
**Record of Decision
Resource Programs
Final Environmental
Impact Statement**

Bonneville Power Administration

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**U.S. DEPARTMENT OF ENERGY
Bonneville Power Administration**

Resource Programs Final Environmental Impact Statement

Record of Decision

AGENCY: Bonneville Power Administration (BPA), DOE

ACTION: Record of Decision (ROD) for BPA's Resource Programs EIS

SUMMARY: BPA needs to acquire sufficient new resources to meet electricity deficits caused by growing customer loads. BPA's Resource Program EIS examines 13 alternatives, including No Action. The environmentally preferred alternative is the Emphasize High Conservation Alternative. BPA's preferred alternative is the Emphasize Conservation Alternative.

BPA has decided to take the following actions in pursuit of its long-term conservation and generation resource acquisition objectives (described below):

1. Emphasize Conservation Alternative

BPA's resource acquisitions (through its biennial Resource Programs) will be guided by the resource priorities of the Emphasize Conservation Alternative of the Resource Programs Final EIS; that is, all cost-effective conservation and efficiency improvements will be acquired, as well as a mix of renewable resources, cogeneration, and combustion turbine generation.

In order to analyze maximum likely impacts, the amount of each resource type in the Emphasize Conservation Alternative was based on an assumption of the need to meet high load growth. High load growth is unlikely; therefore, BPA would probably not acquire the amounts of each resource type identified in the EIS for this alternative. For example, unless load growth is unexpectedly high, there is little probability of BPA acquiring the identified nuclear resources (WNP 1 or 3) because of the large size of the two plants and their costs, which are higher than some other available resources. Similarly, new coal resources would not likely be acquired because of their generally large unit size and high environmental costs.

The resource supply and environmental impact information in the EIS will be reviewed periodically and used to inform BPA resource acquisition decisions. The actual amount of each resource type that BPA acquires will be decided in biennial Resource Programs (see below).

2. High Conservation Alternative

BPA will actively investigate the additional conservation resources described in the Emphasize High Conservation Alternative, and to the extent that their supply, cost, and reliability can be validated, BPA will seek to acquire them.

3. Resource Programs

BPA will make decisions about the specific amounts of conservation and generation resources it proposes to acquire through biennial Resource Programs, which will periodically clarify and update the decisions made in this Record of Decision. Each Resource Program will update load projections and will use information from the Resource Programs EIS regarding resource characteristics and environmental impacts, as well as the most current data about supplies and costs, to set targets for acquisition of resources of various types. Each Resource Program will include opportunities for public review and input to BPA's resource decisions.

Resources may be acquired through a variety of resource acquisition processes, including competitive bidding, billing credits, and targeted acquisitions. Unsolicited proposals may be considered, and resource options (such as those being considered under BPA's Resource Contingency Plan) may be acquired.

Site-specific NEPA documentation (tiered to the programmatic Resource Programs EIS) will be prepared for individual generation projects BPA proposes to acquire.

4. Mitigations

BPA proposes to adopt a number of mitigations to minimize the environmental impacts associated with acquiring and operating conservation and generation resources. These mitigations are described in section 6 of the attached Supplementary Information.

ADDRESSES: Copies of the Resource Programs Final EIS, January, 1993 (DOE/EIS___) and the Record of Decision are available from BPA's Public Involvement Office, P.O. Box 12999, Portland, Oregon 97212.

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**Record of Decision
Supplementary
Information**

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Supplementary Information

1. Background

1.1 Purpose of and Need for the Action

1.1.1 Need

BPA needs to acquire sufficient new resources to meet electricity deficits caused by growing customer loads.

1.1.2 Purpose

The purposes of this action are to:

- ◆ Ensure that BPA can meet its contractual obligations to supply cost-effective electric power as requested by its customers--taking into account potential environmental consequences when making any decisions to acquire resources to meet those loads;
- ◆ Assure consistency with BPA's statutory responsibilities, including the Northwest Power Act, while taking into consideration the Northwest Power Planning Council's Power Plan and its Fish and Wildlife Program; and
- ◆ Restore and enhance environmental quality and avoid or minimize possible adverse environmental effects.

1.2 Resource Programs EIS

On April 2, 1990, BPA published a Notice of Intent to Prepare an EIS in the Federal Register. The official comment period on the scope of the Resource Programs EIS was from April 2 through May 15, 1990. A scoping meeting was held in Portland on May 1, 1990. Nineteen people commented on the scope of the EIS.

