How electrode boilers can cut the cost of steam generation

Surplus generating capacity now burdening many utilities can make high-voltage power a low-cost boiler fuel—if you use it right

By John Reason, Associate Editor

It seems like a paradox: Use work to generate electricity, transmit the electricity to the customer, who uses it to generate heat. But in today's world of topsy-turvy energy costs, electric steam generation can be economical.

The secret is the high-voltage electrode boiler, in which steam is generated by direct passage of an electric current through the water (see box). Such boilers are 100% efficient, require short startup times, and incur almost zero maintenance costs. These features, together with the current structure of electric-utility rates, lead to the following situations in which electric boilers can cut your total fuel cost:

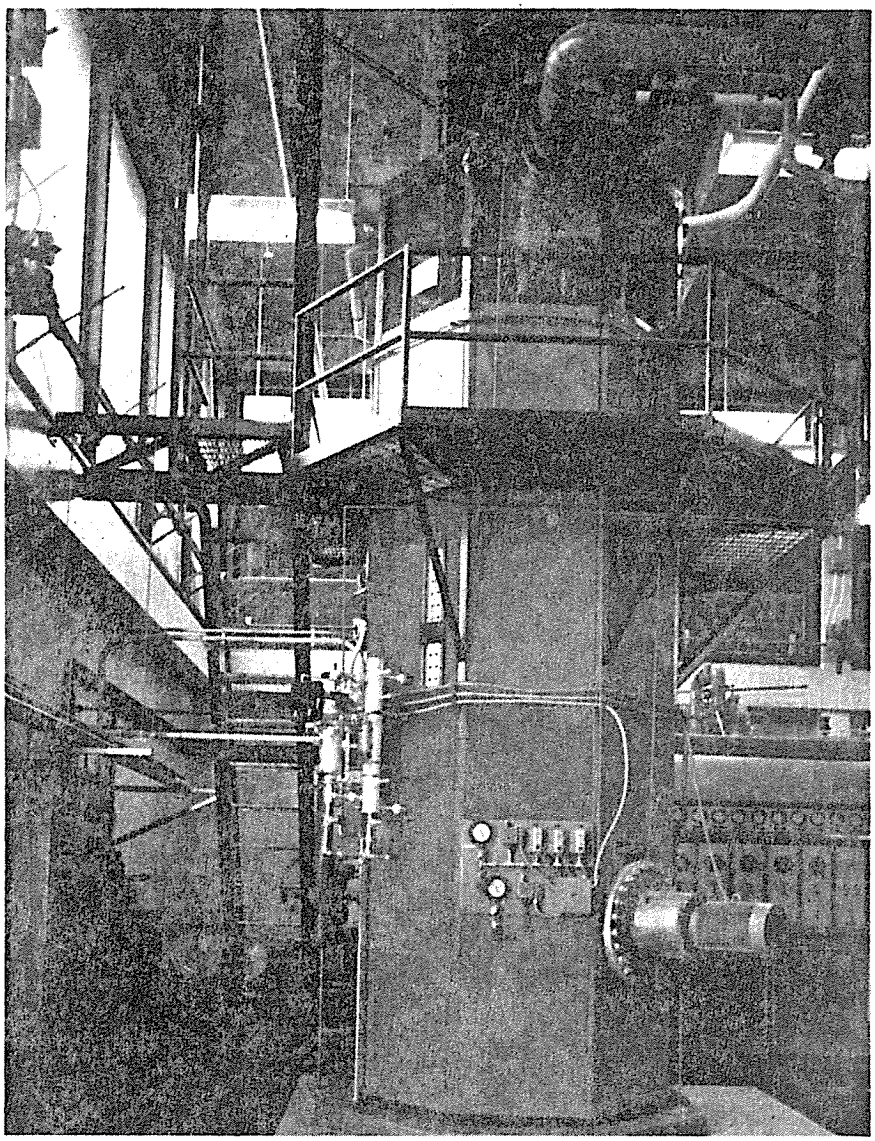
Load leveling

Many utilities have rate structures that make the peak kilowatt demand charge a significant component of the total bill. To this, they have added the ratchet clause, which means that the peak demand incurred in any one month is also charged for the succeeding 11 months, whether that demand level is reached again or not.

Electric users who are unable to avoid a high seasonal or monthly peak demand must pay this heavy ratchet charge. But they can buy additional electric energy at very favorable rates by filling in the valleys in their kilowatt-hour consumption. They pay only the energy charge for this additional energy because they do not increase their peak demand.

The electric boiler is an excellent device to use these off-peak kilowatt-hours. Used in conjunction with a gas- or oil-fired boiler and an energy-management computer, the electric boiler can be controlled to consume an almost constant electric load around the clock.

St. Vincent Hospital, Indianapolis,



1. This electrode boiler at St. Vincent Hospital, Indianapolis, Ind—originally purchased to forestall natural-gas shortages—is now used for load leveling

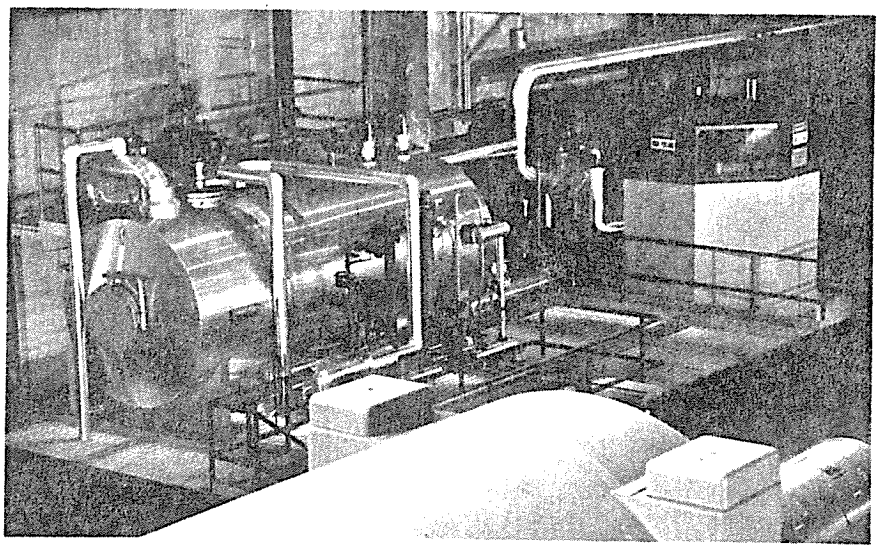
Ind, has a summer air-conditioning peak that approaches 8000 kW. Utility tariffs demand that the hospital use or pay for at least 75% of that peak year round. To supply its heating needs, the hospital has a natural-gas-fired boiler and a 6000-kW, 20,000-lb/hr electrode boiler. This boiler was purchased in 1978 when natural-gas shortages were threatened, but today it provides a means of using off-peak electricity at a saving.

According to Superintendent of Plant Operations Joe Monroe, the hospital is now in the process of installing a building-automation system that will control the electrode boiler to maintain a constant kilowatt load year round. The electrode boiler will be kept hot so that it can be called into operation instantly. The gas boiler has a 30-min warmup time and will be prewarmed automatically when signalled by the computer.

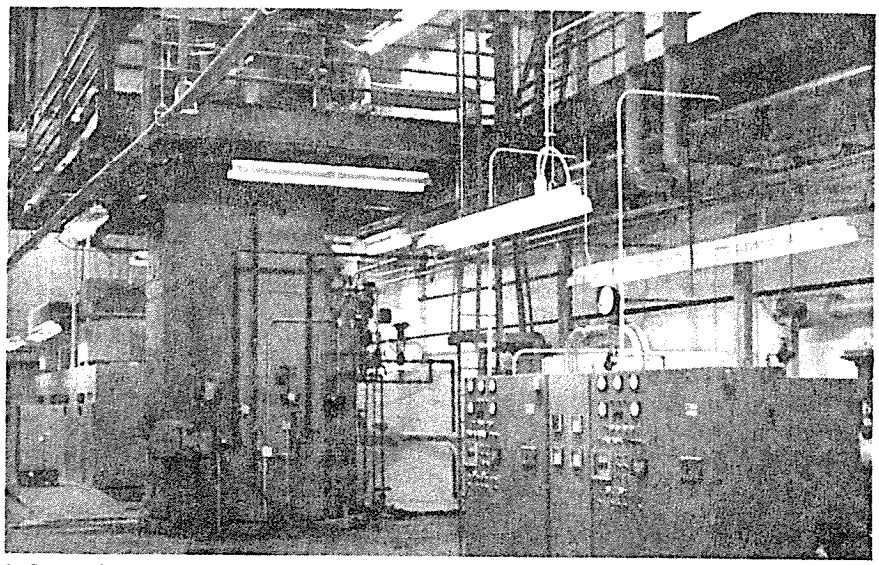
However, the economics of electricity as a boiler fuel are very dependent on where the user is located, and may change drastically with time.

Seattle Steam Co, Seattle, Wash, has a 30,000-kW, 100,000-lb/hr electrode boiler that was installed in 1976 to supply 10% of the total steam needs of the plant. The rest of the steam is supplied by gas and oil. Until this year, the boiler was used during eight summer months when electric rates were low. But this month, electric rates will rise 30-40% as a result of the Washington Public Power Supply System bond default, and use of the boiler might have to be phased out.

Johnson Wax Co, Racine, Wis, has an electrode boiler that was used for four years until time-of-day rates were introduced by the utility, Wisconsin Electric Power Co. Now, according to Corporate Energy Manager Robert Coffey, electricity is 50% more expensive than natural gas, even during off-peak periods.



2. Standby electrode boiler at Kansas City Power & Light Co's Hawthorn station operates at 13.8 kv. Deaerator left, plant steam turbine in foreground



3. Space-heating steam for the US Postal Service, Chicago, is provided by this 13.2-kV electrode boiler. Control and recorder cabinets are at right

Station startup/standby

Most utility and large industrial powerplants use packaged oil- or gas-fired boilers to provide steam for equipment warmup and for auxiliaries during startup. These boilers, which may be in use only a few hours a year, represent considerable underutilized capital. In addition to the capital cost of the boiler, there is the cost of fuel-handling and -storage equipment, cost of fuel on hand, and maintenance costs.

An electric boiler, though more costly to operate, represents only 75% of the capital cost of an oil-fired unit. In some instances, powerplants are using older field-erected boilers to provide startup and standby steam. These boilers incur their own startup delay and, since they are operated for short periods at low loads, frequently incur high fuel costs. The electric boiler may be able to undercut these costs.

Kansas City Power & Light Co used to operate the 3.5-million-lb/hr primary coal-fired unit at its Hawthorn station with one of four older, smaller units on standby. The backup boiler was needed to provide emergency freeze protection for the main unit's air-preheat coils in winter and domestic station heat year-round. The eight-hour startup time and low-load operation of this backup boiler meant high fuel costs, even though the fuel was coal.

In 1983, KCP&L purchased and installed a 24,000-kW, 80,000-lb/hr electrode boiler to provide standby steam. The utility budgeted $500,000 for the project in the summer of 1983. However, in order to have the boiler on line in time for the winter season, the company elected to purchase a boiler from Hydro Steam Industries Inc, Springfield, Va, that had been repurchased from a cancelled nuclear powerplant.

Pollution abatement

Electrode boilers release no emissions. This eliminates ductwork and pollution-abatement equipment, which can be particularly valuable in crowded urban nonattainment areas.

The US Postal Service complex in Chicago recently added a new boiler room to generate heating steam for the site, replacing steam that was previously purchased from Union Station Steam Co. At the time of the design in 1980, local laws would not allow gas or oil to be used for steam loads at the projected size of 200,000 lb/hr. Coal was ruled out because the complex is inside Chicago's Downtown Loop, a nonattainment area.

Electric power was the only alternative. The local utility, Commonwealth Edison Co, has excess wintertime gener-

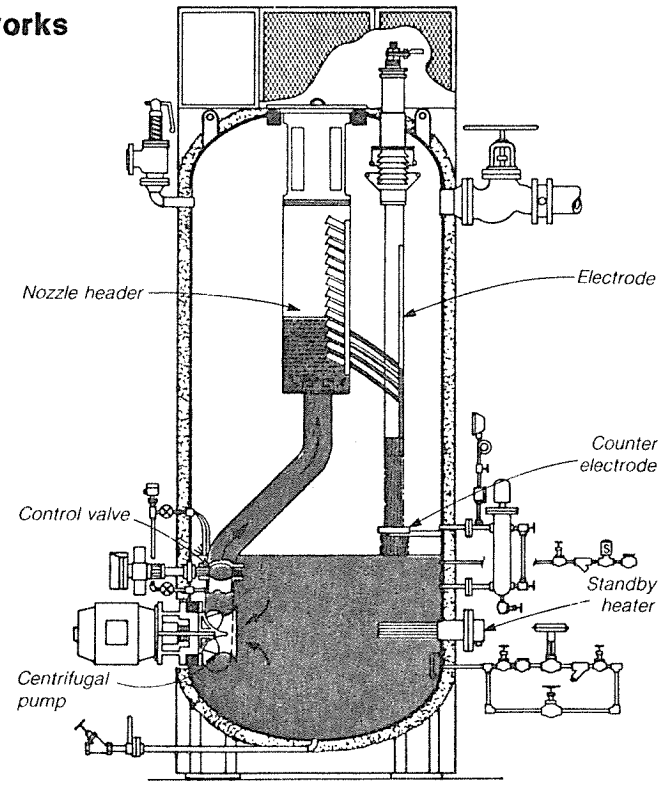
How the high-voltage electrode boiler works

Electrode boilers generate steam, not with an electric arc, but by direct passage of electric current through a water stream. Steam is created by resistance heating of the water. Typical boiler construction is shown in the figure. Water is circulated within the boiler by a circulation pump which raises water from the boiler reservoir to the nozzle header. From the nozzle header, it flows by gravity through nozzles that direct collimated streams of water at the electrode. After striking the electrode, the water flows to the counter electrode mounted directly below, and back to the reservoir.

Electric current flows in two directions from the electrode through the water streams to the counter electrode and the nozzle header, both of which are solidly grounded. Boiler output is controlled by varying the flow of water. This may be done by throttling the pump output with a control valve, by varying the pump speed, or by adjusting the position of a control sleeve around the nozzle header to vary the number of water streams striking the electrode.

Water quality, especially as it relates to water conductivity, is of great importance to the electrode boiler. High-conductivity water causes rapid electrode erosion. Equipment needed for deaerating, testing, and chemically treating feedwater is similar to that needed for the conventional fossil-fuel-fired boiler. But, no part of the electrode boiler is subjected to a higher temperature than the steam generated. This means that formation of scale in the boiler is of less concern than in a fossil-fueled boiler, except for possible plugging of the flow nozzles. Contaminants such as iron, which could cause a short circuit, must be kept out of boiler water.

The electrode boiler operates at medium voltages, from 4.16 kV to 25 kV. Three-phase power can be brought directly into the plant at these voltages and supplied directly to the electrode boiler with no need for large step-down transformers.



Electrode boiler generates steam by direct passage of current through water streams from electrode to ground

Startup time for an electrode boiler is 15-20 minutes from cold, one minute from a hot condition. An auxiliary heater may be supplied to maintain the boiler water at operating temperature. Load changes during operation are practically instantaneous and are easily controlled as part of the energy-management system.

ating capacity and provides electricity at a favorable flat kWh rate. There is no demand charge since the load is for heating. Two 30,000-kW boilers were started up in September 1982 and provide a total capacity of 204,000 lb/hr at 125 psig.

Essential services

There are several situations where the low installation cost, low maintenance needs, and high reliability of electrode boilers are of such overriding benefit that they are used around the clock despite the resulting high fuel costs. A nuclear power station is a prime user of electrode boilers for these reasons. These stations typically are remotely located and have no other fossil-fired equipment of supply of fossil fuel on hand. Electrode boilers can be located close to the steam point of use in the plant. In this way, they eliminate not only the cost of fuel storage, but also much of the cost of steam piping. Unlike fossil-fueled boilers, they require minimum qualification to protect against fire or explosion.

Commonwealth Edison Co has six electrode boilers at its LaSalle County two-unit nuclear station in Illinois. The boilers, which were supplied by CAM Industries Inc, Kent, Wash, are rated at 4500 kW and 3000 kW, and are used for waste treatment, steam sealing, startup auxiliaries, moisture separators, and gland sealing. They must be ready in the event that no steam is available from an operating reactor.

Mechanical Engineer Sam Powers points out that, if fossil-fueled boilers were used for the same purposes, additional fire protection and plant ventilation would be required, and storage for fuel oil or piping for gas would be needed. It's easier to run cable than piping, and, in a utility system, electricity is always available, even from emergency generators as a last resort. Electrode boilers can be operated from 3% to 100% load as needed with no problems.

Help from the utility

Electric steam generation offers a possible bonus to utilities trying to maintain their energy sales to pay for overcapacity. Otter Tail Power Co, Fergus Falls, Minn, is aggressively promoting the use of electrode boilers to its customers. To increase interest, the utility is offering an interruptible flat rate that aims to provide steam generation below the cost of fossil fuel. The rate includes a fixed service charge in lieu of a demand charge and a guaranteed one-hour notice before interruption. Otter Tail burns North Dakota lignite almost exclusively at its stations.

Through one of its subsidiaries, the utility is also offering to purchase and install electric boilers at a customer's facility, and then lease them to the customer. Says Manager of Industrial Services, Duane Bartsch, "We are offering customers gas/oil boilers a third fuel option at no capital cost."

Presently, the utility has one customer with a 12,000-kW electrode boiler at a cheese factory, but Bartsch has visited numerous other customers and expects to have another 20,000-kW signed up before the end of the year. ■

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NONFIRM

UTILIZATION OF ELECTRIC BOILERS AS A SINK FOR NONFIRM SURPLUS POWER IN THE BONNEVILLE POWER ADMINISTRATION SERVICE AREA

Prepared for

THE NORTHWEST POWER PLANNING COUNCIL

by

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CONSULTING ENGINEERS

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SUMMARY

Utilization of electric boilers has been suggested as a means of creating a demand for surplus hydroelectric power, which is available in the Bonneville Power Administration service area during periods of high water flow in the area's rivers. This report presents the results of a brief study intended to evaluate the possibility of arranging sales of surplus power to industrial consumers, who have a seasonally independent need for large quantities of process steam. If the steam could alternately be generated in either electric boilers or separate boilers fired with different fuels, a variable and controllable demand for surplus power could be created.

The potential power demand of existing industrial electric boilers, which are presently installed and operable, is 400 MW. Only a few of these installations are presently used on a continuous basis. The interruptible demand which can be created by utilizing the remaining installations is estimated to be 300 MW.

The power demand which could be created by adding new electric boiler capacity is estimated to be 500-1000 MW. This estimate should be considered very rough, since the feasibility of installing new electric boilers depends on economic and political factors which must be considered foremost by the power consumers involved, and which also require consideration by utilities, suppliers of alternate boiler fuels, and other power consumers.

The surplus power supply is normally available only during four months in the spring of each year. The amount of power available appears to be 500-1000 MW during this period. Thus, the demand which could be created by electric boilers should be high enough to meet the supply if it is fully exploited.

Utilization of existing electric boilers depends mostly on the power price offered, although some guarantees on availability are also required. The feasibility of adding new boilers is heavily dependent on both power price and availability.

The price and availability guarantees required to encourage electric boiler utilization or installation are widely variable, depending on local conditions facing each individual consumer. According to the scheme proposed, electric boilers are employed as part time substitutes for redundant steam boilers, which use an alternate fuel when inexpensive surplus power is not available. The incentive to use electric boilers is thus dependent on the type of fuel displaced, and the price charged for that fuel. A reliable correlation relating power price to electric boiler power demand can only be developed from contacts between power suppliers and the individual power consumers directly involved.

1. INTRODUCTION

While much of the available potential has now been developed, hydroelectric power remains the foundation of the electrical power supply network for the service area of the Bonneville Power Administration (BPA). Hydroelectric systems are unique. The resource utilized (water) is periodically abundant and scarce in annual cycles. Unfortunately, the period of the highest water flow (April-July) does not coincide with the period of highest regional power demand (November-February). Since impoundment of all surplus water throughout the summer and autumn months is not presently possible, and the demand for power slackens in the spring, considerable volumes of water now spill over dams without utilizing installed power generation capacity.

The use of electric steam boilers has been proposed as one means of utilizing the "surplus" power, which would be available if water presently spilled over dams were passed through existing turbines. The thermal loads associated with process steam generation in industrial plants do not show the marked seasonal, daily, and hourly variations associated with space heating, lighting and residential use. Furthermore, heavy industrial steam loads are concentrated at single locations, reducing the need for a diverse distribution system if the required heat energy is obtained from electric power.

According to the proposed concept, electric boilers would coexist with redundant combustion boilers fired with alternate fuels (gas, oil, wood waste, etc.). Ideally, the alternate power plant would include facilities for cogeneration of electrical power. Cogeneration would be accomplished with gas turbines coupled to waste heat boilers, or with high pressure boilers and steam turbines. Additional power generation capacity would then be created to help alleviate shortages during periods of high power demand.

To encourage the use of electric boilers, the price and availability of surplus power would have to be guaranteed to enable potential consumers a means of justifying installation and use of a separate power plant. The feasibility of such an installation would be dependent on the power price, hours of power availability each year, and value of the alternate fuel displaced.

This report presents an estimate of the total demand for surplus power which could be created by utilizing electric boilers on an intermittent basis. The potential power demand of existing electric boiler installations is presented in Section 2, and a rough estimate of the additional demand which might be created by adding new installations is derived in Section 3. Power cost and availability requirements are discussed in Section 4. Implementation priorities are considered in Section 5.

Information summarized in this report was obtained primarily through telephone contacts with operators and suppliers of electric boilers, and from additional contacts with personnel at some plants considered potential sites for new electric boilers. An inventory of existing electric boilers was developed and checked. Potential sites for new boilers were identified by evaluating the steam generation facilities of some large industrial steam users. Because of EKONO's familiarity with the pulp and paper industry, and because of the high steam consumption characteristic of pulp and paper mills, surveyed locations considered potential sites for new boilers were concentrated in that industry. Information obtained directly from mill personnel was supplemented with data published in directories, and data available in EKONO's files.

2. EXISTING ELECTRICAL BOILER INSTALLATIONS

Overall, about 400 MW of installed electric boiler capacity exists in the BPA service area. This figure represents large industrial installations only, and does not include the numerous small units utilized for space heating or water heating in commercial and residential buildings. Most electric boiler capacity is concentrated in the forest

products and food processing industries. However, some electric boilers are also utilized by the aerospace, petrochemical and primary metals industries. An approximate breakdown of existing capacity is presented in Table I.

TABLE I. EXISTING ELECTRIC BOILER INSTALLATIONS

Industry	Installed Capacity, MW
Forest Products	150
Food Processing	150
Other	100

The installed capacity does not represent the actual potential power demand of existing boilers. Limitations associated with transformer capacity, water treatment requirements and other external factors prevent the operation of some boilers at full capacity.

In most instances, electric boilers represent redundant facilities, which are used as alternates to separate boilers fired with fossil fuels. However, electric boilers are used exclusively at a few locations. Where other steam generation facilities exist, the utilization of electric boilers is usually governed strictly by the price of power as compared to the prices of alternate fuels. In many cases, electric boilers are used to control power demand, although even then the boilers are shut down when the energy charge for power becomes too high.

Presently, electric boilers probably account for an actual power demand of 50-100 MW. Some of the boilers presently utilized are scheduled to be shut down, pending seasonal (winter) or permanent electric power price increases. On the other hand, most of the electric boilers not presently utilized would be restarted if power rates were favorable. Some boilers are already operated on a seasonal basis to take advantage of lower summertime power costs. In some cases non-operating boilers are maintained to provide bargaining leverage when oil or gas prices are negotiated (the reverse is also true).

Although most electric boilers presently installed are maintained in a standby condition or mothballed, permanent changes in the region's electric power rate structure have resulted in the sale and removal of some units. At several other locations, electric boilers are now up for sale. However, most existing electric boilers would probably be utilized if electrical power costs were favorable.

3. POTENTIAL FOR ADDITIONAL ELECTRIC BOILER APPLICATIONS

An accurate estimate of the total potential for new electric boiler applications is impossible without a thorough investigation of power plant operations in all major steam consuming industrial plants in the BPA service area. Simple knowledge of total steam generation or consumption at specific locations does not provide the information needed to arrive at such an estimate. The feasibility of an electric boiler installation is dependent on numerous factors, including existing boiler capacity, boiler fuel mix, fuel prices and availability, electrical power transmission facilities, availability of capital, and even the projected economic viability of a particular operation. As discussed in Section 4, installation of new electric boilers in plants which presently utilize readily available and inexpensive fuel such as self generated hog fuel (wood waste) is extremely unlikely. On the other hand, installation of electric boilers might be easily encouraged in plants limited to utilization of more expensive alternate fuels such as distillate fuel oil.

In terms of magnitude, the greatest potential for electrical boiler utilization exists in the forest products industry. However, electric boilers appear to be more feasible in industries such as food processing, which are less capable of using internally generated fuels. Wood products mills (lumber, plywood, fiberboard, etc.), pulp mills and paper mills all require large quantities of process steam throughout the entire year to maintain operation. Many wood products mills are capable of supplying their total steam requirements by burning bark, sawdust, planer shavings, sanderdust and other wood waste. In fact, many such operations supply hog fuel to other steam consumers, such as pulp and

paper mills. Non-integrated pulp mills are often self sufficient, or nearly self sufficient, in fuels needed to provide thermal energy. Hog fuel and spent pulping liquors are the primary fuels in such cases.

Integrated pulp and paper operations also utilize self generated spent liquors and wood waste, although additional purchased fuel is needed to meet the increased demands for steam. Depending on the individual operation, the purchased fuels may consist primarily of relatively inexpensive purchased hog fuel, although considerable quantities of natural gas and oil are consumed at many locations. Those operations which are most dependent on the use of gas or oil (usually No. 6 oil) represent the most likely candidates for electric boiler utilization.

The greatest potential for electric boiler utilization is believed to exist in pulp and paper mills, where up to 1000 MW in electric boiler capacity could be installed. This figure is derived by assuming all fossil fuel fired steam boilers are displaced by electric boilers. This estimate must be considered very rough, since the true fossil fuel consumption of the pulp and paper industry is very difficult to estimate. Estimation of the actual potential for electric boiler utilization is even more complex, since fuel costs, electric boiler installation costs, profitability requirements and capital availability vary in different companies and different specific mills. Major capital expenditures of any kind must be considered very unlikley in some of the more marginal operations.

The incentives for electric boiler installation are the power price and power availability (hours/year) which can be guaranteed. Decreasing price and increasing availability will encourage increased utilization. Realistically, up to 500 MW of additional electric boiler capacity might be expected in the pulp and paper industry given the most favorable circumstances.

Additional potential for electric boiler utilization undoubtedly exists in other industries which consume substantial quantities of steam, including the chemical and food processing industries. Beyond surveying installations which already have electric boilers, no attempts have been

made to define the magnitude of the potential for additional applications in these other industries. However, the total steam consumption of all other basic industries is much less than that of the pulp and paper industry. The total power consumption of future electric boilers utilized by those other industries is probably less than the estimated potential for the pulp and paper industry. The maximum potential for new installations is therefore assumed to be 1000 MW.

4. AVAILABLITY AND POWER COST REQUIREMENTS

4.1. Availability

Based on information supplied by Tom Foley of the Northwest Power Planning Council, "unuseable" surplus power has historically been available in significant quantities during only four months of the year: April, May, June and July. The available unuseable surplus is presented in Table II. Average surplus power availability peaks during May.

TABLE II. SURPLUS POWER AVAILABILITY [1)]

Month	Surplus Power Potential, MW (Average Unusable)
January	7
February	29
March	14
April	511
May	2178
June	959
July	613
August	57
September	0
October	17
November	0
December	14

1) Data supplied by Tom Foley of NWPPC

The figures shown in Table II are averages, and the actual surplus power availability is subject to annual, weekly, daily, and even hourly variations. Although the data shown indicate about 500 MW of power should be available over a four month period, and as much as 1000 MW might be available for two months, a more detailed analysis is required to firmly establish the true power availability. Individual consumers must be guaranteed power for some minimum time period to justify restarting an existing boiler or installing a new boiler.

The time periods required are different for different consumers. Duration curves for total surplus power availability are presented in Figures 1-4 for the months of April, May, June and July. The curves, which represent data obtained over a forty year period, show the average total surplus power for the month in each year. Surplus power represents all power which can be produced in excess of power accounted for by firm commitments. Much of the surplus power is sold, and only the "unuseable" portion is considered available for utilization in electric boilers. The average "useable" amount of surplus power is indicated on each figure. The values of unuseable surplus power shown in Table II are derived by subtracting the useable surplus from the total average surplus.

Figure 1 shows large quantities of surplus power are often available in April, although annual variations are erratic. During seven of the years surveyed no surplus power at all, useable or unuseable, was available during this month. Unuseable power was apparently available during more than half of the forty years (total surplus greater than the average useable surplus of 7884 MW). Similarly, June and July show wide annual variations in surplus power availability. The supply of surplus power is especially uncertain in July, where no surplus power was recorded during eleven of the forty years. Although the average supply of surplus power (4172 MW) was lower than in April, the average useable surplus power was also less (3559 MW), and unuseable surplus power appeared to be available in July during about fifteen of the years surveyed.

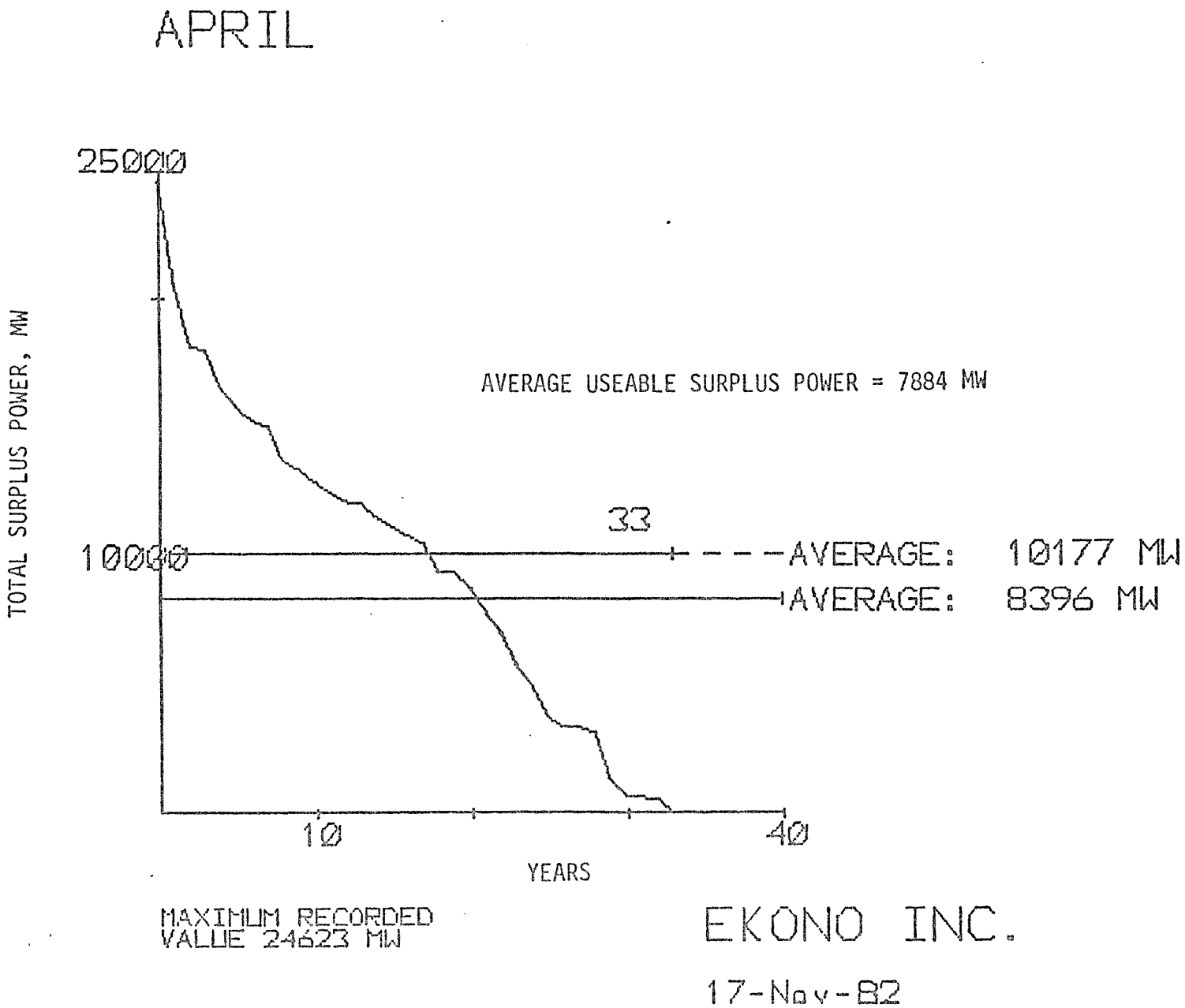

FIGURE 1. AVERAGE SURPLUS POWER DURING APRIL

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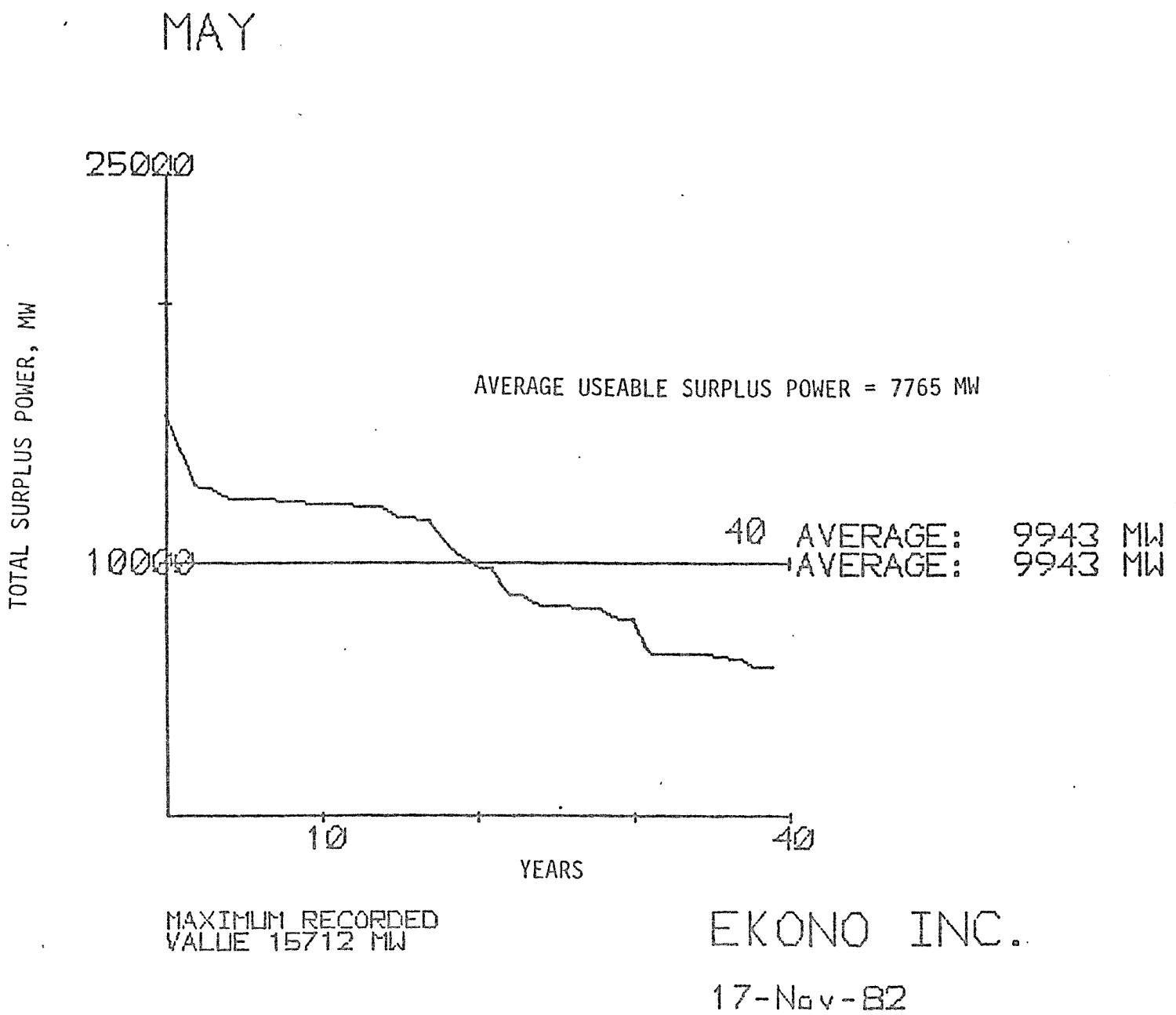

FIGURE 2. AVERAGE SURPLUS POWER DURING MAY

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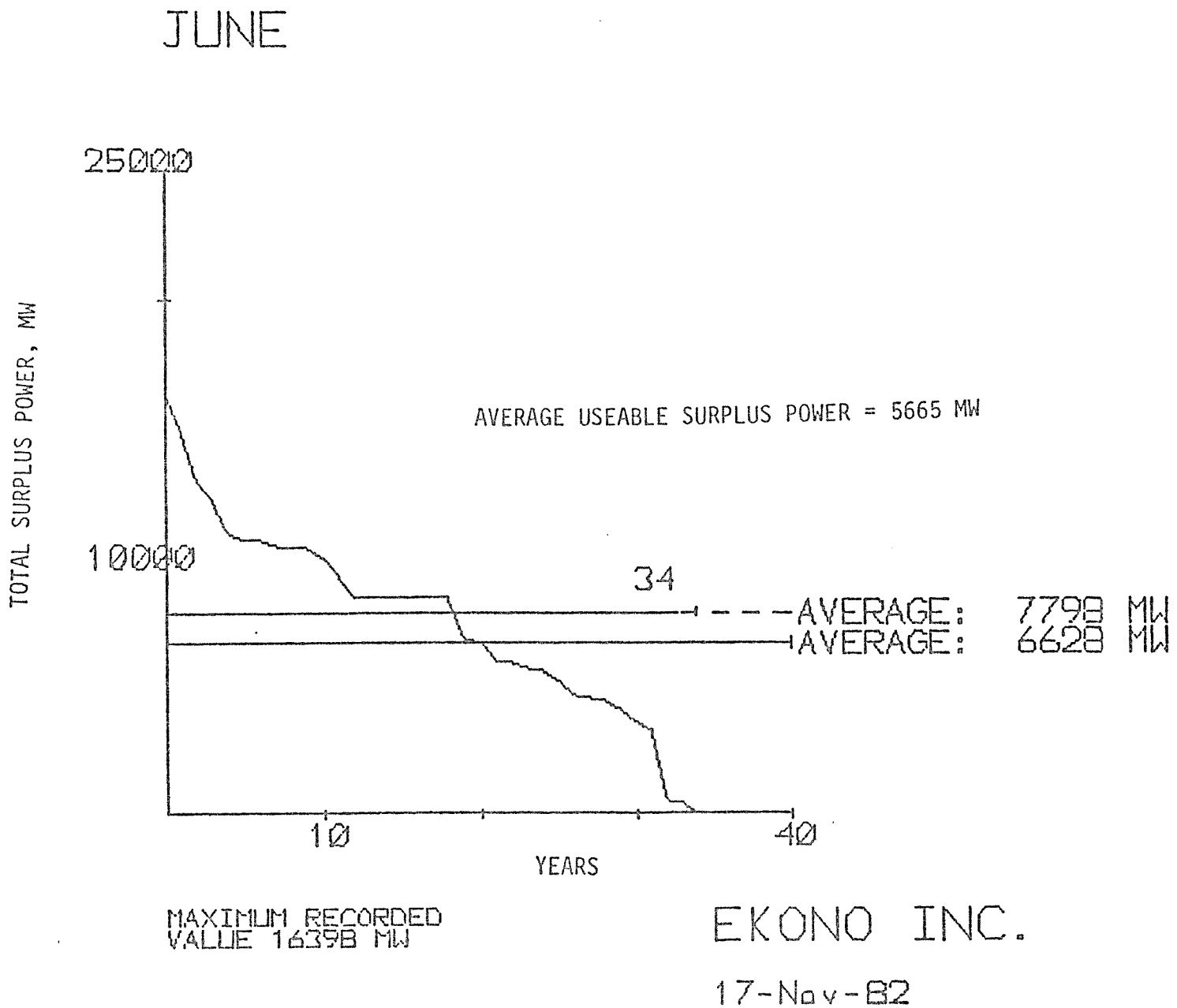

FIGURE 3. AVERAGE SURPLUS POWER DURING JUNE

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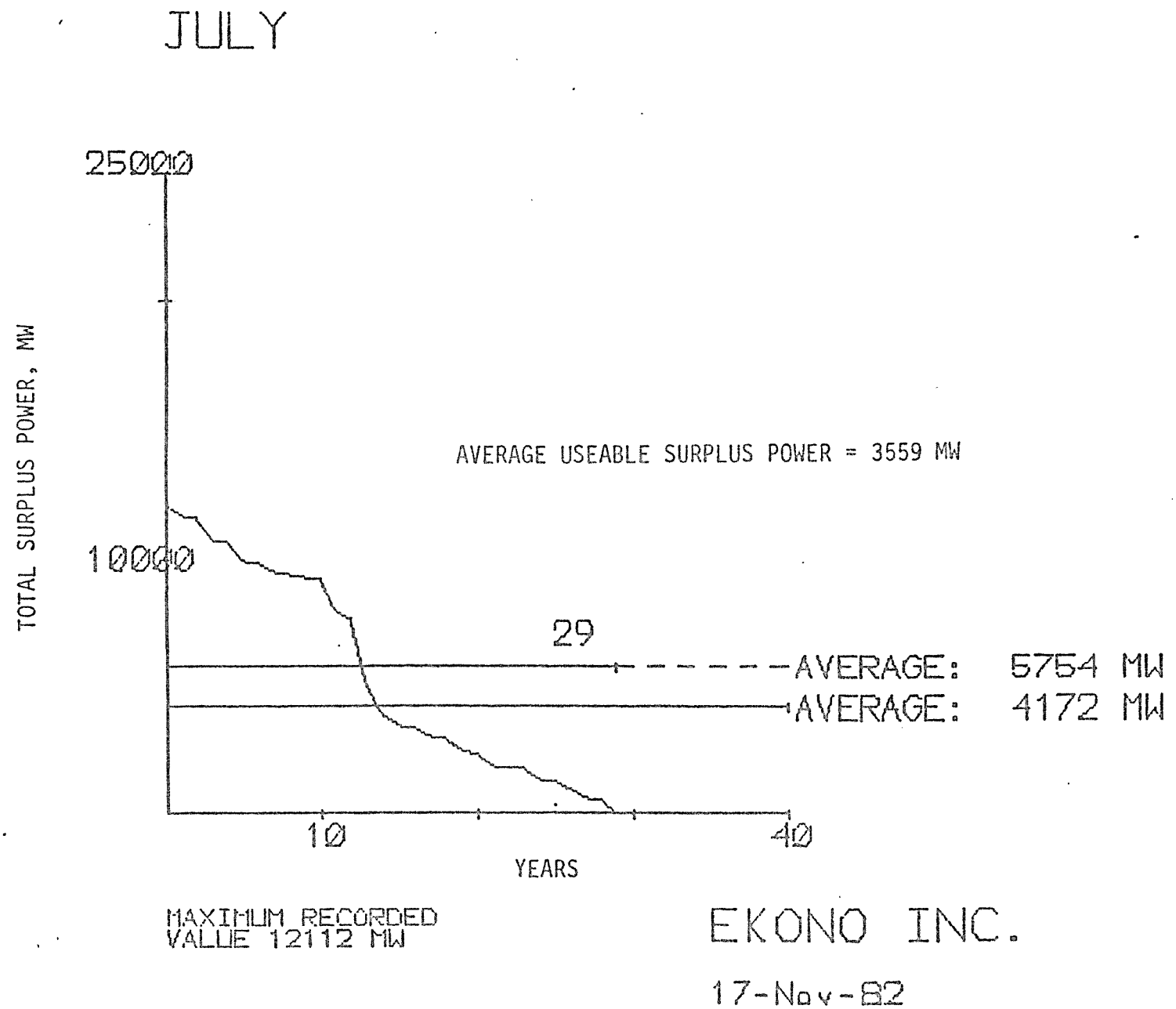

FIGURE 4. AVERAGE SURPLUS POWER DURING JULY

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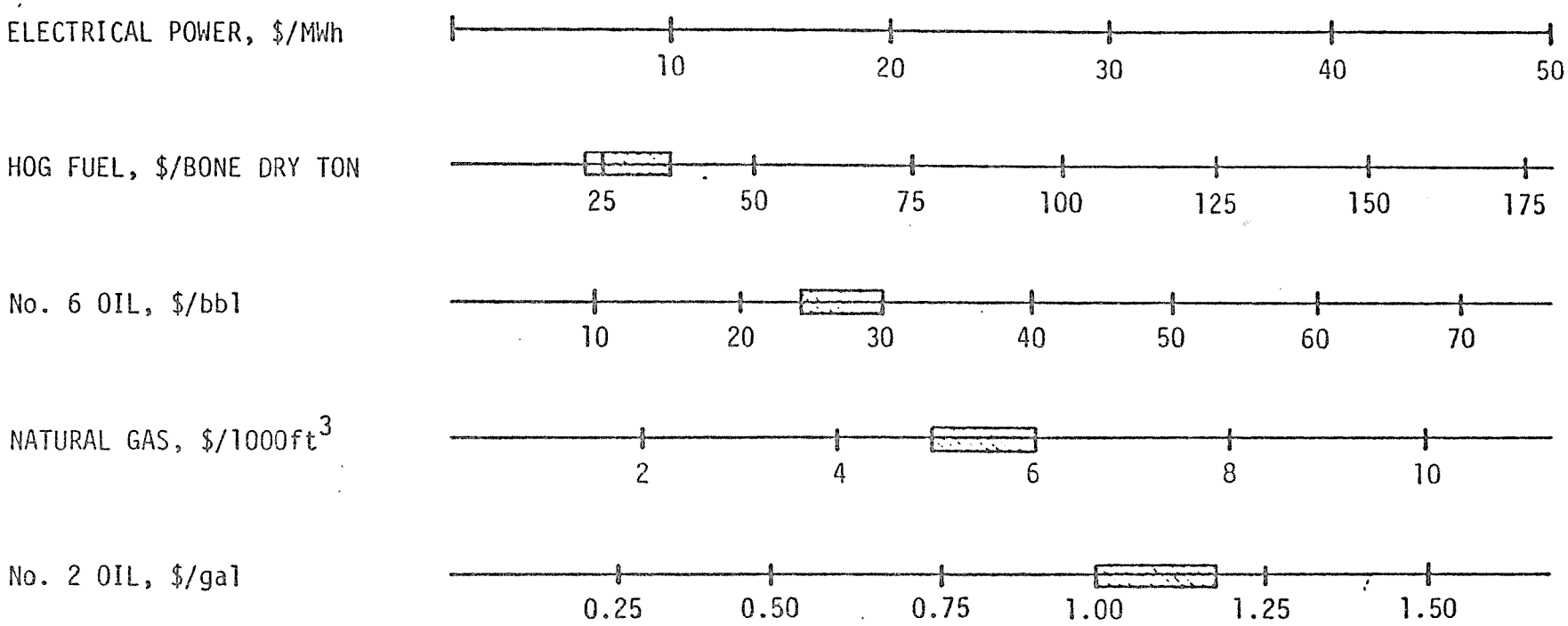
Only during May is a consistent supply of surplus power almost guaranteed, and a supply of unuseable surplus power also appears to be available almost every year during this month. The difference between average total and average useable surplus power is by far the greatest during May, which is also indicated in Table II.

4.2. Power Price - Existing Installations

The power price required to promote utilization of existing electric boilers varies according to local circumstances facing each individual owner. As the power price drops, electric boilers will be used first at those locations which are dependent only on No. 2 oil or other distillate oils as their alternate boiler fuel. However, few plants are dependent solely on such high priced fuels. More commonly natural gas or heavy oils are the alternate fuels. Since these fuels are usually less costly than distillate oils, lower power prices are required to encourage the switch to electric boilers. External factors such as minimum demand clauses in fuel supply contracts may further complicate the situation, and such factors must be accounted for. In some cases, particularly in the pulp and paper industry, much less expensive alternate fuels such as hog fuel may be utilized. In these cases, electric boilers will be utilized only if the power price offered is extremely low.

The relative values of various fuels used to generate steam for industrial process use in the BPA region are illustrated in Figure 5. The actual costs of the fuels (electric power, hog fuel, No. 6 oil, natural gas and No. 2 oil) are shown on scales which are equivalent when converted to the cost of steam produced in boilers using those fuels. For this comparison, only the fuel costs are considered. The steam costs thus depend on boiler efficiencies (based on high heating values), which are different for the various fuels. The value of steam generated in an electric boiler, which is assumed to have an efficiency of 97%, is equivalent to the price of steam generated in a hog fuel boiler when the costs of electric power and hog fuel are $20/MWh and $72/bone dry ton, respectively. The efficiency of the hog fuel boiler is assumed to be



FUEL	HIGH HEATING VALUE	STEAM BOILER EFFICIENCY
ELECTRICAL POWER	3413 Btu/kWh	97 %
HOG FUEL	8500 Btu/DRY lb	70 %
No. 6 OIL	6.3×10^6 Btu/bbl	80 %
NATURAL GAS	1000 Btu/ft^3	75 %
No. 2 OIL	140.000 Btu/gal	80 %

FIGURE 5. COMPARATIVE COST OF VARIOUS FUELS USED FOR STEAM GENERATION BY INDUSTRIAL PLANTS

70%, based on a high heating value of 8500 Btu/lb for dry hog fuel. The present price range for hog fuel is $20-35/bone dry ton, which is indicated by the shaded area on the hog fuel scale in Figure 5. When power prices exceed $10/MWh, hog fuel is therefore a less expensive boiler fuel than electric power.

When electric power costs $20/MWh, the equivalent costs of No. 6 oil, natural gas and No. 2 oil are $30/bbl, $4.50/1000 ft^3 and $0.70/gal, respectively. Assumed boiler efficiencies are 80% for oil and 75% for gas. Present representative price levels for all three fuels are indicated in the figure. For the prices indicated, electric power becomes competitive with No. 6 oil as a boiler fuel only when the power cost falls below $20/MWh, while steam produced from natural gas is slightly more expensive than steam generated from electric power at that price. In terms of fuel cost, No. 2 oil is the least desirable fuel. Electric power maintains a cost advantage over this fuel until power cost exceeds $30/MWh.

Figure 5 is included for illustrative purposes only. Actual fuel prices, boiler efficiencies and other external factors will influence the choice of fuel used at a specific location. Included in the latter category are legal ramifications involving fuel suppliers, local utilities and other power consumers, which further complicate the situation and which are beyond the scope of this study. In general, however, owners of existing electric boilers who must rely on relatively more expensive alternate fuels will be persuaded by decreasing power prices to operate their units before other owners who can utilize the less expensive fuels. No attempt has been made to develop a demand curve relating utilization of the existing 400 MW of installed capacity to the cost and availability of surplus power. Such a curve can only be developed if the individual boiler owners are presented with concrete and binding proposals from their power suppliers.

4.3. Power Price - Future Installations

The possible impact of power price on the feasibility of new electric boiler installations is illustrated with simple examples represented by Figures 6 and 7. The figures show the power prices and availability required to justify installation of new electric boilers assuming the following economic criteria:

Tax Rate:	50%
Depreciation (Straight line):	5 years
Required 1st year after tax rate of return on investment (ROI):	20%

For this simple analysis the after tax ROI corresponds to a payback time of 2.5 years. The annual cost savings required to achieve this ROI correspond to 60% of the total capital cost. All savings are assumed to represent fuel costs only.

Power costs corresponding to the 20% ROI are plotted as functions of annual power availability (hours available/year) for four different fuels. The fuels and fuel properties are as follows:

Fuel	Heating Value (HHV)	Fuel Cost	Boiler Efficiency	Steam Cost
No. 2 Oil	140,000 Btu/gal	$1.10/gal	80%	$9.82/$10^6$ Btu
Natural Gas	1,000 Btu/ft^3	$5.40/$cuft^3$	75%	$7.20/$10^6$ Btu
No. 6 Oil	6.3×10^6 Btu/bbl	$28/bbl	80%	$5.56/$10^6$ Btu
Hog Fuel	8,500 Btu/dry lb	$30/dry ton	70%	$2.52/$10^6$ Btu

Electric boiler efficiencies are assumed to be 97%.

Figure 6 shows the feasibility of a 10 MW electric boiler, while Figure 7 shows the feasibility of a 30 MW boiler. The feasibilities are determined assuming the following boiler costs:

	Budget Price	Installed Cost
10 MW Boiler	$130,000	$330,000
30 MW Boiler	$250,000	$630,000

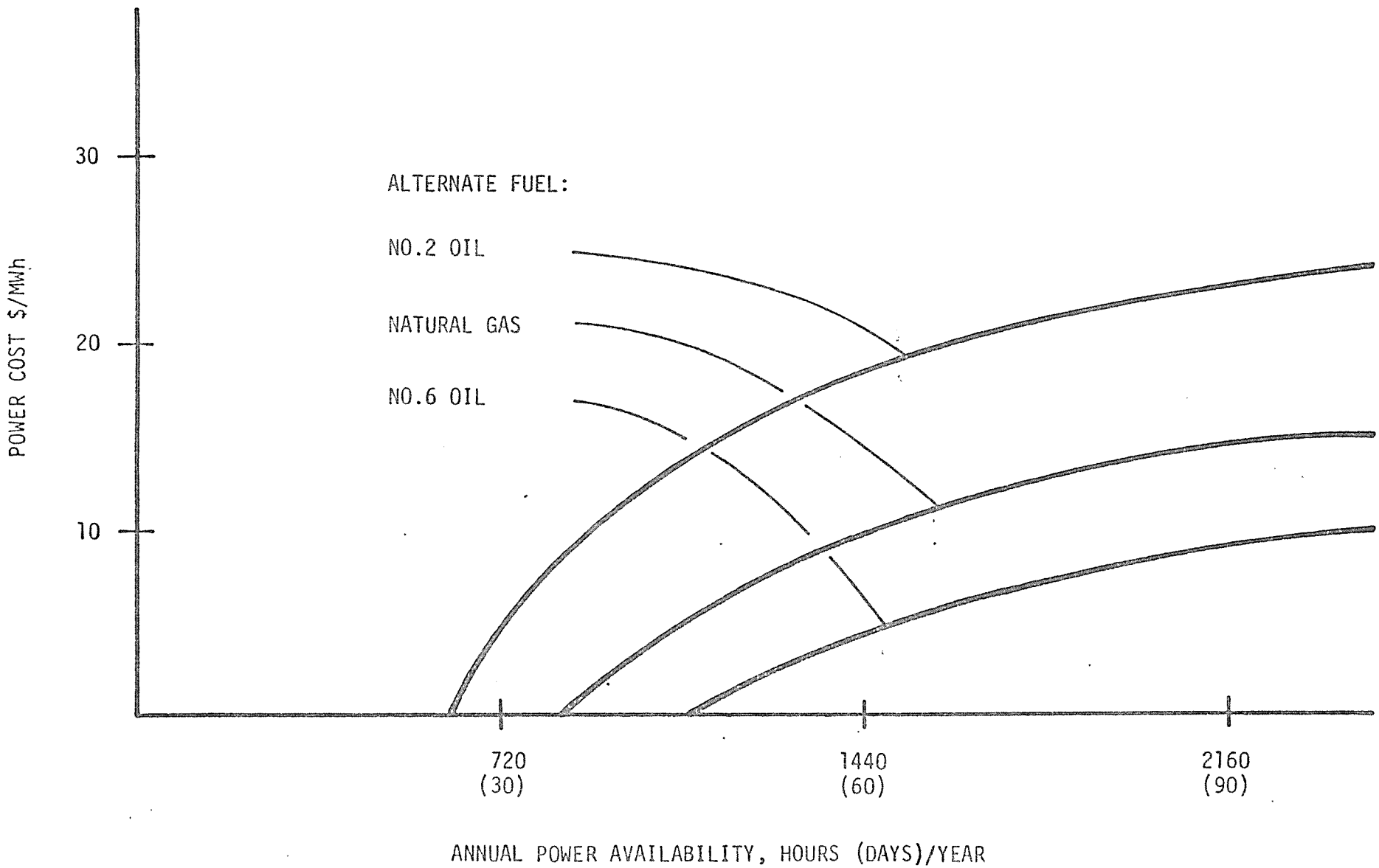


FIGURE 6. EXAMPLE OF ELECTRIC BOILER INSTALLATION FEASIBILITY-10 MW BOILER

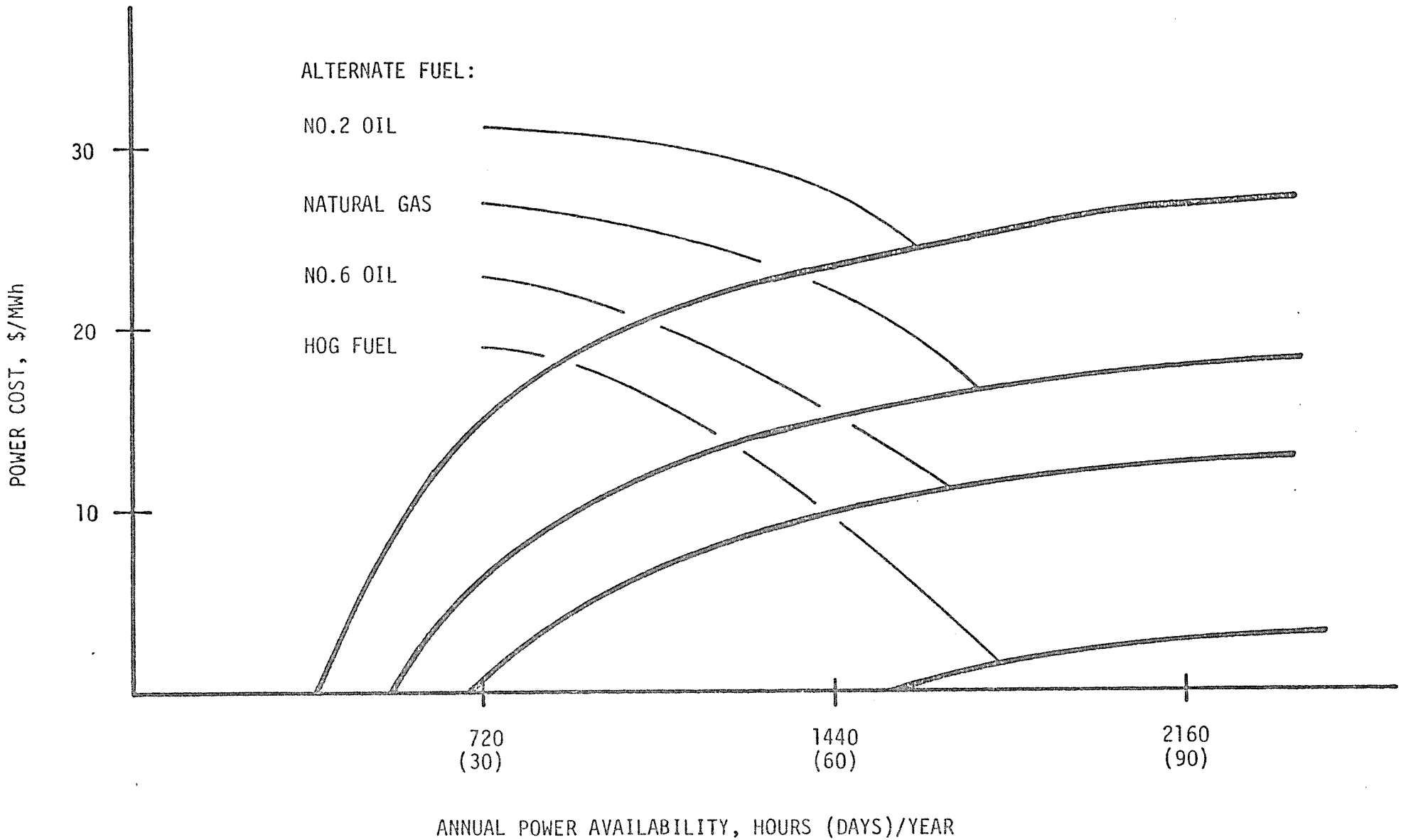


FIGURE 7. EXAMPLE OF ELECTRIC BOILER INSTALLATION FEASIBILITY-30 MW BOILER

The installed costs shown above are assumed to be 2.5 times the budget price. Exact cost estimates for boiler installations are not possible without detailed knowledge of local conditions. The actual cost will depend on space, building and foundation requirements, electrical power transmission facilities (power lines, transformers, switchgear, etc.), and boiler auxiliaries (pipelines, valves, controls, water treatment facilities, etc.) needed for the installation. Very likely, the installed cost of a boiler and all the peripheral equipment needed would be much higher than the figures shown above.

