to acquire and construct resources to meet regional load. The decision to begin construction is a separate decision from the decision to begin siting and licensing, and one that may be delayed, in the absence of an immediate need for power. By making a second decision--a decision to start construction based on current loads and resources--the probability and cost of overbuilding resources will be reduced. At this stage, prior to commencing construction, utilities in consultation with the Council would again examine the inventory of options to see that the lowest-cost resources were being constructed. It also would be prudent before construction begins to assess whether other lower-cost resources exist outside of the inventory of options.

A. Monitor Viability of Secured Options

As noted above, it is possible that some resources that have been optioned will never be constructed. Holding an optioned resource beyond a reasonable lifetime could result in technical or economic problems or regulatory obsolescence. Utilities could extend options for which licenses or permits are about to expire or for which there have been significant technological advances, by repeating the previously described steps to decide if the project remains an attractive resource. In certain cases, it may be desirable to update the design of the resource to be consistent with current regulatory and environmental standards. In any event, utilities must determine which options remain viable.

B. Identify Need for Resources

During its normal planning cycle, the Council will revise the plan to update both the inventory of options and to recommend that construction begin on particular optioned projects. The normal Council process of public review and comment, including hearings throughout the region, will provide the basis for a regional consensus both on the viability of options that have been previously secured and on the prudence of beginning construction on cost-effective and environmentally sound projects.

C. Consistency with the Plan and the Northwest Power Act

In addition to meeting the requirements found in the acquisition principles in Part 1 for certain acquisitions by Bonneville, Section 6(c) of the Northwest Power Act sets forth a review procedure for testing consistency with the plan. The Act requires Bonneville to perform a public review process on any Bonneville proposal to acquire a major resource or to implement a conservation measure that will conserve an amount of electric power equivalent to a major resource and to determine whether the proposed resource acquisition is consistent with the Council's power plan. A major resource is any resource larger than 50 average megawatts

that is acquired by the Bonneville administrator for a period of more than five years.

The Act also provides that "the Council may determine by majority vote of all members of the Council, and notify the administrator that the proposal is either consistent or inconsistent with the plan" (Section 6(c)(2)). If either Bonneville or the Council finds the proposal inconsistent with the plan, Bonneville must get congressional approval before it can proceed with the acquisition.

In November 1986, after a review process in which both Bonneville and the Council accepted broad-based public comment, each agency adopted a statement of policy regarding its obligations under Section 6(c). The Council decided that when it elects to review a Bonneville proposal it will do so by a majority vote of all the members, within 60 days of receiving the administrator's determination made pursuant to Section 6(c)(1). The Council also outlined the approaches it expects to pursue to inform itself regarding the proposal. The Council adopted the following standard for finding consistency.

> A Bonneville proposal pursuant to Section 6(c)(1) of the Northwest Power Act shall be found consistent with the Northwest Conservation and Electric Power Plan, if it is judged to be so structured that it will achieve substantially the goals and objectives of the plan in effect at the time the proposal is made.

The Council's policy was issued on November 12, 1986, and the complete text is available from the public involvement division of the Council's central office (request "Statement of Policy--Implementing Section 6(c)).

In practice, the Council expects that this review process should be particularly expeditious in the case of resources that have had the preliminary steps completed, but then were placed on hold. Much of the review required to determine consistency with the plan already will have been completed in the preliminary steps outlined in this acquisition process. All interested parties, including state and local governments, will have had the opportunity to address the question of consistency. Unless new information is revealed in either Bonneville's or the Council's Section 6(c) review, it is expected that the resource will be found to be consistent with the plan.

Following a finding of consistency by the Council, Bonneville will direct the developer of the resource to commence construction.

V. Construct Resource

At this step in the process, the resource developer, with appropriate financial backing, will construct the resource. Rapid cost escalations and/or major design problems during construction could cause a re-evaluation of resources on which construction has begun. Even though uncertainty can be reduced through successful implementation of the options concept, it is still possible that some projects may not be completed as planned. The Council factors into its planning

the probabilities that resources could be lost at some stage of the acquisition process and that replacement resources may be needed.

Part 3: Conditions for Hydropower Development

In response to the Northwest Power Act, the Council includes the following conditions in its plan, which requires due consideration for protection, mitigation and enhancement of fish and wildlife, related spawning grounds and habitat.