Persons involved in BPA's Resource Program, as well as people interested in fish and Tribal issues, were invited to participate in Technical Review Panels to develop analysis methods. Those who were interested came to an initial meeting on August 13, 1990, and participated at various levels thereafter as they chose.

On May 15, 1992, the Draft EIS was released for public review (through July 6, 1992). On June 16, 1992, BPA held an open house and public hearing on the draft Resource Programs EIS. Fifty-two people commented at the hearing or by letter. Comments on the draft EIS were addressed in the Final Resource Programs EIS, issued in January, 1993.

2. BPA's Resource Program

2.1 The Process

Every two years, BPA prepares a Resource Program, which identifies projected loads and the amounts and types of resources that BPA will acquire to meet the power requirements of its customers. In developing the Resource Program, BPA prepares load forecasts in cooperation with the Northwest Power Planning Council (Council). A set of five forecasts (low, medium-low, medium, medium-high, and high) is prepared to reflect uncertainties about future load growth. A range of load/resource balances is prepared by comparing the energy capability of the existing Federal system resources to the range of projected Federal system energy loads over the next 20 years. In a parallel process, BPA and the Council develop new resource supply forecasts.

In the 1991 joint forecast, if medium load growth occurs, the Federal system is 400 to 500 aMW in deficit in the near term, and would require 800 aMW by the year 2000. The actual level of future loads is not known. If demand grows faster than the medium loads case or if resources do not perform as expected, BPA could face a larger deficit. Under high load growth, BPA could have almost 5,000 aMW of additional load to meet by the end of its 20-year planning period. The uncertainty of load growth is one reason BPA must use the biennial Resource Programs to update and clarify the resource decisions made in this Record of Decision.

In addition to this projected energy load growth, changes in the operation of the hydroelectric system to increase fish survival may reduce the capacity of the Federal system. The loss of resource capability would function like load growth in requiring more resources to serve load. The need to replace capacity to meet peak loads may become an increasingly important goal of BPA's future Resource Programs.

2.2 The 1992 Resource Program

The 1992 Resource Program was developed through a collaborative process involving a technical review panel that included representatives from customer utilities and many other interests. In addition, working groups dealt with specific technical issues, such as modeling and analysis, conservation implementation, generating resource implementation, fuel choice, environmental costs, and Local Conservation Plan development. The priorities of the 1992 Resource Program were based on the Northwest Power Planning Council's 1991 Northwest Power Plan, the 1991 Joint Load Forecast, the most current information on resource supplies, and information about environmental impacts of conservation and generation resources from the draft Resource Programs EIS.

The 1992 Resource Program proposes that BPA set budgets for the 1994-95 period that would allow it to acquire all cost-effective conservation (targeting 600 aMW) and 120 aMW of efficiency improvements through 2003. The 1992 Resource Program also proposes that BPA acquire an additional 400 aMW of generating resources or interregional power purchases or exchanges in addition to 350 aMW of resources previously committed to through the billing credits program and competitive bid. The 1992 Resource Program also recommends a total of 1,450 aMW of options and contingencies.

3. Alternatives Examined in the Resource Programs EIS

The Resource Programs EIS examines both resource *types* (e.g., residential conservation; combustion turbines) and resource *alternatives* (portfolios of resources to meet long-term need, each of which emphasizes a particular resource type).

3.1 Resource Types

For most resource types, information is provided on technical characteristics, operating characteristics, contribution to system capacity, costs (both direct and environmental), environmental effects and possible mitigations, and supply. The following resource types are examined in the Resource Programs EIS:

- ◆ Conservation (commercial, residential, industrial, irrigation, and agricultural sectors)
- ◆ Renewable resources (hydropower, geothermal, wind, and solar)
- ◆ Cogeneration
- ◆ Combustion turbines
- ◆ Nuclear (the completion of WNP-1 and WNP-3)
- ◆ Coal (both conventional pulverized coal and clean coal technologies)
- ◆ Fuel switching
- ◆ Energy imports
- ◆ Efficiency improvements
- ◆ Load management

Information is also provided on emerging technologies (fuel cells, hydrogen, new nuclear fission technology, and pumped storage) that may become more commercially viable in the future.

3.2 Alternatives

The Resource Programs EIS examines 13 alternatives, which represent the range of actions BPA could take to meet its load obligations. In the *No Action Alternative*, the underlying need for energy to meet the growing loads of BPA customers would not be satisfied. Neither BPA nor the region would acquire new resources to meet these loads.