Based on the costs, economic criteria and fuel characteristics assumed, installation of an electric boiler to utilize surplus power appears feasible if the fuel displaced is No. 2 oil. For example, installation of a 10 MW boiler is justified if power is available for at least 1440 hours (60 days) annually at a cost of no more than $18/MWh. For higher steam flows, installation of a 30 MW boiler is feasible under the same conditions when the power price is below $23/MWh. Boiler utilization is assumed to be 100% for the entire operating period.

As indicated in Figures 6 and 7, if the displaced fuel is natural gas or No. 6 oil, power must be available at a lower cost, or for a longer period of time, to justify electric boiler installation. For power availability of 60 days, the maximum power costs allowable to justify purchase of a 10 MW boiler are $10/MWh to displace natural gas and $4/MWh to displace No. 6 oil. The corresponding figures for a 30 MW boiler are $15/MWh for gas and $10/MWh for heavy oil.

Extremely low power prices and high available are necessary to justify displacement of hog fuel. Hog fuel is not even considered in Figure 6, since installation of a 10 MW electric boiler cannot be justified even if power is available at no cost for 100 days/year. For a larger 30 MW boiler, installation of an electric boiler would be nominally feasible in some circumstances. However, power costs of no more than $2/MWh would be required, and at that price the availability requirement would be about 90 days.

The ROI calculations discussed here are only intended as examples for the purpose of illustration. Individual power consumers all have their own standards of evaluating profitability, which are probably more complex and conservative than the simple 20% ROI method used here. Furthermore, fuel costs and installation costs are variable. Thus, the feasibility of electric boiler installation can only be determined by the individual consumers, taking into account their strictly local circumstances.

5. IMPLEMENTATION OF A PROGRAM FOR ELECTRIC BOILER UTILIZATION

5.1. Utilization of Existing Capacity

Using the figures presented in this report for nominal installed capacity, potential for added capacity, and apparent surplus power availability, electric boilers may indeed represent a means of utilizing most or all of the surplus power which can be generated during periods of high water flow. If an electric boiler utilization program is implemented, first priority should be given to the use of existing installed capacity. Assuming 100 MW of the installed capacity represents base loaded or unavailable installations, 300 MW of short term power demand remains. This demand will almost certainly be created if price and availability requirements are met. As emphasized previously, the price and availability requirements are different for each specific installation, and these requirements cannot be defined without contacting electric boiler owners. Many of the personnel contacted during the course of this study responded favorably to the concept of surplus power utilization, although no specific price and availability figures were discussed.

5.2. Installation of Additional Capacity

Conditions required to encourage installation of additional electric boiler capacity have not been defined. Indeed, the necessity of adding new capacity has not been established. While up to 1000 MW of surplus power appears to be available, the amount which can actually be utilized

on a sustained basis is uncertain. Furthermore, other means of created short term power demand already exist. Many industrial plants have the ability to generate power, either in gas turbines or steam turbines, utilizing the heat drop available in process steam generating facilities. This cogeneration capacity represents a power supply which can be switched on or off depending on the relative costs of fuel and purchased electric power. The cogeneration capacity already amounts to hundreds of megawatts, and it should continue to increase. When combined with existing electric boiler capacity, existing cogeneration facilities may provide enough variable power demand to follow the average seasonal hydroelectric power supply swings.

Nevertheless, if enough surplus power is available, installation of new electric boilers may be justified. Again, the feasibility of such installations can only be determined by the potential boiler owners after they are individually supplied with firm power cost and availability guarantees. The apparent potential in this area, combined with existing installations, does appear capable of creating more than enough demand to utilize the average supply of presently unuseable surplus power.

a report on

MARKETING NON-FIRM ELECTRICAL POWER TO PACIFIC NORTHWEST MANUFACTURING INDUSTRIES

for the

NORTHWEST POWER PLANNING COUNCIL

PORTLAND, OREGON

EKONO Inc.
CONSULTING ENGINEERS

July 1984

EKONO

FINAL REPORT

MARKETING NON-FIRM ELECTRICAL POWER TO PACIFIC NORTHWEST MANUFACTURING INDUSTRIES

Prepared for

THE NORTHWEST POWER PLANNING COUNCIL
Portland, Oregon

By

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Section 1
SUMMARY

Electric boilers are particularly well suited for consuming electric energy on an interruptible basis. They are extremely efficient in converting electricity to heat and are relatively easy to operate, although a certain minimum amount of attention must be given to water treatment and to proper maintenance to reduce the probability of electrical shorts. They are also relatively inexpensive to purchase and install. The capital costs for electrical boilers ranging in size from 2 MW (6800 lb/hr) to 42 MW (142,000 lb/hr) are $423,000 to $1,028,000, respectively. These costs do not include high voltage lines and transformers which could add another $1 million. Variable costs, other than power, range from 5 to 15% of the annual electricity cost.

A survey was made of the Pacific Northwest manufacturing industries to assess the market potential for consuming non-firm electric energy and power. The survey consisted of a questionnaire mailed to 200 Northwest manufacturing entities, an extensive follow-up phone campaign, and visits to selected plant sites. The survey was designed to determine those factors, conditions, prices, and constraints which would lead to the utilization of non-firm electric power:

- In existing or future electric boilers.
- By backing out self generated electric power.
- In non-boiler processes or equipment that could be converted or modified to use electricity.
- By interregional shifting of production to the Pacific Northwest.

The survey uncovered a total of 457 MW of existing, installed electric boiler capacity larger than 1 MW each. Of this, about 65 MW are on-line

independent of any non-firm power rate, i.e., the boilers operate on firm power at a price already low enough or they have no alternative to electricity. It was determined that if the retail power price were dropped from 18 to 7 mills per kWh, an additional 245 MW of existing electrical boiler capacity could be brought on-line. (Refer to Figure 5-1, page 5-1). However, most of this additional capacity would remain idle unless the boiler operators were assured that the power would be available continuously for at least one month.

As for new, not yet existing electric boilers, an extensive analysis of 63 potential applications resulted in the two demand curves shown in Figure 5-2, page 5-10. For the two cases considered, reducing the non-firm power price to 8 mills/kWh would result in the following new electric boiler demands:

Case	Payout	Availability	Demand, MW
A	3 yrs	2500 hr/yr	up to 250
B	2 yrs	6000 hr/yr	up to 750

Following the payout period, these new boilers would be operated when power costs were 14-20 mills, subject to the same availability requirements as existing boilers.

The demand curve for Case B can be considered an upper bound of the economic potential for new electric boilers; a non-firm power availability more than 6000 hours annually is not likely. This curve shows up to 950 MW of new boiler capacity, if the power price were reduced to zero. The technical potential for new electric boilers, on the other hand, was estimated to be 1500 MW.

The potential of backing out self-generated power, given a non-firm power price to compensate for fuel costs, varied from 0 to 220 MW as the price dropped from 20 mills to 7 mills. (Refer to Figure 5-3, page 5-17).

The technical potential for non-boiler applications to consume non-firm power totalled 210 MW. Of this, only 1 MW was considered presently viable. Shifting production to the Pacific Northwest from other regions could consume up to 9 and 30 MW of non-firm power, given a price of 10 and 18 mills/kWh, respectively (Refer to Table 5-6, page 5-16).

Factors affecting the availability of non-firm power are discussed with particular emphasis on the sales of power to California via the Intertie, industrial conservation and cogeneration, and long term industrial trends. Current alternative fuel prices are presented. Hog fuel is shown to be the cheapest fuel and thus the most difficult to displace. Three examples of programs by utilities outside the region to promote the use of electric boilers are presented. Finally, the barriers to marketing non-firm power with reference to rates and the criteria for eligibility are discussed with a recommendation that more flexibility be designed into the non-firm power rate schedule.

Section 2
INTRODUCTION

Surplus power has historically been available in the Pacific Northwest. Often substantial amounts of unused surplus energy are available during the peak run off period between the months of April and July. Unfortunately this unused surplus does not coincide with the normal period of highest regional power demand (November through February). If no market for the unused surplus exists in the Northwest, then the tendency is to sell it at low rates to California via the Intertie. The economic benefits lost to the region are obvious.

In trying to find ways to market non-firm power in the Northwest, the Council in late 1982, asked EKONO to make a brief assessment of electric boilers which could be used on an interruptible basis. This study, summarized in a report dated 19 November 1982, found that about 400 MW of electrical boilers were installed and operable in the region. Of this, 300 MW were found suitable for operating on interruptible power. The remaining 100 MW were consuming firm power on a continuous basis. On top of this, it was estimated that a technical potential of 500 to 1000 MW of new electric boiler capacity was possible. However, the economic potential was expected to be somewhat less than that.

Subsequent to this preliminary assessment of electric boilers as a means to consume non-firm power, the Council in its two-year action plan stated its objective to develop additional markets for interruptible energy in the Northwest. With the emphasis on Northwest industries (non-DSI) the Council wanted to know:

- The existing installed capacity of electric boilers larger than 1 MW in the region and the criteria (power price and availability) to operate them on an interruptible basis.
- The potential and critera for new, not yet existing, electric boilers to operate on non-firm power.
- The potential and incentives required to replace self generated electricity with non-firm power.

- The potential and criteria required to shift production to the Northwest when low cost non-firm power was available.
- The potential for other processes and equipment to consume non-firm power and the incentives for doing so.

To accomplish these ends, a survey questionnaire was sent to about 200 companies. The responses to the questionnaire, supplemented by calls to both respondants and non-respondants were analyzed and the results summarized in this report. Also shown in a definitive manner are the industrial markets, methods and criteria for consuming non-firm power.

Section 3
ELECTRIC BOILERS

3.1. DESCRIPTION

Electricity can be used for

- generating steam
- heating water
- heating other process liquids, e.g., cooking oil
- superheating process vapors, e.g., steam
- heating and vaporizing special heat transfer fluids, e.g., Dowtherm

Generating steam or heating water in electric boilers currently holds great interest because of their ability to efficiently consume large quantities of power on an interruptible basis. Electric boilers are extremely efficient, their only heat losses coming from radiation and (in the case of steam boilers) blowdown.

Basically there are two types of electric boilers, high voltage electrode and immersion element. Characteristics of both are briefly summarized in Table 3-1.

Table 3-1
TYPES OF ELECTRIC BOILERS

Type	Capacity, MW	Voltage, kV	Des. Press., psig
Electrode			
Steam	0.5 to 50	4.16 to 13.8	75 to 500
Hot Water	2.5 to 20	4.16 to 13.8	up to 160
Immersion Element			
Steam	0.045 to 2.5	0.20 to 0.55	100-125
Hot Water	0.120 to 3.6	0.21 to 0.55	125-160

Immersion Element Boilers

Both steam and hot water immersion element boilers consist of a vessel containing fixed resistance-type heating elements. Control is maintained in step fashion by opening or closing heating element supply circuits. The basic difference between the two boilers is that the steam boiler vessel is sized to maintain a vapor space under all operating conditions. The hot water boiler vessel is flooded at all times. Because of their size and capacity, immersion element boilers find use in commercial or institutional applications for space heating and small process steam loads. Literally hundreds of these boilers can be found in the Pacific Northwest.

High Voltage Electrode Boilers

Electrode boilers are used for larger steam and hot water loads, up to 170,000 lb/hr and 68 MM Btu/hr, respectively.

Hot Water. The operation of a hot water electrode boiler is illustrated in Figure 3-1.

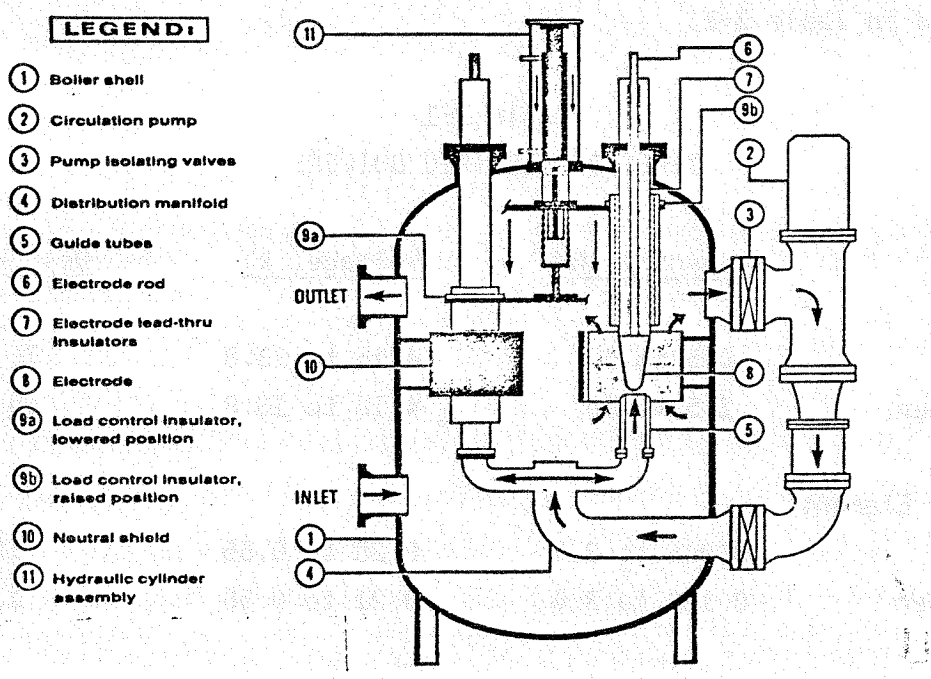

Figure 3-1. High voltage electrode hot water boiler
(Source: Cam Industries, Inc., Kent, Wash.)

Water is heated by passing current between an electrode, usually one per phase, to a concentrically arranged neutral shield. To smoothly control the amount of current passing between the electrode and the shield, and thus the amount of heating, a hydraulically operated load control insulator is inserted between the electrode and shield. A circulation pump enhances heat transfer. As in the case of the immersion element boiler, the pressure vessel is completely flooded. Only two or three of these hot water electrode boilers can be found in the Pacific Northwest.

Steam. One example of a high voltage electrode steam boiler is illustrated in Figure 3-2.

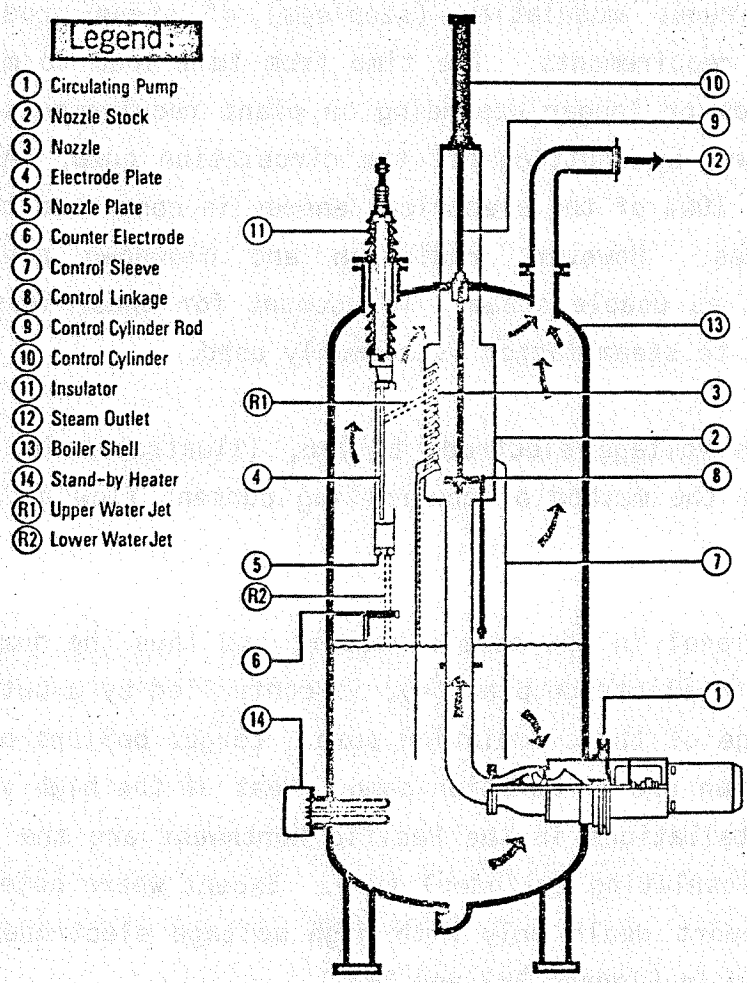

Figure 3-2. High voltage electrode steam boiler with hydraulic load control cylinder.
(Source: Cam Industries, Inc., Kent, Wash.)

In this type, water is pumped from a reservoir at the bottom of the pressure vessel to a collection pipe fitted with many nozzles. The collection pipe is full at all times and under pressure. Water is forced through the nozzles to strike the electrode plate (one per phase), passing current and thus generating heat proportional to the resistance and number of water jets. Water not evaporated drops from the electrode plate to the counter electrode, thus completing the circuit. The amount of current passed, and thus the amount of steam generated, is controlled by raising or lowering a hydraulically operated cylinder which covers or exposes nozzles. At 100% load the cylinder is in the down position and all nozzles are exposed. Raising the cylinder reduces the number of nozzles exposed, which decreases the amount of current passed, and thus reduces the amount of steam generated. This feature allows continuous modulation (stepless) of steam production depending on process requirements. The time from full load to minimum load can be 20 seconds or longer depending on plant requirements. The boiler can "crash down" by shutting off the circulation pump. As with all electric boilers, 100% of the electrical energy is converted to heat with no stack losses. However, radiation and blowdown precludes recovery of all heat as usable steam. To account for these losses, a 98% to 99% efficiency to steam factor is commonly used.

Another type of high voltage electrode boiler, illustrated in Figure 3-3, differs only in the method of controlling current flow and steam generation.

In this boiler, the level in the nozzle header, and thus the number of water jets striking the electrode plate(s), is controlled by a butterfly valve on the discharge of the circulation pump. Larger boilers of this type may have more than one circulation pump. Most of the high voltage electrode boiler installations in the Pacific Northwest are the former (hydraulic operated insulating cylinder) type. Except where noted, the remainder of this report deals only with high voltage electrode steam boilers as illustrated in Figures 3-2 and 3-3.

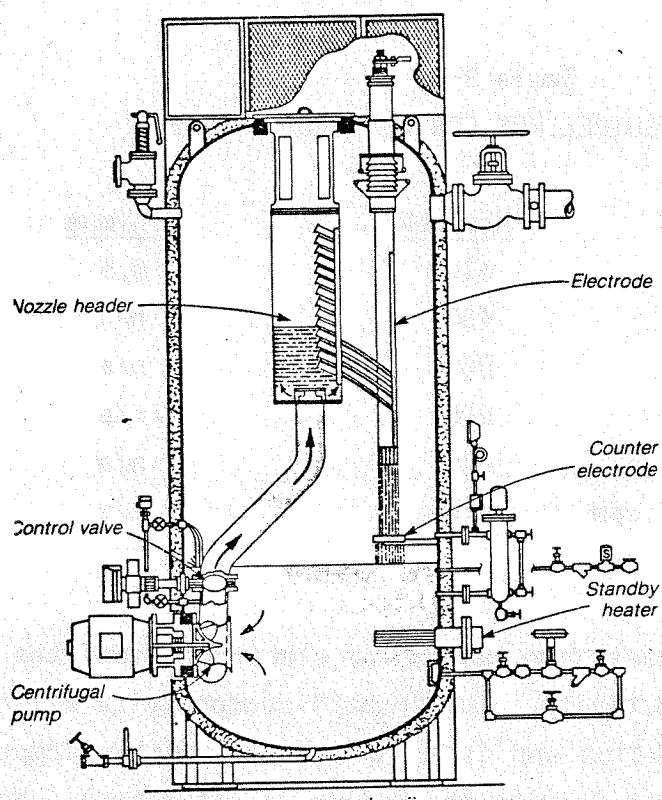

Figure 3-3. High voltage electrode steam boiler with load control valve.
(Source: Power, May 1984, pp 87-89)

3.2. OPERATING PRACTICES AND PROBLEMS

The relative ease of operating electric boilers makes them particularly suitable for consuming power on an interruptible basis, e.g., during off-peak hours or for longer periods during excess hydro years. But relative ease of operation does not mean that electrical boilers are free from abuse or inattention. They are susceptible to water quality problems and electrical shorts. Furthermore, if they are to be shutdown for periods longer than a month or two certain procedures should be followed to prevent damage to boiler components.

Most operating problems with electric boilers can be attributed to difficulties in maintaining water quality. Table 3-2 shows typical water quality characteristics for electric boilers.

Table 3-2

WATER QUALITY GUIDELINES FOR ELECTRODE BOILERS

Parameter	Maximum	Minimum
Hydrogen ion, pH	11.9	8.5
Alkalinity, ppm	400	n/a
Oxygen, ppm	.005	n/a
Iron, ppm	0.5	n/a
Hardness, makeup H_2O, ppm	0.5	n/a
Hardness, boiler H_2O, ppm	0	n/a

In order for current to pass from nozzle to electrode plate the boiler water must have some conductivity. The "exact" conductivity will depend on the particular installation and is a function of boiler temperature (or pressure since the steam leaving the boiler is saturated). Normally conductivity will not exceed 3500 micromhos/cm. For boilers operated under capacity the conductivity may be lower, 1500 to 2000 micromhos/cm, to assure that sufficient nozzle jets are operating to maintain controllability during periods of load swings. Agents that could lead to foaming, e.g., greases and oils, should not be allowed into the boiler water. Foaming can cause boiler shutdowns and electrical arcing. Depending on the raw water quality and the precent of condensate returned, water treatment can vary from simple chemical addition to full demineralization including softening and reverse osmosis.

Electric boilers are subject to phase to phase and phase to ground shorts. Many shorting events can be traced to failure of the electrode porcelain insulators. To minimize these occurrences some operators change insulators frequently on a regular schedule. Newer insulators, high in alumina, seem to have reduced this problem somewhat. Even with all precautions regarding water quality, electrode insulators, etc. shorts are always possible. A frequently checked and maintained main breaker is the operator's last defense against equipment and system damage from electrical shorts.

For shutdowns of less than a month a standby electric immersion heater will keep the electrode boiler warm and under low pressure. This prevents corrosion from air. Standby immersion heaters usually range in size from 36 kW to 45 kW. For longer shutdowns when non-firm power is not available, such as the during the winter, the boiler is drained and may be purged with dry nitrogen. The boiler must be kept dry during extended shutdowns to prevent corrosion. Oxygen may also be excluded by keeping the boiler filled with nitrogen under slight pressure. Some operators located in dry climates have found this latter action unnecessary.

3.3. CAPITAL COSTS

An electrical boiler generally will cost less to install than a comparable boiler fueled by an alternate means. However, the costs for an electric boiler can be substantial depending on whether or not additional electrical service is necessary. The estimated fixed capital investments for high voltage electrode boilers ranging in size from 2 MW to 42 MW are presented in Table 3-3.

In developing these estimates the following assumptions were made:

- Power to boiler: 13.2 to 13.8 kV - 3 phase
- Steam pressure: 150 psig
- Buildings and utilities not included
- Electrical: 13.2 to 13.8 kV service to main breaker by others, two hundred feet from main breaker to boiler; 480 volt service to MCC by others; two hundred feet from MCC to boiler; all wiring within battery limits included
- Piping: 100 ft high pressure steam line, raw water line and condensate return line to battery limits; all piping within battery limits included
- Boiler cost: includes 5% freight and handling
- Escalation: 6% added to make estimate current to mid-1984
- Auxiliaries include: DA tank and pumps, water softener, chemical feed system, blowdown flash tank and heat recovery.

Table 3-3

HIGH VOLTAGE ELECTRODE BOILER CAPITAL COSTS, $1000's

	42 MW	24 MW	12 MW	6 MW	2 MW
Equipment and Materials					
Boiler	267	164	112	98	83
Auxiliaries	103	79	48	31	25
Electrical	132	109	95	88	85
Piping	17	12	10	8	6
Instrumentation	20	20	20	15	15
Foundations	5	4	3	2	1
Labor, Fringes and Indirects	126	102	80	65	58
Insulation (Subcontract)	10	10	9	8	7
DIRECT COSTS (DC)	680	500	377	315	280
Contractor's Fee and Expenses (5% DC)	34	25	19	16	14
Engin'g and Superv'n (15% DC)	102	75	57	47	42
INDIRECT COSTS (IC)	136	100	76	63	56
DIRECT & INDIRECT COSTS (DC+IC)	816	600	453	378	336
Contingency (20% DC+IC)	163	120	91	76	67
Escalation (6% DC+IC)	49	36	27	23	20
SUBTOTAL	212	156	118	99	87
FIXED CAPITAL INVESTMENT	1028	756	571	477	423
DOLLARS/kW	24.48	31.50	47.58	79.50	211.50

The capital costs estimated here should be used only as an approximation. More accurate cost estimates can only be done on a site specific basis. For example, the cost of installing additional electrical service to the site is not included. Installed high voltage transformers cost $400,000 to $600,000. Five hundred feet of transmission line to the transformer will cost $50,000 to $80,000. Depending on the location, a high voltage transformer station and new transmission lines could easily add another $1 million to the amounts shown in Table 3-3.

Figure 3-4 graphically displays the results of Table 3-3.

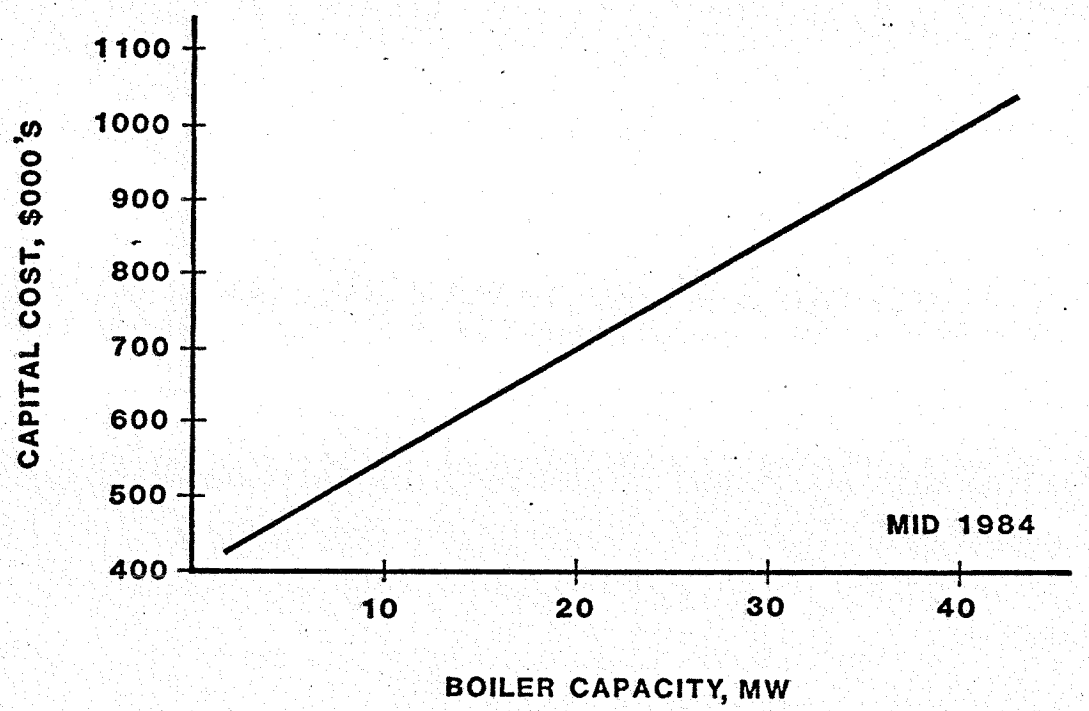

Figure 3-4. Fixed capital investment for 13.8 kV electrode boilers. Does not include additional electrical service to main breaker.
Source: EKONO

3.4. OPERATING COSTS

The major operating cost is that for electricity. To estimate this cost assume that 98% to 99% of the electrical energy is converted to steam. Other variable costs, i.e., operating, labor, maintenance, water treatment, etc. will probably range from 5 to 15% of the annual electrical cost.

Section 4
SURVEY OF INDUSTRIES

4.1. GENERAL

To determine the industrial potential of utilizing low cost, non-firm (interruptible) power in the Pacific Northwest, a survey questionnaire was developed in a cooperative effort by members of Industrial Customers of Northwest Utilities (ICNU) and other industrial groups. The latter included the Northwest Pulp and Paper Association and the Northwest Food Processors' Association. The questionnaire was mailed in late February to over 200 non-DSI industrial concerns in the BPA service region. There were 73 responses. To assure confidentiality of data, all responses were returned to the ICNU. In some cases any information that could be used to identify individual firms responding was removed. A sample of the questionnaire, including the ICNU cover letter, is presented in Appendix A.

The questionnaire was designed to determine those factors, conditions, prices, constraints, etc. which would lead to the utilization of non-firm electric power:

- In existing or future electric boilers
- By backing out self-generated electric power
- In non-boiler processes or equipment that could be converted or modified to use electricity
- By interregional shifting of production to the Pacific Northwest.

Quantitatively, the desired end result would be a curve of demand as a function of non-firm electric energy price for each of the scenarios above. Qualitatively, the survey would serve to determine those criteria or constraints that would have to be met or mitigated in order to sell the non-firm power. Such criteria could include non-firm availability, minimum continuous service, lead time and return on

capital. Perceived constraints might consist of environmental, institutional, political or legal barriers.

As expected, the quality of the responses to the questionnaire varied. A few were comphrensive and left little doubt that the respondants knew exactly what non-firm power was and how their companies could make use of it. Without exception, these responses came either from large companies and/or from firms consuming large blocks of power.

Most responses to the questionnaire were vague, ambiguous, or both. This, and the fact that there were many who did not respond or who were not sent a questionnaire, required that an extensive follow-up telephone survey be carried out. The result of these efforts is a fairly accurate picture of the potential for consuming non-firm electrical power by Pacific Northwest industry (non-DSI).

The survey results, both from questionnaire responses and phone calls, are presented in a series of 24 tables in Appendix B. They are preceded by explanatory notes. What follows below is a brief discussion of the results of the survey as tabulated in Appendix B.

4.2. FOOD AND KINDRED PRODUCTS

This industry group had the largest number of respondants (25). It also had the largest number of non-respondants (42).

The Pacific Northwest food industry is characterized by:

- Its diversity. The survey identified plants in all 9 three-digit SIC codes (201-209).
- Its seasonable nature. Food processing activities are dependent upon harvest times and storability of raw product.
- The large number of potato processors. Thirty-two (32) potato processing plants (friers, freezers, dehydrators, etc.) were identified.
- Its significant requirement for thermal energy. Typical unit operations requiring thermal energy include evaporation, e.g.,

fruit juice concentrates; extraction, e.g., sugar refining; heat transfer, e.g., cooking oils; and refrigeration, e.g., french fries.

- Its competiveness. Without exception all firms contacted, while very cooperative, were very concerned how the data would be used in this survey.
- Its concern and attention to quality control and cleanliness from raw product to finished product.

Of all industries surveyed, the food and kindred products group had the largest number of electric boilers, 18 units, and installed capacity, 182 MW. This together with its thermal requirements indicates a large potential demand for non-firm power via the standby electric boiler scenario. This is tempered significantly by the fact that most of the existing electric boilers identified were already running on either firm power or on non-firm power at a cost low enough to be attractive.

The industry has no potential to shift production to the Northwest. Nor does it have viable, i.e. economical, non-firm electricity consuming processes. There is, however, a potential to back out about 30-31 MW of self-generated power.

4.3. LUMBER AND WOOD PRODUCTS

For an industry with 597 sawmills, 76 veneer mills and 111 plywood plants in the Pacific Northwest, the 4 responses to the questionnaire represented a statistically meaningless sample. However, even with this poor response it was still possible to characterize lumber and wood products industry to the extent necessary to show that not much, if any, economic potential exists for consuming non-firm power.

Lumber

Table 4-1 shows the estimated consumption of thermal and electrical energy in the Northwest lumber manufacturing industry for the year 1980.

Table 4-1
PROFILE OF ENERGY CONSUMPTION
IN LUMBER MANUFACTURING - 1980

Energy Type	Specific Consumption (1)	1980 Consumption Ave MW (2)
Thermal	2.67×10^6 Btu/MBF	1200
Electrical	153.8 kWh/MBF	235

1. Source: EKONO
2. Assumes: 13.4×10^9 BF; 3400 Btu/kWh; 8760 hr/yr

Virtually all of the thermal energy consumed is steam (95% of the dry kilns in the PNW are heated with steam). Thus, a hypothetical potential for a power demand of 1200 MW in electrical boilers exists. However, because of the great number of sawmills (597) mostly having low cost or "free" hog fuel, and given the usual criteria for return on capital (2 years or less after taxes payout), meeting this demand with standby electrical boilers is highly unlikely.

Since the electrical energy is consumed in a plethora of small motors, non-boiler processes, e.g., dual drives for consuming non-firm power, are probably not feasible.

For the most part, shifting lumber production to the Northwest is not viable. Raw material costs are too high and the markets are too far away. The survey indicated a potential of backing out 18-19 MW of self generated power with non-firm power. This potential could be much larger because of the likelihood of many small condensing units in the region. However, with self generated wood waste as the prime fuel the economic potential is probably low.

Plywood

Plywood manufacturing consumed energy in 1983 at the levels estimated in Table 4-2.

Table 4-2
PROFILE OF ENERGY CONSUMPTION
IN PLYWOOD MANUFACTURING - 1983

	Specific Consumption (1)	1983 Consumption Ave MW (2)
Thermal	4.8×10^6 Btu/M ft^2	1500
Electrical	139 kWh/M ft^2	148

1. Source: EKONO
2. Assumes: 9300 MM ft^2, 3400 Btu/kWh; 8700 hr/yr

In the Northwest about 70% of the veneer dryers are steam heated. For the same reasons as in lumber manufacturing, investing in a standby electrical boiler to consume non-firm power is not likely. Similarly, electrical energy consumption is diffuse, reducing to insignficant levels the non-boiler processes capable of consuming non-firm power.

Because of raw material costs, the distance to markets and the advent of composite paneling (OSB, waferboard, etc.) production shifting away from the Northwest is more likely than vice versa.

4.4. PAPER AND ALLIED PRODUCTS

Twenty one (21) responses to the questionnaire were received from this industry. These together with a phone survey of ten (10) additional plants, yielded a good estimate of the potential for this industry to consume non-firm power.

In the 1979 Annual Survey of Manufacturing the pulp and paper industry was the fourth largest consumer of energy in the United States. It is characteristic of this industry, especially in the Pacific Northwest where chemical pulping predominates, that much of the energy consumed is steam generated from the combustion of spent pulping liquors. Additional steam requirements are met by hog fuel, oil, natural gas and electricity. In fact, the industry has 7 electrical boilers with a

total installed capacity of 149 MW, second only to the food processing industry. However, unlike the food industry, these boilers are mostly idle, awaiting electricity prices low enough to back out hog fuel (see Section 5.1).

More capacity for electrical self generation, about 300 MWe, exists in this industry than in any other in the Northwest. While not all this capacity is presently on-line, a large potential exists to be backed out by non-firm power (see Section 5.4). A small block of non-firm power, about 8 MWe, could be consumed by interregional production shifting.

4.5. CHEMICALS AND ALLIED PRODUCTS

Thirteen (13) chemical plants responded to the survey questionnaire.

Data from the respondants was supplemented by calls to 16 other firms. One company presently uses 16 MW of spill rate power. At least four or five consumers are considering electrical boilers, although it is not clear whether the economics favor them being installed on a non-firm basis. About 30 MW of non-firm power could be consumed by interregional production shifting given the right price, availability and end product market conditions. Non-boiler processes for consuming non-firm power do not appear likely.

4.6. PETROLEUM REFINING AND RELATED INDUSTRIES

Data for this industry originated from four questionnaire respondants and one non-respondant. The industry has one small electrode boiler. Much of the industry's thermal energy needs are fulfilled by off-gas streams. Capital recovery requirements are probably too high to justify boilers, equipment, etc. that would be on standby awaiting non-firm electricity. The only self generator of power* located in the survey cannot be backed out by non-firm power. No potential for production shifting exists.

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* Mechanical power with low cost steam.

4.7. PRIMARY METAL INDUSTRIES

This industry is made up of small to medium sized foundaries, forges and smelters (the DSI's were, with one exception, excluded from this work). Eight firms responded to the survey; eleven others were called.

Generally the industry has a small requirement for steam. Much of the energy consumed is in electrode or gas fired furnaces. The survey indicated some potential for increased electrical use by induction heating. One firm could consume an additional 120 MW by increasing production. The economic constraints, however, made this unlikely, at least under present market conditions.

4.8. OTHER INDUSTRIES

This group, made up of cement, printing, electronics and transportation companies sent in nineteen responses to the questionnaire. The survey responses indicated that there were 7 electric boilers among this group. Another large electric boiler was located during follow-up calls. Up to 54 MW of the identified electric boiler capacity could be used to consume spill power. Another 70-90 MW of new electric boiler capacity could be installed providing the economics of using electricity on a interruptible basis were attractive. There is a potential of backing out about 9 MW of cogenerated power.

Section 5
DEMAND FOR NON-FIRM POWER

5.1. EXISTING ELECTRICAL BOILERS

A demand curve for the power consumption of existing large electrical boilers identified in this study is presented in Figure 5-1. The power demand of high voltage boilers presently consuming firm power is indicated in the lower part of the figure, while the variable demand of boilers using non-firm power is represented by the upper curve.

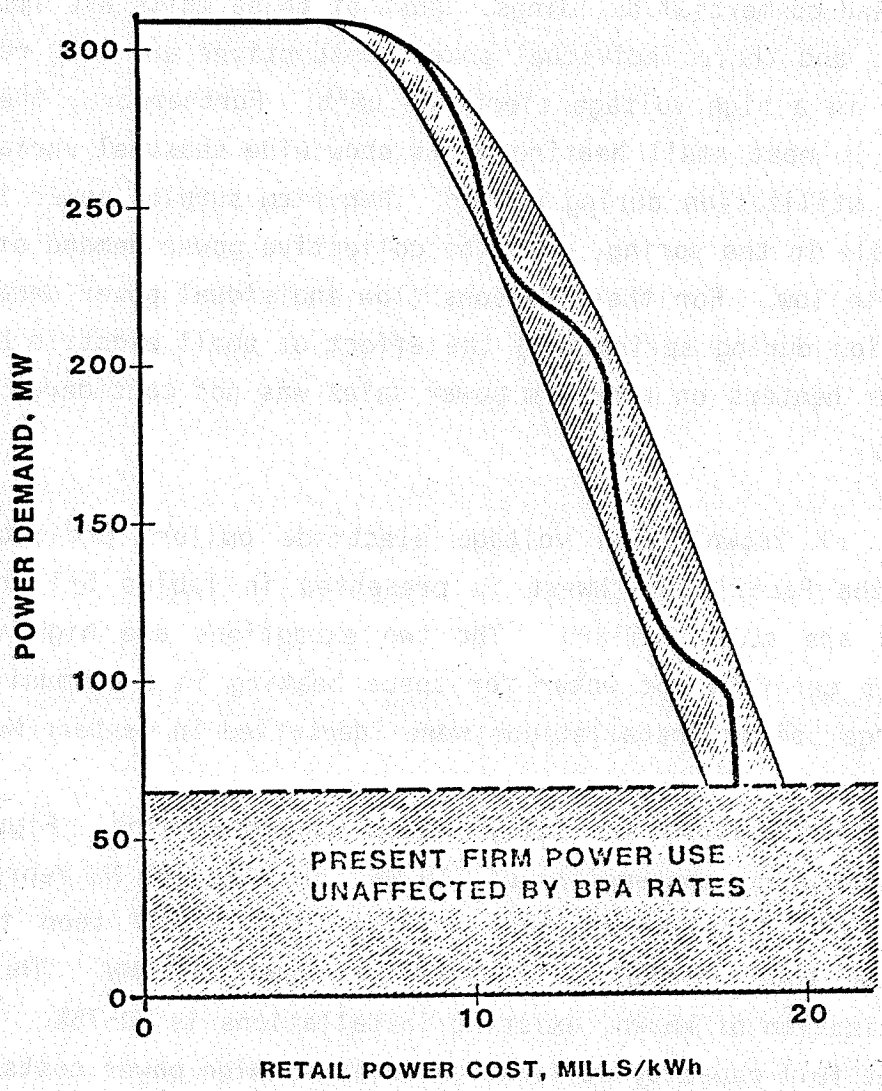


Figure 5-1. Electric boiler utilization demand curve For existing installations. (Source: EKONO)

The power consumption of boilers utilizing inexpensive firm power, which is supplied by generating utilities, will not be affected by changes in the price or availability of non-firm power from BPA. An additional firm power load of 10 MW is expected to come on line this summer, which will increase the known firm power load from 65 to 75 MW. The normal power consumption of some small high voltage boilers was not established, and the total firm power load is somewhat higher than that indicated.

Figure 5-1 shows the power demand only of known high voltage electrode boilers. No attempts were made to establish the power demands of small, low voltage hot water heaters and steam boilers used for heating in residential and commercial buildings. Most of those units are immersion type devices, and their individual power consumptions are low, relative to power use in a high voltage electrode unit. Furthermore, the power consumptions in most small heating units show wide seasonal variations, with maximum utilization during winter. Non-firm surplus power is most often available in the spring, when the collective power demand of those units is quite low. For these reasons (low individual power demand and low utilization during springtime) the effect of small electric boilers and hot water heaters on non-firm power sales was not considered in the present study.

An inventory of known, high voltage electrode boilers presently installed in the Pacific Northwest is presented in Tables 5-1 and 5-2. All but two are steam boilers. The two exceptions are high voltage units used to generate hot water for space heating in a community college. No large boiler installations were identified in western Montana.

Not all electric boilers are fully loaded when operating. Figure 5-1 shows a maximum power consumption of 310 MW. Of this, 65 MW represents a non-interruptible firm power load, with another 10 MW soon to come on-line. The total installed capacity is over 450 MW. Thus, the maximum utilization of known, existing installations is 70-75%. Factors which prevent full capacity utilization include: high power costs, plant production limitations (no demand for additional steam), inadequate

Table 5-1
INVENTORY OF HIGH VOLTAGE ELECTRODE
BOILERS IN THE PACIFIC NORTHWEST

Area	No. Units	Total MW	Boiler Size, MW Max.	Min.	Avg.
Idaho	2	12	6	6	6
Oregon	6	78	36	3	13
Eastern Wash	18	136	24	2	7
Western Wash	13	231	30	3	18
BPA REGION	39	457	36	2	12

Table 5-2
INVENTORY OF HIGH VOLTAGE ELECTRODE
BOILERS IN PACIFIC NORTHWEST INDUSTRIES (1)

Industry	No. Units	Total MW	Boiler Size, MW Max.	Min.	Avg.
Food Processing	18	182	36	2	10
Lumber & Plywood	1	3	3	3	3
Pulp and Paper	7	149	30	4	21
Chemicals (2)	2	18	14	4	9
Petroleum Refining	1	7	7	7	7
Primary Metals	1	10	10	10	10
Transportation	2	27	15	12	14

(1) Excludes institutional and governmental installations.
(2) Includes 14 MW mothballed and for sale.

power transmission facilities, use of boilers on an intermittent basis or as back-up, and the necessity of reserving capacity to follow swings in steam load.

Because of uncertainties concerning the exact cost of steam generated from alternate fuels, the demand curve for existing installations (Figure 5-1) is represented by a band. The solid line encompassed by the band approximates the demand curve established from data collected during this study. The shape of that curve, which is characterized by three steep discreet increases in demand, can be related to the current BPA rate schedule for non-firm power as discussed in the following paragraphs.

Presently, no electric boilers consume power which costs more than 19 mills. At a price of 17-19 mills, a demand for 30-40 MW of power is created. This power should be considered "modified" non-firm power, since some guarantees on availability must be provided to justify starting up an electric boiler. If the power is truly "interruptible" (on a day/night basis, for example) lower power prices will be needed to justify electric boiler utilization, since the alternate fuel boilers must be maintained in a warm standby condition. In some cases, considerable amounts of fuel must be burned to keep the standby boilers on-line. In general, this situation applies to all installations with multi-fuel capabilities. In extreme cases, the costs and problems associated with interruptible operation preclude the use of electric boilers unless non-firm power availabilty is guaranteed on a continuous basis over a period of weeks.

Most existing electric boilers are utilized when spill power is available. The BPA rate for spill power is 11 mills. The retail price is different for different boiler installations. A sharp increase in electric boiler power demand occurs when the retail price drops below 15-16 mills. At 13 mills, the demand curve begins to flatten out. By this time all electric boilers displacing oil or gas will be operating, provided prices for those fuels do not decrease further.

The final sharp increase in electric boiler utilization occurs when the retail power cost is 8-11 mills. In this region electric power becomes competitive with hog fuel as a boiler fuel. Above 11 mills, hog fuel

alone will not be displaced by electricity unless some other benefits are realized, such as reductions in other operating costs or a concurrent reduction in oil or gas use. On the other hand, in some cases hog fuel will not be displaced even if electric power is offered at the BPA displacement rate (7 mills). Again, variations in the costs of fuel and boiler efficiencies for different installations must be recognized when attempting to equate the prices of steam generated from electric power and alternate fuels.

At present, no demand for firm or non-firm power exists in large electric boilers when the retail power cost is 20 mills or higher. Alternate fuels provide steam at less cost, and electric boilers are not used when the cost of power reaches this level. Within the past few years, electric boilers have been removed from several locations because of increases in power cost. Removal of some remaining electric boilers is a likelihood unless the operators of those boilers are guaranteed access to non-firm power at a cost less than their alternate fuel costs.

Figure 5-1 was developed from data reflecting the operation of known boiler installations. Most of those boilers had been previously identified by EKONO in 1982. Additional information was provided from the survey questionnaires sent out by the ICNU. A few other boilers were located by telephone calls to survey non-respondents or plants not covered by the survey. Despite these attempts to conduct a comprehensive survey of the BPA service area, some electric boilers may remain unidentified. However, extensive contacts with both utilities and industry have been made in the last two years. The capacity represented by unidentified industrial boilers with capacities of 1 MW or greater is probably much less than 50 MW.

5.2. NEW ELECTRIC BOILERS

Technical Potential for New Electric Boiler Installation

To establish a ceiling representing the maximum demand for electrical power, which conceivably could be created by new electric boilers, a

"technical potential" was defined and estimated. The technical potential represents the thermal energy production of all known, large industrial boilers presently fired with gas or oil. New electric boilers will not replace or displace boilers fired with hog fuel, coal, by-products or other inexpensive fuels. Steam presently generated in many such boilers could be produced in electric boilers without impacting the manufacturing processes involved. However, the extremely unfavorable economics of new electric boilers in those cases renders the possibility of their installation practically impossible under any foreseeable circumstances.

The total technical potential for new electric boiler installations, as defined in the preceding paragraph, is presented in Table 5-3.

Table 5-3.
TECHNICAL POTENTIAL OF NEW ELECTRIC BOILER INSTALLATIONS

Sector	Power Demand, MW
Pulp & Paper Mills	600
Food Processing Plants	600
All Other (Aerospace, Chemicals, etc.	300
Total	1500

Table 5-2 shows most of the technical potential for new boiler installations exists in the pulp/paper and food processing industries. The steam loads of individual plants are highest among the former group, although many pulp and paper mills depend heavily, sometimes exclusively, on the use of hog fuel and by-product fuels for their supply of thermal energy. On the average, individual food processing plants have much lower steam loads. However, food processing plants are more numerous, and they depend almost exclusively on gas and oil to generate steam.

Realistic Potential for New Electric Boiler Installations

The actual demand for power, which can be realistically created by new electric boiler installations, is much less than the technical

potential. Factors limiting the "realistic potential" range from the simple unwillingness of some operators to install electric boilers to the extremely high costs associated with new power transmission facilities (especially high voltage transmission lines, when they are required) needed for some locations. Also, replacement of existing fossil fuel boilers with new units capable of utilizing less expensive fuels, usually hog fuel or coal, is a realistic option, which offers a more permanent and reliable means of reducing energy costs in many cases.

Estimation of the demand for non-firm power, which can be created by new electric boiler installations when specific incentives are offered, requires detailed knowledge of alternate fuel prices, boiler installation costs and investment criteria (required payback period or return on investment) at all locations considered. Among responses to the ICNU questionnaire, very few specific answers were given to question (4C), which asked for the power rates and availabilities required to encourage the purchase of new electric boilers intended to utilize only non-firm power. Typical responses were of the nature: "cost of power must be low enough to pay for boiler", or "this plant operates continuously and cannot use interruptible power". When specified, required after-tax payback periods were commonly on the order of two years. Attempts were seldom made to develop preliminary estimates of boiler installation cost, which precluded the possibility of establishing feasibility in most cases.

Data obtained from the questionnaire were supplemented with information gained during numerous discussions with individual plant operators and representatives of the public or private utilities serving those plants. The information sought from those discussions included alternate fuel costs, steam demand of the plant, investment criteria, availability of transmission facilities, and willingness of the plant or utility to undertake investments in this kind of project. Boiler installation costs (excluding substation and high voltage lines) were estimated from Figure 3-4 when no other information was available.

Additional costs were included when special facilities, such as extraordinary water treatment equipment or a steam superheater, were considered necessary. The costs of new substation facilities (transformers, breakers, transmission lines, etc.) were determined separately.

When the feasibility of a future electric boiler installation was evaluated, the following guidelines were observed:

- No electric boilers displacing units fired with hog fuel or coal will be installed.
- Power price and availability must both be guaranteed for a specific number of years, and boiler installations must be paid for within the specified period of guaranteed availability.
- During the capital recovery period, power is wheeled to customers with no mark-up by utilities, except when a utility requires revenue to pay off its own investments necessary to install the boilers.
- Conditions for incentive power sales are worked out between customers and their utilities; no political barriers to electric boiler installation are raised by BPA or public utilities commissions.

The total number of new boiler installations will depend on both the guaranteed annual availability of power (number of hours and the period power will be available each year) and the consecutive number of years power availability is guaranteed. To encourage boiler installations, "incentive rates" must be offered for a period of years to allow recovery of capital investments. The power demand created from new installations is estimated as a function of incentive rate for two cases in Figure 5-2. In the first case (Case A), power is assumed to be available on a guaranteed basis for 2500 hours each year for 3 consecutive years at the rate indicated. This corresponds to a guaranteed <u>continuous availability</u> of 3-4 months during the spring of each year. Incentive rate power only is consumed in electric boilers during this

period, and the operation of those boilers is subject to the non-guaranteed availability of incentive power (or modified incentive power offered at a different rate) during the remainder of the year. In the second case, (Case B), incentive power is assumed to be available on a continuous, guaranteed basis for 6000 hours (8-9 months) for 2 consecutive years.

Figure 5-2 was developed by individually evaluating specific cost and investment criteria at 63 specific locations considered potential sites for future boiler installations. Investment and operating cost data relevant to each of those 63 sites are summarized in Appendix C.

During the period information on potential new boiler installations was compiled, the active involvement of some utilities in electric boiler projects became apparent. Those utilities were often offering to share installation costs, and in some cases the utility was proposing to underwrite the entire installation. Because the investment criteria for utilities are usually different from those of their customers, the feasibility of many installations was improved by utility participation. In fact, at least one electric boiler may be installed by the spring of 1985 under the sponsorship of one utility without BPA involvement. This installation is justified by relatively low installation costs and the utility's perception of a continued supply of available non-firm power for the next several years. Utility involvement in specific projects is indicated in Appendix C.

Any number of demand curves such as those shown in Figure 5-2 can be developed, depending on the annual guaranteed availability (hours/year) of power, and the number of years it will be available. However, beyond 3 years of guaranteed availability (independent of the number of hours each year), the curves will not change markedly, since capital investments must be recovered within 3 years in most cases. When customers assume all the financial risk, the required payback period is more often 2 years.

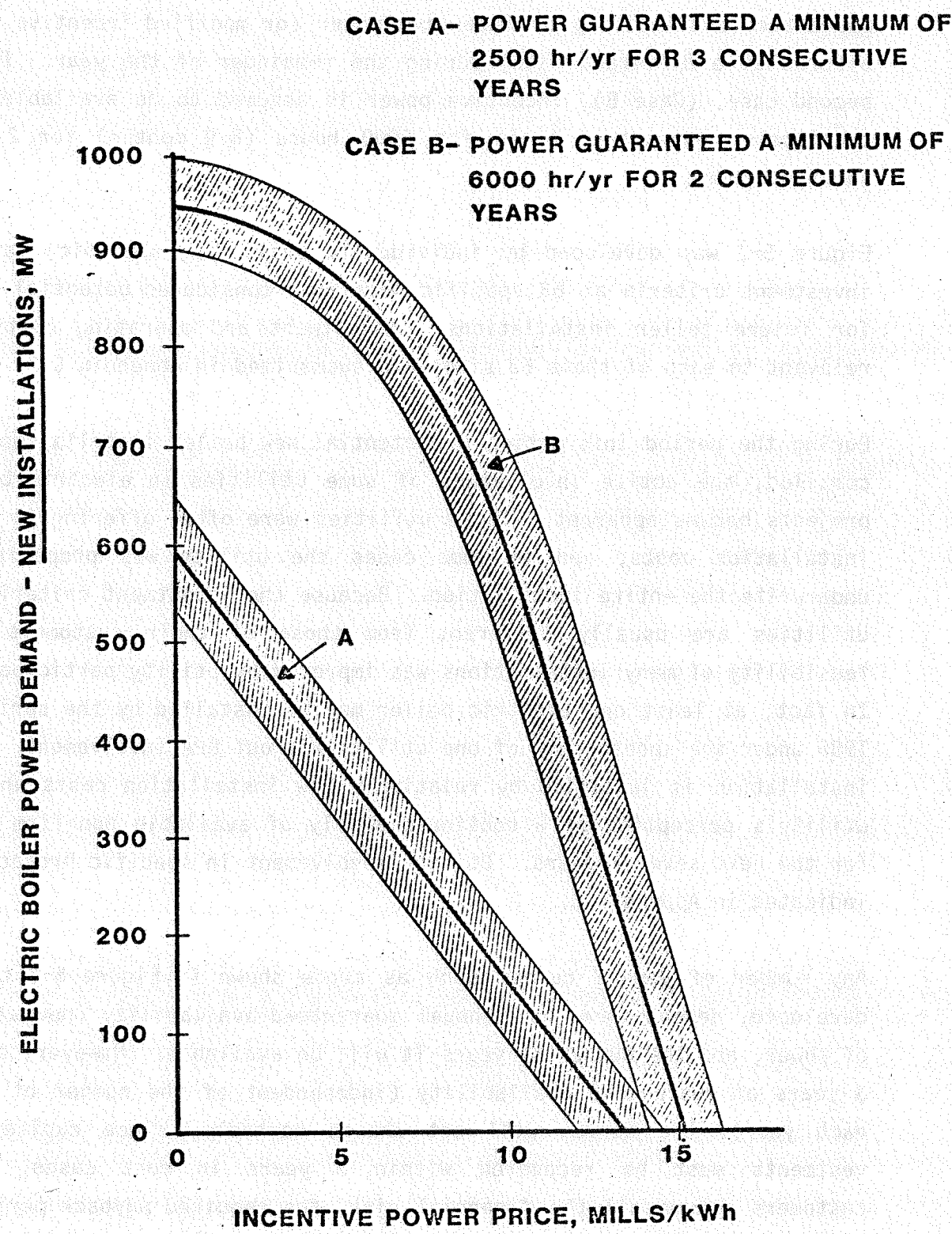


Figure 5-2. Effect of incentive power rates and availability on power demand created by new electric boilers. (Source: EKONO).

The demand curves in Figure 5-2 do not include the power demand of installed boilers, which have already been paid for. As discussed in Section 5.1, operation of most existing electric boilers is dependent only on the comparative operating costs of those boilers and alternate fuel boilers. Following the "incentive period", which corresponds to the time required to pay off new installations, operation of the newly installed electric boilers will also be governed solely by evaluations of operating costs. The operating costs will be almost entirely dependent on the prices of alternate fuels, which may also incorporate demand clauses when gas is the alternate fuel.

Based on existing gas and oil prices, all of the new boilers will be utilized when retail non-firm power prices are in the range 14-20 mills/kWh after capital investments are recovered. Wholesale rates will be less, depending on the mark-up required by the utilities involved.

Although power price will have the greatest influence on the future operation of all new and existing electric boilers, some guarantees concerning availability must be provided directly by the utility, and indirectly by BPA. This issue was discussed in Section 5.1. As with existing boilers, the guaranteed availability needed to justify future operation of new boilers (following the capital recovery period) will range from 8 hours to a month.

Most likely, the full potential demand indicated by the curves in Figure 5-2 will never be achieved even if all the appropriate guaranteed incentives are offered. Barriers which will inhibit boiler installation include: reluctance of some companies to invest capital in this type of project, which has an uncertain future; lack of co-operation from some utilities; opposition by public utility commissions. Concerning the latter point, several independent sources indicated that the public utilities commission of one state would probably not approve new electric boiler projects.

Another factor which must be considered with respect to future electric boiler installations is the ability of some generating utilities to

supply their own non-firm surplus power. Not all of the projected demand for non-firm power indicated in Figure 5-2 can be assigned to BPA. Utilities with their own surplus hydroelectric power will dispose of it before wheeling in non-firm power supplied by BPA.

In summary, the curves shown in Figure 5-2 are representative of the maximum realistic demand which could be created for non-firm power through a concerted effort to encourage installation of new electric boilers. No attempt has been made to differentiate between the non-firm power supplied by BPA and self-generating utilities. Furthermore, all political factors which could inhibit boiler installation have been neglected.

5.3. NON-BOILER APPLICATIONS AND PRODUCTION SHIFTING

Non-Boiler Applications

Most responses to question (6) of the ICNU questionnaire ("Other potential uses of non-firm electricity") were negative. Very few non-boiler applications were identified, and the possible applications suggested were almost always discussed in vague terms. Very few firm estimates of potential power demand were cited. Furthermore, capital expenditures were required for almost all of the suggested applications, although no estimates of the magnitude of such expenditures were provided. In many cases the technical feasibility was uncertain.

The responses were such that no meaningful curve of non-firm demand as a function of price could be developed for processes, equipment, etc., which could utilize power on a non-firm basis. However, some applications were identified from both the questionnaire responses and EKONO's subsequent telephone survey. These are tabulated in Appendix B and are summarized below in Table 5-4.

Of the 210-212 MW of potential demand identified in Table 5-4, only 1 MW is judged by EKONO to be presently viable. This could come on-line now if 10 mill non-firm power were available for a reasonably long period, say two weeks minimum.

Table 5-4
SUMMARY OF NON-BOILER APPLICATIONS

SIC Group	Tech. Pot. MW	Explanation
20 (Food)	29	A total of 7 applications identified; all required capital; typical payback is 2 years or less after taxes; some require or will run on firm power
26 (Paper)	1-2	Paper drying equipment; 10 mill power available 2900 hours/year required; firm power may be used once capital investment is recovered.
26 (Paper)	8	Vapor recompression evaporator dual drive capability; capital required will be justified by high firm power cost; thereafter non-firm will be used if cheaper than steam
28 (Chemicals	6	Dual drives; probably not feasible at maximum paybacks of 1-2 years before taxes.
33 (Metals)	1	Increase production. Maximum non-firm price of 10 mills and suitable market conditions.
33 (Metals)	45-46	Total of 6 applications; all require capital; paybacks of 2 years or less; some will back out firm power.
33 (Metals)	120	Go to 24 hour schedule; requires: a) displacement rate power, b) 90 days lead time, c) 4000 hours per year continuous availability, d) 2 year payback on some capital, e) suitable market conditions for product.