I. Protection, Mitigation and Enhancement of Fish

Bonneville should not agree to acquire power from, grant billing credits for, or take any other actions under Section 6 of the Act, concerning any hydropower development in the region without providing for:

1. Consultation with interested fish and wildlife agencies and tribes, state water management agencies, and the Council throughout study, design, construction, and operation of the project;

2. Specific plans for flows and fish passage facilities prior to construction;

3. The best available means for aiding downstream and upstream migration of salmon and steelhead;

4. Flows and reservoir levels of sufficient quantity and quality to protect spawning, incubation, rearing and migration;

5. Full compensation for unavoidable fish or fish habitat losses through habitat restoration or replacement, appropriate propagation, or similar measures that give preference to natural propagation over artificial production of fish;

6. Assurance that the project will not inundate the usual and accustomed fishing and hunting places of any tribe;

7. Assurance that the project will not degrade fish habitat or reduce numbers of fish in such a way that the exercise of treaty rights will be diminished; and

8. Assurance that all fish protection and mitigation measures will be fully operational at the time the project commences.

II. Protection, Mitigation and Enhancement of Wildlife

Bonneville should not agree to acquire power from, grant billing credits for, or take other actions under Section 6 of the Act concerning any hydropower development in the region without providing for:

1. Consultation with interested wildlife agencies and tribes, state water management agencies and the Council throughout study, design, construction and operation of the project;

2. Avoiding inundation of wildlife habitat, such as winter range or migration routes essential to sustain local or migratory populations of significant wildlife species, insofar as practical;

3. Timing construction activities, insofar as is practical, to reduce adverse effects on nesting and wintering grounds;

4. Locating temporary access roads in areas to be inundated;

5. Constructing subimpoundments and using all suitable excavated material to create islands, if appropriate, before the reservoir is filled;

6. Avoiding all unnecessary or premature clearing of all land before filling the reservoir;

7. Providing artificial nest structures, when appropriate;

8. Avoiding construction, insofar as is practical, within 250 meters of active raptor nests;

9. Avoiding critical riparian habitat (as defined in consultation with the wildlife agencies and tribes) when clearing, riprapping, dredging, disposing of spoils and wastes, constructing diversions, and relocating structures and facilities;

10. Replacing riparian vegetation if natural revegetation is inadequate;

11. Creating subimpoundments by diking backwater slough areas, creating islands, level ditchings, and nesting structures and areas;

12. Regulating water levels to reduce adverse effects on wildlife during critical wildlife periods (as defined in consultation with the fish and wildlife agencies and tribes);

13. Improving the wildlife carrying capacity of undisturbed portions of new project areas (through such activities as managing vegetation, reducing disturbance, and supplying food, cover and water) as compensation for otherwise unmitigated harm to wildlife and habitat in other parts of the project area;

14. Acquiring land or management rights where necessary to compensate for lost wildlife habitat at the same time other project land is acquired, and including the associated costs in project cost estimates;

15. Funding operation and management of the acquired wildlife land for the life of the project;

16. Granting management easement rights on the acquired wildlife lands to appropriate management entities; and

17. Collecting data needed to monitor and evaluate the results of the wildlife protection efforts.

III. Protected Areas

Conflicts over the development of hydropower projects in critical fish and wildlife areas generate cost and uncertainty for the region's power system. Mitigating the effects of hydropower development on fish and wildlife is risky, expensive, and time consuming. Lengthy disputes have occurred over the possible effects of development and over the likelihood that mitigation may be successful. These disputes are not only disruptive, but they add to developer costs and utility rates, and leave the region less certain about its ability to develop new resources when they are needed.

The Council directed extensive studies of fish and wildlife, their spawning grounds and habitat in the region, and analyzed alternative means of protecting them from further degradation. The Council concluded: 1) the studies have identified fish and wildlife resources that are of critical importance to the region; 2) mitigation techniques cannot ensure that all adverse impacts of hydroelectric development on these fish and wildlife can be mitigated; 3) even small hydroelectric projects may have unacceptable individual and cumulative impacts on these resources; 4) because of the likely cost and difficulty of developing hydroelectric projects in protected areas, the Council considers these projects unlikely to be reliable and available within the time needed for purposes of cost-effectiveness determinations under the Northwest Power Act; and 5) protecting these resources and habitats from hydroelectric development is consistent with an adequate, efficient, economical and reliable power supply. Accordingly, the Council, relying on these studies, has designated certain river reaches in the region as "protected areas," where the Council believes hydroelectric development would have unacceptable risk of loss to fish and wildlife species of concern, their productive capacity and their habitat.

Standards for the Bonneville Power Administration and the Federal Energy Regulatory Commission for hydroelectric projects located in the Columbia River Basin are set forth in Section 1103 of the Council's fish and wildlife program. Standards for the Bonneville Power Administration and the Federal Energy Regulatory Commission for hydroelectric projects located outside of the Columbia River Basin are as follows:

1. River reaches to be protected are those reaches or portions of river reaches listed on the "protected areas list" adopted by the Council on August 10, 1988 or as later amended by the Council. For each river reach on the protected areas list, the fish or wildlife to be protected are those indicated on the list. The Council will supply a copy of the protected areas list free of charge on request of any party.