Each of the alternatives other than the No Action Alternative comprises a combination of the resource types listed above. The *Status Quo Alternative* is based on minimizing total system costs, with no consideration of environmental costs (as was done in the 1990 Resource Program). The *Base Case Alternative* is also a least-cost resource mix, but the costs considered in ordering the resource mix include quantified environmental costs.

All other alternatives in the EIS are compared to the Base Case, and each emphasizes a particular resource type. The resource stacks for these remaining alternatives were developed by placing the available supply of the emphasized resource at the top of the Base Case stack (without regard to cost) after non-

discretionary conservation. These alternatives were developed in the recognition that no single resource type could serve all the resource need (if high load growth occurs), and in order to look at potential interactions and cumulative impacts of emphasizing particular resource types. The following alternatives are compared to the Base Case:

- ◆ Emphasize Conservation Alternative
- ◆ Emphasize High Conservation Alternative
- ◆ Emphasize Renewables Alternative
- ◆ Emphasize Cogeneration Alternative
- ◆ Emphasize Combustion Turbines Alternative
- ◆ Emphasize Nuclear Alternative
- ◆ Emphasize Coal Alternative
- ◆ Emphasize Clean Coal Alternative
- ◆ Emphasize Fuel Switching Alternative
- ◆ Emphasize Imports Alternative

4. Decision Factors and Issues

The alternatives examined in the Resource Programs EIS were evaluated against the purpose of and need for the action (see paragraph 1.1).

Meeting BPA's Contractual Obligations: All of the alternatives except No Action were designed to meet the need of assuring that BPA can cost-effectively fulfill its contractual obligation to meet the electrical loads of its customers. The alternatives with the lowest total system costs (i.e., direct plus environmental costs) were the Emphasize High Conservation and Emphasize Fuel Switching Alternatives, followed by the Emphasize Conservation Alternative.

Consistency With BPA's Statutory Responsibilities: All of the alternatives were designed to be consistent with BPA's statutory obligations, including the Northwest Power Act (which requires consideration of the Council's Plan and its Fish and Wildlife Program). Specifically, load assumptions were developed jointly with the Council. The environmental costs used in the EIS were developed using the Council's methodology and data. The hydropower supply curves used in the EIS excluded projects located in the Council's Protected Areas.

Environmental Quality: The EIS examines the potential environmental impacts of resource types and combinations of resource types. It evaluates a range of environmental impacts, including air quality, water consumption, thermal discharges, and land use. It also compares the quantified environmental costs of each alternative, looks at potential impacts on hydroelectric operations, and evaluates the potential contribution of each alternative to the overall capacity of the Federal system.

The EIS shows that the alternative with the lowest environmental impacts overall, as well as the lowest environmental costs and total system costs, is the Emphasize High Conservation Alternative. The Emphasize High Conservation Alternative is not BPA's preferred alternative because the cost-effectiveness, reliability, and

commercial availability of the additional conservation resources that distinguish the Emphasize High Conservation Alternative from the Emphasize Conservation Alternative have not been confirmed. Although BPA has established the goal of acquiring all cost-effective conservation, it is not clear that all of the conservation resources that make up the Emphasize High Conservation Alternative can be acquired reliably or cost-effectively.

After the Emphasize High Conservation Alternative, the Emphasize Conservation Alternative has the next lowest environmental impacts overall. This alternative would lead to the same or fewer emissions of sulfur dioxide, nitrous oxides, particulates, carbon monoxide, and carbon dioxide than all other alternatives except High Conservation and Renewables. It would discharge the same or less waste heat and would use the same or less water than all alternatives except High Conservation and Renewables, and would use the same or less land than all alternatives except High Conservation.

The Emphasize Fuel Switching Alternative has lower system costs and lower total costs than the Emphasize Conservation Alternative, but its environmental costs are predicted to be slightly higher than the Emphasize Conservation Alternative.

5. BPA Decision Regarding the Preferred Alternative

BPA's preferred alternative is the Emphasize Conservation Alternative. System and environmental costs are low. Environmental impacts from conservation are minimal. This alternative is cost-effective and environmentally responsible.

6. Mitigation

The following outlines mitigation measures BPA proposes to adopt. It should be noted that mitigation for conservation is described in more detail than mitigation for generating resources because generating resources will be the subject of additional project-specific NEPA review. Mitigation measures will be detailed in a mitigation plan to be developed pursuant to this Record of Decision.