Paper Drying Equipment. One potential application mentioned several times, especially among pulp and paper industry respondents, involved the use of electricity to heat air in dryers. The magnitude of electric power which could be consumed for this purpose in a single large paper machine is on the order of 5-10 MW. When considering the use of electric power for air heating, two points must be emphasized: (1) Electricity is not presently used to any significant degree for air

heating in large industrial dryers, and (2) specialized, as yet undeveloped equipment would be required to allow electrical air heating in most new applications. No attempts were made by any respondents to estimate costs of equipment needed for this purpose. Superficially, this concept is so impractical that the majority of respondents did not consider it.

Dual Drives. Another, more realistic application substitutes electrical power for power generated in small steam turbines. Motors or turbines are used to drive boiler feedwater pumps, large fans, vacuum pumps, compressors and large machine driveshafts. Interruptible electric power demand could be developed by installing redundant large electrical motors where steam turbines are already in use, or conversely, installing steam turbines to back up existing motors.

For some specific applications, such as high pressure boiler feedwater pumps, redundant (electric motor and steam turbine) drive capacity may already exist for safety reasons. However, in most cases, new installations would be required. As with any other cost reduction measure, the considerable capital costs involved would have to be recovered within the time frame required by the individual company for such projects. Typical payback periods are in the range 1-2 years after taxes.

The total power demand which could be created by equipping large pumps, fans and compressors with redundant drives is on the order of 2-5 MW for a single plant. However, few or none of the individual drives within the plant would have a power demand of more than 1 MW. Thus, to monitor their operation, individual motors in scattered locations would have to be equipped with separate wattmeters.

Vapor Recompression Evaporators. The option of using vapor recompression evaporators (VRE's) as a means of creating demand for interruptible power was not considered by any of the ICNU questionnaire respondents. This potential application was evaluated by EKONO in a subsequent follow-up telephone survey. Vapor recompression evaporators are located in 9

industrial plants. Most of them are driven by motors, although some use steam turbine drives. A breakdown of known VRE installations is presented in Table 5-5.

Table 5-5
INSTALLED VAPOR RECOMPRESSION EVAPORATORS

No. of Locations	Drive	Power Demand
7	Motor	15-20
2	Turbine	~ 5
	Total	20-25

VRE's can be used as consumers of surplus power if either of two situations exists: (1) Redundant evaporation capacity is available, allowing VRE's to be displaced by multiple effect evaporators, or (2) the VRE's are equipped with redundant (electric motor and steam turbine) drives. Situation (1) exists at one location, although the VRE compressor has not yet been installed. At all other locations, VRE use is required to maintain production. The second situation does not presently exist anywhere.

Because of rising power costs, some VRE operators plan to replace existing motors with steam turbines. Installation of turbines or motors to provide dual drive capabilities is also a possibility. However, for various reasons (use of inexpensive hog fuel to generate steam, inadquate power supply, use of all high pressure steam in turbogenerators) installation of redundant drives will never be justified at a number of locations. The maximum future demand for interruptible power which might be created by this application is on the order of 10 MW.

Production Shifting

Judging from the questionnaire responses and from the extensive follow-up telephone survey, very little potential for interregional production shifting exists. The vast majority of respondents stated that power costs had negligible impact on the operating schedules or production

output of their plants. Most of the large non-DSI industries in this region (wood products, pulp and paper, food processing, aerospace, etc.) are located here because of raw material availability. Energy costs, especially power costs, do not typically have any impact on production schedules. Typical reasons given for not shifting production were:

- Freight costs exceed electrical costs.
- No plants outside region.
- Electrical costs relatively minor part of production costs.
- Non-firm power not sufficiently available.
- Employee disruption; negative labor union reaction (by curtailing production at other plants).

As shown in Table 5-6, the potential for utilizing non-firm power by shifting production to the Pacific Northwest is 39-40 MW. However, this potential is totally determined by the demand for end products. Thus, if there is no product demand, non-firm power will likely not be consumed no matter what the price. At present all 39-40 MW could come on-line given the price and availability criteria summarized in Table 5-6.

Table 5-6

SUMMARY OF PRODUCTION SHIFTING

SIC Group	Tech. Pot. MW	Explanation
26 (Paper)	8	10 mill power; 730 continuous hours per month; one month min.; March-July
28 (Chemicals)	30	18 mill power; no demand change; 3100 hr/yr min.
33 (Metals)	1-2	10 mill power; 3 mo. lead time.

5.4. ELECTRIC POWER GENERATION BACK-OUT

A curve showing the demand for surplus hydroelectric power, which could be created by backing off steam or combustion gas* turbine generators used in industrial power plants, is presented in Figure 5-3.

* Gas produced by any combustion process.

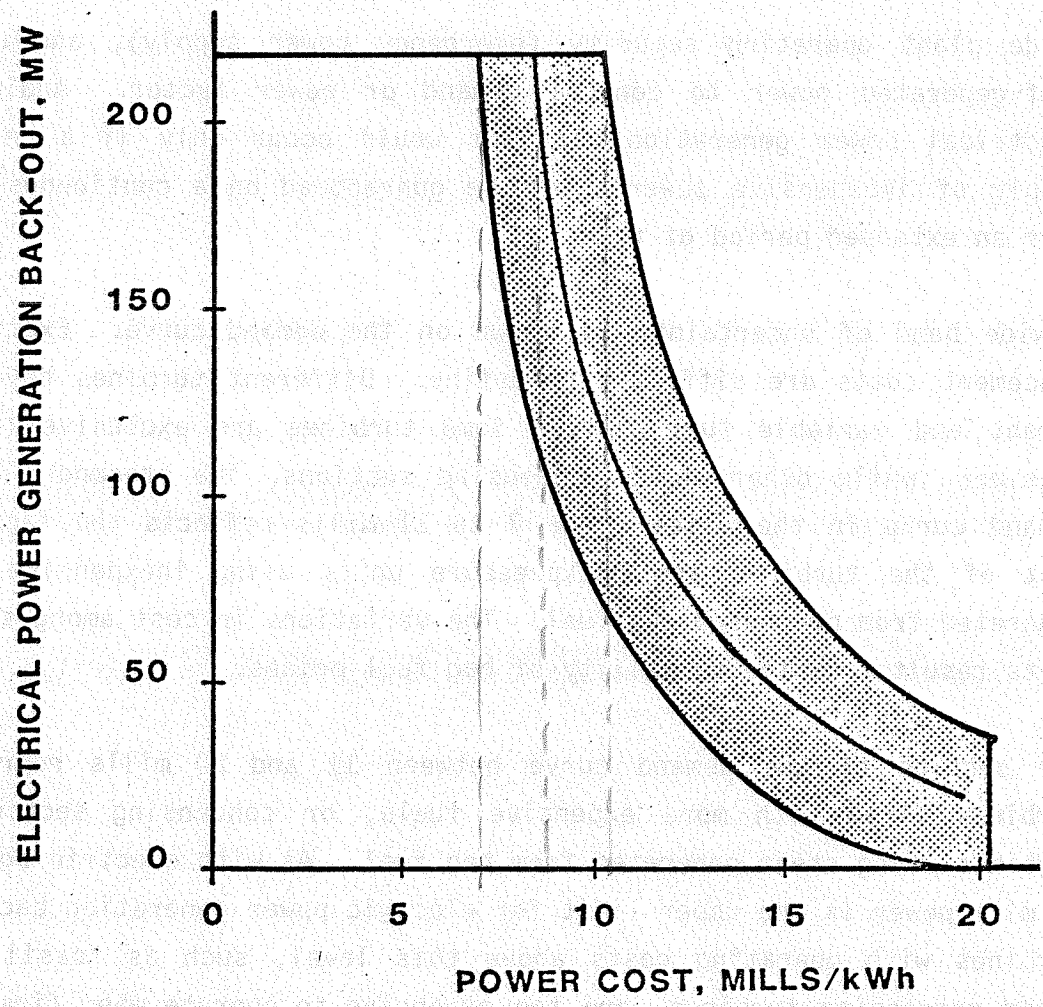


Figure 5-3. Electrical power generation back-Out. Total capacity of industrial turbogenerators whose operation may be influenced by availability of non-firm surplus power. (Source: EKONO)

The demand curve in Figure 5-3 represents the variable output of a limited number of large units. Not included is the output of numerous small turbines, many of them condensing units, which are either used only infrequently or operated continuously. The cost of power in Figure 5-3 represents cost to the region, and is equivalent to the cost of steam from the fuel used to generate power.

The back-out potential shown in Figure 5-3 does not correspond to the total generation capacity of the turbines involved. In most cases, some minimum load will always be maintained. The reasons for retaining some self-generation, even when the purchased power price is very low, in-

clude plant operating security (emergency power supply), and use of self-generated power to control demand or power factor. Additional electrical power generation back-out would occur only if a reliable supply of inexpensive power could be guaranteed on a continuous basis over an extended period of time.

A wide band of uncertainty is shown on the demand curve. Exact displacement costs are difficult to define. Different turbines have different and variable fuel costs. Some turbines are exclusively backpressure, while others have condensing sections. The steepness of the demand curve in the price range 7 to 11 mills reflects the fact that most of the turbines are backpressure units using inexpensive steam generated from purchased hog fuel. The variations in cost among similar units result from the volatility of hog fuel prices.

The section of the demand curve between 11 and 20 mills represents turbines fired with more expensive fuels, or condensing sections of turbines using steam generated from hog fuel. As with electric boilers, 20 mill power is the upper limit for electric power generation back out. Turbines with operating costs above this level, such as fossil fired steam condensing turbines, are too expensive to operate when firm power can be purchased instead. Several such units are installed in plants throughout the Northwest. However, they are only used when power outages occur, or during periods of extreme power shortage. At such times they may be started up at the request of the utility. Since these turbines are not normally used, they are not considered a variable load which can be displaced by interruptible surplus power.

Some turbines will always be operated, regardless of the availability of inexpensive surplus power. For example, this situation exists in a number of wood products (lumber, plywood) mills, which have a surplus of self-generated hog fuel available. Very few of the wood products plants responded to the ICNU questionnaire, although the existence of several

turbine installations is known. Where turbines are installed, their operation will most likely be unaffected by changes in BPA power rates. Because a great deal of time and effort would be required to carry out a comprehensive survey of the wood products industry, and very little useful information related to this project would be gained, no such survey was attempted.

Although the number of existing, large turbogenerators is limited, such turbines represent a very significant future source of power. More power generation capacity will become available as firm power prices continue to rise. Several projects are "on the shelf", awaiting further increases in firm power cost to justify their implementation. The magnitude of this future potential capacity has been addressed in other studies, and no attempts have been made to quantify it in the present study. However, future installation of self-generating units will have an impact on surplus power demand, since those turbines can be backed off during periods of surplus hydroelectric power availability. Installation of self generation capacity will supersede power conservation as a means of reducing power costs in large industrial plants, excepting those such as electrochemical and aluminum plants where power represents the major operating expense.

Section 6
MARKETING NON-FIRM POWER

6.1. FACTORS AFFECTING AVAILABILITY

Surplus electrical power consists of both "firm surplus" and "non-firm surplus". Both have been marketed. But, as is shown in Appendix A, a significant amount of firm surplus and non-firm surplus has remained unutilized and available.

The availability of surplus energy depends on energy resources and energy demands. In the Pacific Northwest about 80% (nominally 12,350 MW under dry or "critical" water conditions) of the generation capacity is hydroelectric. The amount of hydropower available at any time depends on river flows, reservoir levels and water requirements related to fisheries management. These in turn are a function of such factors as season, snowpack, and precipitation. On the demand side, variable and seasonally dependent uses such as electric heating, air conditioning, water heating, irrigation and lighting account for much of the demand for firm energy. The availability of surplus power in any given year is therefore dependent upon the whims of nature. However, both the supply and demand of power are influenced by other factors. Those factors are related to economics, geography or politics, and thus affect the availability of surplus power.

Firm Power Sales to California

Long-term firm power sales to California will result in more or less non-firm power for Northwest customers depending on the following:

- The availability of surplus power
- The amount of long-term firm power sales to California
- The capacity of the Intertie.

The factors determining the availability of surplus power were discussed above. If the amount of firm power sales to California increases faster than the anticipated upgrades in Intertie capacity, then more non-firm power will be available for Northwest users. Increases in the Intertie capacity larger than firm power sales will tend to have the opposite effect.

In selling non-firm surplus power, the BPA must give preference to Pacific Northwest buyers. Concurrently they hope to maximize their revenues. The surest way of achieving these ends, regardless of Intertie capacity or firm sales to California, is to maximize the consumption of non-firm power in the Northwest. Doing so would tend to limit the amount of non-firm available to the Southwest via the Intertie and thus increase both the price and revenues from firm and surplus sales. The key to this is to create an additional large, stable market for non-firm power in the Northwest.

Industrial Conservation and Cogeneration

Cost effective electric power conservation is an energy resource which increases the supply of power. Assuming no increase in overall demand, conservation will tend to increase the availability of both firm surplus and non-firm surplus power. If energy conservation is implemented in a timely fashion, which simultaneously offsets increases in regional power demand, the effect on surplus power availability will be negligible.

Industrial cogeneration can have the same impact as conservation. Unless the increased power supply from new cogeneration projects is balanced by a simultaneous increase in firm power demand, the availability of surplus power will increase.

If industrial firm power prices increase too rapidly, manufacturers will conserve power and install self-generation capacity strictly on the basis of internal economics without consideration of the regional balance of power supply and demand. In this scenario, the supply of surplus power will increase, since firm power will be displaced by self generated power and conservation.

Current Surplus Power

The current surplus of power is just that, current. The supply of surplus power any given in future year is not insured. As noted in Section 5.2, uncertain availability of surplus power will inhibit investment in electric boilers, or any other measures undertaken specifically to allow utilization of non-firm power. Generally, two conditions must be satisfied in order to promote the use of non-firm power: the price must be low enough and minimum availability must be guaranteed for a long enough time to justify the investment, if any. As long as continued availability of the current surplus is not guaranteed, very little new demand for non-firm surplus power will be created. The existing market for surplus power is not utilized even now. The variable demand which is presently represented by installed electric boilers (245 MW), existing industrial generators (210 MW) and the possibilities for production shifting (40 MW) is only partially exploited, although ample surplus power is available to meet the entire demand.

Long Term Industrial Trends

In the future, the consumption of electricity by industries may be substantially lower than at present. The aluminum industry was established in the Northwest because an ample supply of low cost electrical power was created. Less than 5 years ago, power was sold to aluminum companies for less than 3 mills. In fiscal 1983, the average power price was 22.2 mills. Existing aluminum potlines could consume up to 3000 average MW given the right economic incentives. However, other than the fact these potlines are in place, their present location offers no economic advantages over many plants located elsewhere.

Other regions have abundant supplies of inexpensive hydroelectric power. For example, the province of Quebec in Canada can supply 4000 MW of power at a variable cost of 0.2 mills. This low cost power is being offered as an incentive to attract electric intensive industries to the province. The long term implication for the Pacific Northwest is clear. Most, if not all of the current 3000 MW of capacity in aluminum plants

will be retained as incremental swing capacity only. Barring massive growth in some unforeseen sector of the Northwest economy, large blocks of power will be released, adding to the supply of surplus electricity. The means of creating a demand for this future interruptible surplus should be encouraged now.

6.2. DISPLACING FIRM POWER

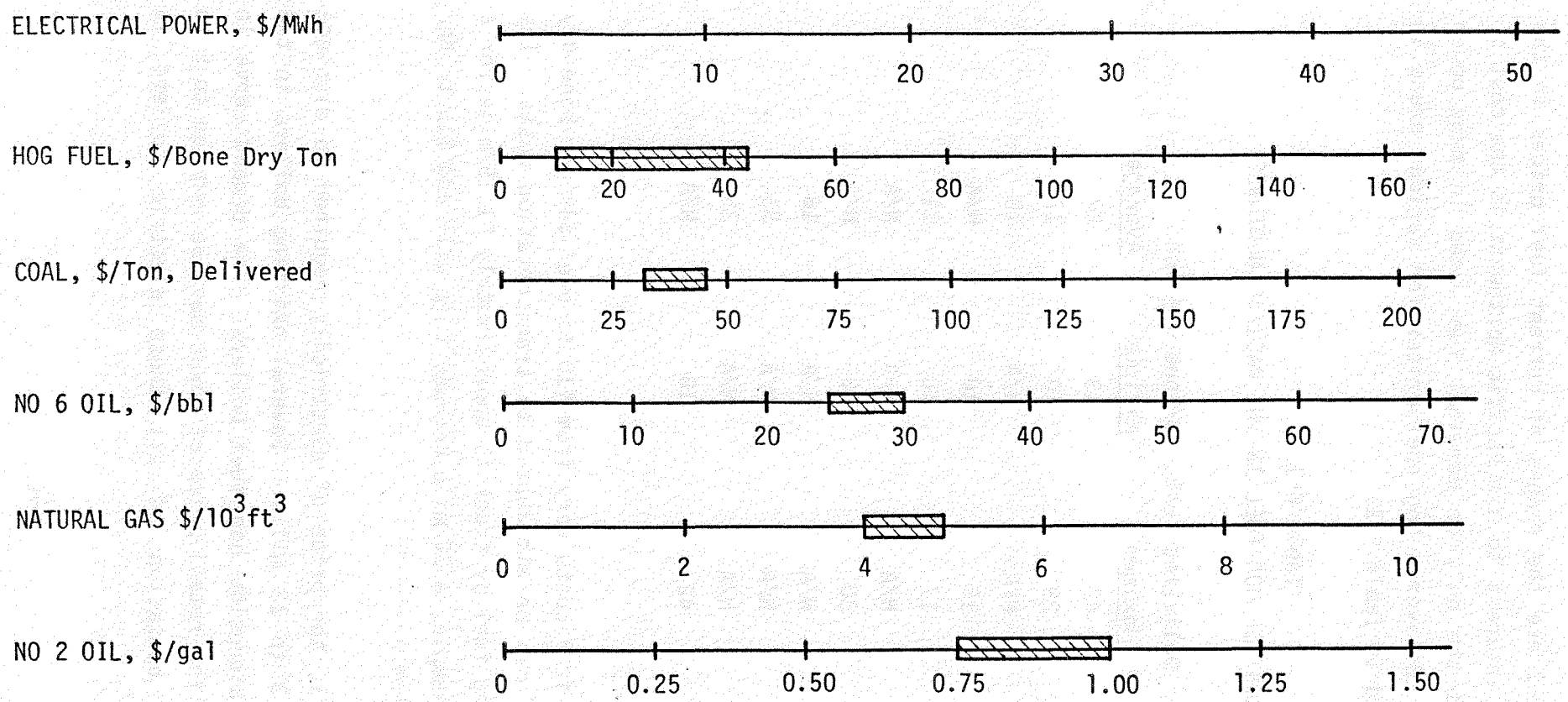
However the region goes about marketing non-firm power, displacing higher priced firm power with cheap non-firm power will not be included. Such a policy would only result in reduced revenues. Generally, the greatest benefit to the region will occur when non-firm is used for loads that have alternate ways of accomplishing their end, e.g, electric boilers, production shifting, etc.

6.3. DISPLACING ALTERNATE FUELS

Existing Electrical Boilers

Figure 5-1 shows that up to 245 MW of existing electric boiler capacity can be used to displace other fuels if the retail price of non-firm power is low enough. The actual displacement price is site specific and is a function of the alternative fuel price, boiler characteristics and other factors affecting boiler operating costs.

The displacement price can vary widely, depending particularly on the delivered cost of the alternative fuel, its heating value and the boiler efficiency. Figure 6-1 illustrates this. In this figure the equivalent costs of steam generated in boilers fired with various fuels, including electricity, are compared. It shows what the price of non-firm power must be to displace more expensive fuels assuming certain higher heating values and boiler efficiencies. For example, to back out No. 6 oil costing $30/bbl requires that the retail price for power be less than $19/MWh (19 mills per kWh).



Fuel	High Heating Value	Steam Boiler Efficiency
ELECTRICITY	3413 Btu/kwh	98%
HOG FUEL	8500 Btu/Dry lb	70%
COAL	10,000 Btu/lb as delivered	75%
NO 6 OIL	6.3×10^6 Btu/bbl	80%
NATURAL GAS	1000 Btu/ft^3	75%
NO 2 OIL	140,000 Btu/gal	80%

Figure 6-1. Comparative cost of fuels used for steam generation by industrial plants - July 1984
Source: EKONO

EKONO

Also shown in Figure 6-1 are the ranges of current fuel prices in the region. Of particular interest to the Pacific Northwest is the cost of hog fuel. Hog fuel is the only or marginal fuel used in many power plants in the region. Delivered hog fuel prices for various areas in the region are presented in Table 6-1.

Table 6-1

THE DELIVERED COST OF HOG FUEL IN THE PACIFIC NORTHWEST

	Delivered Cost, $/Bone Dry Ton		
Area	Maximum	Minimum	Average
Columbia River	42	13	28
Puget Sound	29	10	17
Washington Coast	N/A	N/A	10
Oregon Coast	15	10	N/A
Willamette Valley	17	10	14
Southern Oregon	N/A	N/A	N/A
East Wash/North Idaho	30	20	N/A
South Idaho	N/A	N/A	16
West. Montana	N/A	N/A	33
East Oregon	N/A	N/A	15
Region	42	10	N/A

As is shown above, hog fuel costs vary from $10 to over $40 per bone dry ton. This wide range can be attributed to transportation costs. The cost of transporting hog fuel by truck is approximately $1.15/mile for a 10 unit load. As an example, a 50 mile one-way trip will add $15 to the cost of each bone dry ton.

Referring to Figure 6-1, the price of electricity required to displace hog fuel ranges from 3 to 12 mills. Several existing boilers in the region are installed alongside hog fuel boilers. The demand curve in Figure 5-1 shows that the retail price of power must be reduced to 5 to 6 mills before the operation of all those electric boilers is economical.

Although electricity price is the major factor determining whether or not a standby electric boiler is operated, certain minimum availability requirements must also be satisfied at each of the individual boiler installations. In some cases, high costs are assigned to de-mothballing a standby electric boiler. Even if appropriate power prices are offered, much of the existing boiler capacity indicated in Figure 5-1 will remain unutilized unless the boiler operators are reasonably assured the power will be available continuously for at least a month (730 continuous hours/year or longer).

Non-firm power is, by definition, interruptible. But the usual one-hour basis for interruptibility is not acceptable to electric boiler operators - no one wants to operate a boiler on a hour-to-hour basis. However, experience has shown that consumers of non-firm power are not cut off after only one hour of service. Working arrangements between customers and utilities have been made whereby the utility acts as a buffer, extending the period of availability even if the supply of non-firm power is curtailed on short notice by the BPA.

The results of this survey indicated that the minimum availability requirement for non-firm power to justify operation of electric boilers is 8 hours daily over an extended period (weeks or months). However, when operating in this mode, the electric boiler would always consume some power, since it must be maintained in a warm standy (minimum load) condition to allow full-scale operation on short notice. Most survey respondants preferred operating on a continuous, rather than a cyclical (day/night for example) basis.

Questions of systems stability aside*, interruptible power has been historically supplied to customers (DSI's for example) over periods of a month or longer. The sale of non-firm power on a truly hour-by-hour basis is rare. While consumers of non-firm power may understand that it is subject to interruptibility, they know that in reality it is available for longer periods.

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* No one to EKONO's knowledge objects to load shedding with little warning to protect the regions' generating and distribution system.

New Electric Boilers

For most future electric boiler installations, the savings achieved by displacing alternate fuels must be great enough to allow recovery of the capital investment within 2 years, although the payback times may be extended in some cases. This issue is discussed in Section 5-2. The demand curves in Figure 5-2 are a function of three factors:

1. The savings achieved by backing out the more expensive fuel.
2. The guaranteed availability of the non-firm power.
3. The criteria used to justify the investment for a new electric boiler.

The major question concerns the assignment or assumption of capital risk. Should the customer or the utility make the investment, or should it be shared between the two? When the purchase and installation of the boiler is the responsibility of the customer, it is his criteria that is used to justify the capital. And generally, this criteria tends to be more stringent than that for the serving utility. A public utility, for example, does not have to consider the effects of taxation. Thus, in certain instances, the utility has offered to assume the capital risk.

At least two utilities in the BPA service area are considering the purchase of electric boilers on behalf of specific customers to allow utilization of surplus power. Both of these utilities have their own generating capabiltity. Both would sell steam rather than power to the customer. Other utilities, dependent on the BPA for power have been involved in electric boiler projects to the extent of attempting to procure guarantees concerning price and availability of surplus power on behalf of their customers. Those projects have gone nowhere, since BPA has been unable or unwilling to provide the minimum required guarantees.

Other utilities outside the region have successfully tried similar concepts. The Hydro Quebec, Otter Tail Power Company and Minnkota Power Cooperative programs are prime examples. All three of the programs have the following in common:

1. The utility has taken most or all of the capital risk.
2. Power prices are competitive with a more expensive marginal fuel.
3. The power, while interruptible, is available for many hours annually.

Hydro Quebec. This government owned utility has vast hydroelectric resources. Unlike the BPA, they are looking at years of surplus power availability. And this in light of the fact that they have not yet exploited all of the hydro potential to generate power. Hydro Quebec is agressively marketing their abundant surplus energy in order to attract new industries (particularly aluminum and electrochemical) and to obtain additional revenues. Promoting the use of industrial electric boilers is one facet of their secondary energy program.

As briefly described in Appendix D, Hydro Quebec's idea is to promote the installation of electric boilers by actually subsidizing them. The salient points of the program are as follows:

a) Hydro Quebec subsidizes up to $30 per kW for the boiler plus 70% up to $35 per kW for the cost of switchgear, substation, etc.
b) Hydro Quebec charges for energy at 90% the price of the fuel backed out. Typically this is No. 6 oil.
c) The boiler owners must guarantee operating hours per year (usually 5000 or more) and kWh per year, both for a period of four years.

Otter Tail Power Company. This private utility headquartered in Fergus Falls, Minnesota offers a five year program to industrial steam users larger than 10 MW to back out No. 6 oil. Power is sold to the steam consumer on an interruptible basis: 1 hour or longer notice and about 400-450 interruption hours per year. Details of the program can be found in Appendix E.

The main point is that the utility, through a wholly owned subsidiary, Otter Tail Management Corporation, has taken all the capital risk in return for the steam user paying for the electrical energy at a price competitive with No. 6 oil. In addition, the steam user pays a monthly rental fee and a charge for fixed facilities, i.e., transformers, etc. In this way the boiler itself becomes non-utility properly and thus not part of the rate base. A certain fraction of the other equipment not covered by the facility change becomes part of the utility's rate base to be amortized in 25-30 years.

Otter Tail is also in the process of developing a new Dual Fuel Marketing Program that would encompass all customer classes, even residential. Industrial customers down to 1 MW would be included.

Minnkota Power Cooperative. This utility is a power generation and transmission cooperative serving the eastern North Dakota and northwestern Minnesota region. In their program, illustrated by the two contracts in Appendix E, Minnkota sells heat as steam or hot water to the consumer. The rates charged the consumer are designed to compete with No. 6 oil and to amortize the cost of the facility, which remains the property of Minnkota. Steam or hot water can be interrupted, but if such interruption is excessive the consumer is reimbursed for his alternative fuel costs.

Key points in the two contracts are:

Customer	USAF	Food Processor
Heat Sold	400°F Water	125 psig Steam
Facility Owner	Minnkota	Minnkota
Operator	USAF	Food Processor
Interruptibility	800 hours/year; 2 hours notice; Consumer reimbursed for excess costs	400 hours/year maximum; 200 hours/year 3 year average; consumer reimbursed for excess costs; 1 hour notice
Length of Contract	8 years	8 years

6.4. NON-BOILER APPLICATIONS

As discussed in Section 5.3 the potential demand for non-firm power in equipment, processes, etc. and in production shifting is not great. Assuming an attractive price for non-firm power, these applications also require that the power be reasonably available and if capital is required, an adequate return. An added requirement for increasing or shifting production is a good market for the end products.

6.5. DISPLACING ELECTRIC GENERATION

Figure 5-3 in Section 5.4 shows that lowering retail non-firm power prices to a level of 4 to 6 mills could result in demand for 170 MW of power, created by backing off generation of electrical power from industrial turbines. In fact, about 50 MW of this self generated power was displaced with non-firm power this year. Backing out self-generated power requires incentives for, and agreement by, both the customer and the utility. Appropriate dispatching clauses must also be considered.

For the case of a cogenerator who sells power to a utility at the avoided cost, the utility may have to pay the customer to back off his turbine and use non-firm power. However, both parties can conceivably benefit from such an arrangement when the non-firm power can be purchased by the utility, effectively displacing higher cost cogenerated power. For example, consider the case where backpressure power is generated using steam from a hog fuel boiler having a thermal efficiency of 65%. Assume the cogenerator purchases power at a cost of 30 mills, while simultaneously selling power at the avoided cost of 50 mills. Also assume that the cost of hog fuel is 5 mills ($25 per bone dry ton). The cost of producing steam heat is therefore 7.7 mills/kWh, and the cogenerator receives a net revenue of 20-7.7 = 12.3 mills/ kWh by selling cogenerated power. To entice the cogenerator to shut down the turbine, the utility would actually have to <u>pay the cogenerator 12.3 mills/kWh to use non-firm power.</u> Simultaneously the utility would buy 7.7 mill power from the BPA. The utility would benefit if it could purchase the non-firm power at a cost less than this.

6.6. OTHER MARKETING SCHEMES

The BPA has been successful in marketing non-firm power in a number of ways. These have included:

- The March 1983 sale to DSI's. Under the terms of this contract, the DSI's bought as much as 780 MW to operate plants which would otherwise have remained idle.
- A sale to 27 utilities in 1983 to support increased irrigation loads.
- A 1983 sale of about 150 average MW to electric boiler owners in various industries.
- The April 1984 sale of approximately 28-30 MW of non-firm power to non-aluminum DSI's in order to increase production.

Another idea being investigated by the BPA is to complement the power required by new plants or expansions that might otherwise exceed the firm 10 MW "new large single load" limitations in the Regional Act. For example, say a new plant requires 13 MW. The new plant would buy 9.99 MW of firm power and 3.01 MW of non-firm power for up to one year. After one year the non-firm power would be curtailed and the plant theoretically could operate totally on firm power.

6.7. NON-FIRM RATES - FIXED OR VARIABLE ?

Throughout this study one question was continually asked. Why can't the usable capacity of existing electric boilers be used to displace alternative fuels? As pointed out above, up to 245 MW of capacity would do so if the retail price of non-firm electricity were low enough.

Is the answer that the price of non-firm power too high? BPA's Non-firm Energy Rate (NF-83) specifies that 7 mill power can be used to displace qualified "end-user alternate fuel sources". A local utility adding one mill for wheeling to this displacement rate, will result in an eight (8) mill retail electricity price. Eight mill power will cause 200 to 220 MW of electric boiler capacity to back out alternative fuels (refer to Figure 5-1). But it hasn't.

Is it that displacement rate power is not available? The Intertie is presently filled to capacity with non-firm power. Furthermore, the BPA is currently offering and selling non-firm power at 3.9 mills via the Western Systems Coordinating Council (WSCC) Energy Broker System using the Energy Broker Rate (EB-83). For example, on June 6, 1984, the BPA sold 3000 MWh (375 MW during an 8-hour period) of interruptible power to PP&L at a wholesale price of 3.9 mills. Why wasn't any of this energy available within the region to back out alternative fuels at a higher rate?

Are the standby electric boiler owners not "qualified" to consume displacement rate power? In trying to answer this question one comes face on with BPA's ambivalence in regards to the marketing of non-firm power. As pointed out above, many of the electric boilers, were they to come on-line, would back out hog fuel. In these cases the BPA has questioned the need for non-firm availability longer than their standard one hour and the cost of steam from hog fuel boilers. They do not believe that some hog fuel boiler owners actually require 7 mill power or less to displace hog fuel. This has put the BPA in the role of making judgments where they have no expertise to do so, i.e., knowing both the operating characteristics of and costs associated with a hog fuel boiler. The fact that many of these electric boilers have not come on-line to displace hog fuel ought to be a prima facie indication that the operators are correct and the BPA is wrong.

While there seems to be no clear answer to any of the questions above, there is a possible solution: non-firm rates and criteria more flexible than those in Schedule NF-83. Certainly it should be possible to design some kind of rate system within the existing body of law which would recognize and consider the costs of alternate fuels at specific sites. Perhaps something similar to the energy broker system could be devised. Let the BPA specify that a certain amount of power will be available for a certain period of time. Let the utilities bid on it and let them "qualify" the end users. They know their market better than the BPA. Perhaps a share-the-savings rate could be devised. In any case move away from fixed non-firm rates and qualifications - they do not reflect reality.

APPENDIX A

Questionnaire and Cover Letter

February 24, 1984

NOTE: Response requested by March 23rd.

Dear :

Attached is a survey to determine industry's potential for using low-cost interruptible electricity in the northwest. The survey is being conducted by the Northwest Power Planning Council in cooperation with Industrial Customers of Northwest Utilities (ICNU) and other industry groups. Since industry can ultimately benefit from this study, it is important that you complete and return the survey by March 15, 1984. Following is a brief explanation of the purpose of this survey and its importance to northwest industries.

BACKGROUND. The Regional Power Plan emphasizes making the most economic use of the region's surplus electricity. This surplus is available in many years when an abundant runoff allows more power to be generated than is needed to meet the region's firm load. However, the availability of this surplus varies on a daily basis and is therefore "non-firm."

Typically this low-cost power has been sold to California. However, in response to the Plan, the Council is looking for new uses for this power within the northwest. Your response to this survey is critical in determining to what extent industries in the northwest could put this power to use if it were made available.

FOCUS OF SURVEY. The Council is looking for new uses of this interruptible power, not for ways it could be substituted for existing electrical firm loads. For instance, much of the survey focuses on industry's use of electric boilers, since these have great potential for using the low-cost interruptible power. Most companies with electric boilers are not using them because most have other boilers that are currently using less expensive fuels. The region could offer low-cost interruptible electricity through local utilities for use in these existing electric boilers, benefiting the region, the industrial consumer, and yet not altering the region's firm electrical loads.

MAR 22 1984

PURPOSE OF SURVEY. The Council wants to determine what industry needs — in terms of price and availability of this non-firm power — to put idle electric boilers to use or to justify investing in new electric boilers. The Council is also interested in learning whether some industries could increase their northwest production by taking advantage of low-cost interruptible rates, possibly shifting production from other areas of the country.

PROJECTIONS FOR INTERRUPTIBLE POWER. The availability of non-firm power is difficult to predict over the long-term since it chiefly depends on the amount of water runoff. However, the Council staff has looked at 102 years of historical records to provide you with a rough idea of the power that might be available. They have estimated the percentage of time during each month that at least 1500 MW of non-firm power would be available in a price range of 7-9 mills, as follows:

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.
% of time with 1500 MW @ 7-9 mills	5-10%	15-20%	35-45%	30-50%	40-45%	40-55%	40-50%

The lower percentage availability represents changed conditions either in sharply higher near term firm loads or a 1,000 MW expansion in intertie capacity. The higher percentage availability represents current conditions.

PLEASE RESPOND. Every effort has been made to structure this survey to make it as concise as possible, and yet enable all types of industries to respond. The survey was developed by the Council's consultant, Charles Rivers Assoc., in close cooperation with the Council staff, ICNU, the Northwest Pulp and Paper Association, and the Northwest Food Processors.

Please complete the survey as thoroughly as possible. Please return the survey by March 23rd. The first page of the survey will be removed and coded to the remainder of the survey and will be kept by ICNU. CRA will summarize the narrative responses. All completed surveys will be returned to ICNU. All information will be treated confidentially and will only be used in an aggregate or melded fashion.

Also attached is a brief explanation of ICNU and its membership.

Thank you for your cooperation.

Sincerely,

Ken Canon

KC:bab

Enclosures

Charles
River
Associates

CRA No. 786

QUESTIONNAIRE

TO DETERMINE THE POTENTIAL FOR THE USE OF NON-FIRM POWER AND ENERGY IN THE INDUSTRIAL PLANTS OF THE PACIFIC NORTHWEST

Survey being carried out for the Northwest Power Planning Council by:

Charles River Associates
200 Clarendon Street
Boston, MA 02050

Please send responses to:

Kenneth D. Cannon, Director
Industrial Customers of Northwest Utilities
700 N.E. Multnomah, Suite 1200
Portland, OR 97232

CRA

Company: _____ Date: _____

Plant: _____ Products: _____

address: _____ Phone: _____

Respondent: _____ Title: _____

Hog fuel available? (yes or no)_____ Name of electric utility supplier?

_____

1) Plant Operating Schedules: (Days per week and shifts per day)

Jan.	Feb.	Mar.	Apr.	May	Jun.
d___s___	d___s___	d___s___	d___s___	d___s___	d___s___

Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
d___s___	d___s___	d___s___	d___s___	d___s___	d___s___

2) Inventory of electric boilers greater than 1 MW and large boilers fired by other fuels. The purpose of the question is to identify equipment that electric boilers might displace to serve a portion of the plant's steam load.

Type 1: No.____, Size:_____, Main fuel:_____, Pressure:_____

Capacity utilization - March to July:_____

Type 2: No.____, Size:_____, Main fuel:_____, Pressure:_____

Capacity utilization - March to July:_____

Type 3: No.____, Size:_____, Main fuel:_____, Pressure:_____

Capacity utilization - March to July:_____

Type 4: No.____, Size:_____, Main fuel:_____, Pressure:_____

Capacity utilization - March to July:_____

3) Questions pertaining to any electric boiler now in place.

Size of unit:_____(mw), Pressure_____, Currently operational?_____

Typical capacity utilization when operating?_____

What are the most important influences on the decision to operate the electric boiler? What would electricity rates have to be? How important are alternative fuel prices, the ability of the electric boiler to respond to steam load shifts, the reliability of the electric boiler and any other factors that are important to the decision to operate the unit, particularly when non-firm energy might be available in the spring and early summer?

3) continued

4) New boiler purchases (Either electric or othert fuels)

a) Will any new boilers be purchased in the next several years?

Year:_____Size:_____, Main fuel:_____, Pressure:_____

Capacity utilization - March to July:_____

b) Is an electric boiler a realistic option to meet this increase in steam load? _____ Why or why not?_____

_____

_____

_____

_____

_____

_____

c) What kind of electricity rates and other conditions would lead you to purchase an electric boiler to take advantage of low cost, non-firm electricity that may often be available in the spring and early summer?

Approximate size of unit?_____(mw). Rates and other conditions that will have to prevail before an electric boiler would be purchased?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

4) continued

5) Cogeneration backout

a) Does your plant generate electricity for its own use or for sale to others?

size of unit?_____ Principal fuel _____

Capacity utilization of unit from March to July?_____

Percentage of generation used in the plant from March to July?_____

Percentage of generation sold to a utility from March to July?_____

b) Would your plant "back out" cogenerated electricity in the spring and early summer if low cost non-firm electricity is available?

How much back out?_____

Under what rates and other circumstances?_____

5) continued

6) Other potential uses of non-firm electricity.

a) Are there any other classes of plant equipment (eg. furnaces, dryers, refrigeration units) in your plant that might be convertible to non-firm electricity in the March to July water run-off period, if electricity rates are favorable?

Types, sizes and typical capacity utilization of such equipment in the spring and early summer?

b) What factors would lead you to use non-firm electricity in these classes of equipment? What would electricity rates have to be? How important are alternative fuel prices, the effect of electricity use on the materials being processed in such equipment, the investments necessary to make such a shift to electricity and any other factors that are important in determining the potential use for electricity in such equipment when non-firm electricity is available in the spring and early summer?

6) continued

7) Questions pertaining to the firm's ability and incentive to shift rates of production and energy use between regions of the country.

a) Can the outputs of your plant(s) in the Northwest displace production from plants operated by your firm in other parts of the country?

b) Would lower electricity rates from March to July provide any incentive to increase the rates of production in your plant(s) in the Pacific Northwest and to lower these rates in plants in other regions?

c) What electricity rates and availability guarantees would lead you to undertake such inter-regional production shifts and how much additional non-firm electricity would you utilize in your Pacific Northwest plant(s) in such circumstances?

7) continued

APPENDIX B

Survey Results - Tables

SURVEY RESULTS - TABLES

The following tables summarize the results of the survey to determine the demand for non-firm electrical power in Pacific Northwest manufacturing industries. Data is included from both those companies who answered the questionnaire (respondants) and those companies that did not return the questionnaire and were contacted directly by EKONO (non-respondants). In many cases, because of ambiguities in the returned questionnaire, respondants were also directly contacted.

The tables are grouped by standard industrial classifications (SIC). These are:

- SIC 20 - Food and Kindred Products
- SIC 24 - Lumber and Wood Products
- SIC 26 - Paper and Allied Products
- SIC 28 - Chemicals and Allied Products
- SIC 29 - Petroleum Refining and Related Industries
- SIC 33 - Primary Metal Industries (also includes SIC 34, Fabricated Metal Products)

The last grouping, labelled "O", includes SIC 27 - Printing, Publishing; SIC 32 - Stone, Clay, Class and Concrete; SIC 35 - Machinery; SIC 36 - Electrical and Electronic Machinery; SIC 37 - Transportation Equipment; and SIC 39 - Miscellaneous Manufacturing.

Each group can have up to four tables:

1. Existing Boiler Data
2. Future Boiler Data
3. Production Shifting and Non-Boiler Processes
4. Generation of Electricity

To maintain confidentiality, each plant site is given a number preceded by the letter R, for those responding to questionnaire or by the letter N, for those who didn't. Other abbreviations, nomenclature, etc. used in the tables are explained as follows:

MW	Boiler steam capacity in megewatts (thermal). For example, under the heading MW, 3 x 2 should be read 3 boilers of 2 MW capacity.
Fuel	B = No. 6 oil (Bunker C); D = No. 2 oil (Diesel); G = Natural Gas; P = Propane; C = Coal; H = Hog Fuel; E = Electricity; H_2 = Hydrogen; O = Other
Press	Steam pressure as psig
Cap. Util.	Boiler capacity utilization from March to July
Year	Year in which a new boiler will be started up
Type Gen.	Type of electrical generator: C = Condensing; BP = Back-pressure; Extraction/Condensing = E/C; E/B = Extraction/ Backpressure; H = Hydroelectric; GT = Gas Turbine; GT/CC = Gas Turbine/Combined Cycle
MWe	Megawatts electrical generator capacity.

Table 20-1

EXISTING BOILER DATA

for

MAJOR GROUP 20 - FOOD AND KINDRED PRODUCTS

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
R 1	3 x 2	G	-	85 + %	Not Applicable
R 2	19	G	125	70-85%	Not Applicable
R 2	2 x 4	B	125	90%	Not Applicable
R 3	15	G	250	60%	Not Applicable
R 4	9	B	250	75%	Not Applicable
R 4	9	G	250	10%	Not Applicable
R 4	2 x 12	G	-	50-60%	Not Applicable
[illegible]	2 x 4	G	-	50-60%	Not Applicable
R 4	2 x 10	G	-	50-60%	Not Applicable
R 5	18	E	180	55-60%	18 mills backs out fossil fuels
R 5	2.5	G,B,O	180	-	Not Applicable
R 5	2	G,B,O	180	65-70%	Not Applicable
R 6	15	G	290	65%	Not Applicable
R 6	30	G	290	0%	Not Applicable
R 7	2 x 15	G	125	40%	Not Applicable
R 8	7	G	135	30%	Not Applicable
R 8	6	G	135	20%	Not Applicable
R 8	3.5	G	135	0%	Not Applicable

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Table 20-1 (Continued)

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
R 8	3.5	G	135	0%	Not Applicable
R 9	1	G	60	-	Not Applicable
R10	2 x 10	G	300	50-60%	Not Applicable
R11	2 x 6	B	200	100%	Not Applicable
R12	2 x 24	G	260	80%	Not Applicable
R12	18	G	260	40%	Not Applicable
R13	6	G	260	0%	Not Applicable
R13	15	G	260	10%	Not Applicable
R13	2 x 19	G	260	70%	Not Applicable
R14	2 x 36	G	260	60%	Not Applicable
R15	2 x 8	G	260	60%	Not Applicable
R16	24	E	300	75%	Operated continuously; no alternative
R16	4 x 1.5	E	175	60%	Operated continuously; no alternative
R16	6	E	300	25%	Operated continuously; no alternative
R16	16	E	300	?	Operated continuously; no alternative
R17	36	E	350	70%	Elect. price is presently low enough to back out fossil fuels
R17	25	B	300	60%	Not Applicable
R17	20	B	300	20%	Not Applicable
R18	20	G	350	60%	Not Applicable
R19	14	G	300	65%	Not Applicable
R20	6	G	150	80%	Not Applicable

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Table 20-1 (Continued)

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
R20	11	G	250	70%	Not Applicable
R20	10	G	250	75%	Not Applicable
R21	4	G	100	50%	Not Applicable
R21	9	G	250	60%	Not Applicable
R21	18	G	300	100%	Not Applicable
R22	6	G	300	50%	Not Applicable
R23	-	H	-	0%	Note: Plant has 2 unused boilers that could be rebuilt
R24	1.5	G	75	-	Not Applicable
N 1	2 x 18	G,B	600	30-40%	Not Applicable
N 1	37	G,B	600	30-40%	Not Applicable
N 6	7 x 6	O,G	125	65-70%	Not Applicable
N18	1.5	G	-	80%	Not Applicable
N23	18	E	100	90%	8 mills presently backs out gas
N24	2 x 22	G	75	80%	Not Applicable
N25	2 x ?	G	75	70% (est.)	Note: Boiler size estimated @ 20 MW
N27	15-24	G,B	-	80% (est.)	Not Applicable
N28	24	H,C	110	80% (est.)	Not Applicable
N29	30	G	310	100%	Not applicable (recently sold two electric boilers)
N29	12	G	310	Swings	Not applicable (recently sold two electric boilers)
N30	30	G	250	80%	Not applicable (recently sold two electric boilers)

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Table 20-1 (Continued)

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
N30	10	G	250	Swing	Not Applicable
N31	10	G,B	-	100%	Not Applicable
N32	2 x 8	G	-	90%	Not Applicable
N33	3	G,B	225	10-20%	Not Applicable
N33	7	G,B	225	10-20%	Not Applicable
N33	17	G,B	225	80-85%	Not Applicable
N42	17	A,B	-	50%	Not Applicable
N43	4 x 30	C	400	35-40%	Not Applicable

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Table 20-2

FUTURE BOILER DATA

for

MAJOR GROUP 20 - FOOD AND KINDRED PRODUCTS

Plant No.	Year	Boiler Data MW	Fuel	Press	Cap.Util.	Conditions/Constraints for Purchasing Electric Boilers
R 1	-	6	E	-	80%	3.7 mill power to achieve 2 year payback before taxes
R 2	-	-	-	-	-	Two year payback after taxes.
R 3	-	15	E	250	70%	10 mill power continuously for 6 months/year
R 4	1986	2 or 10	G or E	150	60%	10 mill power for more than one year
R 6	-	15	E	-	65%	10 mill power continuously for 6 months/year
R 8	1985	6	G	150	0%	Two year payback
R11	1984	6	C	250	100%	Dissatisfied with performance of previous elect boiler
R18	-	24	E	-	90%	Discussions underway with utility - feasibility uncertain
R19	-	24	E	-	70-80%	Two year payback (9 mill power, 3330 hours/yr)
R21	1985	18	G,B	300	100%	Not Applicable
R21	-	15-20	E	-	-	20 mill power or less; better water conditions
R23	-	2 x 12	E	-	-	Power equiv to gas for 8700 hours/yr
N 6	-	18	E	-	-	Two year payback required
N32	-	15	E	-	-	Discussions underway with utility - feasibility uncertain
N42	-	8	E	-	-	Two year payback required
N27	-	-	-	-	-	Two to three year payback required
N31	-	-	-	-	-	One year payback before taxes.

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Table 20-3

PRODUCTION SHIFTING AND NON-BOILER PROCESSES

for

MAJOR GROUP 20 - FOOD AND KINDRED PRODUCTS

Plant No.	Production Shifting MW	Constraints/Criteria	Non Boiler Processes, Equipment, Etc. MW	Description/Constraints/Criteria
R 2	0	-	1.5	Install steam drives on compressors, etc. Not probable at 2 years payback after taxes
R 3	0	-	4	Spray dry milk. Back out gas with 10 mill power. Not probable at 1-2 years payback after taxes
R 4	0	-	4.5	Spray dry milk. Back out gas. Will require "firm" power at 10 mill cost. Two year payback
R 6	0	-	1.5	Install steam drives on compressors, no criteria specified
R22	0	Freight costs are 10 times greater than elect. costs ($.04/lb vs. $.004/lb)	0	Inventory costs are $.03/lb, much greater than potential elect. savings
N 1	0	-	8	Steam drives on compressors. Probably not economically feasible
N 6	0	-	1.5	Vapor recompression vs. multiple effect evaporators. This is probable at regular elect. rates
N 6	0	-	8	Fruit dryness; convert from gas to elect; 1-2 year payout required. Probably not feasible.

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Table 20-4

GENERATION OF ELECTRICITY

in

MAJOR GROUP 20 - FOOD AND KINDRED PRODUCTS

Plant No.	Type Gen	MWe	Prime Fuel	Cap. Util.	Pct Sold	Pct Used	Conditions/Circumstances Under Which Cogen. Would be Backed Out
N43	BP	7.5	C	100%	0	All	Not stated
N43	BP	2.8	C	100%	0	All	Not stated
N43	BP	0.5	C	100%	0	All	Not stated
N44	GT/CC	20	G	100%	100%	20%	Break even or better considering a) differential power price of 40 mills b) gas price of 51¢/therm Also requires month-to-month availability and 10 days notice for interruptibility

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Table 24-1

EXISTING BOILER DATA

for

MAJOR GROUP 24 - LUMBER AND WOOD PRODUCTS

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
R 1	6 x 6	H	185	60%	Not Applicable
R 1	15	H	285	75%	Not Applicable
R 1	6	H	185	75%	Not Applicable
R 1	3	G	25	25%	Not Applicable
R 2	18	H	550	50%	Not Applicable
R 3	This respondent has 10-20 boilers ranging in size from 1 to 44 MW with pressures to 600 psig				
R 4	3	H	15	100%	Not Applicable

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Table 24-2

FUTURE BOILER DATA

for

MAJOR GROUP 24 - LUMBER AND WOOD PRODUCTS

Plant No.	Year	Boiler MW	Data Fuel	Press	Cap.Util.	Conditions/Constraints for Purchasing Electric Boilers
R 1	86-94	44/60	H	450/850	75-90%	For 3-5 MW size: 100 operating days/yr; 12 hours on-off notice; 5 day min. continuous availability; power at less than 10 mills maximum payback before taxes 3 years
R 3	1988	44	H	-	-	Elect. boiler not feasible. Minimum after taxes IROR is 20%

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Table 24-3

PRODUCTION SHIFTING AND NON-BOILER PROCESSES

for

MAJOR GROUP 24 - LUMBER AND WOOD PRODUCTS

Plant No.	Production Shifting MW	Constraints/Criteria	MW	Non Boiler Processes, Equipment, Etc. Description/Constraints/Criteria
R 1	?	Employee disruption/ union reaction. Power price less than 10 mills for sustained time	?	Increase production: add 3rd shift during Mar-July; depends heavily on housing starts and other economic factors

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Table 24-4

GENERATION OF ELECTRICITY

in

MAJOR GROUP 24 - LUMBER AND WOOD PRODUCTS

Plant No.	Type Gen	MWe	Prime Fuel	Cap. Util.	Pct Sold	Pct Used	Conditions/Circumstances Under Which Cogen. Would be Backed Out
R 1	C	12	H	0-30%	0	All	Presently not applicable. In future, rates low enough to offset lost revenues from power sales and excess fuel
R 3	C	5	H	100%	0	All	Not Applicable
R 3	BP	10	H	100%	50	50	No incentive to purchase non-firm power
N 1	C	7	H	70%	0	All	Fuel is self generated hog fuel, which is essentially free. If not burned it would have to be disposed of.

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Table 26-1

EXISTING BOILER DATA

for

MAJOR GROUP 26 - PAPER AND ALLIED PRODUCTS

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Conditions/Constraints for Using Electric Boilers
R 1	30	E	175	0%	8-9 mill power, continuously several weeks
	200	H,B,G	900	N/A	
	230	B,G	900	N/A	
R 2	18	E	300	0%	6 mill power, swing boiler
	13	H	220	80-100%	
	45	B,G	300	0	
R 3	7	E	150	100%	16 mill power
	35	H	225	100%	
	60	B	225	55%	
R 4	60	E	150	N/A	10 mill power
	N/A	H,B,G	N/A	N/A	
R 5	30	E	150	N/A	13 mill power
	N/A	H,B,G	N/A	N/A	
R 6	40	G	200	30%	
R 7	65	H,G	360	50%	
	115	G	360	80%	
R 8	75	H	400	60%	
	13	B	400	0%	
R 9	60	H	500	N/A	

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Table 26-1 (Continued)

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
	45	B,G	350	100%	
R10	N/A	H,G	N/A	N/A	
R11	45	B	250	55%	
	60	G	250	0%	
R12	25	B,G,O	250	100%	Use required for sludge disposal
	45	G	600	50%	
	40	B,G	250	0-10%	
R13	160	B,G	600	60%	
R14	140	H	600	70-80%	
	50	G	600	25%	
	16	G	150	10%	
R15	60	H	550	100%	
	45	H,B	550	80-100%	
	120	B	750	0%	
R16	16	H	185	Continuous	
	70	B,G	185	Continuous	
	18	B,G	225	Continuous	
R17	100	B	250	60%	
	60	G	250	20%	
R18	55	H	450	100%	
	60	B,G	275	30%	
R19	90	H	900	100%	

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Table 26-1 (Continued)

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
	50	H	600	100%	
	75	B,G	260	0%	
R20	70	H	180	70%	
	65	B	425	35%	
	25	B	180	30%	
R21	60	H	500	100%	
	45	B	500	10%	
N 1	18	B,G	-	30%	
N 2	-	H	-	-	
N 3	-	H,B	-	-	
N 4	-	G	-	Low	
N 5	70	H	-	High	
	50	B,G	-	Low	
N 6	-	H	-	-	
N 7	-	B,G	-	7 MW	
N 8	95	B	-	0-30%	
N 9	50	H	-	-	
N10	-	H	-	-	

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Table 26-2

FUTURE BOILER DATA

for

MAJOR GROUP 26 - PAPER AND ALLIED PRODUCTS

Plant No.	Year	Boiler MW	Data Fuel	Press	Cap.Util.	Conditions/Constraints for Purchasing Electric Boilers
R 1	86-89	150	H,B,G	1200	High	Electric boiler not suitable for this application
R 2	-	?	-	-	-	Would require firm power at lower price than competitive fuels
R 3	-	20	E	-	-	Electric boiler could be used to displace oil. Two year payback required for total investment, plus 20%
R 6	-	20	E	-	-	Utility has discussed possibility of installing an electric boiler to use spill power. Mill would require guaranteed payback of 3 years for any investment
R 7	-	18	E	-	-	Electric boiler would be used to displace oil. Installation requires 2 year after tax payback
R 8	-	?	-	-	-	Electric boiler could be installed if 6 mill power were available all year.
R 9	-	-	H	850	High	Replacement unit, electric boiler not suitable
	-	50	E	-	-	Electric boiler could to displace oil if power available 4 mos/yr at 4 mills. (Assumes power supply is available)
T10	89	150	L	1250	High	Electric boiler not suitable for this application
R10	-	?	E	-	-	Installation of an electric boiler would be contingent on firm guarantees of power price and availability to allow accurate feasibility analysis

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Table 26-2 (Continued)

Plant No.	Year	Boiler MW	Data Fuel	Press	Cap.Util.	Conditions/Constraints for Purchasing Electric Boilers
R11	-	(30)	E	-	-	Electric boiler installation a possibility if cost is competitive and power is available continuously from March to July
R12		(15)	E	-	-	Electric boiler could be installed to displace gas. Installation would require 2 year after tax payback
R13		30	E	-	-	Electric boiler could be installed to displace gas. Investment would require 5 year payback
R15		15	-	-	100%	Boiler is needed for incremental capacity increase. Guarantee of power price (10 mills) and availability needed for electric boiler installation
R16	-	10	E	-	100%	Power needed continuously for 2 years at 10 mills to justify installation
R17	-	(30)	E	-	-	Electric boiler could be installed to displace oil
R18	-	(15)	E	-	-	Electric boiler could be installed to displace gas/oil, although they have not given it serious consideration. High cost of transmission facilities makes project unattractive
N 1	-	6	E	-	-	Electric boiler could be used to replace oil if investment paid back in 6 months
N 3	-	?	E	-	-	Electric boiler installation was evaluated and determined to be not feasibile

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Table 26-2 (Continued)

Plant No.	Year	Boiler MW	Data Fuel	Press	Cap.Util.	Conditions/Constraints for Purchasing Electric Boilers
N 5	-	15-20	E	-	-	Electric boiler could be used to displace oil boiler during Spring. Feasibility must be evaluated
N 6	-	7	E	-	-	Electric boiler might be installed to displace oil or gas if after tax return on investment were 25%

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Table 26-3

PRODUCTION SHIFTING AND NON-BOILER PROCESSES

for

MAJOR GROUP 26 - PAPER ALLIED PRODUCTS

Plant No.	Production Shifting MW	Production Shifting Constraints/Criteria	Non Boiler Processes, Equipment, Etc. MW	Non Boiler Processes, Equipment, Etc. Description/Constraints/Criteria
R 7	0	-	N/A	Paper machine dryer hoods. Power costs less than 6 mills. Economic and technical feasibility would have to be established
R10		-	2-3	Numerous small mechanical drives. Capital cost estimates and knowledge of power availability needed for economic evaluation
R12	0	-	N/A	Direct heating of air and water. Power cost 15 mills or less. Rates would have to allow payback of capital costs.
R13	0	-	5	Pulp dryer air heaters. Investment paid back in 5 years
R16	8	Production in Northwest maximized when power cost is 10 mills		Not Applicable
R18	0	-	1-2	Paper drying equipment. Installation might be justified by 10 mill power for 4 mos/yr. This is a unique installation which might run on firm power once installed.

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Table 26-4

GENERATION OF ELECTRICITY

in

MAJOR GROUP 26 - PAPER AND ALLIED PRODUCTS

Plant No.	Type Gen	MWe	Prime Fuel	Cap. Util.	Pct Sold	Pct Used	Conditions/Circumstances Under Which Cogen. Would be Backed Out
R 1	B,E,C	45-50	H	-	-	-	Cost of generation vs. purchased power cost, subject to utility contract restrictions (e.g. demand charges). Also, continuous operation required.
R 3	H	(20)	W	-	-	-	Hydroelectric power, availability dependent on stream flow
R 4	B,E	(60)	H	-	-	-	Power generation can be "backed out" if displacement rate power available
R 5	B,C	(12)	H,B	-	-	-	Power generation depends on utility's needs. Not normally needed during Spring
R 7	B,E,C	7	H,B,G	90	0	100	2 MW backed out if purchased power is available at less than 19 mills
R 8	B,C	7	H	26	0	100	1 MW backed out if purchased power is available at less than 6 mills
R10	B	>31	H	90	0	100	22 MW backed out at power cost of 10 mills. Power will be sold to utility, and approval by P.U.C. required to "back-out"
R14	N/A	10	H	65	0	100	N/A
R15	B	3	H	0	0	0	Turbines old, not used

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Table 26-4 (Continued)

Plant No.	Type Gen	MWe	Prime Fuel	Cap. Util.	Pct Sold	Pct Used	Conditions/Circumstances Under Which Cogen. Would be Backed Out
R19	E,C	40	H	60	0	100	Up to 15 MW might be "backed off" if power were available at spill rate or below
R21	N/A	4	H	100	0	100	Not possible to "back-off"
N 2	-	(45)	-	-	-	-	Turbine may be backed off when output not needed by utility
N 5	W	-	-	-	-	-	Hydropower available only during Spring
N 9	B/C	(15)	H	-	-	-	Turbines used only during periods of power shortages

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Table 28-1

EXISTING BOILER DATA

for

MAJOR GROUP 28- CHEMICALS AND ALLIED PRODUCTS

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
R 1	20	G,B	150	85%	Not Applicable
R 1	18	G,B	150	0%	Not Applicable
R 1	29	G,B	150	25%	Not Applicable
R 2	3	G	150	75%	Not Applicable
R 2	5	G	150	40%	Not Applicable
R 3	1	G	125	100%	Not Applicable
R 5	15	G	150	26%	Not Applicable
R 6	10	G	350	50%	Not Applicable
R 7	16	G	200	25%	Not Applicable
R 7	3	G	200	0%	Not Applicable
R11	10	G	105	15%	Not Applicable
R11	10	G	105	80%	Not Applicable
R11	5	G	105	50%	Not Applicable
R12	16	E,G,B	N/A	90%	13.5 mill power presently backs out oil and gas
R12	3 x 10	G,B,O	150	70%	Not Applicable
R13	5	H_2	100	40%	Not Applicable
R13	6	G	100	40%	Not Applicable
N 1	2 x 27	B,G,H_2	190	40-45%	Not Applicable
N 1	1 x 21	B,G,H_2	190	40-45%	Not Applicable

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Table 28-1 (Continued)

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
N 3	6	H_2	130	40-50%	Not Applicable
N 3	6	G	130	20%	Not Applicable
N10	2 x 2	G	90	80-100%	Not Applicable
N11	15	G,B	200	50%	Not Applicable
N12	12	G,B	300	45-50%	Not Applicable

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Table 28-2

FUTURE BOILER DATA

for

MAJOR GROUP 28- CHEMICALS AND ALLIED PRODUCTS

Plant No.	Year	Boiler MW	Data Fuel	Press	Cap.Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
R 1	-	20-45	E	150	-	Minimum IROR's: 30% for discretionay capital and 20% for long term, moderate risk capital. 5 mill power for 20 MW size is probably not feasible; 45 MW size might achieve economic result
R 2	-	0	-	-	-	Payback: 1-2 years before taxes.
R11	-	5	E	105	-	Max. elect. cost of 4 mills; min availability Jan-July or 50%
R12	-	10	E	150	50-70%	Max. payback depends on perceived risk: low risk 2½-3 years aft taxes; highrisk 1 year or less
R13	-	5	E	100	-	Same as R11.
N 1	1986	24	G or E	190	90%	Option is to buy steam over-the-fence from hog fired co-gen un Contract will call for min. annual purchase. Economic hurdle 28-32% ROI after taxes.
N11	N/A	0	N/A	N/A	N/A	30% IROR plus risk assessment
N12	N/A	0	N/A	N/A	N/A	Max. payback 2 years after taxes.