2. Bonneville should not acquire power from hydroelectric facilities located in protected areas. The Council believes that the Long-Term Intertie Access Policy's reliance on protected areas is consistent with the Council's power plan and fish and wildlife program as they apply to fish and wildlife in the Columbia River Basin. The Council continues to recommend that Bonneville

adopt a similar policy with respect to protected areas outside the Columbia River Basin.

3. The Federal Energy Regulatory Commission should consider the Council's protected area designations in licensing and exemption proceedings.

4. Protected area designations are not intended to apply to:

   a. any hydroelectric facility or its existing impoundment that had as of August 10, 1988, been licensed or exempted from licensing by the Federal Energy Regulatory Commission;

   b. the relicensing of such a hydroelectric facility or its existing impoundment;

   c. any modification of an existing hydroelectric facility or its existing impoundment;

   d. any addition of hydroelectric generation facilities to a non-hydroelectric dam or diversion structure.

5. For purposes of cost-effectiveness determinations under the Northwest Power Act, energy from projects located in protected areas is unlikely to be reliable and available within the time it is needed.

6. Amendments:

   a. Upon submission to the Council of a state or tribal comprehensive plan or state or tribal river, river basin or watershed plan, the Council will promptly and carefully consider amending the protected areas list, to reflect relevant portions of a state or tribal plan. With regard to resident fish and wildlife, the Council recognizes that individual state and tribal interests are particularly strong.

   b. For other amendments to protected areas, the Council will follow the processes described in Section 1303 of the Columbia River Basin Fish and Wildlife Program.

Part 4: Acquisition of Reserves by Bonneville

Under Section 5(d)(3) of the Act, the administrator has discretion to sell additional power to existing direct service industrial customers as a means of providing additional power system reserves for the region's firm loads. The Council is required by the Act to determine whether such a proposed sale and acquisition of reserves is consistent with the power plan.

In determining whether a particular proposed sale of power to an existing direct service industrial customer is consistent with the power plan, the Council will be guided by the following principles.

1. Case-by-case determination: Each sale of additional power to a DSI will be reviewed on its own merits. The Council has not determined whether there may be circumstances other than those described in paragraphs 2, 3 and 4 below, in which a sale of additional power to an existing direct service industrial customer may be consistent with the power plan. However, the Council believes that a sale that has the attributes described below has a higher probability of Council approval than one that does not have these attributes.

2. Nonfirm sales: Sales of additional interruptible (nonfirm) power that do not increase net firm resource costs for other customers of Bonneville are likely to be consistent with the power plan. Net firm resource costs mean the firm resource costs after taking into consideration the revenues from the sale of the interruptible power.

3. Firm sales should be the least costly: Sales of additional firm power to an existing direct service industrial customer are likely to be consistent with the power plan only when they result in serving the additional load in a manner that is the least costly to the regional power system, after taking into consideration alternative sources for the power, alternative locations for the load, availability and reliability of transmission, provision of reserves and related factors.

4. Effect of the proposed sale on power planning: Proposals for the sale of additional firm power to an existing direct service industry beyond its current entitlement should include a showing of how the sale will affect Bonneville's need for additional resources, and what resources are potentially available to serve the load.

Conclusion

The Council is keenly aware that the next decade will test the region's ability to acquire those resources that will ensure a least-cost energy future for the Northwest. The acquisition principles set forth by the Council should be met by any resource proposal. The Council believes that the model acquisition process outlined above is one important way in which to reduce the region's risk of over- or underbuilding its resource base. Shortening lead times by use of the options process, that is, completing the relatively inexpensive preliminary resource development activities and then holding a resource so that the decision to construct may be as close in time as possible to the actual need for additional power, may serve as an important device for reducing risk and resource development cost. Of course, this process may require modification when applied to any particular resource acquisition.

The strategy of purchasing options should minimize the likelihood that loads and resources will be out of balance, because it will reduce the time between the decision to construct a resource and the actual need for the resource. The option process has the added advantage of allowing for the evaluation of the environmental consequences of particular resources both when an option is taken, as well as when the decision to construct is reached. State public utility commissions

may offer critical support of this approach to shortening lead times by affording favorable rate treatment to the acquisition of options.

In outlining the principles and proposed resource acquisition process, the Council also has noted the variety of other evaluations that must be made. Section 6(c) applies to certain Bonneville proposals to acquire resources. Section 5(d)(3) applies to others. In all cases, the fish and wildlife provisions of the Northwest Power Act must be met. Setting these requirements out in advance should give all interested parties greater certainty as the region takes up the challenge of acquiring sufficient resources to meet its energy future at the lowest overall cost.

A:BH/BILL.EN9 model acquisition process