6.1 Resource Acquisition Process

Environmental Impact Information: In order to reduce the environmental impacts associated with the acquisition of new conservation and generation resources, BPA will review the information about environmental impacts of resource types and combinations of resource types contained in this EIS when it makes future resource acquisition decisions.

Environmental Costs: With the objective of appropriately reflecting the total costs of new resources, BPA will include quantified environmental costs in the costs used to establish resource supply and cost curves in its Resource Programs.

6.2 Generating Resources

Project-specific environmental review: In order to reduce the environmental impacts associated with the acquisition of new generating resources, BPA will prepare project-specific NEPA reviews of every generating project, tiered from this EIS, before it acquires the output of any generating resources.

Protected Areas: BPA will not acquire the output of any hydroelectric resource located within any Council-designated Protected Area inside or outside the Columbia River Basin.

Environmental Review Criteria: BPA will include clear environmental review criteria in all resource acquisition processes in order to mitigate potential environmental impacts of generating resources by selecting resources with fewer environmental impacts.

6.3 Conservation

6.3.1 Residential Sector

BPA's residential sector energy conservation programs currently operate according to the New Energy-Efficient Homes Programs Record of Decision (ROD), dated February 23, 1989, and the ROD for the Expanded Residential Weatherization Program, dated October 18, 1984. The requirements from both of these RODs will continue to apply to the respective programs, except for the specific changes noted in this ROD.

The New Energy-Efficient Homes Programs ROD recognized the need not only to maintain indoor air quality (IAQ), but also to enhance it to ensure that new energy-efficient homes cause fewer health risks than those potentially occurring in homes built using 1983 standard building practices. Energy-efficient performance standards known as the Model Conservation Standards (MCS) were adopted in 1983, and BPA chose to maintain the ventilation rates at levels generally found in homes built prior to their adoption. A mitigation package formed an integral part of the new energy-efficient homes programs. The environmental requirements included exhaust fans for kitchen and bathrooms, designated outside air supplies for combustion appliances, occupant information on indoor air quality, HUD product standards for formaldehyde emissions from structural building materials, and the offer of a radon package for radon monitoring and radon source control.

The existing environmental requirements for new homes remain intact, except for changes to the radon package. The Resource Programs EIS explains in section 3.1.2 that it is now known that radon entry into homes is predominantly caused by natural forces such as pressure gradients, wind, and air temperature rather than by house tightening techniques. Therefore, it is appropriate to allow builders to substitute passive or active stack ventilation, or other equivalent proven technologies, for the foundation treatments (ventilated crawl space or a layer of gravel under the concrete slab). If neither option is installed, then the builder must monitor for radon in the house after construction. The builder will be required to retrofit the house with an approved mitigation measure and activate the measure if monitoring shows that radon levels exceed the Environmental Protection Agency's (EPA) action level.

The Record of Decision for the Expanded Residential Weatherization Program required the adoption of mitigation strategies to lessen the risk of adverse human health effects that may result after the installation of "house tightening" measures (storm windows, other window treatments for conserving energy, wall insulation, weatherstripping, caulking, and door treatments such as thermal pane replacements). The mitigation strategies included:

1. giving program participants information on indoor air pollutant sources and practical steps for reducing concentrations,

2. giving program participants options for having their homes monitored for radon concentrations, and
3. partially subsidizing the installation of a proven mitigation device if radon concentrations exceed 5 picocuries per liter.

The first two mitigation strategies will continue as program requirements. However, as stated in section 3.1.2 of the EIS, studies have revealed that there is no direct correlation between house tightening and radon levels. Because radon levels are now recognized as substantially source-driven and likely to exist prior to weatherization, BPA will no longer offer radon mitigation to participants of its residential weatherization programs.

BPA recently decided to include manufactured homes in its residential weatherization programs. However, retrofitting insulation into existing manufactured homes provides greater house tightening than the same measures retrofitted into site-built homes. This is because many existing mobile homes have enclosed ceiling and floor cavities containing air spaces that allow air movement and ventilated walls that were designed to let air flow through the wall cavities. Insulating the ceiling, floor, or wall cavities in mobile homes has a greater effect on air leakage because it can virtually block any ventilation. Therefore, BPA will require that existing manufactured homes receiving insulation treatment either have or install a whole-house ventilation system that meets the exhaust and fresh air requirements such as those in the 1982 Super Good Cents (SGC) program and Manufactured Housing Acquisition Program (MAP), or an equivalent proven technology.