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Table 28-3

PRODUCTION SHIFTING AND NON-BOILER PROCESSES

for

MAJOR GROUP 28- CHEMICALS AND ALLIED PRODUCTS

Plant No.	Production Shifting MW	Constraints/Criteria	MW	Non Boiler Processes, Equipment, Etc. Description/Constraints/Criteria
R 2	0	-	6	Dual (Elect/Steam) drives on compressors probably not feasibility at maximum payback of 1-2 years before taxes.
R 4	?	Elect. price not a consideration	0	N/A
R 5	30	18 mill power including demand charge, 3100 hr/yr minimum availability	0	N/A
R12	0	Freight more than balances lower cost power	0	N/A
N 3	0	Shipping costs negate lower power costs	0	Less than 1 MW available; typical payback for low risk, long lived processes and equipment is 5-10 years after taxes.

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Table 29-1

EXISTING BOILER DATA

for

MAJOR GROUP 29 - PETROLEUM REFINING AND RELATED INDUSTRIES

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Conditions/Constraints for Using Electric Boilers
R 1	N/A	O,B	N/A	N/A	
R 2	40	O	600	10%	
R 3	110	O	650	80%	
	105	O,B	650	55%	
R 5	N/A	O,B,G	N/A	N/A	
N 1	7	E	-	70-80%	Firm power rates now favor operation of electric boiler

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Table 29-2

FUTURE BOILER DATA

for

MAJOR GROUP 29 - PETROLEUM REFINING AND RELATED INDUSTRIES

Plant No.	Year	Boiler MW	Data Fuel	Press	Cap.Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
R 2	86	45	0	600	85	Electric boiler not feasible for this application

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Table 29-4

GENERATION OF ELECTRICITY

in

MAJOR GROUP 29 - PETROLEUM REFINING AND RELATED INDUSTRIES

Plant No.	Type Gen	MWe	Prime Fuel	Cap. Util.	Pct Sold	Pct Used	Conditions/Circumstances Under Which Cogen. Would be Backed Out
R 2	B	20	0	100%	0	100	Power is converted from waste heat, which has no cost and cannot be economically displaced by purchased power.

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Table 33-1

EXISTING BOILER DATA

for

MAJOR GROUP 33 - PRIMARY METAL INDUSTRIES

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Utilization of Elect. Boilers - Conditions/Problems/ Constraints Elect. Rates, Operating Problems, Etc.
R 2	2.5	G,P,D	75	25%	Not Applicable
R 2	4.4	G,P,D	75	50%	Not Applicable
R 2	2.5	G,P	10	-	Not Applicable
R 4	18	G	185	10%	Not Applicable
R 4	18	B,G	185	80%	Not Applicable
R 4	37	G	185	40%	Not Applicable
R 5	2.5	G	125	80%	Not Applicable
R 5	2.5	G	150	60%	Not Applicable
N 1	12	G	125	-	Not Applicable
N 1	7	G	125	-	Not Applicable
N 1	7	G	125	-	Not Applicable
N 2	6	G	-	20%	Not Applicable

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Table 33-2

FUTURE BOILER DATA

for

MAJOR GROUP 33 - PRIMARY METAL INDUSTRIES

Plant No.	Year	Boiler MW	Data Fuel	Press	Cap.Util.	Utilizing Electric Boilers - Conditions/Problems/Constraints Elect. Rates, Operating Problems, Etc.
R 1	1986	5.0	G or E	225	5%	Steam used intermittently all year; maximum two-year payback may preclude purchase of standby elect. boiler
R 4	-	36	G	185	40%	Standby for existing gas fired boiler. Minimum IROR required 20% after taxes: power guaranteed for a minimum continuous period of 30 days/year. Longevity of this plant uncertain
R 5	-	2.5	E	150	60-80%	Would consider for year-round use in place of gas, probably not feasible as standby for seasonal non-firm power
N 1	1985	10	E	125	-	5000 hr min available/yr; 15 mills/kWh are over 5 years; IROR = 13% (minimum IROR normally 20% at this plant)

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Table 33-3

PRODUCTION SHIFTING AND NON-BOILER PROCESSES

for

MAJOR GROUP 33 - PRIMARY METAL INDUSTRIES

Plant No.	Production Shifting MW	Constraints/Criteria	Non Boiler Processes, Equipment, Etc. MW	Description/Constraints/Criteria
R 1	0	No other plants	5	New induction furnace. Would require rates to pay off investment in two years or less. Probably not feasible.
R 2	0	No other plants	8	Increase production in existing are furnaces. Not practical; firm power backed out
R 3	0	No other plants	13	New induction preheater (13 MW). Max. allow. payback before taxes is 1 year. Feasible at power price of 10 mills and 11½ month availability
R 6	0	No other plants	3	New induction furnace. Probably not feasible at indicated power price of 10-20 mills
N 3	0	No other plants	15	Upgrade melting furnace for $2 MM. Savings must pay back capital in 1 year or less before taxes. Probably not feasibility
N 3	0	No other plants	2.5	New induction preheater. Size required not presently available on market
N 4	1-2	Three month lead time and 10 mill power	N/A	N/A
N 7	0	No other plants	1	Increase production. Maximum power price 10 mills or less
N11	0	No other plants	120	If sales allow, increase production to 24 hours/day. Requires 7 mill power, days lead, and 4400 hrs/yr availability.

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Table "O"-1
EXISTING BOILER DATA
for
OTHER INDUSTRIES

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Conditions/Constraints for Using Electric Boilers
R 1	15	E	200	100%	Spill rate power
	110	B,G	200	~20%	
R 2	12	E	150	0%	Spill rate power
	95	B,G	150		
	9	B	150		
	35	B,G	100		
	1	B,G	30	~30%	
	2	B,G	30		
	12	B,G	90		
	1	G,O	15		
R 3	110	B,G	250		
	26	B,G	90	~25%	
	12	B,G	15		
R 4	34	B,G	50	~30%	
R 5	150	B,G	250	~30%	
R 6	8	G	N/A	N/A	
R 7	9	G	N/A	N/A	
	1	E	N/A	N/A	

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Table "O"-1 (Continued)

Plant No.	Boiler Data MW	Fuel	Press	Cap. Util.	Conditions/Constraints for Using Electric Boilers
R 8	N/A	N/A	N/A	N/A	
R 9	1	E	N/A	N/A	
R10	4	G	N/A	N/A	
E11	1	G	N/A	N/A	

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Table "O"-2
FUTURE BOILER DATA
for
OTHER INDUSTRIES

Plant No.	Year	Boiler MW	Data Fuel	Press	Cap.Util.	Conditions/Constraints for Purchasing Electric Boiler
R 1	-	15-20	E	-	50-60%	Electric boiler would displace gas/oil boilers, but would swing (full capacity could not be utilized). Investment requires 2-3 year payback
R 2	-	30-40	E	-	60%	Payback: 1-2 years before taxes.
R 3	-	18	E	-	High	Power available 3-4 mos continuously at a cost of 10 mills. Large boiler would be accommodate (variable steam demand) if paid back in 2-3 years
R6-11	-	<10	E	-	-	Electric boilers could be installed to displace gas if power were available at 5-10 mills

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Table "O"-4
GENERATION OF ELECTRICITY
in
OTHER INDUSTRIES

Plant No.	Type Gen	MWe	Prime Fuel	Cap. Util.	Pct Sold	Pct Used	Conditions/Circumstances Under Which Cogen. Would be Backed Out
R 5	GT/CC	9	G	100%	100	0	Mutually acceptable agreement with utility

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APPENDIX C

Feasibility of New Electric Boiler Installations

FEASIBILITY OF NEW ELECTRIC BOILER INSTALLATIONS

The tables enclosed in this appendix contain the information used to develop the power demand curves for future electric boiler installations (Figure 5-2). A total of 63 sites, which were candidates for future boiler installations, were identified. Each site is identified by a confidential code number. (Note: These code numbers do not correspond in any way to those in Appendix B).

Estimated boiler capacities and installation costs are presented in Table C-1. The costs of boiler and auxiliaries (boiler, feedwater treatment plant, superheater, switchgear, piping, instrumentation, etc.), and transmission facilities (transformer, high voltage breakers, cooling systems, transmission lines, etc.) are differentiated. Investment for either or both groups are assigned to either the customer (C) or the utility (U).

Tables C-2 and C-3 show the expected power demand, alternate fuel price (equivalent steam cost), and the annual revenues required to justify installation of the boilers. Revenue requirements are shown for customers and utilities, depending on investment responsibility or assumption. Also shown in the tables are the incentive power rates needed to encourage boiler installation. Those incentive rates are intended to cover installation costs only, and they do not allow for any net revenue to the utility when the customer assumes investment responsibility. Table C-2 shows the required revenues and incentive rates when power availability is guaranteed 2500 hours/year for 3 consecutive years (CASE A), while Table C-3 gives the same information when guaranteed power is available 6000 hours/year for 2 consecutive years (CASE B).

There were two sets of criteria used to justify the capital investment in new electric boilers, one for entities having a tax liability and the other for entities that do not. For both, two-year and three-year payback periods were used. A marginal tax rate of 50% and a five-year straight-line depreciation schedule were used for tax paying entities.

Thus, for entities paying income taxes the annual savings had to be equal or greater than 50% and 80% of the capital required for three-year and two-year paybacks, respectively.

Similarly, non-taxable entities had to achieve annual savings of 30% and 50% of the capital expended.

As an example, consider the tax paying entity, code 50.

Boiler Installation Costs	
24 MW Boiler (From Figure 3-5)	$ 700,000
Special Feedwater Treatment	100,000
SUBTOTAL	$ 800,000
New Transformer and Auxiliaries	600,000
TOTAL INVESTMENT	$1,400,000

This entity underwrites all capital costs. Thus, for a two-year after taxes payback the annual savings must meet or exceed 80% of $1,400,000 or $1,100,000. The cost of steam from the alternative fuel to be backed out is 20 mills/kWh.

Assuming an average boiler utilization of 19MW (79%):

Case A - Non-firm power available for 2500 hours/yr

$(19MW)(2500\ hours)(20-R_A) = \$1,100,000$

R_A = incentive rate = $-3.2/MWh.

In this case, the incentive rate is negative. The installation of the boiler cannot be justified even if zero cost power were available 2500 hours/year.

Case B - Non-firm power available for 6000 hours/yr

$(19MW)(6000\ hours)(20-R_B) = \$1,100,000$

R_B = incentive rate = $10/MWh.

In this case a retail rate of 10 mills is sufficient to justify the boiler if power were available 6000 hours/year.

Table C-1

NEW ELECTRIC BOILER INSTALLATION COSTS

Code	Capacity, MW	Equipment Description	Installation Cost, $
1	50	Boiler & Auxiliaries	N/A
		Transmission Facilities	1,000,000 (U)
2	10	Boiler & Auxiliaries	N/A
		Transmission Facilities	N/A
3	30	Boiler & Auxiliaries	900,000 (U)
		Transmission Facilities	700,000 (U)
4	30	Boiler & Auxiliaries	800,000 (C)
		Transmission Facilities	1,000,000 (C)
5	15	Boiler & Auxiliaries	600,000 (U)
		Transmission Facilities	1,000,000 (U)
6	18	Boiler & Auxiliaries	650,000 (C)
		Transmission Facilities	N/A
7	30	Boiler & Auxiliaries	1,000,000 (C)
		Transmission Facilities	600,000 (U)
8	20	Boiler & Auxiliaries	1,300,000 (C)
		Transmission Facilities	
9	20	Boiler & Auxiliaries	800,000 (U)
		Transmission Facilities	
10	15	Boiler & Auxiliaries	600,000 (U)
		Transmission Facilities	700,000 (U)
11	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	600,000 (C)
12	20	Boiler & Auxiliaries	700,000 (C)
		Transmission Facilities	600,000 (C)
13	10	Boiler & Auxiliaries	500,000 (C)
		Transmission Facilities	400,000 (C)
14	30	Boiler & Auxiliaries	800,000 (C)
		Transmission Facilities	600,000 (U)

Table C-1 (Continued)

Code	Capacity, MW	Equipment Description	Installation Cost, $
15	10	Boiler & Auxiliaries	500,000 (C)
		Transmission Facilities	400,000 (C)
16	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	600,000 (C)
17	18	Boiler & Auxiliaries Transmission Facilities	600,000 (C)
17	18	Boiler & Auxiliaries Transmission Facilities	1,000,000 (C)
18	30	Boiler & Auxiliaries	700,000 (C)
		Transmission Facilities	700,000 (C)
18	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (C)
19	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (C)
20	10	Boiler & Auxiliaries	500,000 (C)
		Transmission Facilities	400,000 (C)
21	30	Boiler & Auxiliaries	800,000 (C)
		Transmission Facilities	600,000 (C)
21	25	Boiler & Auxiliaries	700,000 (C)
		Transmission Facilities	600,000 (C)
22	15	Boiler & Auxiliaries	500,000 (C)
		Transmission Facilities	400,000 (U)
23	12	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (C)
24	12	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (U)
25	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	600,000 (C)
26	12	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (U)

Table C-1 (Continued)

Code	Capacity, MW	Equipment Description	Installation Cost, $
27	12	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	600,000 (C)
28	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (C)
29	7	Boiler & Auxiliaries	500,000 (C)
		Transmission Facilities	400,000 (C)
30	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (C)
31	50	Boiler & Auxiliaries	1,100,000 (C)
		Transmission Facilities	(C)
32	30	Boiler & Auxiliaries	800,000 (C)
		Transmission Facilities	700,000 (C)
33	50	Boiler & Auxiliaries	1,000,000 (C)
		Transmission Facilities	700,000 (C)
34	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (C)
35	30	Boiler & Auxiliaries	800,000 (U)
		Transmission Facilities	600,000 (U)
36	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (C)
37	30	Boiler & Auxiliaries	800,000 (C)
		Transmission Facilities	800,000 (C)
38	20	Boiler & Auxiliaries	900,000 (C)
		Transmission Facilities	N/A
39	25	Boiler & Auxiliaries	800,000 (C)
		Transmission Facilities	600,000 (C)
40	15	Boiler & Auxiliaries	600,000 (U)
		Transmission Facilities	400,000 (U)

Table C-1 (Continued)

Code	Capacity, MW	Equipment Description	Installation Cost, $
41	12	Boiler & Auxiliaries	500,000 (C)
		Transmission Facilities	500,000 (C)
42	18	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	500,000 (C)
43	6	Boiler & Auxiliaries Transmission Facilities	500,000 (C)
44	35	Boiler & Auxiliaries	900,000 (C)
		Transmission Facilities	300,000 (U)
45	30	Boiler & Auxiliaries	800,000 (C)
		Transmission Facilities	300,000 (C)
46	12	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (U)
47	20	Boiler & Auxiliaries	700,000 (C)
		Transmission Facilities	600,000 (C)
48	5	Boiler & Auxiliaries	500,000 (C)
		Transmission Facilities	200,000 (U)
49	40	Boiler & Auxiliaries	1,200,000 (C)
		Transmission Facilities	600,000 (C)
50	24	Boiler & Auxiliaries	800,000 (C)
		Transmission Facilities	600,000 (C)
51	18	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (C)
52	20	Boiler & Auxiliaries	700,000 (C)
		Transmission Facilities	600,000 (C)
53	5	Boiler & Auxiliaries	600,000 (U)
		Transmission Facilities	N/A
54	7	Boiler & Auxiliaries	500,000 (C)
		Transmission Facilities	200,000 (U)
55	5	Boiler & Auxiliaries	400,000 (C)
		Transmission Facilities	200,000 (U)
56	5	Boiler & Auxiliaries	N/A
		Transmission Facilities	N/A

Table C-1 (Continued)

NEW ELECTRIC BOILER INSTALLATION COSTS

Code	Capacity, MW	Equipment Description	Installation Cost, $
57	5	Boiler & Auxiliaries	N/A
		Transmission Facilities	N/A
58	3	Boiler & Auxiliaries	400,000 (C)
		Transmission Facilities	N/A
59	6	Boiler & Auxiliaries	500,000 (C)
		Transmission Facilities	N/A
60	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (C)
61	15	Boiler & Auxiliaries	600,000 (C)
		Transmission Facilities	400,000 (C)
62	5	Boiler & Auxiliaries	500,000 (U)
		Transmission Facilities	N/A
63	10	Boiler & Auxiliaries	N/A
		Transmission Facilities	N/A

Table C-2

NEW ELECTRIC BOILERS - INCENTIVE POWER RATES - CASE A

Code	Power Use MW	Fuel Cost $/MWh	Revenue Requirement, $/yr Customer	Revenue Requirement, $/yr Utility	Incentive Rate $/MWh
1	50	18	2,000,000	350,000	-
2	10	18	700,000	-	-
3	30	19	-	750,000	9
4	23	20	1,400,000	-	-
5	12	18	-	750,000	-
6	18	20	500,000	-	9
7	30	21	500,000	200,000	11
8	20	18	800,000	-	2
9	15	20	-	400,000	9
10	12	19	-	600,000	-
11	15	20	600,000	-	4
12	13	17	1,000,000	-	-
13	7	20	500,000	-	-
14	15	19	600,000	300,000	-
15	8	17	600,000	-	-
16	12	18	600,000	-	-
17	16	15	200,000	-	10
17	10	15	350,000	-	1
18	18	14	450,000	-	4
18	8	14	350,000	-	-
19	8	15	350,000	-	-
20	8	14	300,000	-	-
21	25	14	500,000	-	6
21	12	14	450,000	-	-
22	10	20	400,000	200,000	-
23	9	18	500,000	-	-

Table C-2 (Continued)

NEW ELECTRIC BOILERS - INCENTIVE POWER RATES - CASE A

Code	Power Use MW	Fuel Cost $/MWh	Revenue Requirement, $/yr Customer	Revenue Requirement, $/yr Utility	Incentive Rate $/MWh
24	10	16	500,000	-	-
25	12	18	600,000	-	-
26	9	18	300,000	200,000	-
27	10	18	600,000	-	-
28	10	20	500,000	-	-
29	4	20	500,000	-	-
30	6	20	500,000	-	-
31	40	19	800,000	-	11
32	25	20	600,000	-	10
33	40	20	800,000	-	12
34	9	20	400,000	-	2
35	22	20	-	700,000	7
36	13	20	800,000	-	-
37	24	20	1,300,000	-	-
38	17	20	800,000	-	-
39	20	20	700,000	-	6
40	13	19	500,000	-	4
41	10	20	1,000,000	-	-
42	9	19	550,000	-	-
43	5	19	250,000	-	2
44	30	20	700,000	100,000	9
45	24	20	900,000	-	5
46	10	22	300,000	150,000	4
47	15	20	650,000	-	3
48	3	20	250,000	70,000	-
49	35	20	1,400,000	-	4

Table C-2 (Continued)

NEW ELECTRIC BOILERS - INCENTIVE POWER RATES - CASE A

Code	Power Use MW	Fuel Cost $/MWh	Revenue Requirement, $/yr Customer	Revenue Requirement, $/yr Utility	Incentive Rate $/MWh
50	19	20	1,100,000	-	-
51	14	19	1,000,000	-	-
52	20	19	900,000	-	1
53	4	15	-	300,000	-
54	5	18	400,000	70,000	-
55	4	18	300,000	70,000	-
56	5	18	200,000	-	2
57	15	18	200,000	-	2
58	3	19	300,000	-	-
59	5	19	400,000	-	-
60	12	18	500,000	-	1
61	10	18	800,000	-	-
62	5	18	-	250,000	-
63	10	20	400,000	-	4

Table C-3

NEW ELECTRIC BOILERS - INCENTIVE POWER RATES - CASE B

Code	Power Use MW	Fuel Cost $/MWh	Revenue Requirement, $/yr Customer	Revenue Requirement, $/yr Utility	Incentive Rate $/MWh
1	50	18	2,000,000	500,000	10
2	10	18	700,000	-	6
3	30	19	-	1,300,000	12
4	23	20	1,400,000	-	10
5	12	18	-	1,300,000	0
6	18	20	500,000	-	15
7	18	21	800,000	300,000	13
8	20	18	800,000	-	11
9	15	20	-	600,000	13
10	12	19	-	1,000,000	5
11	15	20	1,000,000	-	9
12	13	17	1,000,000	-	4
13	7	20	500,000	-	8
14	15	19	600,000	600,000	7
15	8	17	600,000	-	5
16	12	18	600,000	-	10
17	16	15	300,000	-	12
17	10	15	500,000	-	7
18	18	14	700,000	-	8
18	8	14	500,000	-	4
19	8	15	500,000	-	5
20	8	14	450,000	-	4
21	25	14	800,000	-	9
21	12	14	700,000	-	4
22	10	20	400,000	300,000	8
23	9	18	500,000	-	9

Table C-3 (Continued)

NEW ELECTRIC BOILERS - INCENTIVE POWER RATES - CASE B

Code	Power Use MW	Fuel Cost $/MWh	Revenue Requirement, $/yr Customer	Revenue Requirement, $/yr Utility	Incentive Rate $/MWh
24	10	16	500,000	-	8
25	12	18	600,000	-	10
26	9	18	300,000	200,000	9
27	10	18	600,000	-	10
28	10	20	800,000	-	7
29	4	20	500,000	-	0
30	10	20	800,000	-	7
31	40	19	1,400,000	-	13
32	25	20	1,200,000	-	12
33	40	20	1,400,000	-	14
34	9	20	800,000	-	5
35	22	20	-	1,100,000	12
36	13	20	800,000	-	10
37	24	20	1,300,000	-	11
38	17	20	700,000	-	13
39	20	20	1,300,000	-	9
40	13	19	800,000	-	9
41	10	20	1,000,000	-	3
42	12	19	900,000	-	7
43	5	19	250,000	-	11
44	30	20	700,000	150,000	15
45	24	20	900,000	-	14
46	10	22	300,000	200,000	14
47	15	20	650 000	-	13
48	3	20	250,000	100,000	1
49	35	20	1,400,000	-	13

Table C-3 (Continued)

NEW ELECTRIC BOILERS - INCENTIVE POWER RATES - CASE B

Code	Power Use MW	Fuel Cost $/MWh	Revenue Requirement, $/yr Customer	Revenue Requirement, $/yr Utility	Incentive Rate $/MWh
50	19	20	1,100,000	-	10
51	14	19	1,000,000	-	7
52	20	19	900,000	-	12
53	4	15	-	300,000	3
54	5	18	400,000	100,000	1
55	4	18	300,000	100,000	1
56	5	18	200,000	-	11
57	5	18	200,000	-	11
58	3	19	300,000	-	2
59	5	19	400,000	-	6
60	12	18	800,000	-	7
61	10	18	800,000	-	5
62	5	18		400,000	5
63	10	20	600,000	-	10

APPENDIX D

Hydro Quebec's Secondary Energy Program

Continued from page 16

the boiler.

Shortfalls in overall capacity to burn wood refuse are often traceable to a single bottleneck or defect. With a comprehensive test program, bottlenecks can be identified, and estimates provided to increase the wood burning capacity.

In plants which get their wood refuse fuel from many sources, burning efficiency of the material can be a critical factor. Knowledge about how to blend the fuel to maximize burning of wood refuse can mean savings of several thousand dollars per year.

Because the accuracy of tests depends so much on rapid analysis of incoming data, Envirocon employs a mobile combustion and emissions testing laboratory and delivers service on site. Designed by ITT Rayonnier and housed in a 15-metre trailer, the laboratory is one of the most completely equipped facilities of its type in North America, with an equipment inventory that includes continuous gas analysis instrumentation, stripchart recorders and an onboard computer.

Once on site, the unit is parked at a convenient location and a 120-metre cord (heated to keep the temperature of gas samples stable) is run from sampling points at the boiler to the laboratory. Data gathered by the continuous analysis system is continuously displayed on strip chart recorders. Other data is recorded at pre-scheduled intervals on magnetic tape for computer processing.

Working from an on-site laboratory, the test team can check measurements immediately and re-sample if results are ambiguous. Mill managers get to view results as they come in, and can plan adjustments while the data is fresh and the problem still up front in everyone's mind. Typically charts and hard copy summaries are provided before the unit leaves the site.

Would an upgrading of boiler efficiency make a big difference in your mill's operating costs? Although it's impossible to say for sure without testing, there's a good chance that it would—in our experience pulp and paper mills are notoriously inefficient fuel burners.

How big would the savings be? Again you won't know without tests. The evidence we've accumulated over years of boiler studies does allow us to define the possibilities: if your boiler is a 400,000 lb/hr. unit, every one per cent cut you achieve in fossil fuel use (either by running boilers more efficiently or by using more wood refuse) would save you $370,000 a year.

And that is too much to be going up in smoke.

John Trought is vice-president of Envirocon Ltd., Mississauga, Ont.

Energy: GOVERNMENT AID

Incentive program works in Quebec

By Kara Kuryllowicz
Assistant Editor

THE INSTALLATION of approximately 100 electric boilers in Quebec pulp and paper mills has cost Hydro Quebec about $120 million since the inception of its Secondary Energy Program three years ago.

The Quebec government, Hydro Quebec's sole shareholder, began the program with the intention of selling off the company's excess electrical energy.

"Getting rid of excess energy is the only reason Hydro Quebec undertook the program," says Gabriel Ouellet, special project engineer, Hydro Quebec. "But the government knew that if companies were to switch from oil-fired to electric boilers, some sort of incentive would be needed."

Hydro Quebec pays the full cost of the boiler up to $30 per kilowatt and 70 per cent of the costs of the electrical equipment, process control system and installation fees, at up to $35 per kilowatt. The company also signs a four-year contract that entitles it to electrical energy at rates 10 per cent below the current cost of oil.

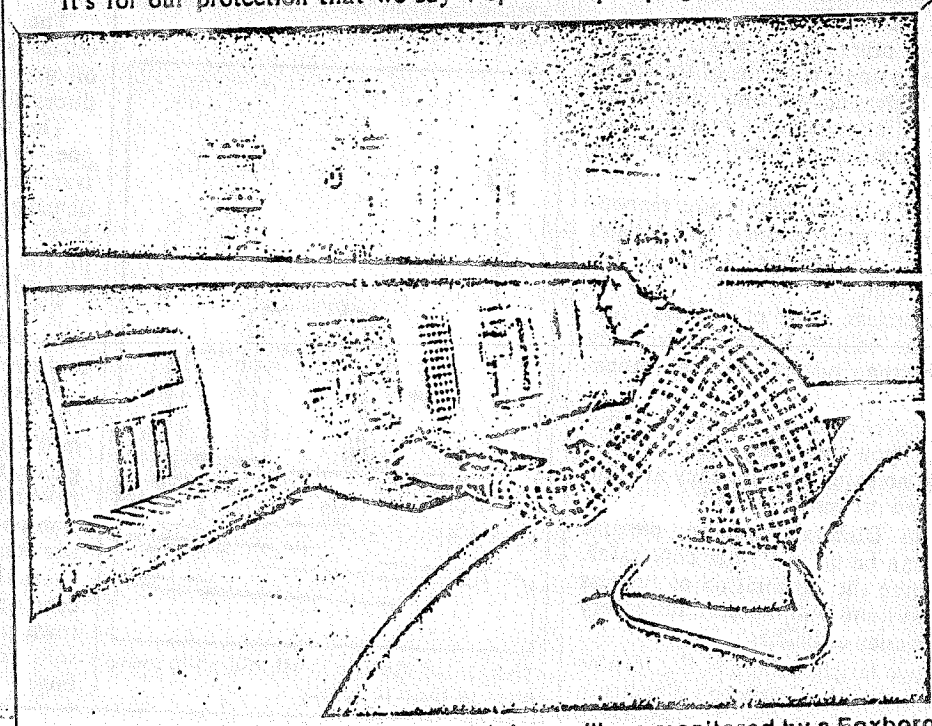
"It's for our protection that we say up to $30 and $35 per kilowat," says Ouellet. "It reminds the customer that we know the prices. We pay for most of it, they pay for 25 to 30 per cent of the electrical part."

Upon signing the four-year contract with Hydro Quebec, a pulp and paper company must estimate the wattage required during its peak periods, then install a boiler. The capacity chosen is the highest that can be used without incurring undue investment costs that could extend the payback period beyond one year. The company then tells Hydro how much energy it expects to use annually.

A company may use more than its allotted energy without being penalized but if less is used, it must still pay for all of the energy contracted for. Therefore when contracting for energy, companies usually request 10 to 30 per cent less than they think they'll need.

It might seem that the government is again fooling with taxpayers' funds. Not so.

Since electricity cannot be stored economically or efficiently, Hydro Quebec's excess energy would simply be lost. Millions of dollars could be spent on pumping stations and reser-



The two large boilers at Rolland's St. Jérôme mill are monitored by a Foxboro Spectrum system.

voirs but it is not practical.

In fact, the program does pay for itself, generally over a nine to 12 month period, when larger installations are involved.

For example, an Acme boiler was recently installed at CIP Inc.'s Matane, Que. mill at a cost of $1.7 million.

"We'll buy about $10 million worth of electricity from Hydro over the four years covered by our contract," says Lambert Bédard, mill manager. "So they get $2.5 million a year from us even though they only paid out $1.5 million."

"We had to make some sort of sacrifice to sell the excess electricity," says Ouellet.

The Secondary Energy Program also inspired the $3.5-million installation of three boilers at Rolland Inc.'s mills in St. Jérôme and Mont Rolland, Que.

The Quebec government contributed $3 million for the two larger boilers installed at St. Jérôme which produce 240,000 lb/hr. of steam and for the smaller Acme boiler at Mont Rolland which produces 54,000 lb/hr. of steam.

"We did it to profit from the electrical plan with Hydro," says Gérard Dufaux, project manager, Rolland Inc. "Our energy costs at both mills will be reduced."

Electrical energy is up to 30 per cent more efficient than oil since it is 97 to 99 per cent efficient while oil is usually 80 to 85 per cent efficient. Oil is considered near its maximum efficiency when at 85 per cent efficiency.

"But from a price point of view, electricity and oil are comparative," says Ouellet. "Gas is normally cheaper than electricity but with this program, electricity is cheaper."

Among other advantages, electric boilers take up three-fifths of the space oil-fired boilers do. Air and noise pollution are eliminated and maintenance costs are reduced by about 90 per cent annually.

Hydro Quebec's clients are responsible for all maintenance and repairs because the equipment officially belongs to them.

Nevertheless, some controversy surrounds the boilers. Some believe they are safer than oil-fired boilers, others do not.

"They are like a big tea kettle," says Bédard, "you just plug them in. But they are no safer because they are still considered pressure vessels."

But in Dufaux's opinion, electric boilers can be up to 95 per cent safer. Most agree the installation of process control systems will increase the safety and efficiency of boilers.

The two larger boilers at St. Jérôme are monitored by Foxboro's Spectrum process control system. It includes a alarm printer, video copier and a microprocessor-based unit control module.

"We could operate it without process control," says Dufaux, "but it must be monitored closely, precisely and around-the-clock which is difficult to do manually. It would be much less efficient and much more hazardous, if it were run by hand."

The government's program which is aimed at large and small industries will officially end in September, so any company wishing to benefit from it must hook up its boilers and sign the contracts shortly. Hydro Quebec recently inaugurated a similar program designed to help schools, hospitals, li-

As a result of the program, Volcano Inc., a manufacturer of boilers based in Ste. Hyacinthe, Que. sold between 75 and 80 boilers in 1983, the largest of which went to the pulp and paper industry. About 25 of those boilers and two-thirds of the megawatts are now in use in pulp and paper mills. Many of the companies that didn't participate in 1983 are expected to do so in 1984.

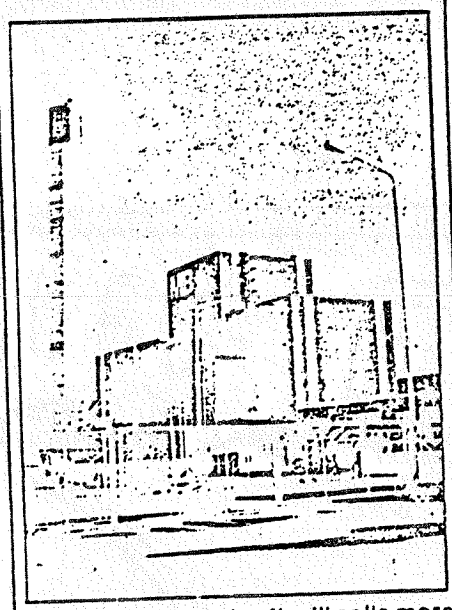
The Ontario and British Columbia hydro companies are also considering incentive programs that will help them sell their excess energy. BC Hydro is loathe to commit itself to major capital expenditures but may give companies that install electric boilers up to a 50 per cent discount on electricity. ■

New Finnish mill is net energy producer

Journal Staff

FINLAND'S NEWEST greenfield kraft pulp mill is not only 95 per cent energy self-sufficient but is also a net producer of electrical energy, supplying the local power company with between 8 MW and 20 MW of surplus electricity annually.

The Oy Metsä-Botnia Ab mill—located in Kaskinen on Finland's west coast—produces 340,000 tpy of bleached softwood and hardwood kraft pulp. It began production in August, 1977. The company is currently building a second large kraft mill at Äänekoski in central Finland. Scheduled for start-up in May, 1985, it should be even more energy efficient than the Kaskinen mill.



The Metsä-Botnia kraft mill sells more energy than it buys.

Ninety per cent of the Kaskinen mill's energy needs are provided by burning black liquor, five per cent from burning bark and the remainder from purchased oil and some peat. Oil is burned only to control load swings.

Weak liquor for the cooking acid is concentrated to 65 per cent solids in a five-stage Enso-Gutzeit evaporation plant which can evaporate up to 360 tons of water an hour.

Concentrated black liquor is burned in an Ahlström recovery boiler which can burn 62 tons of dry solids an hour to produce 440,000 lb/hr. of steam. The boiler is equipped with three electrostatic precipitators.

The mill's primary power boiler burns bark, clarifier sludge, some fuel oil and at times, even peat. It produces 200,000 lb/hr. of steam.

The steam from these two boilers goes to a 45 MW back pressure extraction turbine and a 9 MW condensing turbine, both from AEG-Kanis. The two turbines are installed on the same shaft, at each end of a 67.5 MVA, 10.5 kV generator.

The low pressure steam for the turbine serves the production process and supplies the necessary heating.

Figures for the first eight months of 1981 show that 99 per cent of the mill's electrical energy needs were generated through back pressure power (80.5 per cent) and condensation power (18.5 per cent). Only one per cent was purchased.

Of this total, the mill used 75 per cent and sold the remainder to the town of Kaskinen. In short, the mill sells more electrical energy than it buys. ■

APPENDIX E

Otter Tail Power Company's Electrode Boiler Program

ELECTRODE BOILER
ENERGY SUPPLY PROPOSAL

FEBRUARY 21, 1984

OTTER TAIL POWER COMPANY
215 SOUTH CASCADE STREET
FERGUS FALLS, MINNESOTA

DUANE R. BARTSCH, P.E.
MANAGER, INDUSTRIAL SERVICES

INTRODUCTION

located in Fergus Falls, MN processes milk into cheese and other dairy products operating year around and processing on a 20 hour/day cycle.

The steam energy used by is produced by 2-40,000#/hr., #6 fuel oil fired boilers. Steam operating pressure is approximately 150 PSIG saturated.

Estimated annual #6 fuel oil consumption, at is 1,000,000 gallons.

For the purpose of this proposal, the following data will be used:

#6 fuel oil	-	150,000 BTU/gallon
1 kWh	-	3,413 BTU
1 BHP	-	34#/hour steam
1 BHP	-	10 kilowatts (kW)

Annual cycle efficiency of existing boilers = 65%.
Annual cycle efficiency of electrode boiler = 99%.

On Otter Tail Power Company's Bulk Interruptible Rate and for purposes of this proposal, it is anticipated that the electrode boiler will be interrupted approximately 5% or 438 hours per year, therefore, the electric energy (kWh) used by the electrode boiler would be:

$$\text{kWh} = \frac{\text{fuel oil x BTU/gal. x \% annual hours of operation x eff.}}{\text{BTU/kWh x eff.}}$$

$$= \frac{\text{1,000,000 gals. x 150,000 BTU/gal. x 95\% x 65\%}}{\text{3,413 x 99\%}}$$

$$= \text{27,420,000 kWh per year}$$

In addition, the fuel oil boilers would still consume approximately 1,000,000 gallons x 5% = 50,000 gallons of #6 oil per year.

PROPOSAL

Otter Tail Power Company (Otter Tail) offers to sell, furnish, and deliver to , Fergus Falls, MN, electric power and energy to operate an electrode boiler of approximately 10,000 kW (1000 BHP). It is understood that the rating of the electrode boiler is 13,200 volts, wye, 60 hz, four wire, three phase.

Otter Tail further offers to own, install, operate and maintain the necessary electric facilities to serve the electrode boiler up to and including the 13,200 volt bus in the electric substation and the necessary meters to measure the electricity used by the boiler.

ELECTRIC RATE

Otter Tail offers to sell electric power and energy to the electrode boiler at on the Bulk Interruptible Rate schedule on file with the Public Utilities Commission of the State of Minnesota.

Charges on the Bulk Interruptible Rate Schedule are:

1. Energy Charge:
   cents/kWh per month

2. Fixed Facilities Charge:
   per month

3. Monthly Minimum Charge:
   The Fixed Facilities Charge of $ per month

4. Rate Increase or Escalation
   A maximum of 4% increase per six month period on the Energy Charge only. There would be no increase on the Fixed Facilities Charge for the initial term of the contract (five (5) years).

CONTRACT OR AGREEMENT

Otter Tail's offer of electric service to the electrode boiler is applicable by signed agreement only between Otter Tail and for an initial period of five (5) years.

During the contract period, would be required to use electric energy to provide process steam for their processing operating at Fergus Falls as long as the electric energy was competitive on a $\$/10^6$ BTU basis with their alternate energy source

of #6 fuel oil. Parameters used to determine the $\$/10^6$BTU price of each fuel would be those listed in the Introduction section of this proposal.

would further be required to provide to Otter Tail the necessary easements of Right-of-Way for the construction of electric lines and other elctric fixtures, substations, and apparatus to provide the electric service to the boiler.

INTERRUPTION OF ELECTRODE BOILER AND INTERRUPTION NOTICE

The Bulk Interruptible Rate Schedule offered in this proposal requires that the electric load served (electrode boiler) must be capable of interruption during periods of peak load demand, peak energy demand, and emergencies of Otter Tail. During periods of interruption, would be required to provide an alternative source of process steam supply to their operation, if process steam was needed.

Otter Tail estimates that the average interruption hours per year would be 5% or 438 hours.

Although the normal notice or warning time before electrode boiler interrupton is one (1) hour, Otter Tail would not interrupt the electrode boiler any sooner than the fuel oil boilers are capable of providing an adequate steam supply to the milk process. Otter Tail would request, however, the opportunity to work with to research mutually agreeable methods to limit the notificaton time to a minimum.

Otter Tail would also reserve the right to interrupt the electrode boiler without notification during emergencies.

ELECTRODE BOILER

INSTALLATION & RENTAL PROPOSAL

FEBRUARY 21, 1984

OTTER TAIL MANAGEMENT CORPORATION
215 SOUTH CASCADE STREET
FERGUS FALLS, MINNESOTA

DUANE R. BARTSCH

Otter Tail Management Corporation (OTM), a wholly-owned subsidiary of Otter Tail Power Company offers to purchase and install an electrode boiler and associated equipment to be located on the property of), .
OTM intends that the electrode boiler and associated equipment be used by to supply steam energy to their milk processing operation.

BOILER RENTAL, OWNERSHIP, OPERATION & MAINTENANCE

After installation, initial start-up, and performance satisfaction, OTM intends that rent the electrode boiler and associated equipment. The rental period would begin on the date of commercial operation of the boiler and extend for a period of five (5) years. The rental fee would be $7,175.00 per month.

OTM intends that assume operation and routine daily maintenance responsibilities for the boiler and associated equipment. would also maintain ownership and operation and maintenance responsibilities of the boiler water treatment facilities and other auxiliary boiler systems.

Major maintenance, annual maintenance and defective part replacement and repair responsibilities of the boiler and associated equipment will remain the responsibility of OTM.

OTM will also maintain ownership of the boiler and associated equipment.

BOILER DESCRIPTION

The Electrode Steam Boiler will be a high voltage design, 13,200 volts, three phase, four wire.

Boiler rating will be 10,000 kW (1000 BHP), or above, capable of supplying 40,000 #/hr. of steam at an operating pressure of 150 psig.

The boiler will be complete but not limited to the following standard trim and controls:

a) Load control
b) Limit control
c) Water level control
d) Pressure gauge
e) Feedwater valve
f) Blowdown valve

g) Steam outlet valve
h) Back pressure valve
i) Boiler circulating pump, 480 v./3/60 or 240 v./3/60
j) Conductivity monitoring and alarm system
k) Relays, alarm and silencing system
l) Thermal insulation
m) Thermal jacket and enclosure
n) Thermal guard for high voltage connection
o) Immersion element electric standby heater, 480 v./3/60 or 240 v./3/60
p) Safety valves

Pressure vessel of the boiler will be ASME constructed, National Board inspected and stamped.

ASSOCIATED EQUIPMENT DESCRIPTION

In addition to the electrode boiler, the following is a partial list of the associated equipment that will also be installed to constitute a complete electrode boiler package:

a) One 13.2 kV, three phase circuit breaker and associated relay and control package to be used for boiler electrical protection. Also a 13.2 kV, three phase overhead and/or underground distribution circuit from the breaker to the boiler, breaker control wiring, and remote breaker controls located at the boiler.

b) Necessary 480 volt, 240 volt and/or 120 volt switches, wiring and associated equipment to connect boiler circulating pump, standby heater, and 120 volt control system to the existing electrical system of .

c) One boiler feed pump of approximately 50 HP - 3 phase - 480 volt or 240 volt and necessary electrical apparatus to connect to the existing electrical system. Feed pump would be for electrode boiler.

d) Necessary steam piping, condensate piping, elbows, flanges, etc. to connect the boiler to the existing steam and condensate system of .

e) Necessary building modifications and/or additions to house the electrode boiler.

BOILER AND ASSOCIATED EQUIPMENT LOCATION

It is assumed by OTM for purposes of this proposal that the boiler, boiler feed pump and associated equipment can be located in, or adjacent to, the existing Mid-Am facilities.

Any changes necessary in the existing Mid-Am facilities such as building additions, slab reinforcement, etc. will be performed by OTM at OTM's expense.

BOILER RENTAL AGREEMENT

OTM extends the boiler and associated equipment purchase, installation, ownership, maintenance and rental offer by signed agreement between OTM and . Some terms and conditions of the agreement would be:

a) Monthly rental fee of $7,175.00
b) Initial contract period: date of commercial operation for five (5) years
c) Necessary easement of right-of-way for installation of OTM equipment on property
d) Operation and maintenance responsibilities

e) Water treatment to be maintained by with water quality adequate to insure proper operation of the electrode boiler

APPROVALS

If this proposal is accepted by , it would be OTM's intent to work closely with on equipment location, equipment installation procedures and all other items necessary to complete the electrode boiler installation. OTM appreciates the fact that all equipment would be located on property and be operated by personnel and, therefore, would strive to be receptive to the suggestions and wishes of . OTM would ask that understand that certain assumptions in boiler location, installation, etc. were made in determining costs for this proposal and that, although OTM is receptive to changes in these assumptions, major changes will effect the rental fee. OTM would also ask that understand that after initial boiler installation, any changes in boiler location etc. initiated by may alter the rental fee.

APPENDIX F

Minnkota Power Cooperative, Inc.

Electric Boiler Contracts

U. S. DEPARTMENT OF AGRICULTURE
RURAL ELECTRIFICATION ADMINISTRATION

REA BORROWER DESIGNATION North Dakota 20 Grand Forks

THE WITHIN High Temperature Hot Water Agreement dated July 16, 1982, between Minnkota Power Cooperative and the United States of America (Grand Forks Air Force Base)

SUBMITTED BY THE ABOVE DESIGNATED BORROWER PURSUANT TO THE TERMS OF THE LOAN CONTRACT, IS HEREBY APPROVED SOLELY FOR THE PURPOSES OF SUCH CONTRACT.

Donald L. Ohm
FOR THE ADMINISTRATOR

DATED
October 5, 1982

E. FORM 28a REV 5-73

CONTRACT APPROVAL

NUMBER	AMOUNT
F32605-82-D0008	$2,236,000.00 (EST)

CONTRACTING OFFICE

Grand Forks AFB ND 58201

CONTRACTOR

Minnkota Power Cooperative, Inc.
P.O. Box 1318
Grand Forks ND 58201

CONTRACT FOR

High Temperature Hot Water

LOCATION OF WORK

Grand Forks AFB ND 58201

APPROVAL CONDITIONS Subject to REA approval. Correcting typo'in Exhibit B, paragraph 2, line 2, last word, change from excalated to escalated.

ACCEPTANCE	APPROVED
DATE July 30, 1982	DATE 29 JUL 1982
Minnkota Power Cooperative, Inc. CONTRACTOR	UNITED STATES OF AMERICA
BY [signature]	BY [signature] HAROLD J.M. WILLIAMS Brigadier General, USAF DCS/Logistics
TITLE President	TITLE

SAC FORM NOV 60 376

RFP F3260582R0005

UTILITY SERVICE CONTRACT

DEPARTMENT OF THE AIR FORCE NEGOTIATED Utility SERVICE CONTRACT		CONTRACT NUMBER F3260582D0008	
PREMISES TO BE SERVED Grand Forks AFB	CITY Grand Forks	COUNTY Grand Forks	STATE North Dakota
CONTRACTOR Minnkota Power Cooperative, Inc.		CONTRACTOR'S ADDRESS *(Include Zip Code)* P. O. Box 1318, Grand Forks, ND 58201	
PREMISES ARE ☐ GOVERNMENT OWNED ☐ GOVERNMENT LEASED X Contractor Leased	SYMBOL NUMBER OF LEASE	NAME OF LESSOR United States of America Grand Forks AFB	
ESTIMATED ANNUAL COST HEREUNDER $ 2,236,000.	BILLS WILL BE RENDERED TO Civil Engineering	PAYMENTS WILL BE MADE BY Accounting & Finance Officer	
CONNECTION CHARGE $ N/A	AT Grand Forks AFB North Dakota	AT Grand Forks AFB North Dakota	
TERMINATION LIABILITY $625,000.	APPROPRIATION CHARGEABLE *(All orders for delivery of services hereunder will contain a citation of the appropriation chargeable.)*		

This contract is negotiated pursuant to 10 U.S.C. 2304(a) (10).

THIS CONTRACT, entered into as of 16 July 1982, by and between the UNITED STATES OF AMERICA, hereinafter called the Government, represented by the Contracting Officer executing this contract, and Minnkota Power Cooperative, Inc. whose address is P. O. Box 1318, Grand Forks, ND 58201 hereinafter called the Contractor.

SCOPE OF CONTRACT. Subject to the terms and conditions hereinafter set forth, the Contractor shall furnish, and the Government shall purchase and receive High Temp Hot Water service (hereinafter called service) requested by the Government from the Contractor at the premises to be served hereunder (hereinafter called the service location), in accordance with the General and Technical Provisions and the High Temp Hot Water service specifications attached hereto and made a part hereof.

TERM OF CONTRACT. ~~XXXX

The following Defense Acquisition Regulation clauses and provisions, the full text of which will be made available upon request, are incorporated herein by reference with the same force and effect as if set forth in full text:

CONTRACT NUMBER F3260582D0008

CLAUSE NO	DAR REFERENCE	REQ BY DAR	CLAUSE TITLE	CLAUSE DATE
1.	7-103.1	S5-203.2,II,8	Definitions	1979 Mar
2.	7-103.8	S5-203.2,II,9	Assignment of Claims	1962 Feb
3.	7-103.12	S5-203.2,II,10	Disputes (Modified by using alternate subparagraph h)	1980 Jun
4.	7-103.16	S5-203.2,II,18	Contract Work Hours and Safety Standards Act - Overtime Compensation	1971 Nov
5.	7-103.18	S5-203.2,II,19	Equal Opportunity	1978 Sep
6.	7-103.19	S5-203.2,II,11	Officials not to Benefit	1949 Jul
7.	7-103.20	S5-203.2,II,12	Covenant Against Contingent Fees	1974 Oct
8.	7-103.27	7-1902.21	Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era	1976 Jul
9.	7-103.28	7-1902.24	Affirmative Action for Handicapped Workers	1976 May
10.	7-103.29	7-1902.25	Clean Air and Water (applicable to contracts) over $100,000	1975 Oct
11.	7-104.3	S5-203.2,II,16	Buy American Act and Balance of Payments Program (applicable only to contracts requiring the furnishing of supplies)	1980 Oct
12.	7-104.16	S5-203.2,II,15	Gratuities	1952 Mar
13.	7-104.17	12-202	Convict Labor	1975 Oct
14.	S5-203.2	S5-203.2,II,4	Change in volume or Character of Service	1974 Oct
15.	S5-203.2	S5-203.2,II,5	Continuity of Service and consumption	1974 Oct
16.	S5-203.2	S5-203.2,II,6	Contractor's Facilities DELETED	1974 Oct
17.	S5-203.2	S5-203.2,II,7	Conflicts	1974 Oct
18.	S5-203.2	S5-203.2,II,1	Payment	1974 Oct
19.	S5-203.7	S5-203.7	Multiple Service Locations	1974 Oct
20.	S5-203.2	S5-203.2,II,3	Public Regulation and Change of Rates ~~XXXXXXXXXXXX~~ Change of Rates (Alternate B)	1974 Oct
21.	7-104.15	S5-203.2,II,14	Examination of Records By Comptroller General	1975 Jun
22.	7-603.10	10-405	Required Insurance	1977 Jan

23. CONTRACTOR'S FACILITIES.

(a) The Contractor, at his expense, shall furnish, install, and maintain all facilities required to furnish service hereunder to, and to measure the service at, the point of delivery specified in the Utility Service Specifications. Title to all of these facilities shall remain in the Contractor and he shall be responsible for all loss of or damage to those facilities except that arising out of the fault or negligence of the Government, its agents or its employees. All taxes and other charges in connection therewith, together with all liability arising out of the negligence of the Contractor in the construction, operation, or maintenance of these facilities, shall be assumed by the Contractor.

(b) The Government hereby grants to the Contractor, free of any rental or similar charge, but subject to the limitations specified in this contract, a revocable permit to enter the service location for any proper purpose under this contract, including use of the site or sites agreed upon by the parties hereto for the installation, operation, and maintenance of the facilities of the Contractor required to be located upon Government premises. Authorized representatives of the Contractor will be allowed access to the facilities of the Contractor at suitable times to perform the obligations of the Contractor with respect to these facilities. It is expressly understood that the Government may limit or restrict the right of access herein granted in any manner considered to be necessary for the national security.

(c) The facilities shall be removed and Government premises restored to their original condition, ordinary wear and tear excepted, by the Contractor at his expense within a reasonable time after the Government shall revoke the permit herein granted and in any event within a reasonable time after termination of this contract, provided, that in the event of termination due to fault of the Contractor these facilities may be retained in place at the option of the Government until service comparable to that provided for hereunder is obtained elsewhere.

24. GOVERNMENT LIABILITY UPON TERMINATION FOR CONVENIENCE OF THE GOVERNMENT.

a. Termination Prior to Completion of Facilities. In the event the Government terminates this contract for convenience prior to completion of the facilities provided for under this contract, the Contractor shall be paid fair compensation, exclusive of profit, for the work performed with respect to the installation of the HTHW Facility. The contractor shall use his best efforts to sell, in the manner, at the times, to the extent, and at the price or prices directed or authorized by the Contracting Officer, any of the facilities provided for under this contract; provided, however, that the contractor (a) shall not be required to extend credit to any purchaser, and (b) may retain any such facilities under the conditions prescribed by and at a price or prices approved by the Contracting Officer; and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Government to the Contractor under this termination clause.

24. GOVERNMENT LIABILITY UPON TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (CONT'D).

b. Termination Subsequent to Completion of Facilities. In the event the Government terminates this contract for convenience subsequent to completion of the facilities provided for under this Agreement, and prior to 30 September 1990, the Government shall pay the Contractor the sum of $625,000. dollars less one/ninety of that amount for each month this contract has been in effect prior to the date of termination.

1. RATES and CHARGES DAR S5-203.2,11,2. a. For all service furnished under this contract to the service location the Government shall pay the Contractor at the rates specified in the rate schedule Exhibit B attached hereto and made a part of this contract.

b. For purposes of charges under this paragraph 3, any demands due to faulty operation of, or to excessive or fluctuating pressure on, the Contractor's system shall not be included as part of the Government's demand.

2. APPROVAL of CONTRACT (1949 Jul).
This contract shall be subject to the written approval of the Secretary of the Air Force or his duly authorized representative and shall not be binding until so approved.

3. ALTERATIONS in CONTRACT (1949 Jul). The following alterations have been made a part of this contract:

a. Change TERM OF CONTRACT on the face of SAC Form 49 to read:

TERM OF CONTRACT. This contract shall commence on date of award and continue thru 30 September 1990.

4. HOLD HARMLESS.
The contractor hereby agrees to indemnify the Government against any and all expenses, taxes, liabilities, and charges of whatever kind or nature that may arise as a result of the activities of the contractor, or Government operating personnel, whether said liability be tortious, contractual or other. The contractor also agrees that it will, at its expense, repair or replace, at the Government's option, any Government property that it may damage or destroy. If the contractor fails or refuses to repair damaged Government property in a timely manner, the contracting officer shall be entitled to effect repairs through other means and to impose the costs on the contractor.

5. REA APPROVAL.
This agreement shall be subject to approval by the Rural Electrification Administration, in addition to those approvals elsewhere in this agreement set forth, and shall become effective only upon being signed by the administrator of said Rural Electrification Administration or his agent.

6. DESIGN REVIEW.
Contractor will provide final design to the Government for review prior to starting construction.

7. APPROVAL OF CONTRACT (1949 JUL) (DAR 7-105.1)
(Applicable to contracts in excess of $100,000.00)

This contract shall be subject to the written approval of the Secretary or his duly authorized representative and shall not be binding until approved.

1. MEASUREMENT of SERVICE. a. All service furnished by the Contractor shall be measured by metering equipment of standard manufacture, furnished, installed, maintained, calibrated, and read by the Contractor at his expense. When more than a single meter is installed at the service location, the readings thereof shall be billed conjunctively. In the event that any meter fails to register or registers incorrectly, the quantity of service delivered through it during that period shall be determined and an equitable adjustment based thereon shall be made in the Government's bills (for this purpose any meter which registers not more than (2) percent slow or fast shall be deemed correct). Failure to agree on any adjustment shall be a dispute concerning a question of fact within the meaning of the "Disputes" clause of this contract.

b. The Contractor shall read all meters at periodic intervals of approximately thirty (30) days. All billings based on meter readings of less than twenty seven (27) days or more than thirty two (32) days shall be prorated accordingly.

2. METER TEST. The Contractor, at his expense, shall periodically inspect and test the meters installed by him in accordance with his regulated practice or in the absence thereof, at intervals of no longer than one (1) year. At the written request of the Contracting Officer, the Contractor in the presence of the Government representatives, shall make additional tests of any or all meters. The cost of such additional tests shall be borne by the Government if the percentage of error is found to be not more than (2) percent slow or fast. No meter shall be placed in service which on test registers in excess of one hundred (100) percent under normal operating conditions.

SPECIAL PROVISIONS

1. AVAILABILITY AND COMMENCEMENT OF SERVICE. Service will be available upon completion of heating facilities and will commence upon written notice by the contracting officer.

2. INVOICING PROCEDURES. Specify the following information on all invoices or billings in addition to other required entries:

(1) Contract number.

(2) Type of service.

(3) The period covered (inclusive dates).

(4) Point of delivery.

(5) A breakdown of the total amount, indicating the total units of each type of service rendered, the rate charged per unit, and the total charge.

EXHIBIT A-1

SERVICE SPECIFICATIONS FOR HIGH TEMPERATURE HOT WATER (HTHW) ELECTRIC BOILERS

HOT WATER REQUIREMENTS:

1. High temperature hot water (HTHW) shall be provided for all buildings connected to the HTHW distribution system at Grand Forks AFB, N.D.

2. Estimated maximum hourly demand is 136,480,000 BTU's.

3. Estimated annual consumption is 400,000 million BTU's.

4. Point of delivery of hot water shall be the point of connection of the electric boilers to the hot water distribution system in building 423.

5. Hot water shall be provided at a temperature of 400 degrees fahrenheit and a maximum pressure at the boiler outlet of 275 PSIG. Minimum water return temperature will be 250°F.

6. The size of the pipeline to the point of delivery shall be as required to provide a water flow rate of 1800 GPM without excessive pressure drop through the existing circulating system.

EXHIBIT A-2

TECHNICAL SPECIFICATIONS FOR ELECTRIC HIGH TEMPERATURE HOT WATER GENERATORS AT GRAND FORKS AFB, ND.

1. GENERAL: The contractor shall provide all plant, labor, and materials required to construct an electric high temperature hot water (HTHW) generators and facility to house the generators and associated apparatus at Grand Forks AFB, N.D. The government will provide property adjacent to the existing heating plant (Bldg 423) on Grand Forks AFB on which to locate the facility in the form of an easement for the term of the contract. Lease fees above one dollar ($1) may be added to the rates charged for HTHW. An easement across government property will also be provided for power lines and associated substations as required to serve the new facility. The government will provide personnel to operate the HTHW facility to provide heating to Grand Forks AFB facilities served by the HTHW system. The facility HTHW generators, and associated power service lines and substation shall be owned and maintained by the contractor. The contractor shall provide power to operate the facility at the capacity specified in the Service Specifications. The government will purchase HTHW from the contractor at rates set forth herein. These rates shall include the cost of power to operate the HTHW facility plus an added amount to amortize the cost of the new facility over the term of the contract.

2. HOT WATER USAGE: The government agrees to purchase hot water from the contractor during the term of this contract. The government shall have the right to generate hot water using existing government owned fuel oil fired HTHW generators as required to insure reliability of operation of the oil fired units. The hot water purchased will be decreased by the amount generated by the fuel oil fired units at the times that they are operated without penalty to the government. Except for the operation of fuel oil fired units to insure reliability, all HTHW needs of the base will be filled by purchase from the contractor unless service is interrupted by the contractor as indicated in para 3 below.

3. INTERRUPTION OF SERVICE BY THE CONTRACTOR: The HTHW to be supplied by the contractor shall be supplied on an interruptible basis. The contractor shall have the right to partially or totally discontinue electric service to the electric HTHW generators during periods of peak electric demand on the electric system. During these periods of interruption the government will provide for HTHW requirements via operation of existing fuel oil fired HTHW generators. The hours of interruption shall normally not exceed 800 hours per year. During any hours of interruption in excess of those stated above, the contractor shall reimburse the government for fuel costs incurred by the government which exceed the cost that would have occurred without an interruption. An example of such reimbursement is shown in Exhibit A-3. The contractor shall provide 2 hours notification to the government prior to interruption of power to the electric service to the electric HTHW generators, except as provided below. This will normally allow time to pick up the heating load using the existing

EXHIBIT A-2 CONT'd

fuel oil fired HTHW generators. In the event of an electric system emergency as determined by the contractor the contractor may interupt power to the generators without notice. When less than ½ of the then existing load is interrupted, the interruption hours will be calculated as being one half of the actual interrupted hours. When ½ or more of the existing load is interrupted the interruption hours will be calculated as being all of the actual interrupted hours. When an interruption occurs for less than half an hour, no interruption hours shall be counted. When an interruption occurs for ½ hour or more, the whole hour shall be counted. Constants to be used for the purpose of reimbursement computations are 72% efficiency and 150,000 BTU's per gallon.

4. METERING: The contractor shall provide suitable KWH and demand metering to measure the electrical usage of the electric boilers and other electrical requirements in the new facility such as pumps and lights. Also see Technical Provision Nr. 2.

5. BILLING: For billing purposes, all metered electricity shall be converted to BTU's based on a conversion factor of 3412 BTU/KWH. Based on this conversion factor, 293.08 KWH of energy will produce 1,000,000 BTU's. Billing will be monthly based on millions of BTU's as converted from the total metered KWH's, and using the appropriate rate as determined from the rate schedule hereinafter shown on Exhibit B.

6. OPERATION: The government shall provide competent operators to oversee operation of the electric boilers at all times.

7. MAINTENANCE: Maintenance of the electric HTHW generators, power lines and substations, facility housing the HTHW generators, and associated appurtenances in the new facility shall be the responsibility of the contractor. Repair of any component(s) requiring replacement of worn or damaged parts shall be the responsibility of the contractor. Any maintenance actions performed by the government operators shall be only those normally involved in day-to-day operations of the boiler plant such as tightening packing glands, adjustment of valves, or replacement of fuses. All materials required for repair or replacement at the HTHW plant shall be provided by the contractor.

8. CONNECTION TO EXISTING SYSTEM: The contractor shall be responsible for connection of the electric HTHW generators to the existing circulating system in the existing plant (Bldg 423). The existing circulating pumps may be used to circulate HTHW through the electric HTHW generators. These pumps can be used in various combinations to give a variable flow rate as required to meet system loads. The contractor shall be responsible for providing balancing valves, bypass loops or other provisions in the piping system to assure proper flow control through the new HTHW generators in conjunction with the existing circulating pumps. The new HTHW generators shall be connected in such a manner as to allow circulation of HTHW through the existing fuel oil fired HTHW generators when the electric HTHW generators are in use. This will allow minimum time to pick up the heating load with the oil fired units when

EXHIBIT A-2 CONT'd

interruption of electric service is pending. The government will provide layout drawings of the existing plant and provide for contractor site visitations as required to determine piping requirements.

9. WATER TREATMENT: Any water treatment required by the new electric HTHW generators in addition to the existing treatment systems (water softeners and dealkalizer) shall be provided by the contractor. Additional water treatment equipment shall be provided by the contractor and operated by government personnel. Additional treatment equipment may be integrated with the existing system for treatment of makeup water to provide a single treatment system. Additional chemicals used to provide added treatment shall be provided by the contractor as well as necessary chemical handling apparatus and test kits. It shall be the contractor's responsibility to determine any requirements for water treatment in addition to those that already exist. Repair of additional water treatment systems shall be the contractor's responsibility. Any additional water treatment shall not increase the corrosive characteristics of the system water nor impart any characteristics to the system water that will cause accelerated deterioration of the existing HTHW distribution system.

10. SITING: Drawing number GRF 82-6/82 Apr 20, indicates the easement areas for the required transmission line, substation and electric HTHW generating facility.

11. OPERATION INSTRUCTION: The contractor shall provide instruction to government operators at the time of HTHW plant start-up. This instruction shall be as required to fully acquaint government personnel with procedures, instruments, adjustments, or any other requirements for competent day-to-day operation of the HTHW plant. Manufacturers operation procedures for the HTHW plant shall be provided in written form to the government at the time they assume responsibility for plant operation. The government shall also be provided with notification procedures to be used in the event of operation or maintenance problems with the HTHW plant. A representative of the electric HTHW generator manufacturer shall be present when the system is initially put into operation.

12. INSTRUMENTATION: The electric HTHW generators shall be provided with sufficient instrumentation to determine all pertinent operating conditions to allow for efficient and safe boiler operation. Instrumentation to measure the following variables shall be provided as a minimum:

a. Inlet water temperature to electric HTHW generator.
b. Outlet water temperature from electric HTHW generator.
c. Instantaneous power requirements of HTHW generator(s) in KW.
d. Water flow rate through each HTHW generator (GPM or lb/hr).
e. Total energy consumption of electric HTHW generator(s) in KWH.

EXHIBIT A-2 CONT'd

13. PLANT OPERATING LOGS will be maintained on a daily basis by government operators. Hourly readings of power levels, energy usage, flow rates, and inlet and outlet temperatures will be recorded. Also, notations of any significant operation problems, or abnormalities will be made. Each month, a monthly log with daily average values for recorded data will be prepared. A copy of the monthly log will be provided to the contractor and a copy will be retained for the government's records. Log entries will also include hours of interruption of HTHW service by the contractor.

14. ACCESS TO PREMISES: Contractor personnel will be admitted to the Air Force Base as required for service work in connection with the electric HTHW facility, substation, transmission line and related facilities thereon installed.

15. BOILER INSPECTION: The contractor shall provide for inspection of new HTHW generators as required by current ASME codes.

16. HTHW GENERATOR AND PIPING INSTALLATION shall conform to applicable National Fire Codes and ASME codes.

17. FACILITY CONSTRUCTION: The new facility shall be constructed and protected in accordance with current National Fire Codes. Existing water and sewer systems on the Air Base may be utilized to serve the new facility. Drawings of existing utility systems will be made available to the contractor by the government. Applicable criteria in Air Force Manual 88-15 shall be followed in the construction of the new facility. A copy of AFM 88-15 is available for the contractor's use at Civil Engineering/DEE.

EXHIBIT A-3

EXCESS HOUR INTERRUPTION REIMBURSEMENT EXAMPLE
(ASSUME A TIME FRAME SEVERAL YEARS HENCE)

Assume:

1. All of the 800 hours of allowable curtailment are used up.
2. An additional 24 hour curtailment is required.
3. The Minnkota current hot water rate is $6.74/MBTU.
4. The cost of #6 oil is $1.00/gallon. (Price based on the then most recent oil invoice.)
5. Oil used during excess 24 hour period is 15,000 gallons.
6. Oil burner is 72% thermal efficient.
7. #6 oil heat content is 150,000 BTU/gallon.
8. Metered energy cost for month (less the 24 hours) is $220,000.

Billing:

MPC metered energy for the month		$220,000.00
Cost of oil burned	$15,000.00	
Cost of Equivalent MPC Energy		
$\frac{15{,}000 \times 150{,}000 \times .72}{1{,}000{,}000} \times \$6.74 =$	$10,918.80	
difference	$ 4,081.20	
deduction		$ 4,081.20
corrected billing for the month		$215,918.80

THIS SHEET IS TO BE USED AS AN EXAMPLE OF HOW REIMBURSEMENTS SHOULD BE COMPUTED.

EXHIBIT B

RATE SCHEDULE

RATES FOR HTHW SERVICE shall be computed on the basis of cost to produce one million BTU's of heat. The rates shall be adjusted upward by 5.5% each year to account for inflation in accordance with the following schedule:

From 1 Oct 1982 to 30 Sep 1983	$5.59 mil BTU
From 1 Oct 1983 to 30 Sep 1984	$5.89 " "
From 1 Oct 1984 to 30 Sep 1985	$6.22 " "
From 1 Oct 1985 to 30 Sep 1986	$6.56 " "
From 1 Oct 1986 to 30 Sep 1987	$6.92 " "
From 1 Oct 1987 to 30 Sep 1988	$7.30 " "
From 1 Oct 1988 to 30 Sep 1989	$7.70 " "
From 1 Oct 1989 to 30 Sep 1990	$8.13 " "

The above rates shall be the maximum rate for each year. These rates ~~sh~~ M.D. shall be discounted in the event the price of residual oil has ~~e~~scalated at a rate less than 5.5% per year. Each year the rate to be charged shall be computed based on the following formula:

$$\text{NEW PRICE} = \frac{\text{AVERAGE ANNUAL PRICE}}{\text{BASE PRICE}} \times \$5.59$$

WHERE: Average annual price = that average price of residual oil as computed from monthly wholesale average prices quoted by the Independent Petroleum Association of America for the previous year.

BASE PRICE = that dollar amount agreed to as the average residual oil price for the twelve month period, 1 Oct 1980 to 1 Oct 1981. This price shall be computed as the average annual wholesale price as quoted by the Independent Petroleum Association of America. It is hereby agreed that the average residual oil price for the 12 month period from 1 Oct 1980 to 1 Oct 1981 is 59.7¢.

In no event shall any adjustment result in HTHW price of less than $5.59 per million BTU's nor in a price greater than the price quoted in the above rate schedule.

E EPTION TO SF 30, APPROVED BY NARS 5/79

S NDARD FORM 30, JULY 1966
GENERAL SERVICES ADMINISTRATION
FED PROC REG (41 CFR) 1-16.101

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

PAGE 1 OF 1

1. AENDMENT/MODIFICATION NO. J 2605-82-D0008 P00001

2. EFFECTIVE DATE 82 Nov 09

3. REQUISITION/PURCHASE REQUEST NO.

4. PROJECT NO. *(If applicable)*

5. ISSUED BY CODE

321 SMW/LGCV
(ntracting Division/Bldg 125
Grand Forks AFB, ND 58205
Cheryll Berg/594-3420

6. ADMINISTERED BY *(If other than block 5)* CODE

7. ONTRACTOR AME AND ADDRESS CODE FACILITY CODE

Minnkota Power Cooperative, Inc
PO Box 1318
Grand Forks, ND 58201

(S ret, city, county, state, and ZIP Code)

8. ☐ AMENDMENT OF SOLICITATION NO. ____

DATED ____ *(See block 9)*

☒ MODIFICATION OF CONTRACT/ORDER NO. F3260582D0008

DATED 82 Jul 16 *(See block 11)*

9. THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in block 12. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.

fferors must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended, by one of the following methods:

(a) By signing and returning ____ copies of this amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND ATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If, by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram letter, provided such telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

10. ACCOUNTING AND APPROPRIATION DATA *(If required)*

11. HIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS

(a) ☐ This Change Order is issued pursuant to ____

The Changes set forth in block 12 are made to the above numbered contract/order.

b) ☒ The above numbered contract/order is modified to reflect the administrative changes (such as changes in paying office, appropriation data, etc.) set forth in block 12.

(c) ☐ This Supplemental Agreement is entered into pursuant to authority of ____

It modifies the above numbered contract as set forth in block 12.

12. DESCRIPTION OF AMENDMENT/MODIFICATION

a. SAC Fm 49, Block titled "Symbol Number of Lease" should read: Lease No. DACA 45-1-83-6001; Easement No. DACA 45-2-83-6002.

b. No other changes.

ASON FOR MOD: Add Lease No. and Easement No. to Contract.

Ex ot as provided herein, all terms and conditions of the document referenced in block 8, as heretofore changed, remain unchanged and in full force and effect.

13. ☒ CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT ☐ CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN ____ COPIES TO ISSUING OFFICE

14. NAME OF CONTRACTOR/OFFEROR Minnkota Power Cooperative, Inc.

BY [signature] (Signature of person authorized to sign)

15. NAME OF TITLE OF SIGNER *(Type or print)* President

16. DATE SIGNED 11/10/82

17. UNITED STATES OF AMERICA

BY Stuart L. Neset (Signature of Contracting Officer)

18. NAME OF CONTRACTING OFFICER *(Type or print)* STUART L. NESET

19. DATE SIGNED 82 Nov 09

STEAM SERVICE AGREEMENT

This Agreement, made and entered into this ____ day of _____, 1981, by and between Minnkota Power Cooperative, Inc., whose post office address is Box 1318, Grand Forks, North Dakota 58201, hereinafter referred to as "Minnkota," and [redacted] Company, whose post office address is _____, hereinafter referred to as [redacted]" witnesseth:

That in consideration of the mutual covenants herein contained, Minnkota and [redacted] agree as follows:

1. PURPOSE. Minnkota wishes to offer for sale and supply process steam for industrial usage, and [redacted] wishes to purchase such supply of process steam for use in its Grand Forks plant. The purpose of this Agreement is therefore to set forth the terms and conditions upon which such purchase and sale of process steam shall be made.

2. AGREEMENT TO SELL AND BUY. Minnkota hereby promises and agrees to sell and deliver to [redacted] and [redacted] promises and agrees to purchase from Minnkota during the term of this Agreement, steam which shall be required by [redacted] for its processing purposes, delivered to [redacted] plant site situated at Grand Forks, North Dakota, subject to the terms and conditions of this Agreement as hereinafter stipulated.

3. TERM. The term of this Agreement shall commence on February 1, 1982, and shall continue in full force and effect through midnight, October 20, 1990. In the event the installation of the boiler and related facilities has not been completed by the beginning term date, it is hereby agreed that the beginning term date shall be changed to such date as normal operations of the boiler and related equipment situated at [redacted] plant shall begin.

4. NATURE OF SERVICE AND EQUIPMENT TYPE. It is hereby agreed that Minnkota shall furnish to [redacted] an interruptible steam supply rated at 125 psig, with a maximum hourly delivery

rate of 100,000 pounds of steam, or such lesser capacity, as may be based on the boiler capability. Service shall be provided by means of an electric boiler to be owned by Minnkota, and physically located within [redacted] plant. [redacted] shall, free of any charge, provide a suitable place in its plant for Minnkota to install the boiler, and shall make hook up of the same to its existing steam lines. Minnkota shall furnish the proper electrical facilities for connection to said boiler, and for that purpose, [redacted] does hereby agree to provide to Minnkota, upon [redacted] property, a site for installation of an electric substation and also such rights of way as may be needed for an electric transmission line in such locations as Minnkota shall determine, also free of any charge.

5. OPERATING YEAR. For purposes of computing a year of time, an "operating year" as determined by Minnkota shall be from October 20 to the following October 20 and shall comprise the term of one year.

6. STEAM USAGE. It is hereby agreed that [redacted] shall purchase from Minnkota, during the term of this contract, the full amount of its process steam usage at its Grand Forks plant, subject to Minnkota's right to interrupt such steam supply as is hereinafter provided, and subject to interruptions beyond the control of Minnkota, caused by third parties or acts of God. At times of such interruptions, [redacted] shall have the right to supply itself with steam from alternate sources of supply.

7. INTERRUPTION OF SERVICE, NOTICE. The steam to be supplied by Minnkota shall be supplied on an interruptible basis. Minnkota operates a load control program, by which it has the right to interrupt certain power loadings during times of peak electric power use. Pursuant to such program, Minnkota shall have the right to interrupt its supply of electric power to the boiler located in [redacted] plant. The hours of interruption will normally not exceed an average of 200 hours per year during any three year period, with a maximum of 400 hours in any single year.

At certain times, it may be necessary for Minnkota to interrupt steam service from the electric boiler for a length of time in excess of 400 hours per year, or in excess of a three year average of 200 hours per year. In the event of interruption in excess of the hourly figures above stated, Minnkota agrees to reimburse [redacted] for [redacted] additional fuel costs which result from producing alternate sources of steam during the hours of interruption in excess of those provided above.

Minnkota shall endeavor to give [redacted] at least one hour notice of pending service interruptions. During such periods of interruption, [redacted] shall employ, in its own behalf, such methods to produce its process steam as it deems necessary.

8. POINT OF DELIVERY. The point of delivery of the process steam supplied by Minnkota to [redacted] shall be at the boiler outlet.

9. RATES. Rates shall be computed on the basis of cost for producing 1,000 pounds of steam. The rates shall be adjusted from year to year to reflect inflationary costs. The following schedule provides these rates, to wit:

From commencement date to October 1, 1982	$6.12
From October 1, 1982, to October 1, 1983	6.46
From October 1, 1983, to October 1, 1984	6.81
From October 1, 1984, to October 1, 1985	7.19
From October 1, 1985, to October 1, 1986	7.59
From October 1, 1986, to October 1, 1987	8.00
From October 1, 1987, to October 1, 1988	8.44
From October 1, 1988, to October 1, 1989	8.91
From October 1, 1989, to October 1, 1990	9.40

While the above schedule provides a ceiling for the amounts to be charged for process steam, such rates may be discounted in the event the price of residual oil has escalated at a rate less than 5.5% per year.

For purposes of calculating an adjusted rate, for the years from October 1, 1983, to October 1, 1990, the price shall be adjusted downward in any year in which the average price of residual oil, as published by the Independent Petroleum Association of America, has escalated in the aggregate less than 5.5% per year. The base year for such calculation shall be October 1, 1980, to October 1, 1981, and it shall be agreed that the average price for residual oil for that year shall be 59.8¢ per gallon.

The following table sets forth the residual oil prices for each of the yearly periods as above stated, escalated at 5.5% annually.

October 1, 1980, to October 1, 1981	$.598 per gallon
October 1, 1981, to October 1, 1982	.631 per gallon
October 1, 1982, to October 1, 1983	.666 per gallon
October 1, 1983, to October 1, 1984	.703 per gallon
October 1, 1984, to October 1, 1985	.742 per gallon
October 1, 1985, to October 1, 1986	.783 per gallon
October 1, 1986, to October 1, 1987	.826 per gallon
October 1, 1987, to October 1, 1988	.871 per gallon
October 1, 1988, to October 1, 1989	.919 per gallon
October 1, 1989, to October 1, 1990	.970 per gallon

Using the above table, the formula to be used to establish the current price of steam shall be as follows:

$$\text{New Price} = \frac{\text{Average Annual Price}}{\text{Base Price}} \times \$6.12$$

Where: Average Annual Price = that average annual price of residual oil as computed from monthly wholesale average prices quoted by the Independent Petroleum Association of America.

Base Price = that dollar amount agreed to as the average residual oil price for the twelve month period, October 1, 1980, to October 1, 1981.

In no event shall any adjustment result in a steam price of less than $6.12 per 1,000 pounds of steam nor in a price greater than the price quoted in the rate schedule in paragraph 9.

10. METERING. Minnkota will provide suitable kWh metering to measure the electrical usage of the boiler. Such metered

kWh's shall be converted to pounds of steam produced according to the following formula: It is hereby agreed that each kW hour of electricity used will produce 3,412 BTU, and that 1,100 BTU are needed to produce 1 pound of steam. By calculation, it is derived that each kW hour of electricity will therefore produce 3.105 pounds of steam. Again, using this figure to calculate the number of kWh needed to produce 1,000 pounds of steam, it is found that 322 kWh will be used. It is therefore agreed that for purposes of billing, the consumption of 322 kWh will be assumed to have produced 1,000 pounds of steam.

11. PAYMENT. Payments for process steam shall be made to Minnkota by [redacted] at Minnkota's offices in Grand Forks, North Dakota, within 10 days after receipt of a bill provided by Minnkota for such steam.

12. OPERATOR. [redacted] shall furnish suitable operators to oversee the operations of the electric boiler at all times.

13. MAINTENANCE. Items of maintenance incidental to operation of the boiler shall be performed by [redacted] personnel at [redacted] expense. All other maintenance, repair and inspections shall be done by Minnkota personnel, at Minnkota's expense.

14. ACCESS TO PREMISES. Minnkota personnel shall be admitted onto the [redacted] plant property for service work in connection with the electric boiler, substation, transmission line and related facilities thereon installed.

15. RIGHT OF CANCELLATION. This Agreement shall continue in full force and effect by and between the parties for its full stated term. There shall be no right of cancellation on the part of either party, except that in the event [redacted] shall terminate the operations of its Grand Forks plant, then this Steam Service Agreement shall terminate as of the date of the closing of said plant.

16. RIGHTS OF PARTIES UPON TERMINATION. At such time as this Agreement may be terminated, either by the closing of the

[redacted] Grand Forks plant or by the expiration of the contract term, Minnkota shall have the right, for a period of six months thereafter, to remove its equipment from [redacted] plant and grounds. In connection therewith, all of the equipment constructed on [redacted] property by Minnkota shall remain personal property, whether attached to the realty or not, and may be removed upon termination according to this provision.

17. DISCLAIMER OF LIABILITY. [redacted] agrees that Minnkota shall not be liable to [redacted] or to third persons for personal injury resulting from the use of the electric boiler, or from the presence of Minnkota's service equipment upon [redacted] premises, unless due to willful fault or neglect on the part of Minnkota. It is further understood that Minnkota assumes no responsibility for the installation of piping and connection to the boiler by [redacted] or for any injury resulting from piping leaks on [redacted] steam lines.

18. REA APPROVAL. This Agreement shall be subject to approval by the Rural Electrification Administration, and shall become effective only upon being signed by the Administrator thereof.

19. APPLICABILITY OF LAWS. It is agreed by and between the parties that this contract has been drafted in North Dakota, and shall be governed by North Dakota law.

IN WITNESS WHEREOF, both parties have set their hands and seals the day and year first above written.

MINNKOTA POWER COOPERATIVE, INC.

ATTEST:

_____ Secretary

By: _____ President

[redacted] COMPANY

ATTEST:

_____

_____

GENERAL DOC NO 1602
OLSchmidt
March 27, 1984

4-2 alt. fuel

TO: Randy Seiffert - PGC

FROM: Owen L. Schmidt - APG-12

SUBJECT: EA on Nonfirm Energy Sales Policy; Your Request of March 14, 1984

1. Page i. This is an EA and should have a "need" statement, but not "purposes." See 1508.9. The "purposes" are only relevant if preparing an EIS and a ROD.

2. Page 2. Ditto. Delete "purposes and."

3. Page 2. "Objectives" is not really the issue in the needs statement. Objectives means goals or ends to be achieved. Needs are the problem to be fixed or the opportunity to be seized. Objectives and needs can be the same, but they are not necessarily the same. Why use a synonym? Stick with "The underlying need to which BPA is responding with the proposed action is the need for . . . ."

4. Page 2. What is the need? Reading this, it seems to me that only "increased revenues" is a need. This is the problem and the opportunity. Compliance with the Council's Plan and improvement in the region's economy are only incidental niceties. Neither of these factors compel us to take action, at least as a matter of law.

5. Page 2. "Waste" of the hydroelectric resource is not a very objective way of describing spill. Water not used to generate electricity is not necessarily wasted water, and unused hydroelectric potential is not necessarily "waste." The EA should be an objective explication of the agency's proposal.

6. Page 3. Has this determination been made? Where? You should put the determination here, or refer the reader to where it is.

7. Page 3. None of this stuff is "need" and should be moved elsewhere. Compliance with the Preference Act, the Project Act, the Plan, the Program, the Regional Act, court cases, all that is useful information and should be

somewhere here in the EA but not in the underlying need section. See 40 C.F.R. § 1508.27(b)(1) for these type of requirements and put these discussions where you put the rest of statutory compliance discussions.

8. Page 33. This sentence is redundant of the title and of what follows.

9. Page 39. Ditto.

10. See miscellaneous comments on the text itself.

OLSchmidt:lmc:3/28/84 (WP-APG-1602G)

cc:
Official File - APG-12

DOE F 1325.8
(7-79)

U.S. DEPARTMENT OF ENERGY

memorandum

DATE March 16, 1984

REPLY TO ATTN OF BPA-SJ

SUBJECT Advance Review of Environmental Assessment (EA) on BPA's Proposed Policy for Sales of Nonfirm Energy to Utilities for Service to Loads with Alternate Fuel Capability

TO Michael Kleinrock, Compliance Policy Division, PE-251

Two copies of the subject document are attached for your review. Following your review, we will submit the EA for the official approval of the Assistant Secretary for Policy, Safety, and Environment. We would appreciate receiving your comments as soon as possible. You may telephone your comments directly to Tom McKinney of my staff at FTS 429-4721.

Anthony R. Morrell
Environmental Manager
Bonneville Power Administration

Attachment

BPA:KPierce:amy:633-8330:03/16/84 (WP-SJ-27640)

cc:
BPA-AC (2)
J. Pyrch - PGC
Official File - SJ

EQ 4-2 alpha "A"
Alternate Fuel Nonfirm Policy EA

MAR 14 1984

PGC

Addressees

John B. Pyrch, Environmental Coordinator
Office of Power and Resources Management - PGC

Draft Nonfirm Policy Environmental Assessment

The attached draft environmental assessment (EA) prepared by this office on BPA's Nonfirm Policy for Service to Consumer's Alternate Fuel Loads has been transmitted to DOE for preliminary review.

A preliminary copy of this EA was reviewed in November and January. Comments from these previous reviews have been incorporated, and the EA has been rearranged to aid in readability.

I would appreciate your reviewing this EA and returning your comments to Randy Seiffert by close of business March 28, 1984. If you have any questions, please call Gabrielle Foulkes or Randy at extension 4261.

Attachment

Addressees:
L. Baker - ALP
O. Schmidt - APG
J. Luce - APP
M. Austin - APR
Area Power Managers -
OKC, OPC, OSC, OWC,
T. Esvelt - P
J. McLennan - PG
W. Pollock - PH
J. Palensky - PJ
T. Noguchi - PK
C. Combs - PKI
S. Melton - PL
S. Palmatier - PLAC
D. Hoffard/J. Hornor - PN
J. Holmstrom - PQ
G. Fuqua - PR
L. Dean - PS
D. Faulkner - PS
T. Morrell/T. McKinney - SJ

SPrice:ljc (2779K)

cc:
R. Seiffert - PGC
G. Foulkes - PGC
Official File - PGC

MAR 1 4 1984

EQ 4-2 alpha "A"
Alternate Fuel Nonfirm Policy EA

PGC

Anthony R. Morrell
Environmental Manager - SJ

John B. Pyrch, Environmental Coordinator
Office of Power and Resources Management - PGC

Preliminary DOE Review of the Nonfirm Policy Environmental Assessment.

Attached are three preliminary copies of the Environmental Assessment on BPA's Proposed Final Policy for Sales of Nonfirm Energy to Utilities for Service to Loads with Alternate Fuel Capability for your office to transmit to DOE for advance review. If you have any questions, please call me or Randy Seiffert on extension 4261.

Attachments (3)

SPrice:aw (WP-PGC-2630K)

cc:
L. Baker - ALP
O. Schmidt - APG
J. McLennan - PG
R. Seiffert - PGC
T. Noguchi - PK
C. Combs - PKI
Official File - PGC

Bonneville Power Administration
U.S. Department of Energy

all comments taken care of.

BPA

DATE : FEB 09 1984

In reply refer to : PRI

UNITED STATES GOVERNMENT

Memorandum

TO : John B. Pyrch, Environmental Coordinator
Environmental Analysis and Review - PGC

FROM : for Gary L. Fuqua, Director — Robert C. Lamb
Division of Power Resources Planning - PR

SUBJECT: Comments on Nonfirm Policy Environmental Assessment

We have reviewed the subject document. We find it generally well written, candid, and thorough. Our few comments range from "detail" to "general."

1. On page 1, section 1.1.1., lines 1 and 6, insert "firm" before "loads."

2. On page 23, the first paragraph seems to discard some partially valid ideas with little explanation.

3. On page 28, line 3, change "Appendix A" to "Appendix B."

4. The last paragraph on page 35 says we want to inhibit cogeneration. Shouldn't it say we want to inhibit noneconomic cogeneration even if they both lead to the same conclusion?

5. Couldn't check figure 1 on page 43, it wasn't there.

6. The use of the word "optimum" in describing Water Budget seems an overstatement of analysis done on the Budget. Perhaps "desired" would be a better choice of words.

MFMcCoy/CECancilla:lsr (WP-PRI-0206H)

cc:
Official File - PRI

Bonneville Power Administration
U.S. Department of Energy

Randy - your copy

BPA

DATE : February 8, 1984

Comments taken care of

In reply refer to : SJ

UNITED STATES GOVERNMENT

Memorandum

TO : John B. Pyrch
Power and Resources Management Environmental Coordinator - PGC

FROM : Anthony R. Morrell
Environmental Manager - SJ

SUBJECT: Environmental Assessment (EA) on BPA's Nonfirm Policy Proposed Final Policy for Sales of Nonfirm Energy to Utilities for Service to Loads with Alternative Fuel Capability

We have reviewed the subject EA in response to your January 30, 1984, memo and submit the following comments:

The EA accommodated all comments that we previously had raised. Minor editorial comments have been submitted on a copy of the document. This EA has done a truly excellent job of quantifying impacts, particularly air impacts. Your staff should be commended for their thorough analysis.

We feel that such quantified predictive comparisons provide decisionmakers with valuable information concerning impacts of the proposal and alternatives. As the quality of analysis improves, decisionmakers can give environmental factors more weight in decisionmaking.

NStas:amy (WP-SJ-27050)

cc:
O. Schmidt - APG
J. McLennan - PG
Official File - SJ

Bonneville Power Administration
U.S. Department of Energy

BPA

UNITED STATES GOVERNMENT

Memorandum

DATE : February 1, 1984

In reply refer to : PNSC

TO : John B. Pyrch, Environmental Coordinator
Office of Power and Resources Management - PGC

FROM : John R. Wilkins, Agricultural Economist
Economic Studies Section - PNSC

SUBJECT: Nonfirm Policy Environmental Assessment Review

I have reviewed the nonfirm policy environmental assessment and have no comments. Much of the information and the alternatives are useful as we evaluate nonfirm sales for the irrigators.

JWilkins:jd (WP6176A)

cc:
J. G. Hornor - PN
G. B. Moorman - PNS
C. G. Schneider - PNSC
Official File - PNSC

JAN 3 0 1984

Alt. Fuel
EQ 4-2 Nonfirm Policy

PGC

Addressees listed below

John B. Pyrch, Environmental Coordinator
Office of Power and Resources Management - PGC

Nonfirm Policy Environmental Assessment Review

Attached is a copy of the environmental assessment (EA) prepared by this office on BPA's Nonfirm Policy for Service to Consumer's Alternate Fuel Loads. We distributed a preliminary copy of this EA at the end of November, and comments from that review have been incorporated into this copy. As a result of the comments, the major changes in this draft are: (1) expansion of the discussion on California impacts, and (2) re-analysis of the amounts of nonfirm energy to various markets using different assumptions and resulting in generally lower figures.

I would appreciate your reviewing this EA and returning your comments to Randy Seiffert by close of business February 6, 1984. If you have any questions, please call me or Randy at extension 4261.

Attachment

Addressees:

L. Baker - ALP
O. Schmidt - APG
S. Jensen - APP
J. Luce - APP
T. Esvelt - P
J. McLennan - PG
G. Foulkes - PGC
W. Hibbard - PGC
S. Price - PGC
W. Pollock - PH
S. Smith - PJI
R. Harper - PJI
M. Knapp/K. Ward - PJS
T. Noguchi/D.J. Anderson - PK
C. Combs - PKI
S. Melton - PL
S. Palmatier - PLAC
J. Hornor - PN
J. Wilkins - PNSC
G. Fuqua - PR
D. Faulkner - PS
A. Morrell - SJ
N. Stas - SJ

SPrice:sp (2694K)

cc:
R. Seiffert - PGC
Official File - PGC

Bonneville Power Administration
U.S. Department of Energy

BPA

DATE : JAN 3 0 1984

In reply refer to : PGC

UNITED STATES GOVERNMENT

Memorandum

TO : Addressees listed below

FROM : John B. Pyrch, Environmental Coordinator
Office of Power and Resources Management - PGC

SUBJECT: Nonfirm Policy Environmental Assessment Review

Attached is a copy of the environmental assessment (EA) prepared by this office on BPA's Nonfirm Policy for Service to Consumer's Alternate Fuel Loads. We distributed a preliminary copy of this EA at the end of November, and comments from that review have been incorporated into this copy. As a result of the comments, the major changes in this draft are: (1) expansion of the discussion on California impacts, and (2) re-analysis of the amounts of nonfirm energy to various markets using different assumptions and resulting in generally lower figures.

I would appreciate your reviewing this EA and returning your comments to Randy Seiffert by close of business February 6, 1984. If you have any questions, please call me or Randy at extension 4261.

Attachment

Addressees:

L. Baker - ALP
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J. Luce - APP
T. Esvelt - P
J. McLennan - PG
G. Foulkes - PGC
W. Hibbard - PGC
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J. Hornor - PN
J. Wilkins - PNSC
G. Fuqua - PR
D. Faulkner - PS
A. Morrell - SJ
N. Stas - SJ

SPrice:sp (2694K)

cc:
R. Seiffert - PGC
Official File - PGC

Bonneville Power Administration
U.S. Department of Energy

BPA

UNITED STATES GOVERNMENT

Memorandum

DATE : December 28, 1983

In reply refer to : SJ

TO : Randy D. Seiffert
Environmental Engineer - PGC

FROM : Nicholas J. Stas Nicholas J. Stas
Environmental Specialist - SJ

SUBJECT: Environmental Assessment on BPA's Proposed Policy for Sales of Nonfirm Energy to Utilities for Service to Loads with Alternative Fuel Capability

We have reviewed the subject document and find that it provides an excellent review of issues related to the proposal. We submit the following comments:

1. The document should further explain what types of problems would be encountered if the marketing threshold we set lower than 1 MW (i.e., What types of problems this would pose for power dispatchers?).

2. Discussions of environmental impacts to the Southwest both adverse and beneficial should be clarified in order that a finding of no significant impact can later be made. (For example, if the load under this policy approaches the 700 MW threshold referenced on page 4, would this policy then be reevaluated for significant impacts?)

3. Minor and editorial comments are indicated on the copy of the attached document.

If you have any questions concerning these comments please call me at extension 4721.

Attachment

NStas:jh (WP-SJ-26280)

cc:
Official File - SJ

Bonneville Power Administration
U.S. Department of Energy

BPA

UNITED STATES GOVERNMENT

Memorandum

DATE : December 9, 1983

In reply refer to : PJI

TO : John Pyrch, Environmental Coordinator
Office of Power and Resources Management - PGC

FROM : Stephen H. Smith, Chief
Systems Integration Branch - PJI

Steve

SUBJECT: Review of Non-Firm Environmental Assessment

We have completed our review of your draft Environmental Assessment (EA) and have attached an interlined copy with our comments. Due to current workload levels within the Division we have been unable to review the EA in a comprehensive fashion. We have however, fully addressed those points we consider to be significant and have provided some other comments. If we can be of further assistance please let me know.

Attachment

RJHarper:nb (WP-2561N)

cc:
R. Seiffert - PGC
J. Palensky - PJ
R. Harper - PJI
Official File - PJI

Bonneville Power Administration
U.S. Department of Energy

BPA

DATE : DEC 0 2 1983

In reply refer to : PRC

UNITED STATES GOVERNMENT

Memorandum

TO : John B. Pyrch, Environmental Coordinator
Environmental Analysis and Review - PGC

FROM : Gary L. Fuqua, Director
Division of Power Resources Planning - PR

SUBJECT: Review of Environmental Assessment on Proposed Policy for Nonfirm Energy Sales

As you requested, we have reviewed the subject document and submit the following comments:

1. One week lead time is insufficient to accomplish distribution of draft environmental assessment (EA), review, and submittal of comments.

2. Eliminate paragraph on bottom of page 6, top of page 7. The reference to premature drafts of reservoirs seems to be implying shift, flex, and advance, which do not need to be included in the EA.

3. Page 35 - Entire page should be rewritten to read:

   BPA proposes to offer, on an ad hoc basis, to qualified consumers, nonfirm energy in amounts and at times determined by BPA. Such times include conditions of spill, imminent spill, and other conditions. Although there may be legal constraints, BPA has the options of restricting sales of nonfirm under this policy to times of spill only, or to times of spill or imminent spill only, or of establishing some other standards as part of the policy by which it would be decided when to offer nonfirm to the utilities and/or qualified consumers and how much nonfirm to make available. BPA would use the flexibility available under the proposed approach to maximize its revenues within its operational, planning, and legal constraints.

   Serving qualified consumers at times of spill and/or imminent spill, would lessen the amount of nonfirm energy BPA would make available to the utilities. This approach could reserve for qualified customers, secondary energy which otherwise could be produced under nonspill conditions for use by other customers classes, most notably the DSI's. (In the case of the DSI's, it would be sold as auxiliary power under one of the three industrial rates.) This approach may be contrary to the preference provisions of the Bonneville Project Act, other laws, and the Central Lincoln I lawsuit decision. Although this approach would tend to reduce the frequency with which nonfirm may be available to qualifying consumers, it would lengthen the time nonfirm is available on those occasions when spill does occur. This may be . . . .

   As the text reads now - P.L. 88-552 is incorrect designation for Bonneville Project Act.

4. Page 39, item 3 - It is not clear as to whether there is 300 or 400 average MW of existing boiler capacity.

5. Page 41, second and third lines from bottom of page - The reference to optimum flows seems to be a use of the term "optimum" as it has been used in the development of the water budget under the Fish and Wildlife Program. Since that definition is not widely recognized, it should not be used in this context.

6. Page 42, section 5.1.1.2, first two sentences - Should be rewritten to read: The availability of an additional 1,400 average MW of nonfirm market will result in a decrease in the amount of unusable water or spill on the system. This occurs because existing markets do not always absorb all the nonfirm energy when it occurs. Thus, generation is available to meet at least some of an additional nonfirm market.

7. Page 49, section 5.1.3, second paragraph, first line - Delete the words "at times."

8. Page 50, second line - Add a comma after "nonfirm energy." Last sentence in first paragraph - Rewrite to read: This increased risk should be considered by plant owners/operators and appropriate protective measures taken and/or necessary backup systems installed.

9. Page 51, bottom 3 lines - need to be edited.

10. Page 61, lines 7 and 8 - need to be edited.

11. Typographical errors:

Page 8, next to last line	- may uphold <u>or</u> reverse
Page 53, line 13	- quartile
Page 54, line 3	- their
Page 55, sixth line from bottom	- chances <u>of</u> displacing
Page 57, line 3	- environmental impact
Page 60, line 4	- fossil
Page 61, line 4	- more power
Page 61, seventh line from bottom	- effects
Page 63, fourth line from bottom	- environmental
Page 73, line 10	- no action
Page 75, line 8	- plants

CECancilla/MFMcCoy:sj/lsr (WP-PRC-0090G)

cc:
Official File - PRC

NOV 2 3 1983

PGC

EQ 4-2 alpha
"alternate Fuel ....."

Addresses listed below

(Sgd.) JOHN B. PYRCH

John B. Pyrch, Environmental Coordinator
Office of Power and Resources Management - PGC

Nonfirm Policy Environmental Assessment Review

Attached is a preliminary copy of the environmental assessment (EA) prepared by this office on BPA's Nonfirm Policy for Service to Consumer's Alternate Fuel Loads. In order to maintain the established schedule, I would appreciate your reviewing the preliminary EA and returning your comments to Randy Seiffert by close of business December 1, 1983. If you have any questions or problems meeting the deadline, please call me or Randy at extension 4261.

Attachment

Addressees:

L. Baker - ALP
O. Schmidt - APG
S. Jensen - APP
J. Luce - APP
J. McLennan - PG
S. Price - PGC
W. Pollock - PH
S. Smith - PJI
R. Harper - PJI
M. Knapp - PJS
T. Noguchi/D.J. Anderson - PK
A. Unkovskoy - PKI
C. Combs - PKI
S. Palmatier - PLAC
J. Hornor - PN
J. Wilkins - PNSC
G. Fuqua - PR
D. Faulkner - PS
A. Morrell - SJ

SPrice:aw (WP-PGC-2576K)

cc:
R. Seiffert - PGC
Official File - PGC

ENVIRONMENTAL ASSESSMENT

on

BPA'S PROPOSED POLICY FOR SALES OF NONFIRM ENERGY TO UTILITIES FOR SERVICE TO LOADS WITH ALTERNATIVE FUEL CAPABILITY

OFFICE OF POWER AND RESOURCES MANAGEMENT

BONNEVILLE POWER ADMINISTRATION

U.S. DEPARTMENT OF ENERGY

DECEMBER 1983

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Chapter 1.0

EXECUTIVE SUMMARY

The proposed policy formalizes procedures for serving a new market for BPA nonfirm energy, first served under interim arrangements in 1983. The market is to regional utilities whose customers (consumers) find it economical at times to displace oil, gas, or other fuel usage with nonfirm electrical energy. Any load of 1 average MW or more which can be fully served by an alternate fuel and which is operated by a consumer of a regional utility customer of BPA's is eligible for nonfirm service under the policy. The policy requires separate metering and special communications equipment to be installed by utilities and/or consumers, and for utilities to sign special contracts in order to secure nonfirm for this purpose. Because of these requirements and the fact that the initial contract offering will be for only until June 30, 1987, BPA does not expect large amounts of interruptible load to be served during the initial phase of this policy. This ameliorates some of the potential environmental impacts of the policy and also will help BPA, utilities, and consumers to learn more gradually and with reduced risk about operating under the policy.

Because many of the utilities seeking nonfirm service under the policy for their consumers are preference customers, under the Central Lincoln I decision, nonfirm energy will be provided for this market to the detriment of amounts available to other nonfirm markets, namely the direct service industries, Northwest investor-owned utilities, and export markets.

Environmental impacts of the policy derive both from changes in operation of the Federal Columbia River Power System (FCRPS) to provide an increased amount of nonfirm energy when it is possible to do so in order to meet the expanded market for it; and from changes in the operations of consumers served under the policy, and of those entities which will experience reduced availability of nonfirm energy. Affects on FCRPS operation are primarily reflected as impacts on fish, wildlife, and recreation. Analysis performed for this EA shows that, while there may be some exacerbation of existing operational impacts on fish, wildlife, and recreation, the changes in flows and reservoir levels projected do not indicate significant impacts in these areas. In addition, existing constraints and agreements are in place which will prevent undue harm to anadromous fish from the policy's implementation.

Impacts related to changes in availability of nonfirm to various market classes depend on whether the class gains or loses access to nonfirm and on what the power is used for. With respect to the alternate fuel loads the policy is meant to serve, there will be environmental benefits since the nonfirm electrical energy will substitute for use of fuels which produce air pollutants and perhaps solid waste. There will also be benefits to the physical environment from losses of nonfirm to the DSIs since they would otherwise use it to operate industrial facilities which have adverse environmental impacts. The investor-owned utilities and export markets use nonfirm to displace polluting thermal resources, and the reduced availability of nonfirm to these markets has a negative environmental impact. With one possible exception, all these impacts are nonsignificant. This is because either the degree of change is nonsignificant or the impact being changed is not in itself significant. The possible exception is impacts due to reduced

availability of nonfirm to export markets. Since some of these marekts use nonfirm to displace thermal resoures in or which impact areas with severe air pollution problems (most notably the Los Angeles Basin), this impact may be significant if large amounts (more than 700 average MW) of nonfirm alternate fuel load are served under the policy. BPA will reevaluate the policy with respect to this impact if and when nonfirm alternative fuel load to be served under the policy approaches 700 average MW.

Pending public and agency review, BPA has concluded that implementation of the proposed policy is not an action significantly affecting the human environment and, therefore, does not require preparation of an environmental impact statement (EIS).

Chapter 2.0

INTRODUCTION

2.1 BACKGROUND

This section will describe some of the elements which are fundamental to the understanding of and the development of the proposed policy.

2.1.1 Grades and Availability of Power

BPA projects its ability to serve loads on a 42-month historical record of streamflow data, the critical period, which results in the least amount of potential generation. Studies made on this basis determine Firm Energy Load Carrying Capability (FELCC). FELCC is the amount of energy BPA can be confident of supplying to customers to serve loads. If loads the Administrator is obligated to serve as "firm," that is with very high reliability, exceed FELCC, BPA would be deficit, would have to allocate power, and would need to seek new resources to attain a firm load/resource balance. If FELCC exceeds expected firm obligations as in the current situation, BPA is capable of serving more firm load than its customers have and would attempt to market the excess FELCC as "surplus firm." Most of the time more water is available for generation by the Federal dams from which BPA markets power than under critical period conditions. The additional energy which can be generated is "nonfirm" energy. It cannot be sold as firm, at least without some form of backup heretofore unprovided, because it varies in quantity and

at times is not available at all. Nonfirm energy is most likely to be available in the late spring and early summer when snow melting in the mountains causes high flows in the rivers and the Northwests' peak winter electrical loads are over.

Implementation of the Northwest Power Planning Council's (Council) Water Budget will, on the average, increase nonfirm energy capability by 432 average annual MW (while sacrificing 510 average MW of firm energy capability). This energy will be available in the period between April 15 and June 15 of each year when water is provided under the water budget to provide downstream flows to aid migration of smolts to the ocean.

When Washington Nuclear Project Number 2 (WNP-2) begins producing energy commercially, expected to be on or about April 30, 1984, additional nonfirm energy may be made available to market for as long as BPA remains in a surplus situation.

Nonfirm energy may be generated in two situations. One is when there is a high probability of having more than enough water available to meet firm loads and to refill reservoirs and meet all other constraints on the hydroelectric system such as the Water Budget, fish passage, navigation, etc., and a decision is made to prematurely draft reservoirs to generate marketable nonfirm power. The second situation is when water must be released from reservoirs because of high flows and/or operational constraints such as flood control, reservoir levels, fish migration, etc. In one case, generation of nonfirm is discretionary; a decision is made to take a limited risk of water conditions not turning out as well as predicted in order to produce marketable

nonfirm power to generate BPA revenue or to accomplish some goal such as being able to displace a more costly resource. In the second case, the generation of nonfirm is forced since energy would be wasted if the water which must be released because of high flows or operating constraints were simply discharged over the spillway, or "spilled," instead of being sent through the turbines. Nonfirm energy generated under the second condition or when "spill" would be forced if nonfirm were not being generated, is sold under a lower rate according to BPA's rate schedule. (See Section 3.2.2.9 for a discussion of BPA's rates for nonfirm energy.) There are times when water must be spilled such as when the rate at which water must be released exceeds the capacity of the turbines, when there is no market for all the nonfirm which could be generated, and, at certain dams and times of year, to reduce fatalities of downstream migrating smolts.

BPA is currently surplus; that is, FELCC exceeds loads. Assuming BPA continues to be unsuccessful in marketing all its firm surplus on a firm basis, BPA, after displacing its high cost resources with hydro, could sell its remaining firm surplus as nonfirm. However, such sales would be terminated if a firm customer were found.

2.1.2 Historic Sales and Uses of Nonfirm Power

Historically, sales of nonfirm power have been to the IOU's at the nonfirm rate to displace high cost thermal resources and/or serve interruptible loads; to the Direct Service Industries (DSIs) for service to their top quartile at the IP rate; and to utilities outside the region at the spill rate of the nonfirm rate schedule.

2.1.3 Central Lincoln Lawsuit Decision

Historically, BPA has contractually committed to not interrupt service to the DSI top (interruptible) quartile in order to provide nonfirm service to other customer classes. In Central Lincoln Peoples' Utility District v. Johnson, 686 F.2d 708 (1982), the United States Court of Appeals for the Ninth Circuit ruled that BPA's public agency customers (public utility districts, cooperatives, and municipalities) in the region had a priority to nonfirm power, as well as the historically and legally recognized priority to firm power, over the DSIs under the "preference" provision of the Pacific Northwest Electric Power Planning and Conservation Act. Under this decision, BPA would be forced to interrupt top quartile service to the DSIs if a regional public agency customer wanted to purchase nonfirm energy and there was insufficient nonfirm available at the time to meet both public agency and DSI demands. The decision was one impetus for the proposed policy which establishes one mechanism under which nonfirm sales to public agencies may be made and recognizes a new potential market for nonfirm energy.

As a result of an appeal of the Ninth Circuit Court of Appeals' decision by the Aluminum Company of America, one of BPA's DSI customers, the United States Supreme Court is reviewing the case, and may uphold a reverse the lower courts opinion.

2.1.4 Regional Plan Directive

The Northwest Power Planning Council's 1983 Northwest Conservation and Electric Power Plan provides the following directive:

> "The objective of this program is to develop additional markets for interruptible energy in the Northwest. The effort to develop additional means of retaining the economic benefits of low-cost secondary energy in the region is the most important single regional energy-related economic issue over which the region has control, and it should be treated accordingly."

As part of the Two-Year Action Plan, BPA, in consultation with the Council, should:

-- "Initiate a policy to develop, to the fullest extent possible, regional markets for secondary energy including industrial and irrigation markets;" and

-- "Set an initial goal of 900 to 1,400 megawatts (MW) of potential interruptible load in the industrial sector and conduct further investigations to determine whether more potential is available."

BPA has undertaken three efforts to implement these goals in the short term. They are:

a. a short-term sale of nonfirm energy to the DSI's for startup of idle production capacity;

b. nonfirm energy sales made under the interim principles to some end-user industrial loads of BPA's requirements customers; and

c. an offer of nonfirm energy to incremental irrigation loads.

These actions were taken to retain the benefits of nonfirm within the region on a short-term basis and to increase revenues to BPA. These efforts were directed at existing markets.

Developing new markets for nonfirm energy presents a different and more difficult set of considerations. One consideration, which the Council's Ekono, Inc., study (1982) emphasizes, is the need for some sort of guarantee of price and availability of nonfirm energy with which the amortization of new facilities could be calculated. BPA must also be mindful not to displace firm loads, thus undercutting its own and its utility customers' economic base.

2.1.5 Interim Contracts

In January 1983, BPA drafted principles for selling nonfirm energy to its Northwest utility customers for industrial loads with other energy sources. BPA made sales of this type available to Northwest utilities on an interim basis, pending completion of the long-term policy now being proposed. BPA discussed the interim principles with representatives of publicly owned utilities, investor-owned utilities, the direct-service industries, and industrial consumers of Northwest utilities.

Six utilities signed the interim nonfirm energy sales contracts.

a. Umatilla Electric Cooperative contracted for up to 40 average MW of nonfirm power for three potato processing plants. All three plants have natural gas-fired boilers as alternate fuel sources.

b. The City of Port Angeles contracted for approximately 7 average MW of nonfirm energy, beginning February 1, 1983, for an electric boiler at a Crown Zellerbach paper mill. The mill can use wood waste in lieu of electricity.

c. Cowlitz County Public Utility District contracted on February 25, 1983, for approximately 75 average MW of nonfirm energy for electric boilers at Longview Fibre and Weyerhaeuser mills. These mills can also use wood waste as fuel.

d. Tillamook County People's Utility District contracted for approximately 3 average MW of nonfirm energy since June 11, 1983, for service to a boiler at the Tillamook cheese factory. The cheese factory can use oil as an alternate fuel.

e. Snohomish County Public Utility District contracted for approximately 45 total average MW of nonfirm energy for service to the electric boiler loads of the Weyerhaeuser Kraft Paper and Lumber Manufacturing Facility and the Boeing Commercial Airplane Company since May 11, 1983. Weyerhaeuser can run alternate fuel boilers with natural gas, oil, or black liquor, a by-product of kraft pulp production. Boeing can fire boilers with natural gas or oil in lieu of electricity.

f. Lewis County Public Utility District contracted for approximately 3 average MW of nonfirm energy since June 9, 1983, for service to the American Crossarm Company. Lewis is receiving nonfirm service under the curtailment provisions of the interim nonfirm principles.

2.2 SCOPE OF POLICY

The Council in its Two-Year Action Plan has directed BPA to develop "regional markets for secondary energy including industrial and irrigation markets," indicating that the Council envisions serving interruptible markets beyond those addressed by the currently proposed policy. Commenters responding to BPA's requests for public and/or customer input on means of marketing firm surplus energy (47 FR 53928); Notice of Availability and Request for Comments: Proposed Contracts for Sale of Energy for Use by Northwest Industrial and Irrigation Loads (48 FR 10903); and Notice of Proposed Policy: Nonfirm Energy Sale for Utilities' Industrial Loads (48 FR 33518) have suggested other potential markets for nonfirm power not addressed by the proposed policy. BPA in its interim sales of nonfirm to irrigators and DSI's had difficulty in determining terms of the sale which facilitated such sales while preventing loss of firm load and/or providing equitable treatment to customers within a class. BPA, bolstered by its experience with the interim nonfirm sales to utilities for service to industries having alternate fuel capability, feels that the currently proposed policy under which this type of sale could be continued is a workable means of marketing nonfirm, but needs

more time to devise satisfactory strategies to market nonfirm power to other new markets. As part of BPA's Implementation Programs for the Northwest Power Planning Council's Two-Year Action Plan, BPA intends:

> "to conduct further investigations concerning nonfirm energy. In conjunction with the Council, BPA plans to undertake studies to determine: (1) the specific location of existing loads in the industrial sector; and (2) other generic potential types of process or load in the industrial or commercial sectors which could be served with nonfirm energy which are not presently being served with firm electricity."

Therefore, the currently proposed policy and this EA is restricted in scope to only provide for sales of nonfirm to utilities for service to interruptible loads, sized at 1 average MW demand or greater, with alternate fuel capability. Qualifying loads are most likely to be boilers used for process heat in the pulp and paper, wood products, and food processing industries; and space heating for large industrial plants, commercial facilities (office buildings or complexes, shopping centers, central heating plants, etc.), and institutions (large hospitals, universities, etc.). BPA may propose other policies for marketing of nonfirm for specific applications at later times. BPA will undertake appropriate NEPA compliance activities in conjunction with such future policies.

2.3 POLICY DEVELOPMENT PROCESS

2.3.1 History of Policy Development to Date

In the past year, Northwest loads have been significantly lower than expected, due in part to the recession. At the same time, the region has experienced a

particularly good water year. As a result, nonfirm energy was available at the spill rate (at the time, 9 mills per kWh) from January 1983 through September 2, 1983. Even at the spill rate, some nonfirm energy went unsold.

In order to assist the Northwest economy and to increase its revenues, BPA began to look for new ways to market nonfirm energy in the Northwest.

On November 30, 1982, BPA requested recommendations from the public on ways it could effectively market surplus firm energy (47 FR 53928). A number of the 58 respondents suggested BPA investigate ways to market nonfirm energy in the Northwest, as an alternative to firm energy sales outside the region. In separate forums, the Council recommended that BPA make surplus energy available to irrigators at reduced rates. Employees of BPA's direct-service industrial customers recommended BPA make blocks of power available to the DSIs at reduced rates.

2.3.1.1 Interim Principles for Sales of Nonfirm Energy for Interruptible Loads

In January 1983, BPA drafted principles for selling nonfirm energy to its Northwest utility customers for industrial loads with substitute energy sources. BPA made sales of this type available to Northwest utilities on an interim basis, pending completion of the policy now proposed. BPA discussed the interim principles with representatives of publicly owned utilities, investor-owned utilities, the direct-service industries, and industrial consumers of Northwest utilities.

Operating experience under the interim nonfirm sales agreements was gained by BPA, the utilities, and the industrial customers. These agreements covered both loads which were curtailed, or had announced a curtailment by March 1, 1983, and loads with alternate fuel sources of a capacity equal to or greater than the electric demand.

Experience under these agreements has indicated several things.

a. The nature of some consumers' load is such that the load cannot tolerate, for maintenance and operation purposes, frequent interruption of power supply. This would indicate the need for "block-selling" of nonfirm energy.

b. The need for equivalent capacity of alternate fuel sources is critical. Where this is present, end-use load operators behave in perfectly rational economic modes, i.e., when the price of electricity goes up beyond the price of the alternate fuel source, the power source is switched. This requirement also safeguards to a large extent against building of inventories with nonfirm energy, thus endangering firm loads in future periods.

c. Irrigation loads are not interruptible loads and as such should not be included under the purview of this policy.

Apart from comments received on the Interim Principles, meetings have been held both informally and formally as part of policy development.

BPA staff met with members of the Association of Public Agency Customers (APAC) to discuss ideas for the long-term policy. Staff also met informally with staff of private utilities who are exploring these markets themselves.

End-user industries have also expressed interest on developing long-term arrangements.

A Notice of Proposed Policy for Nonfirm Energy Sales for Utilities' Industrial Loads was published in the Federal Register on July 22, 1983 (48 FR 33518). As part of this policy development process, public involvement meetings on the proposal were held in Portland, Seattle, and Spokane. Written and oral comments were accepted through August 31, 1983.

Chapter 3.0

EXPLANATION OF THE PROPOSAL

3.1 LEGAL AUTHORITY

The Bonneville Project Act, as amended, 16 U.S.C., Chapter 12B, and the Federal Columbia River Transmission System Act, Public Law 93-454, direct BPA to encourage the widest possible diversified use of all electric energy that can be generated and marketed at the lowest possible rates consistent with sound business principles (16 U.S.C. 832a(b); 16 U.S.C. 838g). In addition, the Bonneville Project Act authorizes BPA to enter into any contracts, agreements, or arrangements which BPA deems necessary to effectuate these and other statutory purposes. Finally, the Pacific Northwest Preference Act, Public Law 88-552, expresses the clear intent that energy available to BPA which is in excess of that needed to meet the requirements of BPA's Northwest customers shall be offered for sale first within the Pacific Northwest (16 U.S.C. 837a; 16 U.S.C. 837b). Loss of electrical load to alternate fuels, requests for nonfirm service to alternate fuel loads, requests from interested parties in the Northwest for the development of a long-term policy for such loads, as well as successful sales under the interim agreements for nonfirm energy service to utilities for their alternate fuel loads all lead BPA to foresee that development of this policy will encourage diversified use of electric energy.

3.2 DESCRIPTION OF THE PROPOSAL

This portion of the EA describes the proposed policy and discusses the features of the policy, particularly those which have potential for affecting the environment.

3.2.1 Overview of the Proposed Policy and Policy Implementation

BPA proposes to make nonfirm energy available to its Northwest utility customers for service to loads which can utilize an alternate fuel source when BPA determines that nonfirm energy is not available. As the result of its efforts to make nonfirm energy available under short term agreements this year, BPA has learned that loads that were once served with firm power are either being lost to alternate fuels or are being shut down altogether. The amount of firm power sold for service to industrial loads that are now being lost to alternate fuels had previously varied depending on the market for the product of the industry and the availability of cheap alternate fuel. However, until recent firm power rate increases, firm power was generally competitive with alternate fuels. By making nonfirm energy accessable to these and other loads, BPA hopes to provide intermittent electric service to some loads which have been lost to the region, and eventually encourage development of new interruptible loads.

BPA's objectives in this proposed action are to (1) improve BPA revenues by stimulating nonfirm energy sales that would not otherwise take place; (2) to allow BPA's utility customers and their qualified consumers to enjoy the benefit of low cost energy when it is available, and thereby improve the

region's economy; (3) to utilize BPA nonfirm hydroelectric resources that might otherwise be wasted; and (4) to avoid conversion of existing firm load to nonfirm load and consequent loss of firm sales and firm revenues.

3.2.2 Qualifications of Load for Nonfirm Service

BPA has limited the scope of the proposed policy to service to the nonfirm loads, which are over 1 average MW, of consumers of its utility customers.

Under the proposed policy, BPA intends to make nonfirm service available only for the part of the nonfirm load which is in excess of each consumer's base historical firm load levels. Furthermore, this policy proposes that the level of nonfirm service shall not exceed the difference between historical firm service levels and the equivalent electrical capacity of the required alternate fuel source. BPA would discount recent electrical load operating level in determining historical firm load levels if recent fluctuations do not reflect long range trends. In determining base firm load levels and nonfirm load levels, BPA would avoid loss of firm load to nonfirm energy service.

3.2.3 Term

The proposed duration of the nonfirm contracts to be offered under this policy is through June 30, 1987, a time approximately equal to BPA's 42-month critical period starting at the beginning of policy development. During that critical period, BPA is projecting a firm surplus, which should continue beyond the critical period. This also allows sufficient time to gain experience under this policy and allows the contracts to be brought in line

with any subsequent nonfirm policy development. Resources to provide firm service may be available upon expiration of the contract. If consumers taking nonfirm under the proposed policy desire to receive firm service after the term of the contract, their respective utilities would be required to give BPA 2-years notice of such intent.