6.3.2 Commercial Sector

Two environmental assessments (EA), titled *Energy Conservation Opportunities in Commercial-Sector Facilities in the Pacific Northwest* (August 1982), and *BPA's Alternative Approaches for Acquiring Energy Savings in Commercial Sector Buildings* (September 1991), have been prepared by BPA to analyze the effects of energy conservation measures (ECMs) in commercial sector buildings. The 1991 EA incorporated the analysis from the 1982 EA with subsequent environmental review documents that were prepared for commercial sector conservation activities. BPA developed specific environmental requirements for proven ECMs in a document entitled *Commercial Environmental Requirements (CERs)*, which is referenced in the 1991 EA. All of BPA's commercial conservation programs must comply with the CERs prevailing at the time of installation. The CERs are periodically updated to incorporate new information relevant to the potential environmental impacts of ECMs and to allow for modifications or additions to the list of proven ECMs.

The requirements developed for the September 1991 EA remain intact except for the following:

1. When ECMs reducing the amount of ventilation air during occupied periods are installed in commercial buildings, the *latest* American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) Standard 62, rather than ASHRAE Standard 62-89, will be the required ventilation standard. This will allow for updating of the standard for IAQ just as ASHRAE 62-81 was updated to 62-89.

2. Naturally ventilated buildings must comply with state and local building codes and, at a minimum, must meet the Uniform Building Code (UBC) ventilation requirements.
3. As stated in section 3.1.1 of the Resource Programs EIS, studies indicate that there is no direct correlation between the tightening of a building envelope and radon levels. Therefore, radon monitoring will be offered, but not required, when ECMs that reduce air infiltration are installed in apartment buildings. This will be consistent with the modified radon monitoring requirements of the Residential Weatherization Program.
4. Programs involving HVAC and refrigeration measures will require the recovery and recycle of chlorofluorocarbons (CFCs) in accordance with the Clean Air Act Amendments of 1990.
5. BPA routinely provides building owners with information developed by EPA regarding disposal of fluorescent light ballasts containing PCBs. Program participants are required to follow all Federal, state, and local regulations governing disposal and are encouraged to comply with the disposal guidelines and policies developed by EPA Region 10. However, the small PCB capacitors contained in fluorescent light ballasts, along with spent fluorescent light tubes, continue to be disposed of in municipal landfills, risking ground and water contamination. As a result, BPA will work closely with Federal and state agencies, and BPA customers to develop an acceptable PCB light ballast and lamp disposal plan for its service territory.

6.3.3 Industrial Sector

BPA has developed a list of proven ECMs for the industrial sector that were categorically excluded from NEPA review and are described in section 3.1.3 of the Resource Programs Final EIS. The ECMs were previously evaluated and were determined not to affect environmentally sensitive areas when they are applied to current mechanical processes or are placed within existing commercial or industrial facilities. ECMs that are not listed or those that involve new mechanical processes or the development of facilities will receive environmental review by BPA prior to their inclusion in any sponsored programs. The highly regulated nature of the industrial sector is a safeguard against potential significant adverse environmental impacts.

6.4.4. Agricultural Sector

BPA's existing irrigated agriculture energy conservation program was categorically excluded from NEPA review on January 8, 1985. Specific mitigation strategies were developed to minimize potential erosion caused by increased runoff that could result from increased droplet size. The mitigation strategies are:

1. a signed statement from the equipment installer stating runoff control was considered in the system design,
2. a brochure explaining runoff problems and detailing methods of control is delivered to each of the program participants,
3. proper training of BPA-certified irrigation system inspectors to evaluate potential runoff problems,

4. a technical assessment, in cooperation with the local Soil Conservation Service office, to identify potential runoff problems and develop specific mitigation strategies, and
5. a follow-up analysis of representative farms is conducted to determine if irrigators are, in fact, adopting runoff control strategies. If not, the mitigation plan will be revised appropriately.

These mitigation strategies will continue to apply to all irrigated agriculture energy conservation programs and pilot programs to ensure that increased water droplet size does not cause a significant increase in runoff and erosion.

6.3.5 Customer System Efficiency Improvements (CSEI)

BPA utility customer distribution and transmission system efficiency improvements include transformer replacements, conductor replacement, and insulator additions and replacements and other activities. Many of these CSEI projects occur within previously developed facility areas and are categorically excluded from NEPA review. Transformers containing PCBs and removed from service will be disposed of in accordance with the requirements of the Resource Conservation and Recovery Act (RCRA).

Issued in Portland, Oregon, on

Randall Hardy
Administrator