3.2.4 Notification and scheduling, etc.

3.2.4.1 Notification of Nonfirm Energy Availability

Under the proposed policy, BPA would notify each utility purchaser when it had nonfirm energy available for the consumers' nonfirm loads. The notification would include estimated price, duration, and amount of nonfirm energy available. These estimates would not be guarantees and would be subject to change at any time. However, BPA would provide the best estimates it could, based on current information. BPA would inform the utility of any revisions in its estimates with maximum practicable notice. It would be the responsibility of the purchaser and the consumer to respond to any change in availability.

3.2.4.2 Purchase of Nonfirm Energy

During periods of nonfirm energy availability, nonscheduling purchasers would notify BPA's schedulers by noon of the workday prior to the commencement of availability of nonfirm service to a load that they desired to commence nonfirm service. It is anticipated that nonscheduling purchasers would not

need to contact BPA until the workday before an anticipated change of more than 10 percent in their nonfirm load. BPA schedulers, may, however require more frequent communications.

Scheduling purchasers should follow appropriate scheduling procedures specified in their power sales contracts.

3.2.4.3 Transition to Alternate Fuel

At times when BPA no longer has nonfirm energy available, any energy taken for the nonfirm load over the base firm level established in the nonfirm contracts would be billed at the unauthorized increase charge in the BPA firm power rate schedule.

In discussions with utilities and consumers regarding the interim nonfirm agreement, BPA was asked if there was a way it could ease the transition from nonfirm energy to the alternate fuel. Different loads need different lead times to bring on line their alternate fuel capability. Several ideas were discussed, including extended notice, storage, replacement energy, energy advances, and sale of firm surplus for the transition period.

BPA does not normally accept storage during spill periods. Replacement energy may not be available in time if notice of termination of nonfirm energy is so short that replacement energy is needed. BPA would not be able to make an advance without the ability to later restrict firm load for repayment. Firm surplus may be committed at the time of a termination of nonfirm availability. Hence, none of these ideas appear to present practical solutions.

BPA intends to give maximum practicable notice to purchasers of any change in nonfirm availability. BPA generally knows about a week in advance when spill energy will no longer be available. After the spill condition, a standard condition often exists when nonfirm energy continues to be available, but it is generally more difficult to forecast the availability of this type of nonfirm energy. However, BPA proposes in this policy to reserve the right to give notice of termination of nonfirm availability, effective at the end of hour.

BPA could have provided a short fixed notice period of the end of nonfirm availability. However, the result of a fixed notice period would merely be that BPA would be more conservative in giving notice and thus, nonfirm availability might sometimes extend beyond the end of the notice period.

In the event of a sudden loss of capacity or transmission, BPA would give notice if possible, but there is little which can be done to mitigate the effects of an unexpected change of availability of this sort.

BPA offers a guaranteed-delivery provision on a take-or-pay basis in the current rate schedule for nonfirm energy. The delivery is generally guaranteed through the next prescheduled day. A purchaser could take advantage of such an offer under nonfirm contracts concluded in accordance with this policy. Such guaranteed deliveries are subject to restriction in the event of a system emergency.

3.2.5 Facilities

Purchasers who take advantage of the nonfirm service proposed under this policy would be responsible for installation of metering and communication equipment required under the policy. BPA does not propose to recover the cost of such facilities from nonfirm revenues. However, BPA may install the facilities for the purchaser at the purchaser's or the consumer's expense.

3.2.5.1 Metering

In order to segregate the amounts of nonfirm energy from amounts of firm power delivered at the point of delivery, an hourly recording demand meter, an energy meter, and a varhour meter are required at each consumer's nonfirm load under the proposed policy. For both metered and computed requirements purchasers, installation of these meters at the load will provide a means of computing the amount of nonfirm energy for which the purchaser will be billed and will verify that the nonfirm energy got to the consumer's nonfirm load.

BPA has implemented a program to install remote reading equipment on point-of-delivery meters. When BPA installs remote reading capability on a point of delivery, BPA proposes that the purchaser would also be required to install remote reading capability at the point of metering. This would allow BPA to prepare billings quickly and to allow BPA's Division of Power Supply daily access to amounts of nonfirm actually taken. The current cost of such remote equipment is about $2300. The purchaser would also have to provide a dedicated telephone line as part of the remote reading equipment.

3.2.5.2 Communications

BPA expects to install an automatic communications system which will facilitate notification of nonfirm availability. The purchaser would be required to have a hard copy terminal with auto answer modem to receive messages from BPA. The cost of the terminal is about $1500. A dedicated phone line would also be required. More frequent communication from BPA would result because of the ease of operating the communication system. If a purchaser or consumer had any question about a message received, it could call BPA. If a purchaser and a consumer desire, an additional communication terminal could be installed at the consumer's facility.

3.2.6 Allocation

In the event that demand for nonfirm energy exceeded the supply, BPA would allocate the available nonfirm energy in accordance with P.L. 88-552 and the Central Lincoln I decision until such time as that case is finally adjudicated by the U.S. Supreme Court, and on a pro rata basis within a customer class. This means that (1) according to P.L. 88-552, Northwest markets will be served first, e.g. prior to Southwest markets; (2) within the Northwest, public agencies will be given preferential access to nonfirm energy; and (3) within a customer class, i.e., public agencies, nonfirm energy will be prorated according to requests for such energy.

3.2.7 Application for Firm Service

By definition, BPA is not obligated to have nonfirm energy available. In 1983, the region has enjoyed a good water year with an abundance of nonfirm energy. This abundance has been increased by BPA's firm load underruns. As conditions change, consumers served may wish to convert nonfirm loads to firm service. BPA is not obligated to allow such a conversion before the expiration or termination of the nonfirm contract, but may allow such a conversion prior to that time. BPA proposes that firm service to these nonfirm loads would be subject to the requirements of sections 8 and 9 of the Regional Act Power Sales Contract, but in no case can occur on less than 2 years notice.

Limiting the electrical loads served under the policy to receiving only nonfirm service for the duration of the contract prevents switching between firm power when firm power is economical and to nonfirm energy when nonfirm is available and economical. Allowing such switching could effectively result in serving a firm load, for which BPA has a firm planning obligation, with nonfirm energy, and would be detrimental to both BPA revenues and planning.

BPA proposes that nonfirm contracts concluded in accordance with this policy should provide for consultation between BPA and the purchaser at the end of the second and third contract years concerning their ability and desire to enter into a subsequent nonfirm contract. For any such subsequent nonfirm contract, BPA might require different notice for firm service to such loads, especially if BPA is no longer in a surplus condition. Further, if due to a

declining surplus, higher alternate fuel prices, or increased market for the consumer's product, a consumer feels that nonfirm energy availability would be too low, it may not wish to commit to nonfirm service for an extended term.

3.2.8 Rate

3.2.8.1 Wholesale

BPA cannot determine a rate for nonfirm energy in this policy. Rates which would apply to nonfirm service are established, along with other BPA wholesale power rates, in the wholesale power rate adjustment process. New rates resulting from the last such process took effect November 1, 1983, and will continue through June 30, 1985. The rate schedule for nonfirm energy is included as Appendix A. BPA does not propose "take or pay" requirements in its nonfirm contracts.

3.2.8.2 Retail

BPA has not proposed inserting a provision in the final policy which would limit a purchasing utility's markup of nonfirm energy. However, in the event that utilities and consumers fail to agree on retail rate markups in their contracts, or if utility rate increases make nonfirm uncompetitive, BPA may revise the policy to provide a limit on markup.

BPA encourages any consumer considering entering into a contract for nonfirm service with its utility pursuant to this policy to negotiate a maximum markup for the duration of the contract.

Under the interim nonfirm agreements, BPA felt that a limitation on the amount of markup a utility attempted to pass through to a consumer would be unnecessary, because it was expected that the utility and the consumer would cooperate to develop a satisfactory rate. Generally, that was the case. However, BPA received comments from certain consumers that their utilities were attempting to pass through too high a markup on the nonfirm, resulting in delays in entering into an interim agreement. Utility markup in their nonfirm retail rates could cause those rates to be uncompetitive with alternate fuels. BPA encourages utility purchasers of nonfirm to consider adopting retail nonfirm rates designed to be competitive with alternate fuels.

Chapter 4.0

ALTERNATIVES

This chapter discusses alternatives on two levels. The more fundamental is that of alternatives to the broad scope of the policy. The no action alternative, for example, is an alternative on this level. The other is that of alternatives to specific features of the proposed policy which could be varied within some limits while not substantially changing the overall scope of the policy, but which may influence its effectiveness and environmental impacts. Examples of alternatives at this level are different provisions relating to nonfirm loads converting to firm service and different standards for consumers to qualify for nonfirm service. Most of the environmental impact differences among the alternatives are consequences of differences in effectiveness, in terms of bringing on nonfirm load and marketing nonfirm energy under the policy, of the various alternatives, rather than being direct environmental implications.

4.1 ALTERNATIVE POLICIES

4.1.1 No Action Alternative

Under this alternative, consumers of BPA's requirements customers would not be provided access to BPA nonfirm energy through their serving utilities. BPA nonfirm power would continue to be marketed to the same customers under the same circumstances and for the same purposes as prior to the interim contracts

entered into early this year (see Section 2.1.5). The interim contracts, expired as of October 31, 1983 would not be renewed or renegotiated. This alternative does not provide an opportunity for increased sales of nonfirm power and, therefore, does not potentially improve BPA's revenues. It is not responsive to the Regional Council's Two-Year Action Plan or the Central Lincoln I decision. Because the nonfirm market will not be expanded under this alternative, some surplus power which could be generated on the Federal Columbia River Power System will be unutilized resulting in increased spill. Industries which would otherwise use this energy will utilize higher cost fuels, or in borderline situations of profitability, may shut down causing unemployment and reducing their contribution to the economy in general.

4.1.2 Nonfirm Sales to Utilities for Service to Consumers with Minimal Restrictions

This alternative represents a case where BPA wishes to make sales of nonfirm to its utility customers for service to consumers, but chooses to impose minimal control over such sales. The utility and/or consumer would have to provide a means to measure nonfirm deliveries for billing purposes and provide communications as in the proposal. BPA would provide notice of availability of nonfirm as in the proposal. In much the same way as in the proposal, contracts would be granted with utilities for service to their interruptible consumers and a means of allocating nonfirm when demand exceeds availability would be devised. However, there would be no restrictions in the policy on switching from firm to nonfirm service and vice versa and no requirement for alternate fuel capability. BPA would let utilities and their consumers decide on the economics of providing metering, billing, and communications for

delivery of nonfirm power to a particular load, and would, therefore, not impose a lower limit on the size of interruptible load eligible for nonfirm service. There would be no limit on utility markup either.

Under the alternative, many aspects of the proposed policy will be subject to individual negotiation between utilities and consumers. For example, provisions like those of the proposed policy which restrict switching from firm to nonfirm power will be subject to negotiation between the consumer and the serving utility. Utilities which have an incentive to avoid loss of firm load, such as some generating utilities, will restrict switches from firm to nonfirm power. Other utilities, including those which secure all their power from BPA, may be inclined to allow a consumer use of cheaper nonfirm when available, especially if it is a small part of their total demand for which they are charged, if they can get their contact demand changed easily, or if the utility is a metered customer.

This alternative would result in at least some loss of firm load to BPA and therefore reduce revenues. It would also make BPA planning more difficult since firm loads could be added and dropped in an unpredictable fashion.

4.1.3 Affirmative Action to Develop Interruptible Loads

This alternative is the same as the proposal except that BPA would take the additional action of providing further incentives for the installation of interruptible electric loads in the region's industrial plants, commercial facilities, and institutions, both existing and new. Such incentives could include providing direct funding or low cost financing for such installations,

BPA payment for metering and communications equipment required by the policy, grants to explore innovative ways of using nonfirm power and/or potentially other means. This alternative would require commitment of BPA funds which are currently not budgeted. BPA may also not have legal authority to provide direct funding or low interest financing.

4.2 ALTERNATIVES TO FEATURES OF THE PROPOSAL

This section discusses alternatives to specific features of the proposed policy which do not change its overall scope but may influence the policy's effectiveness, the amount of energy which might be sold under the policy, and ultimately, its environmental effects.

4.2.1 Qualifications of Consumer Loads Eligible for Nonfirm Service

Several possibilities exist with respect to alternate requirements which consumers must meet in order to qualify for nonfirm energy under the policy. The case of minimal qualifications in all possible aspects is described as an "alternative policy" in Section 4.1.2. This section discusses the range of options with respect to each qualifying factor in the policy which may conceivably affect the environmental consequences of the policy.

4.2.1.1 Eligibility of Firm Loads

A criteria incorporated into the proposal is that sales of nonfirm would not be made under circumstances that would result in a loss of firm load on either short- or long-term bases. Loss of firm load would reduce BPA revenues, and

may be interpreted as contrary to section 7 of the Pacific Northwest Electric Power Planning and Conservation Act which requires rates to be set at the cost of service to a class of loads. Since BPA has planned for and acquired resources to serve current firm loads as firm, serving them with lower cost nonfirm would not recover the costs incurred on account of these loads. However, barring this interpretation, BPA could conceivably in its policy allow industrial, commercial, and institutional firm loads to switch to nonfirm, either temporarily or permanently, and either universally or based on some criteria.

4.2.1.2 Class of Load

At one time in the policy development process, BPA proposed limiting sales of nonfirm energy under the policy to industrial consumers, and BPA followed this principle in making the interim sales to loads having alternate full capabilities. As a consequence of public comments and discussion with potential non-industrial consumers, BPA reconsidered its position and expanded the propsoed policy to allow other than industrial consumers. BPA determined that the classification of the load was a subordinate consideration to other qualifying factors of the policy, such as size of load, having alternative fuel capability, and ability to economically comply with metering and communications requirements of the policy.

As alternatives to the proposed policy, BPA could revert to its former position of making the policy applicable only to industrial consumers, or could limit the policy in some other way to preclude applicability of the policy to one or more classes of consumers.

At least one DSI has recommended expansion of the policy to permit nonfirm service to alternate fuel loads of DSIs. BPA does not propose to do so at this time because of questions concerning DSI contract demand and loss of firm power sales. BPA may modify its policy in this respect if it can be demonstrated that DSIs interruptible electrical loads with alternative fuel capability are legitimately not included in their contract demand.

4.2.1.3 Alternate Fuel Supply

The proposal requires eligible consumers to have an alternate fuel supply, i.e., a nonelectrical way to provide energy to perform the same function that the nonfirm power performs when it is purchased. BPA has the options of not requiring an alternative fuel supply, of restricting the type of alternate fuel supply, or of requiring some level of alternate fuel supply which is less than the capacity to utilize nonfirm energy. Not having a requirement for an alternate fuel supply would create a potential for consumers to use nonfirm power to augment their firm power supplies to temporarily increase production, or for industries to be constructed solely to utilize nonfirm when it is available. There is concern that not having an alternate fuel supply requirement may cause cyclical employment situations; hardship for firms who may contract for nonfirm power without full realization of its limitations, and their employees; and, ultimately, political pressure to provide relief to the affected firms and thier employees by providing some grade of firm power. Restricting the type of alternate fuel supply would arbitrarily deny some consumers the benefits of nonfirm power.

A special case is that of consumers who rely on cogeneration facilities as their alternative fuel supply. Because cogeneration often serves as an electrical generating resource, or at least relies on a utility for replacement power in the event of failure, permitting consumers with cogeneration as an alternate fuel source could adversely affect utilities. Therefore, such consumers will not qualify for nonfirm service under the policy.

4.2.1.4 Size of Eligible Nonfirm Load

The size of the load for which it is economic to attempt to secure nonfirm power depends, upon other things, on the cost of providing the metering and communications facilities required by the policy and the ability to schedule and restrict power. The proposed limit of 1 average MW is the approximate lower limit of the amount of load BPA generally finds practical to schedule. It may not generally be economical to provide the needed metering and communications for loads as small as 1 average MW; however, BPA has chosen to leave this decision to the purchasing utility and consumer rather than impose a higher limit in the policy, although this is an alternative. Limits higher than 1 average MW would merely further restrict the number of consumers eligible to receive nonfirm under the policy without any apparent justification from a technical or economic standpoint. Limits lower than 1 average MW could pose problems for BPA power dispatchers.

4.2.2 River Conditions Under Which Nonfirm Would Be Sold

BPA proposes to offer, on an ad hoc basis, to qualified consumers for which the serving utility has contracted, non-firm energy in whatever amounts and whenever it determines it is available. This includes conditions of spill, imminent spill, and other conditions. Although there may be legal contraints, BPA has the options of restricting sales of nonfirm under this policy to times of spill only, or to times of spill or imminent spill only, or of establishing some other standards as part of the policy by which it would be decided when to offer nonfirm to the utilities and consumers and how much nonfirm to make available. BPA would use the flexibility available under the proposed approach to maximize its revenues within its operational, planning, and legal constraints.

Restricting sales of nonfirm to BPA's utility customers for serving consumers with alternative fuel capability to times of spill and/or imminent spill would lessen the amount of nonfirm energy BPA would make available to them over the long term. This approach would reserve secondary energy which could be produced under non-spill conditions for use by other customers classes, most notably the DSIs which under existing rate schedules would pay more for it. (In the case of the DSIs, it would be sold as auxiliary power under one of the three industrial rates.) This approach may be contrary to the preference provisions of the Bonneville Project Act (P.L. 88-552) and other laws and the Central Lincoln I lawsuit decision. At the same time, this approach would tend to reduce the frequency at which nonfirm may be available to qualifying consumers of utility purchasers but it would lengthen the duration of time nonfirm is available on those occasions when spill does occur. This may be

advantageous to nonfirm loads which cannot tolerate frequent changes in availabilty. Also the costs of alternative fuels is currently low enough that sales of nonfirm energy to utility purchasers for use by qualifying consumers under other than spill conditions (i.e., at more than the spill rate of 11 mills per kWh) is not expected to be significant in the near term.

Establishing other standards governing offering of nonfirm under this policy may or may not also affect the amount of nonfirm energy qualifying consumers may have available, depending on what the standards were. The standards would presumably encompass all those factors BPA would consider in making an ad hoc decision to offer nonfirm, e.g., risk of having to secure replacement power to meet firm loads in the event water conditions suddenly and unexpectedly worsen or a resource outage occurs; operating constraints of the reservoirs and dams including provisions of the Water Budget; amount of snowpack and expected runoff, etc. However, such standards would be cumbersome in that the underlying factors, such as operating constraints of the dams and reservoirs, and requirements for fish and wildlife mitigation, are subject to frequent change, therefore requiring frequent modification of the standards. Thus, standards would have little advantage over making decisions to offer nonfirm power on a case-by-case basis as proposed.

4.2.3 Duration of Contracts

BPA is proposing to enter into contracts which expire June 30, 1987, with utility customers to provide nonfirm power to qualified consumers. Contracts of shorter duration would discourage utilities and/or their industrial consumers from seeking nonfirm service under the policy.

BPA is projecting a firm surplus until June 30, 1987 and, perhaps, beyond. A longer contract duration could inhibit timely resolution of problems which may arise with implementation of this new policy. The proposed contracts would expire at a time when it is likely that resources would be available to serve the loads as firm if consumers found nonfirm service under the policy unsuitable and wanted to apply for firm service. A longer contract could tie utilities and industries into terms which become undesirable for them, and extend their nonfirm power arrangements to such a time when firm service is difficult to obtain.

4.2.4 Notification and Scheduling

In general, the greater amount of notice BPA can provide regarding the availability, cost, and scheduling of nonfirm power, the more advantageous it will be for the utilities and consumers, and the more likely utilities and consumers will enter into contracts for nonfirm under this policy, and actually utilize the power. Thus, improved notice should also benefit BPA revenues. At the same time the nature of nonfirm power and the generation and transmission system which produces and delivers it imposes limits beyond which BPA cannot practically give notice. There is also a tendency as the required notice period is lengthened, for BPA to become more conservative in its notices, that is to commit to delivery of nonfirm in less quantity and for shorter periods than it might actually be available. BPA intends to give maximum practicable notice of any change in price, amount, or duration of availability of nonfirm, but reserves the right to change the price, amount, or duration of availability of the end of any hour.

A second aspect of the notification and scheduling issue is the requirement for 24-hour day and night telephone numbers and eventual requirement for a hard copy terminal with auto-answer modem. These requirements may inhibit some utilities and/or industries from contracting to receive nonfirm because of the cost. Because of the reservation by BPA to provide as little as 1 hour notice, some means of rapid communication is necessary. As an alternative, the requirement for a hard copy terminal and auto-answer modem could not be implemented until such time that the number of utilities which enter into agreements for nonfirm under the policy exceeds the number that BPA can, as under the interim contracts, manage to give prompt notice by calling each utility individually. However, under this approach a utility and consumer in a situation where the costs of automatic communication equipment are the incremental difference in making nonfirm service uneconomic would have to gamble on whether BPA would get enough nonfirm customers to require the automatic communications equipment, and BPA would risk losing nonfirm customers at the point automatic communications equipment was required.

Chapter 5.0

ENVIRONMENTAL IMPACTS

5.1 GENERAL IMPACTS OF THE PROPOSAL

5.1.1 River Operations and Power Generation

This section will examine the physical changes caused by system operation and the resulting effects on power production and marketing. Since BPA is not confident of the amount of alternate fuel nonfirm load which may be served under the proposed policy (or alternative policies), analyses were performed on five possible levels of nonfirm load which possibly could be served under the policy. These five levels were:

1. 0 average MW, the base case representing the no action alternative;

2. 175 average MW, approximately the amount of load served under the interim agreements (a case which presumes that the policy induces no more utilities or consumers to seek nonfirm contracts);

3. 400 average MW, a case based on the assumption that all 300 average MW of existing Northwest industrial electric boiler capacity that is not generally used (Ekono, Inc, 1982) plus 100 average MW of new nonfirm load is served under the policy, or, alternatively that only all 400 average MW of existing Northwest industrial electric boiler capacity (Ekono, Inc., 1982) is served under the policy;

4. 700 average MW, a case selected to be intermediate between the last case and the preceeding; and

5. 1400 average MW, the maximum goal posed by the Northwest Power Planning Council in Part 15.2 of its 2 year action plan (1983).

None of the cases evaluated would cause flows or reservoir elevations to exceed project specific constraints. This section is limited to discussion of impacts which result from operating the Federal Columbia River Power System (FCRPS) to meet 1,400 megawatts of additional nonfirm load. Operating the FCRPS to serve any lesser levels of new nonfirm load will result in proportionately less impact. (The complete results of the analysis are tabulated in Appendix B.) Impacts to refill in some cases vary with the amount of service analyzed. The variation is in the number of years in which reservoir does not refill.

5.1.1.1 Changes in System Operations

Operating the Federal Columbia River Power System (FCRPS) to provide an additional 1,400 average MW of nonfirm energy will result in reduced elevations at the major reservoirs in all months. The impact varies by reservoir. At Libby the major impact occurs during May and June, 1.5 feet and 2.2 feet below the no action alternative, respectively. During the rest of the year Libby will be less than 0.2 feet below the no action alternative. The major impact at Hungry Horse occurs between December and March when elevations are from 1.2 to 2.2 feet below the no action alternative with the major impact occurring in February. During the rest of the year the impact is

from 0.3 to 1.0 feet below the noaction alternative. Grand Coulee's major impact occurs during May and June, 2.5 feet and 2.2 feet below the no action alternative, respectively. During the rest of the year the impact is less than 0.9 feet. At Dworshak the major impact occurs from June to August with the impact ranging from 0.6 to 1.1 feet below the no action alternative with the major impact occurring in August. During the remaining portion of the year Dworshak elevations are from 0.1 to 0.5 feet below the no action alternative.

The operation of the FCRPS to provide these amounts of nonfirm also reduces the ability of some of the reservoirs to refill by July 31. At Libby and Grand Coulee there is no impact in any of the alternatives. Refill at Hungry Horse and Dworshak is impacted. Hungry Horse refills in one less year (from 30 years in which it would refill to 29 out of the 40 years studied) with 700 average MW of additional nonfirm energy and in two less years with 1,400 average MW of additional nonfirm energy. Dworshak, refills in one less year (from 28 years in which it would refill to 27 out of the 40 years studied when serving either 700 or 1,400 average MW.

Flows are also impacted. The flows may go up or the flows may go down at any particular FCRPS dam in any month, depending on the water year. There is, however, a general tendency in the studies. First of all, the studies show that even with 1400 average MW of additional nonfirm load, there is no impact on the ability of the system to provide the Water Budget. In fact, there are two years out of the 40 in which the May flows increase from below optimum to above optimum. If only the minimum Water Budget flows can be met, the additional nonfirm energy load does not improve the May flows. Studies show a

decrease in April, May, and June flows in the very wet years. This results in decreased spill. However, there are some wet years in which the flow and the spill are increased. Studies also show decreased flows during July and August. These decreases average 9,600 cfs in July and 1,000 cfs in August at The Dalles when serving 1,400 average megawatts of additional nonfirm load. That corresponds to a 5.8 percent and 0.8 percent reduction in the no-action alternative flows.

5.1.1.2 Effects on Power Production and Marketing

The sale of an additional 1,400 average MW of nonfirm will result in a decrease in the amount of unusable water or spill on the system. This is done by increasing generation to meet the additional nonfirm market. The additional nonfirm energy market to be established by the proposed policy would be preference customer load, giving it the highest priority for nonfirm energy service. When substantial amounts of nonfirm energy were available, this had no impact on any other market. However, when nonfirm energy was limited, the first energy delivered was to these preference customers markets. This resulted in decreased sales to the other users of nonfirm, including direct service industries and investor-owned utilities.

5.1.1.3 Fish, Wildlife, and Recreation Impacts

The effects on spill, reservoir levels, and flows described in section 5.1.1.1 potentially and principally impact fish and wildlife utilizing the Columbia River and its tributaries and recreational opportunities on the reservoirs.

5.1.1.3.1 Anadromous Fish - Upstream migration of anadromous fish returning to spawn may be affected by the policy in three ways. Flows changed as a result of generating additional nonfirm to be marketed under the policy may not coincide with optimum flows for upstream passage; disharges from turbines used to generate nonfirm may mask attraction flows for upstream fish passage facilities (fish ladders) reducing their effectiveness; and decreased spill as a result of generating nonfirm may reduce nitrogen supersaturation. (Nitrogen supersaturation has an adverse affect on both adult and juvenile fish.) Downstream migration of smolts are potentially affected by the policy as a consequence of (1) increased downstream flows as a result of releases to generate nonfirm; (2) decreased spill as a result of generating nonfirm with water which otherwise would be spilled; (3) reduction of nitrogen supersaturation because some water which would have been spilled will be used to generate; and (4) increased turbine mortality at dams with ineffective bypass facilities because more fish may pass through the turbine when more water is used to generate nonfirm instead of being spilled.

However, no significant impact to anadromous fish is expected to actually occur as a result of increased generation of nonfirm under the proposed policy for the following reasons:

1. Flow changes projected as a result of the proposed policy are only a small perentage of total flows projected, and in May and June, which partially coincides with the downstream migration of smolts, flows are either increased or unchanged on the average.

2. Implementation of the policy will have no impact on the ability of the system to provide the Water Budget, which is a mechanism for assisting downstream migration of smolts, and which BPA had adopted as a firm power planning constraint.

3. Project specific operating constraints will not be violated.

4. The Council's Fish and Wildlife Plan (Northwest Power Planning Council, November 1982) requires the U.S. Army Corps of Engineers to provide spills at John Day Dam to achieve a level of smolt survival equal to or better than the best available bypass and screening systems.

   The Plan also requires study to identify or quantify passage problems at certain other dams so that the Council can require appropriate resolution of problems in revisions to the Plan. In addition, the Plan requires the Federal Energy Regulatory Commission to require spills by the Douglas, Chelan, and Grant County Public Utility Districts at their respestive dams to provide smolt survival comparable to that achievable by the best available collection and bypass systems.

5. The contracts proposed to be issued under the policy are short term which will tend to limit the amount of nonfirm load served, and therefore the degree of impacts of the policy, and will also allow evaluation of the effects and modification of the policy if it appears substantial adverse effects are occurring.

6. Fisheries mitigation will receive priority over nonfirm energy generation in BPA marketing and generation. (Reference to be supplied by the Division of Fish and Wildlife.)

5.1.1.3.2 Resident Fish and Wildlife and Recreation - BPA's River Operation Information Retrieval System (River OP) computer data file was consulted in an attempt to identify potential impacts on resident fish and wildlife, and on recreation at the four reservoirs (Libby, Grand Coulee, Hungry Horse, and Dworshak) analyzed in the hydro regulation studies used to predict hydrologic changes under the policy. The comparison of the reservoir elevation data which resulted from the hydro regulation studies with the River OP data did not identify any specific, well-defined problems, largely because the average reservoir elevation decreases were small when compared with the total range, and the reservoir elevation data from the hydroregulation studies were only averages. There are some adverse impacts of operation of the four reservoirs which would potentially be exacerbated by the reduction of reservoir levels to generate nonfirm to be marketed under the policy.

1. Increased predation of aquatic furbearers which are forced to cross more barren ground to find food when reservoirs are lower. (Libby, Hungry Horse, Grand Coulee, and Dworshak.)

2. Certain marinas, and boat launch ramps become unusable because of lower water. Activiites related to boating (e.g., camping and picnicking) may also be affected. (Libby, Hungry Horse, and Grand Coulee)

3. Tree stumps which pose a hazard to boaters may be exposed (Libby).

4. Reservoir elevations below 3475 feet have adverse impacts on cutthroat trout, bull trout, whitefish, and longnose suckers. (Hungry Horse)

5. The water supply for Doris Point Emery Bay, and Lost Johnny Point Campgrounds is secured from the reservoir and becomes unavailable below certain reservoir elevations. (Hungry Horse)

6. Pool drawdowns in late spring or summer can expose chukars to excessive predation by Marsh Hawks. (Grand Coulee)

7. Access to fishing spots becomes difficult because mud flats form when the reservoir level goes below 1575 feets. (Dworshak)

8. At 1570 feet reservoir elevation, 36 mini-camps become inaccessable by boat. (Dworshak)

Because of the variation in reservoir levels from year to year and the small average monthly reductions in reservoir levels, the proposed policy will not affect the above problems significantly, but there will be a minor adverse effect.

5.1.2 Development of New, Nonfirm Loads

The proposed policy and any alternative policy which makes nonfirm power available to consumers through local utilities may induce construction of new facilities to utilize such power. The number and types of such facilities will depend on the economic incentive to use nonfirm, which in turn depends on

nonfirm availability; the rate at which sales would be made; on a number of specific aspects of the policy including metering and notification requirements, allocation provisions, standards for an alternative fuel supply, etc.; and on external factors such as the cost of alternate fuels. In general anything that increases the economic incentive for use of nonfirm energy, increases its availability at a given, competitive price, or makes it available for more applications will tend to cause more new nonfirm loads to be developed. Rates for nonfirm power are determined through BPA's rate process and are beyond the scope of this EA.

The relatively short contract duration, requirements for metering and communications equipment, and the requirement for an alternate fuel, all part of the proposal, and current costs of fuel do not provide substantial incentive for development of new facilities for use of nonfirm energy.

Environmental impacts of development of facilities to utilize nonfirm power by consumers qualifying under the proposed policy vary depending on the situation, but they will generally be typical of nonmajor construction activities. Electric boilers, expected to be a frequent use, are generally built in factories and are delivered to the site for installation. Electrically operated facilities are generally not as noticeable as similar facilities utilizing fossil or other fuels since there are no requirements for a stack to discharge products of combustion nor any requirements for fuel storage. There is also no ash to dispose, but both fossil fuel and electric boilers have similar requirements for feed water treatment and blowdown which can result in solid and/or liquid waste streams which may be discharged with or without treatment depending on circumstances and the regulatory agencies' requirements.

The addition of electrically operated alternative facilities to existing industrial plants, institutions, and commercial facilities, or incorporation of such facilities into new industrial plants, institutions, or commercial facilities is expected to only have minor effects on their appearance, requirements for space, employment, or resources required for construction.

An opposite situation may exist where a firm now having an electrical energy load installs an alternate fuel energy source in order to qualify for nonfirm service under the policy. An alternate fuel source is much more likely to result in adverse environmental impacts than an electric facility. However, because of the current relative costs of electrical energy and fossil fuel, such installations are likely independent of this policy.

An argument can be made that the availability of nonfirm service may be the incremental factor in making a new industrial plant or commercial or institutional facility financially viable, and, therefore, would "enable" it. Such enablement would require BPA to perform an appropriate environmental analysis in accordance with the National Environmental Policy Act (NEPA) prior to signing a contract to provide nonfirm to the plant. One commenter on the policy was concerned that the policy could lead to substantial new industrial development having adverse environmental effects. However, the nondependability of nonfirm energy; the relatively short duration of nonfirm contracts being offered; the potential for long-term changes in cost, both for nonfirm power and alternate fuels; the 30 or so years planned life of most industrial plants or other major deelopments; the general uncertainty of economic predictions; and the many other factors relevant to decisions to

invest in new facilities such as taxes; availability of labor, raw materials, and transportation; etc., are such that it is unlikely that availability of nonfirm service would be the deciding factor in new facility investment or siting.

Nevertheless, BPA will monitor the loads seeking service under this policy, and will reevaluate the policy and/or it's environmental impacts if it appears that the policy is providing an identifiable incentive for new development in the region.

5.1.3 Impacts on Consumers

The availability of nonfirm service to consumers may affect both the operations of the qualified facilities which choose to secure nonfirm service and alter their environmental impacts.

The policy may enable qualified consumers to continue to operate at times under marginally adverse economic conditions if the cost of nonfirm is lower than the cost of operating with the alternate fuel. Thus, the environmental and socioeconomic impacts of these industries, such as emission of air pollutants, discharge of water pollutants, employment, noise, consumption of raw materials, etc., may at times occur when they otherwise would not.

At the same time, there is an increased risk to the consumer of a sudden loss of power while using nonfirm since BPA would, if necessary, drop nonfirm loads immediately and without notice in order to maintain service to firm loads in the event of a sudden outage of a generating unit or transmission line.

Depending on how quickly the consumer's alternate fuel energy source could be brought on line, and the use being made of the nonfirm energy loss or spoilage of product, damage to plant equipment, temporary closures, and possible safety hazards could result. This increased risk should be considered by plant owners/operators and appropriate protective measures taken and/or backup systems installed if necessary.

While using nonfirm electrical power in lieu of the alternate fuel, environmental impacts of use of the alternate fuel will not occur. These impacts are, principally, air pollution and land use for disposal of ash (for solid fuels). Fuel will also be conserved, reducing the impacts associated with the infrastructure which supplies the fuel.

Table 1 indicates estimated reductions in air pollutant emissions and ash requiring disposal for each 1,000 kWh of electrical energy sold to displace alternate fuels. While such reductions would be beneficial to air quality and reduce requirements for disposal of solid waste, it is doubtful that they would be significant to the region since fuel usage in industrial and large commercial and institutional applications is regulated by environmental control agencies and is not generally a direct cause of ambient air quality standard violations in the region. At best, use of nonfirm power would provide only temporary relief of isolated cases where fuel usage at a facility is causing elevated pollutant levels or has excessive visual emissions.

5.1.4 Implication of Reduced Nonfirm Availability to Other Customers

The new preference market for nonfirm power created by the proposed policy will, at least under some circumstances, reduce the amount of nonfirm energy available to the historic purchasers of nonfirm energy (namely the DSIs, investor-owned utilities, and scheduling, preference utilities) and potentially increase the cost of at least some of the nonfirm they would be able to secure. This section discusses the environmental implication of such changes in availability and cost. Appendix C shows the potential average changes in BPA nonfirm availability to various markets.

5.1.4.1 DSIs

The DSIs utilize nonfirm energy for service to their top quartile at the IP rate. Under terms of the proposed policy, and because of the Central Lincoln I decision and the preference provisions of the Bonneville Project Act, the DSIs, collectively, could lose part of the nonfirm energy available to them for service to the top quartile of their BPA contract load. Historically, service to the DSI load was the priority use for BPA nonfirm energy after practicable displacement of BPA high cost resoures. Based on BPA's analysis which assumed nonfirm alternative fuel loads of 175 to 1400 average MW to be served under the policy, the DSIs could lose 15 average MW of their average availability for top quartile load of 625 average MW on an annual basis if 175 average MW of nonfirm alternative fuel load came on under

TABLE 1

Estimated Reduction in Air Pollutant Emissions and Solid Waste Disposal Requirements by Displacement of Alternate Fuels by Nonfirm Electrical Energy (per 1,000 kWh of electricity sold)

Pollutant	Fuel			
	Natural Gas	Distillate (No. 2) Oil	Residual (No. 6) Oil	Hog Fuel
Particulate, lb/1000 kWh	0.022 to 0.066	0.059	0.57 2/	2.1
Sulfur Oxides, lb/1000 kWh	0.0026	1.3 1/	7.7 2/	0.71
Carbon Monoxide, lb/1000 kWh	0.075	0.15	0.14	0.95
Hydrocarbons, lb/1000 kWh	0.013 (as CH_4)	0.030 (as CH_4)	0.028 (as CH_4)	0.95
Nitrogen Oxides, (as NO_2) lb/1000 kWh	0.53 to 1.0	0.65	1.7	4.7
Ash for Land Disposal lb/1000 kWh	---	---	---	4.7

1/ Assumes average sulfur content of 0.39 percent by weight.
2/ Assumes average sulfur content of 1.75 percent by weight.

the policy, and up to 107 average MW if 1400 average MW of nonfirm alternate fuel load came on line under the policy. On a monthly basis, the largest potential percentage, losses of nonfirm by the DSIs occur in September, with about 11 percent of the nonfirm lost to the DSIs on the average if 175 average MW of nonfirm alternate fuel load is served, and about 75 percent of the nonfirm cost to the DSIs on the average if 1400 average MW of nonfirm alternate fuel load is served. (The analysis assumes that the alternate fuel loads take all the nonfirm available to them. In actuality, for the present it is only economical in most cases for them to purchase nonfirm at the spill rate because the alternate fuel is more economical. This would reduce some of the impact on the DSIs, at least as long as fuel costs do not signifiantly escalate.)

The reduced availability of nonfirm to the DSIs for their top quarile loads will mean that they will either have to replace this power on the open market, probably at a higher rate, and/or curtail their loads by reducing production at times when they would not otherwise do so, or by greater amounts.

BPA analyzed the environmental impacts of the DSI loads in its "Role EIS," (BPA 1980). While BPA is aware of some improvements made by some of the DSIs in their pollution control technology since the time of the "Role EIS," the DSIs' operations collectively nevertheless continue to have adverse environmental impacts on the physical environment. Reductions in the amount of power available to them, and/or an increase in its costs, which would tend to force more frequent and/or greater restrictions of their operations, would tend to lessen the adverse effects of their operations on the physical environment.

5.1.4.2 Investor-Owned Utilites

Northwest investor-owned utilities (IOUs) purchase nonfirm energy to displace their own, higher cost thermal resources. (They may also serve interruptible loads on thier system with BPA nonfirm, but IOUs generally have their own nonfirm to market to such loads.) Northwest IOUs have third priorty to BPA nonfirm energy after, under the Central Lincoln decision, preference agencies (i.e., public utilities, municipalities, and cooperatives) and the DSIs. The resources displaced by the IOUs, are ranked by cost with the most expensive usually displaced first. Because of their generic costs, the order of displacement is usually: (1) combustion turbines; (2) small thermal resources; (3) imports from the East (i.e., eastern Montana and Wyoming); (4) Weyerhaeuser and Longview Fibre cogeneration; and (5) large coal and/or nuclear fired generation. There is usually enough nonfirm available under currnet conditions in the Northwest (either from BPA or the IOUs) to displace the combustion turbines and many of the small thermal resources. These resources are currently utilized only under extreme conditions such as when demands are very high during severe winter weather and hydroelectric generation is reduced because of low flows.

Appendix C shows the potential reductions in BPA nonfirm energy available for displacement of the various types of resources at the four possible levels of alternate fuel load analyzed. The decrease in availability of nonfirm decreases the likelihood of displacing any resource at any time. If as much as 1400 average MW of alternative fuel nonfirm load is served under the policy, the average amount of BPA nonfirm available for displacement of any type of resource decreases substantially in September and October, when there

is normally the least nonfirm available and in addition the average amount of BPA nonfirm available for displacement of coal and nuclear plants decreases substantially in August (by 43 percent from 1010 average MW to 580 average MW) and November (by 55 percent from 863 average MW to 387 average MW). It should be noted that even at times when a relatively inexpensive resource such as a large coal or nuclear plant could be displaced, it often continues to operate in order to sell energy on an interruptible basis to an export market.

With respect to nonfirm sales to IOUs, the principal effect of the policy is a substantially reduced chance of Northwest coal resources being shut down in September and October, and if a large amount of alternate fuel load is served under the policy, August and November as well. There is additionally some decreased chance of displacing any resources at any time.

BPA has addressed the impats of the region's principal nonhydroelectric resources in its "Role EIS" (BPA 1980), and has generically addressed the impacts of other resources in the "Role EIS" and other documents (e.g., the Water Budget EA [BPA, May 1983]). Operation of these resources has adverse environmental effects. Reducing the chances od displacing resources, assuming that they would otherwise actually be shut down instead of being operated to produce energy for export markets, therefore has an adverse environmental effect. However, since displacements are temporary, and the resources are regulated and do not result in uncommensurate environmental damage, the impacts are not considered significant.

5.1.4.3 Export Markets

Nonfirm energy which is nonmarketable within the region is available for purchase by utilities, public and private, outside the region, mainly to the Pacific Southwest and the East Group Utilities. These customers use them to displace their expensive thermal resources, many of which are gas or oil fired.

From August through December, there is not much energy, on the average for this market under any circumstances. The total average monthly availability in these months ranges from 13 to 70 average MW. The case of small amounts (175 average MW) of alternate fuel load served under the policy does not affect by much the average availability in these months, but 1400 average MW of alternate fuel load depletes this market's, average availability substantially, completely in some months. During the remainder of the year, these markets would undergo minor effects in the case of 175 average MW of nonfirm load served under the policy, but would be reduced by about 16 to 43 perent if as much as 1400 average MW of alternate fuel load were served under the policy.

BPA has assessed the impacts of sales of nonfirm outside the region, specifically to the Southwest in its "Role EIS" (BPA 1980) and related studies (Stanford Research Institute, 1976). The environmental impacts in the Southwest of nonfirm were determined to be beneficial and significant, principally because of the reduction of air pollutant emissions resulting when Southwest thermal resources are shut down because of the availability of replacement nonfirm energy from the Northwest and because of the severe air pollution problems experienced in the Los Angeles Basin. Serving limited

alternate fuel load of, perhaps, 175 to 700 average MW would not appear to sufficiently reduce the benefits of nonfirm sales to the Southwest to be a significant adverse invironmental impat of the policy. Serving larger amounts of alternate fuel nonfirm load in the Northwest may have notable adverse, environmental effects outside the region. BPA does not immediately expect to serve this large a load under the approximately 3 1/2 year contracts to be initially offered under this policy, since only 400 average MW of potential load was identified by the Ekono report (although this was limited to the industrial sector) and the contract duration is not an incentive for new alternate fuel loads.

5.2 IMPACTS OF ALTERNTIVE POLICIES

This section will discuss the environmental impacts of the alternative policies described in Section 4.1 relative to the environmental impacts of the proposed policy.

5.2.1 No Action Alternative

Under the No Action Alternative, BPA operations and marketing will evolve in the absence of any policy to market non-firm power in ways not undertaken prior to 1983 when the interim contracts were executed. Thus with respect to BPA's historic (pre 1983) role, the no action alternative has no environmental impact. The environmenatl impacts of BPA operations and marketing may change as a consequence of other evolving operational and marketing practices and polices and external factors, but would not change as a consequence of changes from pre-1983 practices for marketing nonfirm energy. Under the no action

alternative the six utilities holding interim contracts and the 10 consumers covered therby would have no further access to BPA nonfirm energy for the foreseeable future. Relative to the condition when they were receiving nonfirm power under the interim contacts, the consumers will experience a less favorable economic status, and will increase consumption of fossil fuels resulting in emissions of air pollutants and other environmental impacts associated with fuel use. At the same time BPA would potentially forego sales of nonfirm and the frequency of spilling at Federal dams would increase. None of these potential differences would be environmentally significant, however, primarily because of the amount of load covered by the interim contracts.

Environmental impacts, adverse and beneficial, of the proposal will not occur if the no action alternative is chosen.

5.2.2 Nonfirm Sales to Utilities for Service to Consumers with Minimal Restrictions

Presumably, because this alternative places fewer restrictions on the sale of nonfirm energy to utilities for service to consumers, more nonfirm would be sold to this market under this alternative than under the proposal. However, it is not possible to determine quantitatively by how much sales would increase under this approach. Also, the types of loads served with the nonfirm will be more varied. Some loss of firm load is likely to occur, and because there would be no requirement for alternate fuel capability, some nonfirm may be utilized for loads or production increases which occur solely because nonfirm is available.

Impacts relating to the generation and delivery of nonfirm energy will likely be exacerbated under this alternative relative to what would occur under the proposed policy. Since loads served under this approach would differ from those which would be served under the proposal, some of the environmental beneifts projects from the proposal, namely conservation of fossil and other fuels and reduction in impacts (air pollution, ash disposal) of their use, may not occur. Also since nonfirm marketed under this alternative may be used to operate load or support increased production which would not be operated in the absence of nonfirm, there is a potential for incurring additional environmental impact, since these load or production increases are likely to produce air pollutants, water pollutants, solid waste, etc.

Since consumers may have greater freedom to switch between firm and nonfirm service under this alternative than under the proposal, there may be increased difficulty in projecting future electrical and other energy resource needs and increased risk of over or underdevelopment of future energy resources, either of which would have environmental and socioeconomic implications.

5.2.3 Affirmative Action to Develop Interruptible Loads

This alternative would presumably lead to greater sales of nonfirm energy to serve interruptible loads of utilities since BPA would enhance the development of such loads. The impacts of generating and delivering nonfirm power will therefore be incresed relative to what is expected to occur under the proposal. The benefits associated with conservation of fossil and other fuels would also be enhanced in comparison with those expected under the proposed policy. Because BPA would be more actively involved in developing specific

nonfirm loads under this alternative, it may be able to influence the types of nonfirm loads developed to help achieve environmental or socioeconomic goals, e.g., by funding electric boilers in locales having chronic air pollution problems to displace fossel fuel boilers when nonfirm is available and thereby also enhance air quality, or by funding interruptible load applications for institutions providing social services. BPA may also be able to prevent development of facilities to use nonfirm energy in those unusual circumstances where they might have significant adverse impacts

5.3 IMPACTS OF ALTERNATIVES TO FEATURES OF THE PROPOSED POLICY

This section addresses the impacts of alternatives to specific features of the policy, as described in section 4.2, which remain within the overall scope of the proposal.

5.3.1 Eligibility of Firm Loads

Incorporating into the proposed policy terms which would allow loads currently served with firm power to receive nonfirm energy, but prevent such loads from reverting to firm service later could (1) reduce demand for firm energy; (2) increase demand for nonfirm energy; (3) decrease BPA revenues; (4) increase the amount of surplus firm power BPA has to market in or outside the region. The occurrence of the preceding consequences naturally depends on whether any consumers actually elect to switch from firm to nonfirm. The impacts of operation of BPA resources depend on whether BPA is successful in marketing the firm surplus made available. If, as has been the case, BPA is generally unsuccessful in marketing the surplus firm, operation of the least

costly, mainly hydro BPA resources would be substantially unaffected. Some of the more costly, mainly thermal, resources (i.e., those whose costs exceed the nonfirm rate) will be shutdown (displaced). In order to maximize revenues (since BPA raises more revenues by selling mroe peower even at a low rate than by selling less power), the nonfirm consumers will receive essentially firm service at the nonfirm rate up to the point where all firm surplus available from the less costly resources is utilized, and additional may would be available to time beyond that.

This case would also minimize the use of alternate fuels by consumers thus minimizing the impacts of alternate fuel use and supply.

If BPA were successful in marketing its surplus firm, the additional surplus firm made available by Northwest consumers switching to nonfirm would benefit those to whom the surplus firm were marketed. For example, if additional surplus firm were purchased by Southwest utilities, they would access financial and environmental benefits by being able to shut down thermal resoures and/or construct fewer new resources. Northwest nonfirm consumers would receive truly interruptible service, and under this scenario impacts of use of alternate fuels would be relatively larger. The revenue affects under this scenario would be minor.

If BPA's policy permitted consumers under the policy to unilaterally return to firm service after switching to nonfirm, marketing of surplus firm would be made more difficult, reducing the liklihood of the preceding scenario, since potential extraregional surplus firm customers would realize that BPA may have to withdraw surplus firm sales in order to return to firm service for

Northwest consumers. In addition, if load growth had eliminated all surplus firm, new resources would have to be secured, having environmental impacts of construction and operation, in order to serve consumers' loads returning to firm service.

5.3.2 Class of Load

The class of load, that is whether it is industrial, commercial, or some other class or classes to be eligible to receive nonfirm energy makes very little difference environmentally from the standpoint of impacts of the use of the nonfirm energy as long as the requirement for alternate fuel capability and the size of load limit is maintained. In any case the impacts will be a reduction in emissions of air pollutants, ash disposal, and the operational impacts of the infrastructure supplying the fuel. The environmental impacts of using fuels are pretty much the same on a per energy unit basis for a given fuel independent of the application. For example a large gas-fired boiler has the same emissions on a per energy unit basis whether it is used by a food processor (industrial) or a university (institutional). In any event such impacts are not considered generically significant (See section 5.1.3). Similarly, there is no generic difference in generating nonfirm for one class of load versus another.

Where the class of load to be eligible does make a difference is in the amount of nonfirm which may be marketed under the policy. The more liberal the definition of class of load eligible under the policy is (BPA has proposed the most liberal approach, that is no specific restriction on class), the more likely it will be of serving a greater amount of load under the policy, the

more likely it will be of marketing greater amounts of nonfirm energy, and the more extensive the environmental benefits of saving fuel and the environmental impacts of generating and marketing nonfirm power will be.

5.3.3 Alternate Fuel Supply

Restricting the type of alternate fuel which qualifies could be environmentally beneficial or harmful. It may be environmentally beneficial to use nonfirm to displace only the most polluting of the fuel burning facilities. Unfortunately, on a policy level basis this is difficult since a poorly controlled gas-fired broiler in an urban setting having an ambient oxidant air pollution problem may be more environmentally detrimental than a wood fired boiler in a rural setting having good air quality, even though gas is generally regarded as a "cleaner" fuel. In addition, limiting the alternative fuel to only "dirty" fuels may actually encourage their use by consumers wanting to qualify for nonfirm service.

Less restrictive requirements for alternate fuel capability would tend to increase the amount of nonfirm load to be served under the policy, the amount of nonfirm sales, and therefore the impacts of generating nonfirm. However, these added loads would have to be ones which could tolerate having less or no backup for their nonfirm. Certain electrochemical or electrometallurgical processes which could buy nonfirm to increase production rates with only minor adjustments to ther equipment may be able to do this. Thus less restrictive alternate fuel requirements could result in increased invironmental impacts from such facilites, but since they are regulated and the increases would be proportionately small, such increased impacts would probably not be significant.

The preliminary results of one BPA sponsored study indicate that a facility to electrolitically produce hydrogen gas using nonfirm energy with some supplemental purchases of firm energy may be economically viable in the Northwest. If the policy requied no alternate fuel backup, such or similar facilities could receive power under the policy.

5.3.4 Size of Eligible Firm Load

The minimum size for a load eligible for nonfirm service under the policy is 1 average MW. Expanding eligibility to smaller loads may slightly increase the total amount of nonfirm load served under the policy, but the limiting factor is the cost of the metering and communication equipment. It is doubtful that it would be economic for many loads smaller than 1 average MW to install the equipment. Increasing the size limit to above 1 average MW would reduce the total load eligible for nonfirm service and nonfirm sales under the policy. This would reduce both the environmental impacts and benefits of the policy, but since these impacts do not appear to be significant, there is no compelling reasons to raise the size limit for eligibility.

5.3.5 River Conditions Under Which Nonfirm Would Be Sold

Restricting sales of nonfirm to alternate fuel loads under the policy to periods of spill and/or imminent spill only would have little immediate impact on nonfirm sales to these loads in that with the current rate schedule which offers a lower rate under spill or imminent spill conditions and with present costs of alterntive fuels, few of the eligible nonfirm loads would seek to buy nonfirm except under these condition. Since when the Federal hydroelectric

system is in a spill or imminent spill mode, nonfirm energy is likely to be abundant and available for an extended period of time, such a restriction would tend to mitigate problems with allocating nonfirm and with consumers inability to adapt to rapid changes in nonfirm availability.

If the cost of alternate fuels escalated rapidly, such a restriction could deny access to some nonfirm to alternate fuel loads which they would otherwise buy, thereby decreasing the environmental and economic benefits as a consequence of sales to alternate fuel loads.

One of the principal incentives for such a restriction is to enhance the availibility of nonfirm energy to the DSIs which would purchase non-spill nonfirm at the industrial firm rate, which is higher than any nonfirm rate, and thereby benefit BPA revenues. Therefore, one of the impacts of such a restriction is to possibly permit higher levels of DSI operations at times when they would otherwise be at reduced operation for reasons of power limitation (rather than poor markets). This would marginally increase the environmental impacts of their operation.

The impacts on river operation of this type of restriction, and thereby on related factors such as fish, wildlife, recreation, etc. would not be significantly different than under the proposed policy since nonfirm generation would still be optimized to meet available nonfirm markets. The only times operation would be different under this proposal is the unusual situation in which the system is in a non-spill condition, capable of generating nonfirm, but when DSI and/or extraregional markets for nonfirm are not sufficient to utilize the nonfirm that could be generated. In this event,

the alternative fuel load could not be served because of the restriction, and water would be held back rather than spilled or generating unmarketable power. This would result temporarily in reduced flows and higher reservoir levels.

The impact of establishing specific standards governing offering nonfirm energy for sale under this policy can not be evaluated fully since this concept has not been fully explored. If there were serious adverse environmental consequences of the proposed policy, such standards conceivably could be established to mitigate them. However, since this does not appear to be the case, the approach of using standards would not seem to have much different environmental effects than the proposal or the above alternative, whichever the standard most closely emulated.

5.3.6 Duration of Contracts

Offering shorter contracts under the policy would make less alternate fuel load likely to be served, and would make development of any new alternate fuel load even more unlikely than under the proposal, since the time in which one could be certain of payback from such an investment would be reduced. Thus shorter contracts would reduce both the adverse environmental impacts and the environmental benefits of the policy.

Offering longer term contracts would have the opposite influence. If contracts were actually long term (10 to 20 years) they could be expected to result in some, perhaps substantial, investment to develop alternate fuel loads.

5.3.7 Notification and Scheduling

Providing for a shorter notice period would probably have a deleterious effect in that it would intimidate potential consumers of nonfirm. Fewer would enter into contracts under the policy and less severe environmental impacts, adverse and beneficial, would occur. Increasing the notice period would have an ambivalent effect since, while consumers would generally appreciate additional notice and this would be an incentive for them to purchase nonfirm, BPA would simply be more conservative in its notification and, as a result, offer to sell less nonfirm.

The alternative of delaying the requirement for automated communication equipment until such time as the number of consumers warrants puts utilities in an uncertain situation and may inhibit some marginally sized loads from contracting under the policy in the short term. Assuming enough customers contract to make automated communications equipment necessary, there would be no long term difference from the proposal.

5.4 OTHER ENVIRONMENTAL CONSIDERATIONS

In addition to their responsibilities under the National Environmental Policy Act (NEPA), Federal agencies are required to carry out the provisions of other Federal environmental laws. Most of the Federal actions related to the proposed policy discussed in this EA do not require a detailed response with regard to the requirements in these other Federal laws. Those requirements are more concerned with specific proposals for direct Federal development, and

not policies such as that assessed in this EA which will merely affect BPA power marketing arrangements and, to some degree, operation of BPA power resources.

The other Federal laws and requirements which will not be affected by the propsed policy but which were considered during preparation of the EA include:

1. OMB Circular No, A-95 Review - The proposed agreement does not involve any direct Federal development or development directly assisted through Federal grants, contractual arrangments, loans, loan guarantees, or insurance.

2. The Coastal Zone Management Act of 1972 - The proposal and alternatives discussed in this EA are not included in Washington's or Oregon's list of Federal activities affecting their coastal zone programs.

3. Endangered Species Act - BPA has not identified any adverse effects on endangered species associated with this proposed policy. The proposed policy analyzed in this document does not directly involve a construction activitiy and therefore does not invoke a section (7) consultation.

4. Heritage Conservation - The proposed policy will not result in direct action by BPA nor impose actions upon others which would affect historic or archeological resources. Therefore, the proposal does not meet the threshold requried for consultation with appropriate agencies charged with Heritage Conservation.

5. Farmlands - The proposed policy will not convert farmlands to other uses becuse there are no site-specific BPA actions proposed in the policy nor does the policy impose actions on other which would affect farmlands.

6. Recreation resources - BPA's proposed policy will not adversely affect any designated or proposed wild and scenic rivers, the National Trail System, or wilderness areas, the policy will have minor adverse impacts because of reduced reservoir level on certain recreational resources and recreational uses associated with FCRPS reservoirs, such as boat ramps, campgrounds, fishing, swimming, boating, and picnicking, (see section 5.1.1.3.2). BPA is distributing for comment copies of this EA to appropriate land management agencies as a means of consultation on this matter.

7. Permits for structures in navigable waters - The proposed action does not include: (a) a structure or work in, under, or over a navigable water of the United States; (b) a structure or work affecting a navigable water of the United States; or (c) the deposit of fill material or an excavation tht in any manner alters or modifies the course, location, or capacity of any navigable water of the United States.

8. Permits for discharges into waters of the United States - The proposed policy and its alterntives do not involve discharge of dredge or fill material into waters of the U.S.

9. Permit for right-of-way on public land - The proposed actions do not include use of public lands in a way not in accordance with the objectives of the management of those lands.

10. Fish and wildlife laws - There are several key provisions and requirements that Federal agencies must address:

-- The Fish and Wildlife Coordination Act requires consultation with USFWS when an agency's actions involve water projects.

-- The Fish and Wildlife Conservation Act encourages agencies to promote conservation of nongame fish and wildlife and their habitat.

-- The Pacific Northwest Electric Power Planning and Conservation Act (Regional Act) requires BPA to protect, mitigate, and enhance fish and wildlife affected by hydroelectric projects, and be consistent with the purpose of the Regional Act, the Regional Council's Fish and Wildlife Program and the Energy Plan.

-- USFWS Mitigation Policy which guides USFWS mitigation recommendation on water-related projects and projects requiring an EIS.

Both Federal and State fish and wildlife agencies will have the opportunity to comment on this EA, and BPA will take their concerns under consideration before a decision is made to implement the

proposed policy. It is BPA's obligation under the Fish and Wildlife Conservation Act to share scientific information and any other appropriate information with States for the purpose of assisting State in developing and revising a conservation plan. By sending a copy of this EA to State fish and game agencies, BPA is meeting its obligations of sharing information it has with the State agencies. BPA asks that State agencies keep it informed of development of conservation plans so that information can be supplied if it is available.

11. Floodplains and wetlands - Executive Oreder 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands, establish a national policy to protect wetlands and floodplains and requires that Federal agencies avoid, to the extent possible long- and short-term impacts associated with occupancy and modification of floodplains and destruction or modification of wetlands.

The proposed policy is indirectly related to other entities' management of Federal and non-Federal dams and reservoirs in floodplains and that management may affect wetlands adjacent to and connected to the Columbia River and it tributaries. However, such impacts will not exceed the operational parameters (flood control, navigation, irrigation, etc.) established for each facility. Therefore, effects on floodplains and wetlands will not exceed those incurred during normal operation.

12. Pollution control at Federal facilities - The proposal does not require procurement of goods, services, or materials, so the contract compliance provisions of the Clean Air Act, Clean Water Act, and other environmental laws to not apply. Implementation of the policy will not alter the current status of any electrical generating resource with respect to compliance with environmental regulations governing air pollution, water pollution, solid waste transport and disposal, hazardous waste, drinking water standards, noise, pesticides, or polychlorinated biphenyls (PCB). Making nonfirm sales under the policy may affect operations of certain resources and transmission facilities at times, but they would not be operated in such a manner as to violate currently applicable standards or permit conditions, nor would resources be operated to exceed a level of envionmental impact that would not occur at least some time during normal operations in absence of the policy.

13. Energy conservation at Federal facilities - The proposal involves operation of Federal facilities in that at times when sales of nonfirm are made, operation of Federal power resources and the BPA transmission system will be altered accordingly. Within the level of control BPA has over the system, it will continue to strive for an optimally safe, reliable, efficient, and economical power supply for the region. The proposed action will be consistent with energy conservation requirements based on the system's adherence to general operating plans. In addition sales made under the policy will conserve fossil and other alternate fuels and conserve energy in that water which might otherwise be spilled may be able to be used to generate marketable energy and not wasted.

Chapter 6.0

CONCLUSIONS

The proposed policy for marketing nonfirm energy to utilities for service to interruptible loads which have an alternate, non-electrical energy source to provide for their needs when BPA nonfirm is unavailable, has environmental impacts as a consequence of physical changes in operation of the Federal Columbia River Power System, and as a consequence of the changes in operation induced by changes in the availability of BPA nonfirm energy to various market classes. Predictions of these impacts are made more difficult by the fact that the amount of nonfirm market which may be served under the policy is undefined. BPA has chosen to analyze four cases of amounts of nonfirm load to potentially be contracted for under the policy, in addition to the noaction alternative. Environmental impacts and benefits are greater if larger amounts of nonfirm alternate fuel load is served. BPA believes that the short term of the initial contract offering, the requirements for metering and automated communications equipment, the restrictions on return to firm service, and the current costs of alternate fuels are factors which will both limit the near-term total amount of nonfirm load to be served under the policy and restrict the amount of investment to develop new facilites in order to take advantage of nonfirm electrical energy availability under the policy. The initial contract period under the policy, as well as the interim contracts of 1983, will and have served as a learning period for dealing with this new nonfirm market. BPA will monitor the implementation of the policy closely,

and may make changes at the termination of the contacts in 1987, or before if necessary. Appropriate environmental documentation will be undertaken with respect to any such changes.

In the long-term, if the policy works well and no or minimal changes are needed, the intitial contracts may be replaced by long-term contracts. At that time, greater incentives for entering into a nonfirm contract under the policy with BPA may exist and more alternate fuel nonfirm load may be served.

Impacts on the operation of the FCRPS manifest themselves in relatively small average changes in reservoir levels, flows, and reductions in spill. These are not expected to be environmentally significant, even assuming as much as 1400 average MW of nonfirm load served under the policy, because of operating constraints on the system and because of existing institutional measures imposed to mitigate adverse impacts of the FCRPS on anadromous fish. Some existing environmental impacts of FCRPS operation may be exacerbated by a minor degree.

Environmental impacts manifesting themselves as a result of changed availability of BPA nonfirm energy to various markets include: (1) reductions in the emissions of air pollutants, generation of ash, and other impacts of combusting fuels, and conservation of fossil fuels by consumers gaining access to nonfirm electrical energy via the policy; (2) potential reductions in environmental impacts of DSIs when they are forced to reduce operations because nonfirm is being used by preference utilities for service to alternate fuel loads instead of being available to them; (3) potentially increased environmental impacts from investor-owned utilities' large thermal plants and

cogeneration since less nonfirm would be availale to them to displace such resources; and (4) potentially increased environmental impacts outside the region from operation of thermal resources since less nonfirm will be available to utilities outside the region for displacement of their resources. None of these impacts are considered environmentally significant, except potentially the increased impacts of operation of extraregional thermal plants. This last effect may be significant, primarily because many of these planst are in or impact areas of Southern California having poor air quality, if large amounts (greater than about 700 average MW) of nonfirm, alternate fuel load is contracted for under the policy. It is highly unlikely, however, that this much load will be served in the initial implementation phase of this policy. At such time that nonfirm load to be served under the policy appears that it may exceed 700 average MW, BPA will reassess this aspect of the impact of the policy.

Unless public and agency review of this environmental assessment reveals sufficient information to the contrary, BPA will conclude that implementing the proposed policy is not an action significantly affecting the quality of the human environment, and an environmental impact statement will not be prepared.

Chapter 7.0

CONSULTATION

BPA requested recommendations from the public on ways to effectively market surplus firm energy in November 1982. Based on those recommendations, BPA drafted interim principles for selling nonfirm energy to its Northwest utility customers for industrial loads with other energy sources, and discussed the principles with representatives of publicly owned utilities, investor-owned utilities, the direct service industries, and industrial consumers of Northwest utilities. Comments on the interin principles were received in March 1983.

A proposed policy as well as a response card for developing a mail list was mailed to the public on July 19, 1983. A public information forum was held at BPA headquarters on July 26, and policy comment forums wre held on August 8, 10, and 12 in Portland, Spokane, and Seattle respectively.

Public comments on the proposed policy were accepted through August 31, 1983.

The following is a general list of agencies and organizations who, because of their indication of interest, will receive a copy of this EA for review and comment.

Federal Agencies

U.S. Army Corps of Engineers, Portland

U.S. Attorney's Office, Portland

U.S. General Accounting Office, Portland

U.S. DOC, National Marine Fisheries Service, Rufus and Pasco

USDOE, WAPA, Loveland, CO

Sacramento, CA

Golden, CO

USDOI, Bureau of Indian Affairs, Warm Springs

Lapwai

U.S. Bureau of Reclamation, Boise

U.S. National Parks Service, Seattle

U.S. Forest Service, Portland

U.S. Forest Service, Missoula

State Agencies

(Note: Add state agencies [OR, WA, ID, MT] dealing with State parks, fish and.or game.)

California: Department of Water Resources/Energy, Energy Commission

Idaho: Public Utilities Commission

State Clearinghouse

Montana: Department of Natural Resources and Conservation

Nevada: Public Service Commission

Oregon: Department of Energy
Public Utility Commission
Department of Agriculture
Employment Division
State Executive Department
Department of Fish and Wildlife
Intergovernmental Relations Division

Washington: Office of the Governor
Department of Game
Office of Financial Management

Interest Groups

Coalition for Safe Power
Columbia River Inter-Tribal Fish Commission
Confederated Salish and Kootenai Tribes
East Multnomah Co. League of Women Voters
Fair Electric Rates Now
Forelaws on Board
Idaho Wildlife Federation
League of Women Voters of Oregon
National Wildlife Federation

Natural Resource Defense Center

Northwest Conservation Act Coalition

Northwest Indian Fisheries Commission

Northwest Labor Coalition of Energy

Oregon Safe Energy

Seattle Comm. to Stop Rising Fuel Prices

WASHPIRG

Other Interested and Affected Parties

City and County Governments

BPA Customers

Businesses

Individuals

Universities

Law Offices

APPENDIX A

APPENDIX B

RESULTS OF HYDRO REGULATION STUDIES

APPENDIX C

IMPACTS OF THE POLICY ON AVAILABILITY OF NONFIRM TO EXISTING MARKETS

APPENDIX D

REFERENCES

REFERENCES

1. Bonneville Power Administration, 1980, Final Environmental Impact Statement: The Role of the Bonneville Power Administration in the Pacific Northwest Power Supply System Including Its Participation in a Hydro-Thermal Power Program, (Role EIS), December.

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3. Bonneville Power Administration, 1983, Implementation Programs for the Northwest Power Planning Council's Two-Year Action Plan, August.

4. Ekono, Inc. 1982, Utilization of Electric Boilers as a Sink for Surplus Power in the Bonneville Power Administration Service Area, prepared for the Northwest Power Planning Council, November 19.

5. Northwest Power Planning Council, 1982, Columbia River Basin Fish and Wildlife Program, Finaly November.

6. Northwest Power Planning Council, 1983, 1983 Northwest Conservation and Electric Power Plan, Vol. 1, April 27.

7. Stanford Research Institute, 1976, Environmental and Socioeconomic Impacts of Sales of Secondary Electrical Energy to California Utilities, May.

RSeiffert:dh (WP-PGC-2204K)

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	RESERVOIR REFILLS
LIBBY													
BASE CASE	2454.5	2454.9	2454.7	2450.2	2431.3	2404.6	2367.8	2341.3	2335.3	2343.0	2395.6	2443.5	33
175 MW	2454.5	2454.9	2454.7	2450.1	2431.2	2404.6	2367.8	2341.4	2335.3	2343.0	2395.5	2443.1	33
	0	0	0	-0.1	-0.1	0	0	-0.1	0	0	-0.1	-0.2	
400 MW	2454.4	2454.9	2454.7	2450.1	2431.2	2404.6	2367.8	2341.4	2335.3	2343.0	2395.3	2442.9	33
	-0.1	0	0	-0.1	-0.1	0	0	-0.1	0	0	-0.3	-0.4	
700 MW	2454.4	2454.9	2454.7	2450.1	2431.1	2404.6	2367.8	2341.4	2335.3	2343.0	2395.0	2442.5	33
	-0.1	0	0	-0.1	-0.2	0	0	-0.1	0	0	-0.6	-0.8	
1400 MW	2454.3	2454.9	2454.6	2450.0	2431.1	2404.6	2367.8	2341.3	2335.3	2343.0	2394.1	2441.1	33
	-0.2	0	-0.1	-0.2	-0.2	0	0	-0.2	0	0	-1.5	-2.2	
HUNGRY HORSE													
BASE CASE	3544.5	3540.1	3536.5	3533.4	3529.3	3515.1	3492.9	3479.5	3467.6	3477.4	3517.2	3543.8	30
175 MW	3544.4	3540.1	3536.5	3533.4	3529.3	3514.9	3492.6	3479.1	3467.5	3477.3	3517.0	3543.8	30
	-0.1	0	0	0	0	-0.2	-0.3	-0.4	-0.1	-0.1	-0.2	0	
400 MW	3544.4	3540.0	3536.5	3533.3	3529.2	3514.8	3492.4	3478.9	3467.4	3477.1	3516.9	3543.6	30
	-0.1	-0.1	0	-0.1	-0.1	-0.3	-0.5	-0.6	-0.2	-0.3	-0.3	-0.2	
700 MW	3544.3	3539.8	3536.3	3533.2	3529.0	3514.4	3492.0	3478.5	3467.3	3477.0	3516.8	3543.4	29
	-0.2	-0.3	-0.2	-0.2	-0.3	-0.7	-0.9	-1.0	-0.3	-0.4	-0.4	-0.4	
1400 MW	3544.2	3539.4	3535.9	3532.8	3528.8	3513.9	3491.6	3477.3	3465.7	3476.6	3516.4	3542.8	28
	-0.3	-0.7	-0.6	-0.6	-0.5	-1.2	-1.3	-2.2	-1.9	-0.8	-0.8	-1.0	
GRAND COULEE													
BASE CASE	1289.7	1289.9	1289.0	1289.0	1289.0	1287.9	1279.1	1260.9	1230.7	1222.5	1236.9	1282.4	37
175 MW	1289.7	1289.9	1288.9	1289.0	1288.9	1287.9	1279.0	1260.8	1230.6	1222.5	1236.7	1282.1	37
	0	0	-0.1	0	-0.1	0	-0.1	-0.1	-0.1	0	-0.2	-0.1	
400 MW	1289.7	1289.9	1288.9	1289.0	1288.9	1287.9	1278.9	1260.6	1230.5	1222.5	1236.3	1281.8	37
	0	0	-0.1	0	-0.1	0	-0.2	-0.3	-0.2	0	-0.6	-0.4	
700 MW	1289.7	1289.9	1288.9	1289.0	1288.9	1287.9	1278.8	1260.5	1230.4	1222.5	1235.7	1281.3	37
	0	0	-0.1	0	-0.1	0	-0.3	-0.4	-0.3	0	-1.2	-0.9	
1400 MW	1289.7	1289.9	1288.9	1288.9	1288.9	1287.9	1278.6	1260.0	1230.0	1222.5	1234.4	1280.0	37
	0	0	-0.1	-0.1	-0.1	0	-0.5	-0.9	-0.7	0	-2.5	-2.2	

RESERVOIR ELEVATIONS (FT)

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	RESERVOIR REFILL
						DWORSHAK							
Base Case	1582.5	1576.9	1560.7	1557.8	1545.6	1538.5	1516.9	1501.0	1492.5	1515.6	1557.3	1582.5	28
175 MW	1582.5	1576.6	1560.6	1557.7	1545.6	1538.5	1516.9	1501.0	1492.5	1515.6	1557.3	1582.4	28
	0	-0.3	-0.1	-0.1	0	0	0	0	0	0	0	-0.1	
400 MW	1582.4	1576.6	1560.6	1557.7	1545.6	1538.5	1516.8	1500.9	1492.4	1515.5	1557.2	1582.3	28
	-0.1	-0.3	-0.1	-0.1	0	0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	
700 MW	1582.4	1576.5	1560.5	1557.7	1545.6	1538.5	1516.8	1500.9	1492.4	1515.5	1557.1	1582.1	27
	-0.1	-0.4	-0.2	-0.1	0	0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.4	
1400 MW	1581.9	1575.8	1560.2	1557.3	1545.3	1538.3	1516.7	1500.7	1492.4	1515.5	1557.0	1581.7	27
	-0.6	-1.1	-0.5	-0.5	-0.3	-0.2	-0.2	-0.3	-0.1	-0.1	-0.3	-0.8	

PROJECT OUTFLOWS (KCFS)

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
						PRIEST RAPIDS						
BASE CASE	125.0	97.6	71.7	78.3	85.8	112.6	158.6	140.4	123.2	111.2	158.1	142.9
175 MW	123.9	97.4	71.8	78.2	85.8	112.6	159.0	141.0	122.6	111.8	158.7	142.6
	-1.1	-0.2	+0.1	-0.1	0	0	+0.4	+0.6	-0.6	+0.6	+0.6	-0.3
400 MW	122.9	97.3	71.9	78.2	85.8	112.6	159.5	141.8	121.9	111.5	159.4	142.8
	-2.1	-0.3	+0.2	-0.1	0	0	+0.9	+1.4	-1.3	+0.3	+1.3	-0.1
700 MW	120.8	97.1	72.0	78.3	85.8	112.7	160.1	142.7	121.1	111.1	160.5	143.5
	-4.2	-0.5	+0.3	0	0	+0.1	+1.5	+2.3	-2.1	-0.1	+2.4	+0.6
1400 MW	116.1	96.6	72.1	78.3	85.5	112.8	161.2	145.4	119.8	110.1	163.0	145.1
	-8.9	-1.0	+0.4	0	-0.3	+0.2	+2.6	+5.0	-3.4	-1.1	+4.9	+2.2
						ICE HARBOR						
BASE CASE	33.8	19.9	23.3	23.1	30.5	32.2	35.9	48.7	47.1	70.0	102.2	88.5
175 MW	33.8	20.0	23.2	23.1	30.5	32.2	35.9	48.7	47.1	70.0	102.3	88.9
	0	+0.1	-0.1	0	0	0	0	0	0	0	+0.1	0
400 MW	33.7	20.0	23.2	23.1	30.5	32.2	35.9	48.8	47.1	70.0	102.4	88.9
	-0.1	+0.1	-0.1	0	0	0	0	+0.1	0	0	+0.2	0
700 MW	33.6	19.9	23.2	23.1	30.5	32.2	35.9	48.8	47.1	69.9	102.6	88.9
	-0.2	0	-0.1	0	0	0	0	+0.1	0	-0.1	+0.4	0
1400 MW	33.4	19.9	23.1	23.1	30.5	32.2	35.8	48.8	47.2	69.9	103.1	88.9
	-0.4	0	-0.2	0	0	0	-0.1	+0.1	+0.1	-0.1	+0.9	0
						THE DALLES						
BASE CASE	166.6	124.5	103.2	113.4	127.8	155.0	208.7	206.3	186.7	196.8	268.4	238.7
175 MW	165.4	124.3	103.2	113.3	127.7	155.1	209.3	206.9	186.2	196.7	269.0	238.3
	-1.2	-0.2	0	-0.1	-0.1	+0.1	+0.4	+0.6	-0.5	+0.6	+0.6	-0.4
400 MW	164.2	124.2	103.3	113.3	127.8	155.1	209.8	207.7	185.5	196.4	269.8	238.5
	-2.4	-0.3	+0.1	-0.1	0	+0.1	+0.9	+1.4	-1.2	+0.3	+1.4	-0.2
700 MW	162.0	124.0	103.3	113.3	127.7	155.2	210.4	208.7	184.7	195.9	271.2	239.2
	-4.6	-0.5	+0.1	-0.1	-0.1	+0.2	+1.5	+2.4	-2.0	-0.2	+2.8	+0.5
1400 MW	157.0	123.5	103.3	113.4	127.4	155.3	211.5	211.4	183.5	194.7	274.1	240.8
	-9.6	-1.0	+0.1	0	-0.4	+0.3	+2.6	+5.1	-3.2	-1.4	+5.7	+2.1

(40 YR AVG)

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL AVE.
BASE CASE	4267	1878	596	914	1656	2468	4856	5677	4672	4496	8180	7235	3891
UNUSABLE ENERGY	409	92	0	19	0	50	37	122	138	280	555	785	207
USABLE NF	3858 +	1786	596	895	1656 +	2418	4819	5555	4544 +	4166	7625	6450	3684
175 MW	4178	1866	600	910	1652	2479	4886	5727	4618	4482	8221	7214	3880
UNUSABLE ENERGY	329	73	0	10	0	45	32	97	108	257	505	690	179
USABLE NF	3849	1793	600	900	1652	2434	4854	5630	4510	4225	7716	6524	3711
GAIN	-9	7	4	5	-4	16	35	75	-34	59	91	74	27
400 MW	4076	1858	606	905	1654	2486	4919	5786	4556	4460	8269	7215	3886
UNUSABLE ENERGY	261	54	0	0	0	40	27	62	69	228	452	604	150
USABLE NF	3815	1804	606	905	1654	2446	4892	5724	4487	4232	7817	6611	3736
GAIN	-43	18 +	10	10	-2	28	73	169	-57	66	192	161	52
700 MW	3904	1844	612	911	1650	2497	4949	5858	4494	4430	8349	7242	3881
UNUSABLE ENERGY	146	41	0	0	0	32	19	22	18	180	392	533	115
USABLE NF	3758	1803	612	911	1650	2465	4930	5836	4476	4250	7957	6709	3766
GAIN	-100	17	16 +	16	-6	47	111	281	-68	84	332	259	82
1400 MW	3487	1818	609	914	1613	2509	5013	6078	4415	4314	8506	7286	3865
UNUSABLE ENERGY	5	24	0	0	0	15	2	0	0	35	218	414	59
USABLE NF	3482	1794	609	914	1613	2494	5011	6078	4415	4279	8288	6872	3806
GAIN	-376	8	13	19 +	-43	76 +	192 +	523 +	-129	113 +	663 +	422 +	122

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	AVG
Small NF													
Base Case	0	0	0	0	0	0	0	0	0	0	0	0	0
175 MW	185	108	70	70	101	114	136	143	141	135	175	153	123
400 MW	290	240	157	152	227	260	310	323	319	304	400	348	277
700 MW	480	394	247	248	384	455	541	550	548	524	700	603	472
1400 MW	906	708	384	424	697	896	1062	1074	1052	1011	1400	1198	900
DSM Max. Q	671	521	302	320	504	607	717	726	721	688	934	802	625
Base Case													
175 MW	640	490	269	298	484	607	712	714	707	677	934	797	610
	-31	-31	-33	-22	-20	0	-5	-12	-14	-11	0	-5	-15
400 MW	598	454	218	272	451	600	707	702	687	665	934	794	589
	-73	-67	-84	-48	-53	-7	-10	-24	-34	-25	0	-8	-36
700 MW	570	415	160	237	419	570	693	700	663	650	934	788	565
	-101	-106	-147	-86	-73	-37	-24	-26	-58	-38	0	-14	-60
1400 MW	5[illegible]	350	74	160	359	454	633	695	632	618	934	771	518
	-160	-171	-228	-160	-145	-153	-40	-31	-89	-70	0	-31	-103
Comb. Turb													
Base Case	174	147	66	69	200	281	329	331	275	236	332	279	229
175 MW	161	134	49	84	184	284	325	321	267	237	332	278	228
	-13	-8	-13	-10	-16	-1	-4	-10	-16	1	0	-1	-8
400 MW	152	133	36	73	177	236	319	331	263	238	332	273	212
	-22	-18	-26	-26	-23	-45	-10	0	-12	1	0	-6	-16
700 MW	148	122	27	[illegible]	171	219	319	331	260	227	332	271	207
	-26	-24	-35	-23	-29	-66	-10	0	-15	-9	0	-8	-22
1400 MW	115	106	16	53	122	165	319	320	251	206	332	268	185
	-59	-41	-46	-46	-73	-115	-10	-11	-24	-30	0	-11	-33
Small Thermal													
Base Case	8	10	3	6	12	11	21	22	16	16	23	20	14
175 MW	8	10	2	4	11	10	21	22	16	16	23	19	13
	0	0	-1	-2	-1	-1	0	0	0	0	0	-1	-1
400 MW	8	9	-2	4	12	9	21	22	16	16	23	19	15
	0	-1	-1	-2	0	-2	0	0	0	0	0	-1	1
700 MW	7	8	-2	4	10	8	21	22	16	15	23	19	13
	-1	-2	-1	-2	-2	-3	0	0	0	-1	0	-1	-1
1400 MW	6	8	-2	3	8	7	21	21	15	14	23	18	12
	-2	-2	-2	-3	-5	-4	0	-1	-1	-2	0	-2	-2
Small Gas Exp													
Base Case	0	5	15	29	31	29	26	10	4	35	0	0	15
175 MW	0	5	11	25	29	26	26	10	3	35	0	0	14
	0	0	-4	-6	-2	-3	0	0	-1	0	0	0	-1
400 MW	0	5	9	23	29	25	26	10	3	35	0	0	14
	0	0	-6	-6	-2	-4	0	0	-1	0	0	0	-1
700 MW	0	5	8	21	26	21	26	10	3	34	0	0	13
	0	0	-7	-8	-5	-8	0	0	-1	-1	0	0	-2
1400 MW	0	4	-5	18	17	18	26	10	3	33	0	0	11
	0	-1	-10	-13	-14	-11	0	0	-1	-2	0	0	-4
Hydro/L.F.													
Base Case	45	36	9	15	34	25	61	63	57	58	84	76	47
175 MW	45	34	8	15	36	32	61	63	57	57	84	69	46
	0	-2	-1	0	2	7	0	0	-1	-1	0	-7	-1
400 MW	43	32	-6	15	34	31	61	63	57	56	84	67	44
	-2	-4	-3	0	-2	-4	0	0	-2	-2	0	-2	-2
700 MW	40	30	-5	13	29	27	61	61	57	55	84	69	41
	-5	-6	-4	-2	-5	-9	0	-2	-2	-3	0	2	-6
1400 MW	34	26	-4	10	18	22	61	62	57	55	84	65	35
	-14	-10	-5	-5	-15	-13	0	-1	-2	-3	0	-4	-12
Coal Fired													
Base Case	1142	1010	196	401	863	1385	1649	1663	1384	1096	2071	1838	1223
175 MW	1098	952	178	379	799	1312	1645	1654	1371	1083	2071	1822	1194
	-44	-58	-13	-22	-64	-73	-4	-9	-13	-13	0	-10	-28
400 MW	1051	888	164	351	713	1222	1639	1645	1354	1038	2071	1815	1153
	-91	-126	-27	-50	-150	-163	-10	-20	-20	-58	0	-23	-73
700 MW	996	800	151	313	612	1114	1628	1630	1351	994	2071	1748	1077
	-146	-210	-42	-88	-251	-271	-21	-33	-35	-102	0	-67	-103
1400 MW	810	580	125	235	388	591	1581	1598	1210	791	2069	1657	1007
	-332	-430	-66	-166	-475	-794	-69	-65	-174	-305	-2	-141	-115
End Gas Exp													
Base Case	215	55	13	[illegible]	13	64	350	350	279	289	500	383	212
175 MW	205	53	12	[illegible]	12	63	347	350	279	272	500	379	208
	-9	-2	-1	[illegible]	-1	-1	-3	0	-1	-17	0	-4	-4
400 MW	200	46	13	[illegible]	13	58	341	349	276	265	500	362	203
	-15	-9	0	[illegible]	0	-6	-7	-1	-2	-24	0	-16	-9
700 MW	192	29	12	[illegible]	7	55	331	349	265	262	500	346	191
	-23	-26	-1	[illegible]	-6	-13	-19	-1	-35	-27	0	-34	-14
1400 MW	175	11	8	[illegible]	13	20	308	338	210	240	473	352	114
	-40	-44	-13	[illegible]	-13	-44	-42	-12	-88	-48	-27	-148	-89
SW Exp													
Base Case	1517	2	0	1	0	6	1589	2250	1705	1668	3500	2867	1125
175 MW	1472	2	0	0	0	6	1587	2208	1585	1685	3417	2811	1121
	-43	0	0	-1	0	0	-2	-42	-120	-33	-83	-56	-3
400 MW	1400	1	0	0	0	3	1405	2150	1456	1554	3302	2755	1116
	-117	-1	0	-1	0	-1	-185	-100	-249	-114	-198	-111	-9
700 MW	1265	0	0	0	0	-5	1274	2075	1300	[illegible]	3143	2656	1081
	-250	-2	0	-1	0	-1	-315	-175	-405	[illegible]	-357	-211	-112
1400 MW	903	0	0	0	0	-5	1[illegible]	1[illegible]	951	[illegible]	2812	[illegible]	909
	-616	-2	0	-1	0	-6	[illegible]	[illegible]	-538	[illegible]	-688	[illegible]	-395
Sm. Exp													
Base Case	86	0	0	0	0	0	78	154	73	82	180	130	[illegible]
175 MW	86	0	0	0	0	0	74	142	54	85	180	135	[illegible]
	0	0	0	0	0	0	-4	-12	-19	+1	0	5	[illegible]
400 MW	71	0	0	0	0	0	62	145	58	73	180	171	[illegible]
	-15	0	0	0	0	0	-16	-7	-15	-9	0	-9	-5
700 MW	59	0	0	0	0	0	40	130	45	64	180	157	[illegible]
	-27	0	0	0	0	0	-30	-24	-28	-18	0	-13	[illegible]
1400 MW	29	0	0	0	0	0	33	113	38	51	168	137	[illegible]
	-79	0	0	0	0	0	-35	-41	-35	-31	-12	-23	[illegible]

DOE F 1325.8
(5-83)

H
Randy

United States Government **Department of Energy**

memorandum

DATE: April 20, 1984

REPLY TO
ATTN OF: BPA-SJ

SUBJECT: Advance Review of Revised Environmental Assessment (EA) on BPA's Proposed Policy for Sales of Nonfirm Energy to Utilities for Service to Loads with Alternate Fuel Capability

TO:

Michael Kleinrock, Compliance Policy Division, PE-251

Two copies of the subject document are attached for your review. The document is substantially revised from the version we sent you March 16, 1984, partly because of your earlier comments. Following this review, we will submit the EA for the official approval of the Assistant Secretary for Policy, Safety, and Environment. We would appreciate receiving your comments as soon as possible. You may telephone your comments directly to Tom McKinney of my staff at FTS 429-4721.

Anthony R. Morrell
Environmental Manager
Bonneville Power Administration

Attachment

BPA:TMcKinney:jh:633-8330:04/20/84 (WP-SJ-28350)

cc:
BPA-AC (2)
J. Pyrch - PGC
Official File - SJ

MAY 2 2 1984

PGC

Anthony R. Morrell, Environmental Manager - SJ
THRU: Janet W. McLennan, Assistant Power Manager for /s/
Natural Resources and Public Services - PG
Gabrielle Foulkes, Acting Environmental Coordinator /s/
Office of Power and Resources Management - PGC

Transmittal of Environmental Assessment on the Policy for Nonfirm Energy Service to Loads with Alternate Fuel Capability

Attached are ten copies of the subject Environmental Assessment (EA). A preliminary draft copy of this EA was last provided on April 20, 1984. Comments received from BPA staff and DOE have been incorporated into this version of the EA.

These ten copies are for your office to initiate a 568 for formal transmittal to DOE.

10 Attachments

SPrice:klm (WP-PGC-2912K)

cc:
L. Baker - ALP
O. Schmidt - APG
J. Luce - APP
J. McLennan - PG
S. Price - PGC
R. Seiffert - PGC
R. Harper - PJI
T. Noguchi - PK
C. Combs - PKI
R. Lamb - PR
D. Faulkner - PS
Official File - PGC

Bonneville Power Administration
U.S. Department of Energy

BPA

DATE : NOV 28 1984

In reply refer to : PGC

UNITED STATES GOVERNMENT

Memorandum

TO : Anthony R. Morrell, Environmental Manager - SJ
THRU: Janet McLennan, Assistant Power Manager for Natural Resources and Public Services - PG
FROM : Gabrielle Foulkes, Acting Environmental Coordinator Office of Power and Resources Management - PGC

SUBJECT: Transmittal of a Preliminary FONSI on the Proposed Policy for Sales of Nonfirm Energy for Service to Loads With Alternate Fuel Capability

Attached are four copies of the subject FONSI. We would appreciate expedited transmittal of these documents to DOE for their review.

DOE has previously reviewed, commented upon, and approved the Environmental Assessment (DOE/EA-0239) upon which this FONSI is based. Public comment on the EA ended on October 26, 1984, and no comments on the EA were received. Based on comments on the policy solicited concurrently with public review of the EA, staff has devised three probable changes from the proposed policy for the final policy. My current understanding of these probable changes is as follows.

1. The final policy may specifically allow a load qualifying under the policy to secure nonfirm electrical energy from another utility when BPA does not have nonfirm energy available or when BPA is not selling nonfirm for such load at a price below the avoided cost of the alternate fuel. This was mentioned as an alternative in the EA (see p. 7), but the impacts of this alternative were not explicitly described in the EA (see p. 20, Section 3.3.3). On the other hand, the revised proposed policy (49 FR 35853) did not specifically preclude use of nonfirm energy from another utility, and in the absence of the policy, such service would be available to a consumer if a utility had nonfirm energy available and was agreeable to such a sale.

2. The final policy may allow BPA to provide firm service to a qualifying load for a limited period in the event an uncontrollable force on the serving utility's system or in the consumer's facilities prevents operation of the alternate fuel source when BPA has no nonfirm energy available, or provision of nonfirm energy from the serving utility's system. This possibility was not contemplated in the EA.

3. The final policy may include provisions to encourage new qualified loads to a limited degree by allowing investments in new electric capability at facilities already having nonelectric capability to be considered as a negative component of the avoided costs when making nonfirm energy sales under a displacement rate. This was not specifically addressed as an alternative in the EA, although an alternative termed "Affirmative Action to Develop Interruptible Loads" was addressed (see pp. 6 and 19).

The above changes in the policy will not result in any environmental impacts substantively different than those described in the EA. The EA was based on an assumption of serving 1400 MW of alternate fuel load under the policy. This is still considered to be much more than is expected to be served even with these three policy changes, so that the analysis in the EA remains quite conservative. Availability of nonfirm energy from other utilities when BPA has more available could slightly increase operational impacts of other utilities' generating resources. Compared to the revised proposed policy, the second change described above might increase operation of generating resources very slightly and decrease the amount of surplus firm energy available to market to others very slightly.

BPA staff is now in the final stages of formulating the final policy, so there may yet be other changes. However, any further changes are not expected to have substantive environmental concerns.

The preliminary FONSI attached may need to be modified to describe the above (and any further) policy changes and to explain why we believe supplementing the EA is not necessary. We expect to have the revised FONSI prepared for transmittal within a week. In the meantime, please advise us if DOE has comments on the attached preliminary draft.

Attachment (4 copies)

RSeiffert:ljc (WP-PGC-3224K)

cc:
O. Schmidt - APG-12
J. McLennan - PG
T. Noguchi/J. Pyrch - PK
C. Combs - PKLC
K. Pierce - SJ
Official File - PGC

U.S. DEPARTMENT OF ENERGY
Bonneville Power Administration

FINDINGS OF NO SIGNIFICANT IMPACT (FONSI)

Proposed Policy for Sales of Nonfirm Energy for Service to Loads With Alternate Fuel Capability

The Bonneville Power Administration (BPA) has prepared an Environmental Assessment (EA) (DOE/EA-0239) to assess environmental effects of the proposed BPA policy named above.

Proposed Action

BPA proposes to establish a policy by which sales of some of its nonfirm energy could be made to displace use of an alternate source of energy, such as natural gas or oil. BPA's Direct Service Industry (DSI) customers and Pacific Northwest (PNW) utility customers would be eligible to purchase this nonfirm energy, under special contracts, to serve specific qualified loads on an interruptible basis. To qualify, a load must: (1) have the capability of being served with electricity, but must also have a nonelectric energy source to substitute when electricity is not available; (2) be larger than 1 average megawatt (MW); and (3) have special metering to differentiate the amount of nonfirm energy delivered to the qualified load from the amount of other electric energy delivered to the site. The policy also defines how availability of nonfirm energy for service to a load will be determined; what previously established rate will be charged the purchasing utility or DSI; how communications between BPA and the utility or DSI are to be handled; and the conditions under which the load could receive firm service if nonfirm service becomes unsuitable or uneconomic. The policy is described more completely in the EA (DOE/EA-0239, p. 1 and Appendix B) and in the FEDERAL REGISTER "Notice of Revised Proposed Nonfirm Energy Policy for Consumer Alternate Fuel Loads and Request for Comments" (49 FR 35853).

Reasons Why the Proposed Policy Will Not Have a Significant Impact on the Human Environment

The potential environmental effects of the proposed policy stem from: (1) changes to produce more energy in the operation of Federal hydroelectric dams in the PNW and other resources from which BPA secures electric energy; (2) changes in the operation and economic viability (including incentives for new development) of facilities served under the policy; and (3) changes in the amount of nonfirm energy available to lower priority customer classes for other uses. These potential impacts were discussed in Chapter 3 of the EA (pp. 9-18). Public and governmental agency review of the EA did not reveal any further environmental concerns.

The analysis in the EA of potential impacts of the policy was based on the assumption that 1400 MW of qualifying nonfirm load would be served under the policy (EA, p. 9). This substantially exceeds the amount of load for which nonfirm service, under the policy, is likely to be requested. However, since all impacts of the policy become greater in magnitude as more nonfirm load is served, the assumption leads to an environmentally conservative analysis.

Operation of PNW Federal hydroelectric projects will be changed to meet additional demand for nonfirm energy under the policy. These changes will reduce reservoir levels, alter river flows, and lower amounts of spill from dams from what they might have been at a particular time if nonfirm energy demand were not increased by the proposed policy's implementation. Reduced reservoir levels, altered flows, and spill reductions may in turn affect fish, wildlife, and recreational opportunities on the reservoirs. However, none of

these impacts are considered significant because they will occur within existing operational constraints of the hydroelectric projects. Also, BPA will mitigate potential fish passage problems related to spill by foregoing nonfirm energy sales which would conflict with any fish passage spills which the Federal dam operators determine to provide, pursuant to Sections 404(a) and (b) of the Regional Council's Program, until effective juvenile fish bypass systems are in operation (EA, pp. 9-11).

BPA's thermal resource operations do not appear to be increased by the policy because: (1) two of these resources (Trojan and Washington Nuclear Project No. 2) have variable costs low enough that they tend to be operated to the maximum extent under any circumstances; and (2) BPA simply cannot substantially influence operation of the other two (the Hanford Generating Project and a 50-MW share of the Boardman Coal plant) to increase generation upon demand (EA, p. 10).

Past study of how availability and cost of electric energy has influenced the siting of industry in the PNW indicates that only the aluminum industry has been substantially influenced to locate here. Since the vast majority of an aluminum plant's load is electroprocess and not conducive to utilization of an alternate fuel, it does not appear that the proposed policy will influence development of new industrial plants. Addition of new electric facilities, such as electric boilers, at existing facilities, or incorporation of such facilities into new projects, to qualify under the policy would have only minor impacts (EA, pp. 11-12).

Under the policy, some PNW consumers may, at times and for economic reasons, displace use of fossil fuel, hog fuel, or other nonelectric energy sources and

elect to use nonfirm electric energy instead when it is lower cost. In marginal cases, this may slightly enhance businesses' financial viability. It also means that when nonfirm energy is substituted, the impacts of use of the alternate fuel, such as air pollution and solid waste generation, do not occur. Thus, an environmental benefit would occur in the PNW. Since industrial, commercial, and institutional consumers which might be served under the policy are regulated by environmental agencies, their fuel burning operations do not generally result in substantial environmental damage. Loads served by the policy will be dispersed over the BPA service area and only be served part of the time. Therefore, the environmental benefit of fuel displacement is not significant to the PNW (EA, pp. 13-14).

Since PNW public utilities and municipalities have priority to purchase BPA nonfirm energy, serving alternate fuel consumers on their systems would reduce the amount of BPA nonfirm energy available to lower-priority customers, namely PNW investor-owned utilities and utilities outside the region, mainly in California. These utilities use BPA nonfirm energy when available to displace more costly thermal generating resources. For the PNW investor-owned utilities, the decreased availability of BPA nonfirm energy means, primarily, a reduced chance of their coal-fired resources being displaced (especially in January, March, April, and July). The increase in coal plant impacts caused by less displacement is not environmentally significant because displacements are temporary, the coal plants are subject to environmental regulation, and do not result in impacts which are abnormally severe for such facilities (EA, pp. 15-16). California utilities tend to use BPA nonfirm energy to displace gas- and/or oil-fired resources. Increases in emissions of air pollutants and other environmental impacts as a consequence of decreased generating resource

displacement in California are not significant because the changes are only small portions of the total amounts of pollutants released by, and the cumulative impact of, other facilities and activities affecting the California environment (EA, pp. 16-18 and Appendix E).

Related Documents

On March 15, 1983, BPA requested comments on interim principles for sales of nonfirm energy for interruptible industrial and irrigation loads (48 FR 10903).

On July 12, 1983, BPA issued its proposed policy for sales of nonfirm energy to utilities for alternate fuel industrial loads. The proposed policy was published in the FEDERAL REGISTER on July 22, 1983 (48 FR 33518). BPA mailed a summary of comments on the proposed policy on November 23, 1983.

BPA issued a Revised Proposed Nonfirm Energy Policy for Consumer Alternate Fuel Loads on September 10, 1984. The revised proposed policy was published in the FEDERAL REGISTER on September 12, 1984 (49 FR 35853). This revised proposed policy considered comments received on the Proposed Policy for Nonfirm Energy Sales for Utilities' Industrial Loads, and BPA's experience under interim alternate fuel nonfirm energy contracts.

Public Availability

Copies of the EA were sent to potentially affected utilities and agencies, and other organizations and individuals who expressed interest in BPA power marketing actions. Copies of this finding will be sent to all persons and agencies who were sent copies of the EA. Copies are also available upon request from BPA (address below).

Determination

Based on the information in the EA and review of the EA by the above agencies, utilities, and interested groups and individuals, it is the determination of the Department of Energy that the proposed policy is not a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA, 42 U.S.C. 4321 et. seq., and, therefore, an environmental impact statement will not be required.

For Further Information Contact: Anthony R. Morrell, Environmental Manager, Bonneville Power Administration, P.O. Box 3621-SJ, Portland, Oregon 97208, telephone (503) 230-5136.

Issued in Washington, D.C., on _____, 1984.

_____
ROBERT C. ODLE, JR.
Acting Assistant Secretary for Policy,
Safety, and Environment

RSeiffert:ljc (WP-PGC-3159K)

NOV 2 8 1984

PGC

Anthony R. Morrell, Environmental Manager - SJ
THRU: Janet McLennan, Assistant Power Manager for /s/
Natural Resources and Public Services - PG
Gabrielle Foulkes, Acting Environmental Coordinator /s/
Office of Power and Resources Management - PGC

EQ 4-2 alpha
A

Transmittal of a Preliminary FONSI on the Proposed Policy for Sales of Nonfirm Energy for Service to Loads With Alternate Fuel Capability

Attached are four copies of the subject FONSI. We would appreciate expedited transmittal of these documents to DOE for their review.

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The above changes in the policy will not result in any environmental impacts substantively different than those described in the EA. The EA was based on an assumption of serving 1400 MW of alternate fuel load under the policy. This is still considered to be much more than is expected to be served even with these three policy changes, so that the analysis in the EA remains quite conservative. Availability of nonfirm energy from other utilities when BPA has more available could slightly increase operational impacts of other utilities' generating resources. Compared to the revised proposed policy, the second change described above might increase operation of generating resources very slightly and decrease the amount of surplus firm energy available to market to others very slightly.

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Attachment (4 copies)

RSeiffert:ljc (WP-PGC-3224K)

cc:
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April 20, 1984

PGC

EQ 4-2 alpha
"Alternate Fuel
Nonfirm Policy
EA"

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DOE Review of the Nonfirm Policy Environmental Assessment

Attached are three revised preliminary draft copies of the Environmental Assessment (EA) on BPA's Proposed Policy for Sales of Nonfirm Energy to Utilities for Service to Loads with Alternate Fuel Capability for your office to transmit to DOE for a second review. This draft of the EA has been reorganized per comments from DOE and BPA staff review. In addition, the following substantive changes have been made.

1. There is now total reliance on the nonviolation of FCRPS operating constraints and implementation of the Council's Fish and Wildlife Plan as justification for lack of significant impacts on fish (both resident and anadromous), wildlife, and recreation, and no discussion of any impacts which might occur within those constraints. Information in Chapter 3.1.2 of the March 1984 draft has been deleted.

2. There is generally no longer numerical quantification of effects of the policy on reservoir elevations, flows, and amounts of nonfirm energy available to various market classes within the body of the document since most readers seemed to regard such quantification as extraneous.

3. The numerical results of the secondary energy studies are no longer included in the Appendices.

4. The Central Lincoln decision is no longer addressed at all.

The conclusion of the document remains the same.

We would appreciate expedited transmittal to DOE and their review of this new draft of the EA. If you have any questions, please call me or Randy Seiffert on extension 4261.

~~X~~ Attachment~~s~~ (3)

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ENVIRONMENTAL ASSESSMENT

on

BPA'S PROPOSED POLICY FOR SALES OF NONFIRM ENERGY TO UTILITIES FOR SERVICE TO LOADS WITH ALTERNATE FUEL CAPABILITY

OFFICE OF POWER AND RESOURCES MANAGEMENT
BONNEVILLE POWER ADMINISTRATION
APRIL 1984

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EXECUTIVE SUMMARY

BPA's proposed policy (hereafter policy) to sell nonfirm energy to utilities and direct service industries (DSIs) for service to their loads which have alternate fuel capability formalizes procedures for serving a new market for BPA nonfirm energy. This market was first served under interim arrangements in 1983, and consists of DSIs and regional 1/ utility customers who find it economical at times to displace oil, gas, or other fuel usage with nonfirm electrical energy. Any load of one megawatt (MW) or more which can be fully served by an alternate fuel and which is operated by a DSI or a consumer of a regional utility customer will be eligible for nonfirm service under the policy. This policy requires utilities (or their consumers) and DSIs to install separate metering and special communications equipment and to sign new nonfirm energy contracts. Because of these requirements and the initial contracts' June 30, 1987 expiration, BPA does not expect to serve large amounts of interruptible load during the initial phase of this policy. This ameliorates the potential environmental impacts of the policy and allows BPA, utilities, and consumers to gradually learn, with reduced financial risk, about operating under the policy. Upon expiration of the initial contracts, modifications to the policy may be made, if necessary, and new, long-term contracts will presumably be offered.

1/ Words underlined when first used in this document are defined in the Glossary, Appendix A.

Most of the utilities seeking nonfirm service under the policy for their consumers are public bodies and cooperatives, known as preference customers. Nonfirm energy will be provided for this market first, in accordance with applicable law. This could affect service to the DSI First Quartile, and nonfirm sales to Pacific Northwest investor-owned utilities (IOUs) and export markets.

Potential environmental impacts of the policy derive from: (1) changes in the operations of consumers and DSIs served under the policy; (2) changes in the operations of those entities which will experience reduced availability of nonfirm energy; and (3) changes in operation of the Federal Columbia River Power System (FCRPS) to provide an increased amount of nonfirm energy in order to meet the expanded nonfirm energy market. Effects on FCRPS operations are primarily reflected as impacts on fish, wildlife, and recreation resources. Analysis performed indicates there will be no new operational impacts on these resources. Operating constraints and agreements are in place which will prevent significant harm to anadromous fish from the policy's implementation. BPA intends to take additional actions in the future to protect and enhance anadromous fish.

Impacts related to changes in availability of nonfirm to various markets depend on whether a customer class gains or loses access to nonfirm energy and on what the energy is used for. There will be environmental benefits since BPA nonfirm electrical energy will substitute for use of fuels which produce air pollutants and, perhaps, solid waste. There will probably be negligble change to the physical environment as a result of reduced DSI nonfirm

availability, since the reduction is small and they probably would seek Industrial Replacement Energy (IRE) more frequently to maintain production. The IOUs and export markets use BPA nonfirm energy to displace polluting thermal resources, and reduced availability of nonfirm energy to these markets could reduce any benefits they might otherwise experience. All these impacts, though, are minor; either the impact is insignificant in magnitude or the impact relates to an aspect of the environment which is not in itself significant.

Pending public and governmental agency review, BPA has concluded that implementation of the policy does not significantly affect the quality of the human environment and, therefore, does not require preparation of an environmental impact statement (EIS).

Chapter 1

INTRODUCTION

This Chapter of the Environmental Assessment (EA) briefly describes the policy and discusses some key features, particularly those which could affect the environment. Additional information on the policy can be found in Appendix B.

1.1 NEED

The proposed action or policy responds to BPA's need to: (1) improve BPA revenues by stimulating nonfirm energy sales that would not otherwise take place; (2) allow DSIs and BPA's utility customers, and their qualified consumers, to enjoy the benefit of lower cost energy when it is available, and thereby improve the region's economy; and (3) utilize BPA nonfirm hydroelectric resources that might otherwise be wasted. In responding to these needs, conversion of existing firm electrical load to nonfirm load must be avoided because it would result in loss of firm sales and associated revenues.

1.2 OVERVIEW OF THE POLICY AND POLICY IMPLEMENTATION

BPA proposes to make nonfirm energy available to its Northwest utility customers and DSIs for service to loads which can use an alternate fuel source

when BPA determines that nonfirm energy is not available. As the result of an analysis of short-term nonfirm energy agreements in 1983 and earlier, BPA has learned that loads once served with firm power are either being lost to alternate fuels or are being shut down altogether. The amount of firm power that was sold had previously varied depending on market conditions and/or the availability of cheaper alternate fuel. Until recent firm power rate increases, firm power was generally competitive with alternate fuels. By making nonfirm energy accessible to these loads, BPA hopes to provide intermittent electric service to some loads which would have been lost to the region, and eventually encourage development of new interruptible loads.

1.3 SCOPE OF POLICY

The proposed policy and this EA are restricted in scope to providing only for sales of nonfirm energy to utilities and DSIs for service to interruptible loads, sized at one average megawatt (MW) demand or greater, with alternate fuel capability. Qualifying loads are most likely to be boilers used for process heat in the pulp and paper, wood products, chemical, and food processing industries; and space heating for large industrial plants, commercial facilities (office buildings or complexes, shopping centers, central heating plants, etc.), and institutions (large hospitals, universities, etc.). BPA may propose other policies for marketing of nonfirm for other specific applications at later times, and will undertake appropriate National Environmental Policy Act (NEPA) compliance activities in conjunction with those policies.

1.4 BACKGROUND

This section describes elements which are fundamental to the understanding and development of the policy. Additional information and a summary of the issues related to the sale of surplus power are found in a BPA brochure, Issue Backgrounder: Surplus Power (BPA, 1983d).

1.4.1 Grades and Availability of Power

BPA projects its ability to serve firm loads based on a historical record of streamflow, the critical period, projections of hydroelectric generation resources, and realistic projections of generation by BPA's thermal resources. Studies made on this basis determine Firm Energy Load Carrying Capability (FELCC). FELCC is the amount of energy BPA can be confident of supplying to customers to serve firm loads, that is loads which are to be served with maximum reliability. If obligated "firm" loads exceed FELCC, BPA would be deficit, would possibly have to allocate power among customers, or would need to acquire resources to attain a firm load/resource balance. If FELCC exceeds expected firm obligations as in the current situation, BPA is capable of serving more firm load than its customers have and would attempt to market the excess firm power as "surplus firm." During most years, more water is available for generation by the Federal dams from which BPA markets power than under critical period conditions and more than enough is available to refill the reservoirs. The additional energy which can be generated under these circumstances is "nonfirm" energy. It cannot be sold as firm, because it varies in quantity and at times is not available at all. Nonfirm energy is

most likely to be available in the late spring and early summer when snow melting in the mountains causes high flows in the rivers and the Northwest's peak winter electrical loads are over.

Implementation of the Northwest Power Planning Council's (Council) Water Budget will, on the average, increase nonfirm energy capability by 432 average annual MW (while sacrificing 510 average MW of firm energy capability) (BPA, 1983a, pp. 22-25).

Nonfirm energy may be generated in two situations. One is when there is a high probability of having more than enough water available to meet firm loads, to refill reservoirs, and to meet all other constraints on the hydroelectric system such as the Water Budget, fish passage, and navigation. Under these conditions, a decision may be made to use available surplus water to generate marketable nonfirm power. The second situation occurs when water must be released from reservoirs because of high flows and/or operational constraints such as flood control, reservoir levels, and the Water Budget. In one case, a decision is made to take a limited risk of water conditions not turning out as well as predicted in order to produce marketable nonfirm energy to generate BPA revenue or to accomplish some goal such as being able to displace a more costly resource. In the second case, the water would be wasted if nonfirm energy were not generated when the water, which must be released because of high flows or operating constraints, were simply discharged over the spillway, or spilled, instead of being sent through the turbines. There are circumstances when water must be spilled: when the rate at which water must be released exceeds the capacity of the turbines; when

there is no market for all the nonfirm energy which could be generated at existing flow levels; and when necessary, at certain dams and times of year, to reduce fatalities of downstream migrating smolts.

1.4.2 Historic Sales and Uses of Nonfirm Energy

Historically, BPA sales of nonfirm energy have been made: (1) to the Pacific Northwest IOUs and generating preference customers at the nonfirm energy rate to displace high cost thermal resources and/or serve their own interruptible loads; (2) to the DSIs for service to their First Quartile at the Industrial Firm Power (IP) rate, and for production increases and other purposes; and (3) to utilities outside the region under the nonfirm energy rate schedule. Sales of nonfirm energy to these various markets for fiscal year 1977 through 1983 are shown in Table 1.

1.4.3 Interim Contracts

In March 1983, BPA completed drafting principles for selling nonfirm energy to its Northwest utility customers. These principles were prompted by requests in the summer of 1982 for such service by one of BPA's preference customers. BPA made sales of this type available to six Northwest utilities on an interim basis in January, 1983, and later expanded these interim offers to include one DSI (see Appendix C).

TABLE 1
BPA NONFIRM ENERGY SALES
FOR FISCAL YEARS 1977-1983 1/ 2/

Customer Class		FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	FY 83
Northwest	1000 KWH	22,724	249,818	604,399	55,680	112,252	30,969	436,493
Preference Customers	$	77,315	772,329	1,986,611	307,187	636,709	538,144	3,973,573
Northwest	1000 KWH	791,764	8,616,030	4,659,730	2,877,447	7,063,797	6,019,076	9,266,036
IOUs	$	2,659,476	27,489,140	14,435,790	17,452,859	52,810,691	48,162,417	80,404,837
DSIs 3/	1000 KWH	6,108,921	6,614,688	6,447,501	6,355,116	7,041,761	5,456,834	6,627,011
	$	15,586,683	16,030,328	18,601,375	29,031,620	43,808,532	87,408,763	125,812,440
Export Markets	1000 KWH	0	5,046,237	392,517	4,339,336	8,767,541	15,221,784	18,902,771
	$	0	16,934,356	751,298	28,552,782	64,024,452	118,942,784	175,241,869
Total	1000 KWH	6,932,409	20,526,773	12,104,147	13,627,579	22,985,351	26,728,663	35,232,311
	$	18,323,474	61,226,153	35,775,074	75,344,448	161,280,384	255,052,108	385,432,719

1/ From BPA Fiscal Year Generation and Sales Statistics for fiscal years 1978 through 1983.
2/ Actual dollar amounts not corrected for inflation.
3/ Values for DSIs computed by multiplying their total Industrial Firm sales by 0.25 to determine the amount of nonfirm which constituted their First Quartile, any adding and additional amounts of nonfirm energy purchased.

RSeiffert:dh (WP-PGC-2764K)

Chapter 2

ALTERNATIVES

This Chapter discusses alternatives on two levels. The first and more fundamental level is that of alternatives to the broad scope of the policy. The no action alternative, for example, is an alternative on this level. The second level is that of alternatives to specific features of the policy which could be varied within some limits while not substantially changing the overall scope of the policy. Alternatives to these features may influence the policy's effectiveness and may incur different environmental impacts. Examples are different provisions relating to conversion from nonfirm to firm service and different standards for consumers to qualify for nonfirm service. Most of the variation in environmental impacts among the alternatives are consequences of differences in effectiveness, and therefore can be identified only in terms of general trends.

2.1 ALTERNATIVE POLICIES

This section discusses alternatives to the broad scope of the policy.

2.1.1 No Action Alternative

Under this alternative, consumers of BPA's requirements customers would not be provided access to BPA nonfirm energy through their serving utilities and DSIs would not have access to BPA nonfirm energy to serve alternate fuel loads.

BPA nonfirm energy would continue to be marketed to the same customers under the same circumstances and for the same purposes as prior to the interim contracts (see Chapter 1.4.2). The interim contracts would not be renewed or renegotiated. This alternative does not provide an opportunity for increased sales of nonfirm energy and, therefore, does not potentially improve BPA's revenues or help hold down other rates. It is not responsive to the Council's Two-Year Action Plan (see Chapter 4.2). Because the nonfirm market would not be expanded under this alternative, some surplus power which could be generated on the FCRPS would remain unmarketable resulting in increased spill. Consumers would consume higher cost fuels, or, in borderline situations of profitability, might shut down causing unemployment and reducing their contribution to the economy.

2.1.2 Nonfirm Sales to Utilities for Service to Consumers with Minimal Restrictions

This alternative represents a case where BPA wishes to make sales of nonfirm energy to its utility customers for service to consumers, but chooses to impose minimal control over such sales. As in the proposal, the DSI or utility and/or consumer would have to provide a means to measure nonfirm deliveries for billing purposes and provide communications, and BPA would provide notice of availability of nonfirm energy. BPA would grant contracts to utilities for service to their interruptible consumers and to DSIs, and devise a means of allocating nonfirm when demand exceeds availability. However, there would be no restrictions in the policy on switching from firm to nonfirm service and vice versa, and no requirement for alternate fuel

capability. BPA would let DSIs and utilities and their consumers decide on the economics of providing metering, billing, and communications for delivery of nonfirm energy to a particular load, and would, therefore, not impose a lower limit on the size of interruptible load eligible for nonfirm service. There would also be no limit on utility markup.

Under this alternative, many aspects of the proposed policy will be subject to individual negotiation between utilities and consumers. For example, provisions which restrict switching from firm to nonfirm power will be subject to negotiation between the consumer and the serving utility. Utilities which have an incentive to avoid loss of firm load, such as some generating utilities, will restrict switching. Other utilities may be inclined to allow a consumer to use cheaper nonfirm when available if: (1) they can change their contract demand easily, or (2) the utility is a metered customer. Utilities will always receive some markup on the nonfirm energy, which is an incentive for them to make it available to customers.

This alternative would result in some, and possibly substantial, loss of firm load to BPA and, therefore, reduce revenues. It would also make BPA planning more difficult since firm loads could be added and dropped in an unpredictable fashion.

2.1.3 Affirmative Action to Develop Interruptible Loads

This alternative is the same as the proposal except that BPA would take the additional action of providing further incentives for the installation of

interruptible electric loads in the region's existing and new industrial plants, commercial facilities, and institutions. Such incentives could include providing direct funding or low cost financing for such installations, BPA payment for metering and communications equipment required by the policy, grants to explore innovative ways of using nonfirm energy, and/or other means. This alternative would require committment of BPA funds which are currently not budgeted. BPA may wish to pursue this alternative some time in the future, but this alternative would require more time to implement. BPA does not wish to forego sales of nonfirm energy under the policy in the meantime.

2.2 ALTERNATIVES TO FEATURES OF THE POLICY

This section discusses alternatives to specific features of the policy which do not change its overall scope but which may influence the effectiveness, the amount of energy which might be sold under the policy, and ultimately, its environmental effects.

2.2.1 Qualifications of Consumer Loads Eligible for Nonfirm Service

Several possibilities exist with respect to requirements which consumers must meet in order to qualify for nonfirm energy under the policy. The case of minimal qualifications in all possible aspects is described as an "alternative policy" in Chapter 2.1.2. This section discusses the range of options which could conceivably affect the environmental consequences of the policy.

Eligibility of Firm Loads - In its policy, BPA could conceivably allow industrial, commercial, and institutional firm loads to switch to nonfirm, either temporarily or permanently, and either universally or based on some criteria.

Class of Load - BPA could make the policy applicable only to industrial consumers served by utilities, or could limit the policy in some other way to preclude one or more classes of consumers or the DSIs.

Alternate Fuel Supply - BPA has the options to: (1) not require an alternate fuel supply; (2) restrict the type of alternate fuel supply; (3) allow a utility customer to serve a consumer's nonfirm loads with its own nonfirm energy at any time or only when BPA nonfirm is unavailable; (4) allow electricity furnished by another utility, which is not a customer of BPA, to serve as an alternate fuel; or (5) require some level of alternate fuel supply which is less than the capacity to utilize nonfirm energy.

A special case is consumers who want to rely on cogeneration facilities as their alternate fuel supply. BPA is considering developing a separate policy for selling nonfirm energy to consumers which have cogeneration resources.

Size of Eligible Nonfirm Load - The size of the load for which it is economical to attempt to secure nonfirm energy depends, among other things, on the cost of providing the metering and communications facilities required by the policy, and the ability to schedule and restrict power. The proposed

limit of 1 average MW is the approximate lower limit of the amount of load BPA has found practical to schedule, but it may not be cost-effective to provide the metering and communications facilities for loads this small. BPA could alternatively set a size limit larger than 1 average MW.

2.2.2 River Conditions Under Which Nonfirm Energy Would Be Sold

BPA proposes to offer to contracted utilities and DSIs nonfirm energy in amounts and at times determined by BPA. Such times include conditions of spill, imminent spill, and other conditions under which BPA elects to market nonfirm energy. Although there may be legal contraints, BPA has the options of: (1) restricting sales of nonfirm under this policy to times of spill only; (2) restricting sales of nonfirm to times of spill or imminent spill only; or (3) of establishing some other standards as part of the policy by which it would be decided when to offer nonfirm under the policy and how much nonfirm to make available. BPA would use the flexibility available under the proposed approach and the nonfirm energy (NF-83) rate schedule or its replacement to maximize its revenues within its operational, planning, and legal constraints.

2.2.3 Duration of Contracts

BPA is proposing to enter into contracts which expire June 30, 1987. Contracts of shorter duration would discourage utilities and/or their consumers and DSIs from seeking nonfirm service under the policy.

A longer contract duration could inhibit timely resolution of problems which may arise with implementation of this new policy. The proposed contracts would expire at a time when resources are expected to be available to serve the loads as firm if consumers found nonfirm service under the policy unsuitable and wanted to apply for firm service.

2.2.4 Notification and Scheduling

BPA intends to give maximum practicable notice of any change in price, amount, or duration of availability of nonfirm, but reserves the right to change the price, amount, or duration of availability at the end of any hour.

A second aspect of the notification and scheduling issue is the requirement for 24-hour day and night telephone numbers and eventual requirement for a hard copy terminal with an auto-answer modem. The costs of these requirements may inhibit some utilities and/or consumers from contracting to receive nonfirm energy, but because of the reservation by BPA to provide as little as one half hour notice, some means of rapid communication is necessary. As an alternative, the requirement for a hard copy terminal and an auto-answer modem could not be implemented until the number of utilities entering into agreements for nonfirm energy under the policy exceeds the number that BPA can manage to give prompt notice by calling each utility individually. Under this approach though, a utility and consumer, in a situation where the costs of automatic communication equipment are the incremental difference in making nonfirm service economical or not economical, would have to gamble on whether

BPA would get enough nonfirm customers to require the automatic communications equipment, and BPA would risk losing nonfirm customers at the point automatic communications equipment was required.

Chapter 3

ENVIRONMENTAL IMPACTS

3.1 IMPACTS OF THE PROPOSAL

The amount of alternate fuel nonfirm load which may be served under the policy (or alternative policies) is uncertain. However, for purposes of analysis, service to 1400 MW of alternate fuel nonfirm load on Northwest preference agency systems was assumed. Based on the Ekono report (1982), which investigated electric boiler capacity in the BPA service area as alternate fuel load, and experience from negotiating the interim contracts, this amount of alternate fuel nonfirm load is substantially higher than what BPA actually expects to serve under this policy, but it is the Council's current maximum goal (see Chapter 4.2). It also represents a "maximum case" since all impacts of the policy decrease in magnitude as the amount of alternate fuel nonfirm loads served to Northwest preference customer systems becomes smaller, both because some impacts occur in proportion to the amount of alternate fuel load, and preference customers have first priority to nonfirm energy which increases impacts on other customer classes.

3.1.1 Changes in System Operations

3.1.1.1 Hydro System

The impacts on system operations have been determined through two 40-year hydroregulation studies; a no action alternative hydroregulation study and a hydroregulation study with 1400 MW of additional nonfirm load. The only difference between these two studies is the additional 1400 MW of nonfirm load.

Analysis of the studies show that operating the FCRPS to serve an additional 1400 MW of nonfirm load would result in reduced elevations at the major storage reservoirs in all months. Flows also would be affected. They may increase or decrease at any particular FCRPS dam in any month, depending on the water year. However, even with 1400 MW of additional nonfirm load, there would be no impact on the ability of the system to provide the Water Budget. Serving the additional nonfirm load does not result in any flow or elevation exceeding the established project specific constraints of any project.

3.1.1.2. Thermal System

BPA has contractually secured portions of the output of four thermal resources to contribute to its FELCC in the near term. These are 60 percent of the output of the Hanford Generating Project (HGP); 30 percent of the output of the Trojan nuclear plant; and 10 percent of the output of the Boardman coal plant and 70 percent of the output of Washington Nuclear Project No. 2 due to

be commercially operable in the summer of 1984. Impacts of each of these resources were addressed in BPA's Final Role EIS (BPA, 1980b, pp. IV-43-48) and other documents (BPA, 1977b; 1980a).

The HGP operates only when the New Production Reactor (NPR) is operated. Operation of the NPR is governed by the U.S. Department of Energy for purposes of plutonium production, and is beyond the control of BPA.

Trojan is an inexpensive resource to operate, and is likely to operate at all times possible since Portland General Electric (PGE) is able to sell the power at a sufficient price to recover the costs. PGE manages the plant, so BPA has only limited influence as to when it operates. During exceptional years, like 1983, when there is a very large amount of FCRPS nonfirm energy sufficient to displace the plant and serve available nonfirm loads, Trojan could be shut down, assuming no unacceptable conflict with maintenance schedules or refueling activities. The policy will not impact such occurrences since there is so much nonfirm energy available under these circumstances. The projected cost of operating the Washington Public Power Supply System nuclear plant, WNP-2, is also low enough that the plant's operation will be unaffected by this policy.

The Boardman Coal Plant is managed by PGE and is run according to their markets for power. In the event PGE wants to shut down the plant at a time when BPA still requires delivery of all or part of its 50 MW share, PGE merely delivers to BPA equivalent energy derived from other of its resources. On the

other hand, the policy will make it slightly less likely that Boardman will be displaced since less BPA nonfirm energy would be available for such purposes (see Chapter 3.1.4.2.2).

Therefore, operation of BPA's thermal resources will not be affected significantly by the policy.

3.1.2 Fish, Wildlife, and Recreation Impacts

As discussed in Chapter 3.1.1, meeting additional nonfirm load will result in no new impacts to fish and wildlife resources or recreation persuits in that the hydrosystem and individual hydro projects will not operate beyond established constraints. A potential impact to anadromous fish resources is reduction of spill at Federal dams. The Council's Fish and Wildlife Program (Program) (Section 404(a) and (b)) requires operators of hydroelectric projects without effective bypass systems to provide spill which will achieve a level of smolt survival comparable to or better than that achievable by the best available bypass system. BPA will mitigate the potential for spill reductions by incorporating spill programs into power planning and operations and will do nothing that could hinder provision of fish passage spill provided for under the annual spill program developed in accordance with Section 404(a) and (b) of the Council's Program. Therefore, no insignificant effects on juvenile downstream migrant anadromous fish should be caused by spill reduction resulting from meeting additional nonfirm loads.

3.1.3 Development of New Nonfirm Loads

The policy and any alternative policy which makes nonfirm energy for displacing alternate fuels available to consumers through local utilities and/or to DSIs may induce construction of new facilities to use such energy. The number and types of these facilities will depend on: (1) the economic incentive to use nonfirm, which in turn depends on nonfirm availability; (2) the price at which sales would be made; (3) a number of specific aspects of the policy including metering and notification requirements, allocation provisions, and standards for an alternate fuel supply; and (4) external factors such as the cost of alternate fuels. In general, anything that increases the economic incentive for use of nonfirm energy, increases its availability at a given competitive price, or makes it available for more applications will tend to cause more new nonfirm loads to be developed.

The relatively short initial contract duration, the requirements for metering and communications equipment, the requirement for an alternate fuel, and current costs of alternate fuel do not provide substantial incentive for development of new facilities for use of nonfirm energy.

The addition of electrically operated alternative facilities to existing industrial plants, institutions, and commercial establishments, or incorporation of such facilities into new projects is expected to have minor effects on their appearance, requirements for space, employment, or resources required for construction. Electric facilities which would be served under

the policy would generally not produce air pollution or solid waste, but some (e.g., electric boilers) would have water pollution implications which are essentially the same as the alternate fuel facilities for which they are substituted.

An argument can be made that the availability of nonfirm service may be the incremental factor in making a new industrial plant or commercial or institutional facility financially viable, and, therefore, would "enable" it. BPA has analyzed the effects of prices for firm electric energy on the location of industrial facilities (BPA, 1974, Pp. IV-36 and 37; BPA, 1977a, Apendix C, Pp. IV-68-73; BPA, 1979, Pp. V-30-32). The conclusion was generally that electricity prices in the Northwest seemed to have significant influence only on the siting of aluminum plants in the region, rather than outside the region. While prices for firm electric power have been a factor in the siting of other energy intensive industries nationwide, other factors, such as availability of raw materials, and labor, have strong and often overriding influence.

Costs and/or availability of nonfirm energy should have even less influence on industrial siting than do prices for firm electric power. Therefore, BPA concludes that: (1) the nondependability of nonfirm energy; (2) the relatively short duration of nonfirm contracts being offered initially; (3) the potential for long-term changes in cost, both for nonfirm energy and alternate fuels; (4) the 30 or so years planned life of most industrial plants or other major developments; (5) the general uncertainty of economic predictions; and (6) the many other factors relevant to decisions to invest in

new facilities such as taxes, availability of labor, raw materials, and transportation are such that it is unlikely that availability of nonfirm service would be the deciding factor in new facility investment or siting.

Nevertheless, BPA will monitor the loads seeking service under this policy, and will reevaluate the policy and/or undertake additional environmental analysis if it appears that the policy is providing an identifiable incentive for new development in the region.

3.1.4 Changes in Utility and Consumer Operations

The availability of an additional 1400 MW of nonfirm load to serve would result in a decrease in the amount of unusable water, or spill, on the system. Thus, generation is available to meet at least some of an additional nonfirm market. The additional nonfirm energy market established by the policy is assumed for purposes of this analysis to be preference customer load. Although DSIs could also contract to receive nonfirm energy under the policy, collectively they now have little load which could qualify, and are not likely to develop a large amount of new qualifying nonfirm load. The assumption that nonfirm energy is used to serve preference customers' load tends to maximize the potential impacts on other customer classes. When substantial amounts of nonfirm energy are available, there is no effect on any other market. However, when nonfirm energy is limited, the first energy delivered, if requested, is to preference customers. This could result in decreased sales to the other users of nonfirm.

3.1.4.1 Impacts on Consumers Served by the Policy

The availability of nonfirm service to utilities' consumers and to DSIs may affect the operations of the qualified facilities which secure nonfirm service, which may in turn alter their environmental impacts.

However, the environmental impacts of these facilities generally are limited through existing regulations.

Environmental impacts from use of the alternate fuel, principally, air pollution and land use for disposal of ash (for solid fuels), will not occur while using nonfirm electrical power. Fuel will also be conserved in the Northwest. Approximate fuel savings in the Northwest and estimated reductions in air pollutant emissions and ash requiring disposal are shown in Table 2 on the basis of 1000 kWh of electricity sold to displace various fuel types.

While reductions of air pollutant emissions and ash would be beneficial to air quality and reduce requirements for disposal of solid waste, it is doubtful that they would be significant to the region since fuel usage in industrial and large commercial and institutional applications is regulated by environmental control agencies and is not generally a direct cause of ambient air quality standard violations in the region. At best, use of nonfirm energy would provide only temporary relief of isolated cases where fuel usage at a facility is causing elevated pollutant levels or has excessive visual emissions.

TABLE 2

ESTIMATED REDUCTIONS IN AIR POLLUTANT EMISSIONS, SOLID WASTE DISPOSAL REQUIREMENTS, AND FUEL USAGE IN THE NORTHWEST BY DISPLACEMENT OF ALTERNATE FUELS BY NONFIRM ELECTRICAL ENERGY

(per 1,000 kWh of electricity sold) 1/ 2/

Pollutant	Fuel			
	Natural Gas	Distillate (No. 2) Oil	Residual (No. 6) Oil	Hog Fuel
Particulate, lb/1000 kWh	0.022 to 0.066	0.059	0.57 4/	2.1
Sulfur Oxides, lb/1000 kWh	0.0026	1.3 3/	7.7 4/	0.71
Carbon Monoxide, lb/1000 kWh	0.075	0.15	0.14	0.95
Hydrocarbons, lb/1000 kWh	0.013 (as CH_4)	0.030 (as CH_4)	0.028 (as CH_4)	0.95
Nitrogen Oxides, (as NO_2) lb/1000 kWh	0.53 to 1.0	0.65	1.7	4.7
Ash for Land Disposal lb/1000 kWh	---	---	---	4.7
Fuel Savings	4400 cu. ft. 4.4×10^6 BTU	30 gal 4.2×10^6 BTU	28 gal. 4.2×10^6 BTU	950 lb. 5/ 4.7×10^6 BTU

1/ Derived principally from emission factors contained in Compilation of Air Pollutant Emmision Factors, Third Edition, Part A, U.S. Environmental Protection Agency, 1977.
2/ Assumes generation of the nonfirm energy does not result in air pollutant emissions or ash (i.e., results entirely from hydroelectric sources).
3/ Assumes average sulfur content of 0.39 percent by weight.
4/ Assumes average sulfur content of 1.75 percent by weight.
5/ Containing 50 percent moisture.

3.1.4.2 Implications of Reduced Nonfirm Energy Availability to Other Customers

The new preference market for nonfirm energy created by the policy would, under some circumstances, reduce the amount of nonfirm energy available to the historic purchasers of nonfirm energy (namely the DSIs, IOUs, Northwest scheduling, preference utilities, and utilities outside the Region) and potentially increase the cost of at least some of the nonfirm they would be able to secure. The following discusses the environmental implications of such changes in availability and cost.

3.1.4.2.1 DSIs - The DSIs use nonfirm energy for service to their First Quartile at the Industrial Firm (IP) rate. Under terms of the proposed policy, the DSIs, collectively, could lose part of the nonfirm energy available to them for service to their First Quartile.

The largest potential percentage loss occurs in September and amounts to an average of 6 percent. A loss of nonfirm to the DSIs at this time would normally be replaced by an FELCC shift. The reduced availability of nonfirm to the DSIs for their First Quartile loads will mean that they will either have to replace this power on the open market, most likely with BPA IRE, and/or curtail their loads by reducing production at times when they would not otherwise do so, or by greater amounts. BPA is developing new, long-term IRE contracts in an effort separate from the development of this nonfirm energy policy.

BPA analyzed the environmental impacts of the DSI loads in Appendix C of its "Draft Role EIS" (BPA, 1977a, Appendix C, Pp. IV-118-212) and its "Final Role EIS," (BPA, 1980b, Pp. IV-79-96). While BPA is aware of some improvements made by some of the DSIs in their pollution control technology since the time of the "Role EIS," the DSIs' operations, nevertheless, continue to have adverse environmental impacts on the physical environment. Reductions in the amount of power available to them, and/or an increase in its costs, which would tend to force more frequent and/or greater restrictions of their operations, would tend to lessen the adverse effects of their operations on the physical environment.

3.1.4.2.2 Investor-Owned Utilities - Northwest IOUs have third priority to BPA nonfirm energy after preference agencies and the DSIs. They purchase BPA nonfirm energy to displace high cost thermal resources, to meet occasional load overruns, and to increase their operating flexibility. The resources displaced by the IOUs are: (1) combustion turbines; (2) small thermal resources; (3) imports from the East (i.e., eastern Montana and Wyoming); and (4) large coal-fired and/or nuclear fired generation.

Under current conditions, there is usually enough nonfirm available (either from BPA or the IOUs) to displace the combustion turbines and many of the small thermal resources. These resources are currently utilized only under extreme conditions such as when demands are very high during severe winter weather and hydroelectric generation is reduced because of low flows.

The variable costs of other resources operated or purchased by Northwest IOUs are low enough that they are not generally displaced unless BPA offers nonfirm energy under the Displacement rate.

Serving alternate fuel, interruptible load under the policy decreases the likelihood of displacing any resource at any time. The average amount of BPA nonfirm available for displacement of IOU coal, nuclear, and other generating plants decreases by more than 20 percent in all but February, May and June, months in which large amounts of BPA nonfirm energy are often available. In terms of magnitude, however, the change is small in August through December because these are months of low availability of BPA nonfirm energy. In February, May, and June, there are substantial amounts, on the average, of Displacement rate nonfirm energy even with serving 1400 MW of nonfirm alternate fuel load under the policy.

The principal effect of the policy is a reduced chance of Northwest coal, and to a lesser degree, nuclear resources being shut down in any month, but especially in January, March, April, and July if as much as 1400 MW of alternate fuel load is served.

BPA has addressed the impacts of the region's principal nonhydroelectric resources in its "Role EIS" (BPA 1980b, Pp. IV-43-59), and has generically addressed the impacts of other resources in the "Role EIS" and other documents. Operation of these resources has adverse environmental effects. Reducing the chances of displacing resources, assuming that they would otherwise be shut down instead of being operated to produce energy for export

markets, slightly reduces any beneficial environmental effect. However, since displacements are temporary, and the resources are regulated and do not result in environmental effects which are abnormally severe for such facilities, the impacts of reduced likelihood of displacement are not considered significant.

3.1.4.2.3 Export Markets - Nonfirm energy which is not marketable within the region is available for purchase by public and private utilities outside the region, mainly to California utilities.

According to the analysis of secondary energy use (Appendix D), the lowest amounts of nonfirm energy available to export markets occur from August through November. BPA nonfirm energy (and other Northwest purchases) is used by Southwest utilities to displace their own resources in the most economic fashion they can. Typically, oil and gas fired thermal generating plants are displaced first.

Use of BPA nonfirm energy in the Southwest saves the gas and oil which would otherwise be used to operate these generating plants. Since this policy expands Northwest markets, less power will be available to sell to the Southwest. Table 3 compares the amounts of energy which could be saved in the two regions by 1000 kWh of BPA nonfirm energy if used in one region versus the other.

Since the policy increases the market for BPA nonfirm energy and fuel savings occur in the Northwest when serving alternate fuel loads it appears that overall conservation of fuel will occur. On the average, savings in fuel in

TABLE 3

COMPARISON OF ENERGY SAVINGS IN NORTHWEST WITH POTENTIAL ENERGY SAVINGS IN THE SOUTHWEST

Fuel Which Could be Saved in the Northwest from Displacing Alternate Fuel Load With BPA Nonfirm Energy 1/ (per 1000 kWh available in the Northwest)	Energy Which Could be Delivered to Southwest in Lieu of Serving Northwest Alternate Fuel Load 2/ (per 1000 kWh available in the Northwest)	Average Heat Rate of California Resources Which Might be Displaced 3/ (per 1000 kWh generated)	Fuel Which Could Be Saved in California by Displacing Resources There With BPA Nonfirm Energy (per 1000 kWh nonfirm available in the Northwest)
Gas: 4.4×10^6 BTU (4400 cu. ft.)	870 kWh to 940 kWh	9.61×10^6 BTU to 11.38×10^6 BTU	8.36×10^6 BTU to 10.7×10^6 BTU
Oil: 4.2×10^6 BTU (28 gal. residual oil or 30 gal. distillate)			(57 to 73 gal. of residual oil or 8,360 to 10,700 cu. ft. of gas)
Hog Fuel: 4.7×10^6 BTU (950 lb. 4/)			

1/ From Table 1 of this EA.
2/ Based on intertie transmission losses of 6 to 13 percent (Stanford Research Institute, 1976, p. 30).
3/ From Stanford Research Institute, 1976, p. 31.
4/ At 50 percent moisture.

(WP-PGC-2729K)

the Northwest from increased use of BPA hydroelectric energy exceeds the increase in consumption for generation in California.

Environmental impacts of generation in California could also increase because of reduced availability of BPA nonfirm energy for export as a result of the policy. These impacts are principally air pollution, and of lesser importance, thermal discharges to the Pacific Ocean and water consumption.

For more details, see Appendix D.2 which discusses impacts to California utilities.

The analysis presented in Appendix D.2 indicates that as a consequence of serving 1400 MW of alternative fuel nonfirm load in the Northwest, the potential increases in air pollutant emissions, water consumption, and thermal discharges which may occur in California would not have a significant impact.

It should also be pointed out that when BPA nonfirm energy is being used to serve Northwest alternate fuel loads, energy may still be available to the California entities from other sources (e.g., Northwest IOUs or B.C. Hydro), which could reduce the impacts of the policy in California.

3.2 IMPACTS OF ALTERNATIVE POLICIES

This section will discuss the environmental impacts of the alternative policies described in Chapter 2.1 relative to the environmental impacts of the policy.

3.2.1 No Action Alternative

Under the no action alternative, BPA operations and marketing will evolve in the absence of any policy to market nonfirm energy to serve alternate fuel loads. Thus, with respect to BPA's historic (pre-1983) role, the no action alternative has no environmental impact. The environmental impacts of BPA operations and marketing may change as a consequence of other evolving operational and marketing practices, policies, and external factors, but would not change as a consequence of deviations from pre-1983 practices for marketing nonfirm energy to alternate fuel loads. Under the no action alternative, the six utilities and their consumers, and the one DSI with interim contracts would lose access to BPA nonfirm energy to serve alternate fuel loads for the foreseeable future.

Adverse and beneficial environmental impacts of the policy will not occur if the no action alternative is chosen.

3.2.2 Nonfirm Sales to Utilities for Service to Consumers with Minimal Restrictions

Since this alternative places fewer resale restrictions on the sale of nonfirm energy to utilities, more nonfirm energy could be sold to this market under this alternative than under the policy. However, it is impossible to determine quantitatively how much sales would increase. Also, the types of loads served with the nonfirm energy could be more varied. Some loss of firm load is likely to occur, and because there would be no requirement for

alternate fuel capability, some nonfirm energy may be used for seasonal loads or production increases which occur solely because and when nonfirm energy is available.

Impacts relating to the generation and delivery of nonfirm energy might be exacerbated under this alternative compared to the policy. Since loads served under this approach may differ from those which would be served under the policy, some of its environmental benefits, namely conservation of fossil and other fuels in the Northwest and the resulting reduction in impacts (i.e., air pollution, ash disposal) may not occur. Also since nonfirm energy marketed under this alternative may be used to operate load or support increased production which would not be operated in the absence of nonfirm energy, there is a potential for incurring additional environmental impact, since these load or production increases are likely to produce air pollutants, water pollutants, and solid waste.

Since more nonfirm energy would likely be sold to the Northwest preference agency market under this alternative than under the policy, impacts to the other customer classes, (i.e., DSIs, IOUs, and extraregional utilities) would likely be greater in magnitude.

Consumers would have greater freedom to switch between firm and nonfirm service under this alternative than under the proposal, and this freedom may (1) increase the difficulty in projecting future electrical and other energy resource needs and (2) increase the risk of over or underdevelopment of future energy resources.

3.2.3 Affirmative Action to Develop Interruptible Loads

This alternative could lead to greater sales of nonfirm energy to serve interruptible loads of Northwest utilities since BPA would encourage the development of such loads. The impacts of generating and delivering nonfirm energy will, therefore, be increased relative to what is expected under the proposal and the benefits associated with conservation of fossil and other fuels in the Northwest may also be enhanced in comparison with those expected under the proposed policy.

Since more nonfirm energy would likely be sold to the Northwest preference agency market under this alternative than under the policy, effects on other customer classes would likely be greater in magnitude.

3.3 IMPACTS OF ALTERNATIVES TO FEATURES OF THE PROPOSED POLICY

Chapter 2.2 described alternatives to specific features of the policy, which remain within the overall scope of the policy. This section addresses the impacts of those alternatives.

3.3.1 Eligibility of Firm Loads

Policy terms which allow for loads currently served with firm power to receive nonfirm energy, but prevent such loads from reverting to firm service later could: (1) reduce demand for firm energy; (2) increase demand for nonfirm energy; (3) decrease BPA revenues; and (4) increase the amount of surplus firm power BPA has to market.

Export markets would be forced to cope with a reduced availability of BPA nonfirm, to seek other sources of firm or nonfirm energy, or to purchase BPA firm surplus, and would take whatever alternative they believe to be most economical. If they chose to buy BPA surplus firm, Northwest nonfirm consumers would receive a greater degreee of interruptibility in their service, and impacts of use of alternate fuels in the Northwest would be relatively larger.

If consumers were permitted to unilaterally return to firm service after switching to nonfirm, marketing of surplus firm would be made more difficult since potential extraregional surplus firm customers would realize that BPA may have to withdraw surplus firm sales in order to return to firm service for Northwest consumers. If load growth had eliminated all surplus firm, new resources would have to be secured, having environmental impacts of construction and operation, in order to serve consumers' loads returning to firm service.

3.3.2 Class of Load

The class of load (i.e., whether it is industrial, commercial, or other) eligible to receive nonfirm energy makes very little difference environmentally as long as the requirement for alternate fuel capability and the size of load limit is maintained. The impacts in the Northwest will be a reduction in emissions of air pollutants, ash disposal, and the operational impacts of the infrastructure supplying the fuel. There is no generic difference in generating nonfirm for one class of load versus another.

Where the class of load eligible does make a difference is in the amount of nonfirm which may be marketed under the policy. The policy incorporates the most liberal approach, that is no specific restriction on class, which allows for serving a greater amount of load under the policy. This results in more extensive environmental benefits from saving fuel in the Northwest, increased environmental impacts of generating and marketing nonfirm power, and larger effects on lower priority nonfirm energy customer.

3.3.3 Alternate Fuel Supply

Less restrictive requirements for alternate fuel capability would tend to increase the amount of nonfirm load to be served under the policy and the amount of nonfirm sales. This would also increase the impacts of generating nonfirm and impacts on other market classes. More restrictive requirements, such as using nonfirm to displace only the most polluting of the fuel burning facilities, would be difficult to impose and may even encourage use of "dirty" fuels for consumers who want to qualify for nonfirm energy service.

Not having a requirement for an alternate fuel supply would create a potential for consumers to use nonfirm energy to augment their firm power supplies to temporarily increase production, or for industries to be constructed solely to utilize nonfirm when it is available. Lack of an alternate fuel supply requirement may cause cyclical employment situations; hardship for firms who may contract for nonfirm energy without full realization of its limitations, and their employees; and, ultimately, political pressure to provide relief to the affected firms and their employees by providing some grade of firm power.

Allowing firm electricity purchased from a utility which is not a customer of BPA to serve as an alternate fuel would potentially harm other ratepayers of that utility since it would have to maintain or secure resources to sell when BPA nonfirm energy is unavailable.

3.3.4 Size of Eligible Firm Load

The minimum size for a load eligible for nonfirm service under the policy is 1 average MW. Expanding eligibility to smaller loads may slightly increase the total amount of nonfirm load served under the policy, but the limiting factors are the cost of the metering and communication equipment and BPA's inability to practically schedule small amounts of energy. Increasing the size limit to above 1 average MW would reduce the total load eligible for nonfirm service and, therefore, nonfirm sales under the policy. This would reduce both the adverse and beneficial environmental impacts of the policy.

3.3.5 River Conditions Under Which Nonfirm Would Be Sold

Restricting sales of nonfirm to alternate fuel loads to periods of spill and/or imminent spill only would reduce the nonfirm sales to these loads by about the amount of nonfirm energy which might be available under nonspill conditions on the FCRPS at the Spill or a lower rate. Nonfirm energy is likely to be abundant and available for an extended period of time when the FCRPS is in a spill or imminent spill mode, and such a restriction would tend to mitigate problems with allocating nonfirm and with consumers' inability to adapt to rapid changes in nonfirm availability.

Such a restriction could deny access to some nonfirm energy by alternate fuel consumers if alternate fuel costs escalate rapidly. The environmental and economic benefits would decrease as a consequence of sales to alternate fuel loads, and would limit increases in the impacts of the policy on California.

One of the impacts of such a restriction is to possibly permit increased DSI operations at times when they would otherwise be at reduced operation due to power limitations (rather than poor markets for their products). This would marginally increase the environmental impacts of DSI operation, but would not impact river operations and related factors such as fish, wildlife, and recreation, differently than under the policy since nonfirm generation would still be optimized to meet available nonfirm markets.

Operations would be different if the FCRPS is in a nonspill condition and capable of generating nonfirm, but the DSI and/or extraregional markets for nonfirm are not sufficient to use the nonfirm that could be generated. This would result in exactly the same operation in this circumstance as would occur under the no action alternative.

3.3.6 Duration of Contracts

If shorter contracts were offered, less Northwest alternate fuel load is likely to be served and development of new alternate fuel load is less likely since the time in which one could be certain of payback from such an investment would be reduced. Thus, shorter contracts would reduce both the adverse and beneficial environmental impacts of the policy. Offering longer term contracts would have the opposite effect.

3.3.7 Notification and Scheduling

If provided with a shorter notice period, fewer consumers would enter into contracts under the policy and less severe environmental impacts, adverse and beneficial, would occur. An increased notice period would generally be appreciated and would be an incentive to purchase nonfirm, but BPA would be more conservative in its notification and, as a result, would offer to sell less nonfirm.

The alternative of delaying the requirement for automated communication equipment until the number of consumers warrants puts utilities in an uncertain situation and may inhibit some marginally sized loads from contracting for the short term. Assuming enough customers contract to make automated communications equipment necessary, there would be no long term difference from the policy.

Chapter 4

OTHER CONSIDERATIONS

In addition to their responsibilities under NEPA, Federal agencies are required to carry out the provisions of other Federal laws. Most of the Federal actions related to the policy discussed in this EA do not require a detailed response regarding the requirements in these other Federal laws. Those requirements are more concerned with specific proposals for direct Federal development, and not with a policy such as the one assessed in this EA, which will primarily alter some Federal power marketing arrangements and, to some degree, operation of some Federal power resources.

4.1 ENVIRONMENTAL MANDATES

The other Federal laws and requirements which will not be affected by the policy but which were considered during preparation of this EA include:

1. Executive Order 12372 Review - The proposed policy does not involve any direct Federal development or development directly assisted through Federal grants, contractual arrangements, loans, loan guarantees, or insurance.

2. The Coastal Zone Management Act of 1972 - The proposal and alternatives are not included in Washington's or Oregon's list of Federal activities affecting their coastal zone programs.

3. Endangered Species Act - BPA has not identified any adverse effects on endangered species associated with this proposed policy. The proposed policy analyzed in this document does not directly involve a construction activity and, therefore, does not invoke a section (7) consultation.

4. Heritage Conservation - The proposed policy will not result in direct action by BPA nor impose actions upon others which would affect historical or archeological resources. Therefore, the proposal does not meet the threshold required for consultation with appropriate agencies charged with Heritage Conservation.

5. Farmlands - The proposed policy will not convert farmlands to other uses because there are no site-specific BPA actions proposed in the policy nor does the policy impose actions on others which would affect farmlands.

6. Recreation Resources - BPA's proposed policy will not adversely affect any designated or proposed wild and scenic rivers, the National Trail System, or wilderness areas. Copies of this EA are being distributed for comment to appropriate land management agencies as consultation on this matter.

7. Permits for Structures in Navigable Waters - The proposed action does not include: (a) a structure or work in, under, or over a navigable water of the United States; (b) a structure or work affecting a

navigable water of the United States; or (c) the deposit of fill material or an excavation that in any manner alters or modifies the course, location, or capacity of any navigable water of the United States.

8. Permits for Discharges into Waters of the United States - The policy and its alternatives do not involve discharge of dredge or fill material into waters of the United States

9. Permit for Right-of-Way on Public Land - Neither the policy nor the alternatives include use of public lands in a way not in accordance with the objectives of the management of those lands, or require a Federal land managing agency permit.

10. Fish and Wildlife Laws - There are several key provisions and requirements that Federal agencies must address:

-- The Fish and Wildlife Coordination Act

-- The Fish and Wildlife Conservation Act

-- The Pacific Northwest Electric Power Planning and Conservation Act

-- USFWS Mitigation Policy

Both Federal and State fish and wildlife agencies will have the opportunity to comment on this EA, and BPA will consider their comments before a finding of no significant impact is made. It is BPA's obligation under the Fish and Wildlife Conservation Act to share scientific information and any other appropriate information with States for the purpose of assisting States in developing and revising a conservation plan. By sending copies of this EA to State fish and game agencies, BPA is meeting its obligations of sharing information it has with the State agencies. BPA asks that State agencies keep it informed of development of conservation plans so that information can be supplied if it is available.

11. Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands - The proposed policy is indirectly related to other entities' management of Federal and non-Federal dams and reservoirs in floodplains. That management may affect wetlands adjacent to and connected to the Columbia River and its tributaries. However, such impacts will not exceed the operational parameters (flood control, navigation, and irrigation) established for each facility. Therefore, effects on floodplains and wetlands will not exceed those incurred during normal operation.

12. Pollution Control at Federal Facilities - The proposal does not require procurement of goods, services, or materials, so the contract compliance provisions of the Clean Air Act, Clean Water Act, and other environmental laws do not apply. Implementation of the policy

will not alter the current status of any electrical generating resource with respect to compliance with environmental regulations governing air pollution, water pollution, solid waste transport and disposal, hazardous waste, drinking water standards, noise, pesticides, or polychlorinated biphenyls (PCB). With nonfirm sales, operations of certain resources and transmission facilities would not violate currently applicable standards or permit conditions. Resources would not exceed a level of environmental impact that would not have occurred otherwise during normal operations.

13. Energy Conservation at BPA Facilities - The proposal involves operation of BPA facilities (i.e., the transmission system) at times when sales of nonfirm energy are made under the policy. However, the proposed action will be consistent with energy conservation requirements based on the system's adherence to design standards and general operating plans.

4.2 OTHER APPLICABLE LEGISLATION

In developing and implementing this policy, BPA is guided, in part, by the Council's Northwest Conservation and Electric Power Plan (Northwest Power Planning Council, 1983), as intended by the Regional Act, Public Law 96-501. The pertinent elements of the Council's Plan are contained in Chapter 10, Two Year Action Plan, Program No. 15 and are as follows:

"The objective of this program is to develop additional markets for interruptible energy in the Northwest. The effort to develop additional means of retaining the economic benefits of low-cost secondary energy in the region is the most important single regional energy-related economic issue over which the region has control, and it should be treated accordingly."

BPA has been requested by the Council to:

-- "Initiate a policy to develop, to the fullest extent possible, regional markets for secondary energy including industrial and irrigation markets;" and

-- "Set an initial goal of 900 to 1,400 megawatts (MW) of potential interruptible load in the industrial sector and conduct further investigations to determine whether more potential is available."

The Bonneville Project Act, as amended, 16 U.S.C., Chapter 12B, and the Federal Columbia River Transmission System Act, Public Law 93-454, direct BPA to encourage the widest possible diversified use of all electric energy that can be generated and marketed at the lowest possible rates consistent with sound business principles. The Pacific Northwest Preference Act, Public Law 88-552, requires that before BPA can export energy from the region, BPA must determine that there is no market for such energy in the Northwest at any established rate (16 U.S.C. 837a; and 837b).

Providing low cost nonfirm energy to consumers which historically have not had access to it is expected to enhance BPA revenues which will, in turn, help hold down rates for all grades of BPA power. In this manner, implementation of the policy carries out the directives of the Bonneville Project Act, as

amended, the Transmission System Act, and the Regional Act. Recognition of the alternate fuel market in the Northwest and the offer to serve this market with nonfirm energy through the policy also furthers the purposes of the Preference Act.

Chapter 5

CONSULTATION

5.1 POLICY DEVELOPMENT PROCESS

Over the past several years, BPA rates for electric power in the Northwest have escalated rapidly. In order to increase BPA revenues and assist the Northwest economy, BPA began to look for new ways to market nonfirm energy in the Northwest.

1. On November 30, 1982, BPA requested public recommendations on ways it could effectively market surplus firm energy (47 FR 53928). A number of the 58 respondents suggested BPA investigate ways to market nonfirm energy in the Northwest as an alternative to firm energy sales outside the region.

2. In March 1983, BPA completed drafting principles for selling nonfirm energy to its Northwest utility customers for industrial and irrigation loads with substitute energy sources. BPA made sales of this type available to Northwest utilities beginning in January 1983 on an interim basis. BPA discussed the interim principles with representatives of preference utilities, IOUs, the DSIs, and industrial consumers of Northwest utilities. BPA requested public comment on these principles in a FEDERAL REGISTER Notice on March 15, 1983 (48 FR 10903).

3. Meetings have been held as part of the policy development. BPA staff met with members of the Association of Public Agency Customers (APAC) and other industries to discuss ideas for the long-term policy, and also met informally with private utilities who are exploring these markets themselves.

4. A Notice of Proposed Policy for Nonfirm Energy Sales for Utilities' Industrial Loads was published in the FEDERAL REGISTER on July 22, 1983 (48 FR 33518). Public involvement meetings on the proposal were held in Portland, Seattle, and Spokane, and written and oral comments were accepted through August 31, 1983. This EA addresses the policy which resulted from the July 22, 1983 proposal, as modified to take into account the comments received.

5.2 ENVIRONMENTAL ASSESSMENT DISTRIBUTION

The following is a general list of agencies and organizations who will receive a copy of this EA for review and comment.

Federal Agencies

US Environmental Protection Agency, San Francisco, CA
Seattle, WA
Denver, CO
US General Accounting Office, Portland, OR
USA Corps of Engineers, Portland, OR
USDOC, National Marine Fisheries Service, Rufus, OR and Pasco, WA
USDOE, Western Area Power Administration, Loveland, CO
Sacramento, CA
Golden, CO
Salt Lake City, UT

USDOI, Bureau of Indian Affairs, Warm Springs, OR
Lapwai, ID
USDOI, Bureau of Reclamation, Boise, ID
USDOI, Forest Service, Portland, OR
USDOI, Forest Service, Missoula, MT
USDOI, National Parks Service, Seattle, WA
USDOJ Attorney's Office, Portland, OR

State Agencies

California: Air Resources Board
Department of Water Resources/Energy
Energy Commission

Idaho: Public Utilities Commission
Department of Fish and Game
Division of Financial Management Clearinghouse

Montana: Department of Community Affairs
Department of Fish, Wildlife, and Parks
Department of Natural Resources and Conservation

Nevada: Public Service Commission

Oregon: Department of Agriculture
Department of Energy
Department of Fish and Wildlife
Department of Transportation, Parks, and Recreation
Employment Division
Intergovernmental Relations Division
Public Utility Commission
State Executive Department

Washington: Department of Ecology
Department of Fisheries
Department of Game
Office of Financial Management
Office of the Governor

Interest Groups

Air Pollution Control Authorities, Los Angeles and San Francisco, CA
Association of Public Agency Customers
Coalition for Safe Power
Columbia River Inter-Tribal Fish Commission
Confederated Salish and Kootenai Tribes
East Multnomah Co. League of Women Voters
Fair Electric Rates Now
Forelaws on Board
Idaho Wildlife Federation
League of Women Voters of Oregon
National Wildlife Federation

Natural Resources Defense Council
Northwest Conservation Act Coalition
Northwest Indian Fisheries Commission
Northwest Labor Coalition of Energy
Oregon Safe Energy
Seattle Comm. to Stop Rising Fuel Prices
WASHPIRG

Other Interested and Affected Parties

BPA Customers
Businesses
City and County Governments
Individuals
Law Offices
Universities

Chapter 6

CONCLUSIONS

The policy for marketing nonfirm energy to utilities for service to interruptible loads which have an alternate, nonelectrical energy source when BPA nonfirm is unavailable will have no new environmental impacts as a consequence of physical changes in operation of the FCRPS and may have minor environmenal impacts for changes in operation induced by changes in the availability of BPA nonfirm energy to various market classes. Based on the analysis in this EA, the impacts are not expected to be environmentally significant even assuming as much as 1400 MW of nonfirm load served under the policy.

BPA has reviewed all aspects of this policy for compliance with legislative and executive mandates adopted to safeguard the integrity of the human environment. BPA has consulted formally and informally with other agencies and entities which may be affected by the policy.

In review of the policy, BPA has not identified any unresolved conflicts over alternative uses of available resources affected by this policy. No controversial circumstances or conditions will be created or furthered by this policy.

Unless public and agency review of this environmental assessment reveals sufficient information to the contrary, BPA will conclude that implementing the proposed policy is not an action significantly affecting the quality of the human environment, and an environmental impact statement will not be prepared.

RSeiffert:dh (WP-PGC-2846K)

APPENDIX A

GLOSSARY

AVERAGE MEGAWATTS (MW) - A measure of average power over a given time period. To determine the average megawatts, divide the total megawatt hours measured in the time period by the number of hours in the period, e.g., if 10 megawatt hours of electric energy are measured over a 5-hour period, then 2 average megawatts would be the average rate of which power is delivered.

BASE HISTORICAL FIRM LOAD - That portion of a consumer's load which data indicates has been firm in the past. BPA proposes not to serve load which has historically been firm with nonfirm energy. BPA may make exceptions to the extent that a lower base firm load level would more accurately reflect long-range trends. For example, if an industrial consumer has shut an electric boiler down because electric rate increases have made an alternate fuel more economical, the base firm load may be adjusted accordingly.

COGENERATION - The simultaneous production of electrical energy and other useful energy, such as usable heat, from a fuel source.

CRITICAL PERIOD - That portion of the historical 40-year streamflow record which, when combined with draft of all available reservoir storage, will produce the least amount of energy being generated according to seasonal load patterns.

DEMAND METER - A device that indicates and/or records the maximum number of kilowatts used during a period of time which is the demand for energy.

ENERGY METER - A meter which measures the total kilowatthours of energy that a customer uses.

EXPORT MARKETS - Markets for electric energy or capacity which are outside the BPA service area (i.e., the Region).

FELCC SHIFT - A planning action, under the Coordination Agreement, in which the Coordinated System generates more FELCC in one portion of the critical period while generating less FELCC in another portion of the critical period. Usually FELCC is shifted into the first year of the critical period, resulting in deeper draft of reservoirs.

FIRST QUARTILE - The quarter of industrial firm power (DSI) contract demand which is nonfirm, i.e., which can be interrupted at any time for any reason and for any period, with BPA giving as much notice as practicable.

INDUSTRIAL REPLACEMENT ENERGY - Energy BPA agrees to purchase for the account of a DSI to replace power restricted by BPA and which may be stored by BPA for later use by the DSIs or used concurrently in load.

PREFERENCE CUSTOMERS - Cooperatives and public bodies (states, public utility districts, counties, municipalities, and Federal customers) in the Northwest, because they have been given preferential rights to FCRPS generated hydroelectric power by Congress.

REGIONAL, REGION, PACIFIC NORTHWEST, NORTHWEST - Refers to the BPA service area as defined by the Pacific Northwest Electric Power Planning and Conservation Act as follows:

> ". . . the area consisting of the States of Oregon, Washington, and Idaho, the portion of the State of Montana west of the Continental Divide, and such portions of the States of Nevada, Utah, and Wyoming as are within the Columbia River drainage basin; and . . . any contiguous areas, not in excess of seventy-five air miles from the area referred to in subparagraph (A), which are a part of the service area of a rural electric cooperative customer served by the Administrator on the effective date of this Act which has a distribution system from which it serves both within and without such region."

VARHOUR METER - A device which measures the reactive energy in a circuit.

WATER BUDGET - Provides certain volumes of water to achieve desired flows at Priest Rapids and Lower Granite control points during April 15 to June 15 to increase the flow velocities of the water between dams to reduce spring period migration time for juvenile salmon and steelhead.

APPENDIX B

DESCRIPTION OF NONFIRM POLICY FEATURES

Appendix B

DESCRIPTION OF NONFIRM POLICY FEATURES

B.1 QUALIFICATIONS OF LOAD FOR NONFIRM SERVICE

Under the policy, BPA intends to make nonfirm service available only for the part of the alternate fuel load which is in excess of each consumer's or DSIs base historical firm load levels. Furthermore, the level of nonfirm service will not exceed the difference between historical firm service levels and the equivalent electrical capacity of the required alternate fuel source. BPA would discount recent electrical load operating level fluctuations in determining historical firm load levels if the fluctuations do not reflect long range trends. In determining base firm load levels and nonfirm load levels, BPA would avoid loss of firm load to nonfirm energy service.

A qualifying alternate fuel source is, generally, a nonelectrical way of fully meeting the energy need for which nonfirm electric energy from BPA would be used. The alternate fuel source must be capable of providing at least as much energy as the nonfirm electrical energy at the maximum demand. Since the alternate fuel source must be nonelectrical, a load which requires its energy to be in electrical form (e.g., an electric arc steel furnace or a city streetlight system) would not qualify for service under this policy.

B.2 TERM

Nonfirm contracts offered under this policy would last through June 30, 1987, a time approximately equal to BPA's 42-month critical period, starting at the beginning of policy development. This allows sufficient time to gain experience under this policy and allows later contracts to be brought in line with any subsequent nonfirm policy development. At the end of the second and third years, the initial contracts will require review of BPA's and the utilities expectations regarding their ability and intent to negotiate future agreements for nonfirm energy. Resources to provide firm service may be available upon expiration of the initial contracts. If customers taking nonfirm energy under the desire to receive firm service after the term of the contract, they would be required to give BPA 2-years notice of such intent (unless BPA waives this requirement), or longer notice as may be required under sections 8 and 9 of the Regional Act utility power sales contracts.

B.3 NOTIFICATION AND SCHEDULING

B.3.1 Notification of Nonfirm Energy Availability

Under the policy, BPA would notify each utility and DSI purchaser when it had nonfirm energy available for their nonfirm alternate fuel loads. The notification would include estimated price, duration, and amount of nonfirm energy available. These estimates would not be guarantees and would be subject to change at any time (except if the customer paid extra and was buying nonfirm energy under the Guaranteed Delivery provisions of the NF-83

Rate Schedule). However, BPA is obligated to provide the best estimates based on current information. BPA would inform each participating utility of any revisions in its estimates with maximum practicable notice. It would be the responsibility of the purchaser and the consumer to respond to any change in availability.

B.3.2 Purchase of Nonfirm Energy

During periods of nonfirm energy availability, nonscheduling purchasers can be required, in accordance with the policy, to notify BPA's schedulers by noon of each workday prior to the delivery of nonfirm energy to a load. However, BPA schedulers may, from time to time, require less frequent communications in certain circumstances.

Scheduling purchasers would follow appropriate scheduling procedures specified in their power sales contracts.

B.3.3 Transition to Alternate Fuel

At times when BPA no longer has any nonfirm energy available, any energy taken for the nonfirm load would be billed at the charge for unauthorized increases under the applicable BPA power rate schedule.

BPA intends to give maximum practicable notice to purchasers of any change in nonfirm availability. BPA generally knows about a week in advance when spill energy will no longer be available. After the spill condition, nonfirm energy

often continues to be available, but it is generally more difficult to forecast the availability of this nonspill type of nonfirm energy. However, BPA proposes in this policy to reserve the right to give notice of termination of nonfirm availability, effective at the end of any half hour.

BPA could have provided a short, fixed notice period of the end of nonfirm availability. However, the result of a fixed notice period would merely be that BPA would be more conservative in giving notice and, thus, nonfirm availability might sometimes extend beyond the end of the notice period.

In the event of a sudden loss of generating capacity or transmission, BPA would give notice if possible, but there is little which can be done to mitigate the effects of an unexpected change of availability of this sort.

BPA offers a guaranteed delivery option in the current rate schedule for nonfirm energy. The delivery is generally guaranteed through the next 4 days but is subject to restriction in the event of a system emergency. A purchaser could take advantage of such an offer under nonfirm contracts concluded in accordance with this policy.

B.4 FACILITIES

Purchasers who take advantage of the proposed nonfirm service would be responsible for installation of metering and communication equipment required by the policy. BPA does not propose to recover the cost of such facilities from nonfirm revenues. However, BPA may install the facilities for the purchaser at the purchaser's or the consumer's expense.

B.4.1 Metering

In order to segregate the amounts of nonfirm energy from amounts of firm power delivered at the point of delivery, an hourly recording demand meter, and an energy meter are required, and a varhour meter may be required at each consumer's nonfirm load served under the policy. Installation of these meters at the load provides a means of computing the amount of nonfirm energy for which the purchaser will be billed and verifies that the nonfirm energy got to the consumer's nonfirm load.

BPA has implemented a program to install remote reading equipment on point-of-delivery meters. This would require the purchaser to install remote reading capability at the point of metering. This will allow BPA to prepare billings quickly and will allow BPA's Division of Power Supply daily access to amounts of nonfirm energy actually taken. The purchaser would also have to provide a dedicated telephone line as part of the remote reading equipment.

Costs of metering and remote reading equipment and installation can be as much as $6,200 if all new equipment must be used and the metering and remote reading equipment are installed at separate times. Installing both at once is less expensive at about $5,500. Costs of the metering equipment alone is about $2,700 including installation.

B.4.2 Communications

BPA expects to install an automatic communications system which will facilitate notification of nonfirm availability. The purchaser would be

required to have a hard copy terminal with auto answer modem to receive messages from BPA. The cost of the terminal is about $1500. A separate phone line would also be required. More frequent communication from BPA would result because of the ease of operation. If a purchaser or consumer had any question about a message received, it could call BPA. If a purchaser and a consumer desire, an additional communication terminal could be installed at the consumer's facility.

B.5 ALLOCATION

In the event that demand for nonfirm energy exceeded the supply, BPA would allocate the available nonfirm energy in accordance with the Bonneville Project Act and the Pacific Northwest Preference Act (P.L. 88-552), and on a pro rata basis related to total requests for nonfirm energy within a customer class. This means that (1) Northwest markets will be served first (e.g., prior to serving Southwest markets); (2) within the Northwest, preference customers will be given preferential access to nonfirm energy; and (3) within a customer class (e.g., preference customers), nonfirm energy will be prorated according to requests for such energy. Service to DSI First Quartile loads would be given higher priority than service to DSI alternate fuel loads.

B.6 APPLICATION FOR FIRM SERVICE

By definition, BPA is not obligated to make nonfirm energy available. In 1983, the region enjoyed a good water year with an abundance of nonfirm energy. This abundance has been increased by BPA's firm load underruns. As

conditions change, consumers may wish to convert nonfirm loads to firm service. BPA is not obligated to allow such a conversion before the expiration or termination of the nonfirm contract, but may allow such a conversion prior to that time (see Appendix B.2).

Limiting the electrical loads served under the policy to receiving only nonfirm service for the duration of the contract prevents switching from firm power (when firm power is economical) to nonfirm energy (when nonfirm is available and economical) and vice versa. Allowing such switching could effectively result in serving a firm load, for which BPA has a firm planning obligation, with nonfirm energy, and would be detrimental to both BPA revenues and planning.

For any subsequent nonfirm contracts, BPA might require different notice for firm service to loads, especially if BPA is no longer in a surplus condition.

B.7 RATES

B.7.1 Wholesale Rates

BPA cannot determine a rate for nonfirm energy in this policy. Rates for BPA wholesale power, including rates for nonfirm energy, are determined in a separate wholesale power rate adjustment process independent from the development of this proposed final policy. New rates resulting from the last such process took effect November 1, 1983, and will continue through June 30, 1985. The final step in setting these rates was the preparation of

the "1983 Final Rate Proposal Wholesale Power Rate Design Study" (BPA, 1983b) which describes the rates and their uses. The new rates were also the subject of the "Bonneville Power Administration 1983 Wholesale Power Rate Final Environmental Impact Statement" (BPA, 1983c).

B.7.2 Retail Rates

BPA has not proposed inserting a provision in the policy which would limit a purchasing utility's markup of nonfirm energy.

BPA encourages any consumer considering entering into a contract for nonfirm service with its utility pursuant to this policy to negotiate an upper limit to the markup for the duration of the contract.

Under the interim nonfirm agreements (see Chapter 1.4.3), BPA felt that a limitation on the amount of markup a utility attempted to pass through to a consumer would be unnecessary, since utilities and their consumers would generally negotiate to develop a mutually satisfactory rate. However, BPA received comments from certain consumers that their utilities were attempting to pass through too high a markup on the nonfirm, resulting in delays in entering into an interim agreement. Utility markup in their nonfirm retail rates could cause those rates to be uncompetitive with alternate fuels. BPA encourages utility purchasers of nonfirm to consider adopting retail nonfirm rates designed to be competitive with alternate fuels.

APPENDIX C

CUSTOMERS TO WHICH NONFIRM ENERGY HAS BEEN SOLD UNDER THE INTERIM CONTRACTS

a. Umatilla Electric Cooperative contracted for up to 40 average MW of nonfirm energy, beginning January 9, 1983, for three potato processing plants. All three plants have natural gas-fired boilers as alternate fuel sources.

b. The City of Port Angeles contracted for approximately 7 average MW of nonfirm energy, beginning February 1, 1983, for an electric boiler at a Crown Zellerbach paper mill. The mill can use wood waste in lieu of electricity.

c. Cowlitz County Public Utility District contracted on February 25, 1983, for approximately 75 average MW of nonfirm energy for electric boilers at Longview Fibre and Weyerhaeuser mills. These mills can also use wood waste as fuel. Kalama Chemical, Inc. was later added on December 1, 1983, to the contract in order to receive approximately 14 average MW of nonfirm energy. This consumer can utilize oil or gas as an alternate energy supply.

d. Tillamook County People's Utility District contracted for approximately 3 average MW of nonfirm energy since June 11, 1983, for service to a boiler at the Tillamook cheese factory. The cheese factory can use oil as an alternate fuel.

e. Snohomish County Public Utility District contracted for approximately 45 total average MW of nonfirm energy for service to the electric boiler loads of the Weyerhaeuser Kraft Paper and Lumber Manufacturing

Facility and the Boeing Commercial Airplane Company since May 11, 1983. Weyerhaeuser can run alternate fuel boilers with natural gas, oil, or black liquor, a by-product of kraft pulp production. Boeing can fire boilers with natural gas or oil in lieu of electricity.

f. Lewis County Public Utility District contracted for approximately 3 average MW of nonfirm energy between June 9, 1983, and November 1, 1983, for service to the American Crossarm and Conduit Company. Lewis received nonfirm service under the curtailment provisions of the interim nonfirm principles which stated that loads which were curtailed or not operating on March 1, 1983, or for which an announcement of such curtailment had been made, were eligible for nonfirm service under the principles if the consumer signed an affidavit attesting that the load would not operate unless nonfirm energy were made available.

g. Kaiser Aluminum and Chemical Corporation, a DSI, contracted for nonfirm energy between January 12, 1984, and April 30, 1984, to operate a 10-MW boiler at their Mead, Washington, aluminum reduction plant. The plant can alternatively fire gas to meet its steam needs.

APPENDIX D

RESULTS OF THE SECONDARY ENERGY ANALYSIS

Appendix D

RESULTS OF THE SECONDARY ENERGY ANALYSIS

D.1 ASSUMPTIONS USED FOR ANALYSES

The secondary energy analysis performed for this EA assumed that:

1. 1400 MW of alternate fuel nonfirm load is contracted for under the policy;

2. all of the load is on Northwest preference agency systems;

3. all preference agency nonfirm load consists of alternate fuel load (i.e., the preference agencies serve no other nonfirm loads);

4. the Spill rate is effective whenever BPA has over 2500 MW of nonfirm energy to market, and the Standard rate is effective at other times; and

5. the consumers served with nonfirm energy under the policy utilize as much nonfirm energy as they can for 1400 MW of load whenever it is available at the Spill or a lower rate and buy 20 percent of this amount when the Standard rate is in effect.

The first three assumptions tend to maximize the impacts of the policy on other customer classes. The third and fifth assumptions reflect a realistic marketing situation in that BPA implements its nonfirm rates to maximize revenues, and the alternate fuel is generally more economical than nonfirm energy at the Standard rate. Under these assumptions, the secondary energy analysis performed for this EA showed that in an averge year about 768 average MW (6.73 x 106 MWh) would be used by the alternate fuel market.

D.2 IMPACTS TO CALIFORNIA UTILITIES

The Stanford Research Institute (SRI) study (1976) entitled Environmental and Socioeconomic Impacts of Sales of Secondary Electrical Energy to California Utilities was prepared under contract to BPA to provide information for BPA's Role EIS. Although now somewhat outdated, the data it contains and the methodologies used in its preparation can still be used for an "order of magnitude" assessment of the impacts of the proposed final policy on water consumption, air quality, and thermal pollution in California. This analysis assumed that the Western Area Power Administration's intertie capacity was fully utilized for firm energy deliveries. The results of the analyses are summarized in Tables D-1 and 2; Figure D-1 shows the air basins referred to in Table D-3.

TABLE D-7

POTENTIAL INCREASES OF WATER CONSUMPTION

AND THERMAL DISCHARGES RESULTING FROM

DECREASED AVAILABILITY OF BPA NONFIRM ENERGY 1/

Utility	Average Annual Increase in Water Consumption 106 gal/year	Average Annual Increase in Thermal Discharges, 109 BTU/year
Pacific Gas and Electric Co.	206	1760
Southern California Edison Co.	190	1640
San Diego Gas and Electric Co.	39.2	337
Los Angeles Dept. of Water and Power	87.1	752
Burbank Public Service Dept.	10.7 2/	93.2
Glendale Public Service Dept.	11.7 2/	98.1
Pasadena Water and Power Dept.	6.1	52.5

1/ Assumes 1400 MW of alternate fuel nonfirm load in the Norhwest.
2/ Uses recycled water from municipal sewage.

TABLE E D-2

POTENTIAL INCREASES OF AIR POLLUTANT
EMISSIONS RESULTING FROM DECREASED
AVAILABILITY OF BPA NONFIRM ENERGY

Air Basin	Particulate		Sulfur Oxides		Carbon Monoxide 3/	Hydro carbons 3/	Nitrogen Oxides	
	average tons/year	Percent of 1973 total 2/	average tons/year	Percent of 1973 total 2/	Average Tons/year	Average tons/year	average tons/year	Percent of 1973 total 2/
San Francisco Bay Area 1/	92.0	0.19	1030	0.94	0.615	33.8	880	0.37
North Central Coast 1/	56.5	0.22	630	3.5	0.378	20.8	540	1.5
South Central Coast 1/	28.3	0.31	315	2.9	0.185	10.4	271	1.3
South Coast	249	0.24	2820	1.4	1.69	92.8	1160	0.24
San Diego	33.5	3/	372	1.8	0.223	12.3	90.3	3/
TOTAL	459.3		5167		3.091	170.1	2941.3	

1/ Pacific Gas and Electric Company emissions divided among these three basins in proportion to the capacities of the plants in each region as listed in Table 21 of the SRI report (1976).
2/ Percent of 1973 total emissions are derived from the Table in Appendix E which is a reproduction of Table 20 from the SRI study (1976).
3/ Data to calculate percentage of 1973 emissions not available from Appendix E.

(WP-PGC-2729K)

The SRI report (1976) projected the impacts of the sales of BPA nonfirm energy for the 1975 calendar year in which 9.2 million MWh were sold to the California utilities. Table 20 of the SRI report (reproduced in Appendix E) showed the impacts by pollutant of that sale on the five air basins (shown in Table D-2 and Figure D-1 of this EA) as a percentage of total emissions in each year for 1973. Depending on the basin and pollutant, emissions reductions by the 1975 sale ranged from 1 to 17 percent of the 1973 emissions. The largest impact in terms of percent of the 1973 emissions was the 17 percent decrease for sulfur oxides in the South Central Coast air basin, which represented an impact of reducing sulfur oxide emissions that year in that basin by about 1825 tons. If 1825 tons represented 17 percent of the 1973 sulfur oxide emissions in the South Central Coast air basin, the total emissions for that year must have been about 10,735 tons. The impact on sulfur oxide emissions in the South Coast air basin of serving 1400 MW of alternate fuel nonfirm load in the Northwest is, on the average, an increase of about 315 tons per year, as projected using the data and methodology of the SRI study. This amount represents about 2.9 percent of the 1973 total emissions. A similar comparison can be made for other pollutants and air basins by using Table 20 of the SRI study. Where such a comparison can be derived from this table, the average increase in potential emissions projected as a consequence of serving 1400 MW of alternate fuel nonfirm load is also given in terms of percent of 1973 total air basin emissions on Table D-36. As can be seen, these percentages are quite small. Even allowing for changes in the total amounts of emissions in the five California air basins since 1973, and changes in the emissions from California generating plants which might be displaced (which are likely to have been reduced through improved air pollution control).

APPENDIX E

TABLE 20 FROM THE SRI STUDY

APPENDIX F

REFERENCES

REFERENCES

Bonneville Power Administration, 1974, Final Environmental Impact Statement: Wholesale Power Rate Increase, August 15.

Bonneville Power Administration, 1977a, Draft Environmental Impact Statement: The Role of the Bonneville Power Administration in the Pacific Northwest Power Supply System Including Its Participation in the Hydro-Thermal Power Program, July.

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Ekono, Inc., 1982, Utilization of Electric Boilers as a Sink for Surplus Power in the Bonneville Power Administration Service Area, prepared for the Northwest Power Planning Council, November 19.

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U.S. Environmental Protection Agency, 1977, Compilation of Air Pollutant Emission Factors, Third Edition, Part A, August.

RSeiffert:dh (WP-PGC-2850K)

RD8

January 30, 1985

PGC

EQ 4-2 "A"

Anthony R. Morrell, Environmental Manager - SJ
THRU: Janet McLennan, Assistant Power Manager for /s/
Natural Resources and Public Services - PG
Gabrielle Foulkes, Acting Environmental Coordinator /s/
Office of Power and Resources Management - PGC

Transmittal of Revised FONSI on the Policy for Sales of Nonfirm Energy to Loads With Alternate Fuel Capability

Attached are two copies of a revised FONSI for the alternate fuel policy. I believe three previous versions of this FONSI were sent to DOE for preliminary review. This version of the FONSI addresses all substantive changes in the policy since the publication of the EA. The changes to the policy are being circulated as part of an "addendum to the staff evaluation of the record" for a 2-week public review. Although it is unlikely significant comment will be received, further changes in the policy are possible as a result of this process, and it would be procedurally incorrect to have the FONSI signed until after the comment period closes on February 5, 1985. Therefore, please promptly forward this revised FONSI to DOE for final approval, but please also tell them not to sign the FONSI until we tell them it is all right to do so. I will call you after February 5 to let you know when it can be signed.

2 Attachments

RSeiffert:paw (WP-PGC-3233K)

cc:
O. Schmidt - APG-12
L. Baker - ALP
J. McLennan - PG
T. Noguchi/J. Pyrch - PK
C. Combs - PKLC
K. Pierce - SJ
Official File - PG

U.S. DEPARTMENT OF ENERGY
Bonneville Power Administration

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Final Policy for Sales of Nonfirm Energy for Service to Loads With Alternate Fuel Capability

The Bonneville Power Administration (BPA) has prepared an Environmental Assessment (EA) (DOE/EA-0239) to assess environmental effects of the BPA policy for the sale of nonfirm energy to loads with alternate fuel capability.

Proposed Action

BPA proposes to establish a policy to sell some nonfirm energy to BPA's Direct Service Industry (DSI) customers and Pacific Northwest (PNW) utilities for loads greater than 1 average megawatt (MW) which have the capability of being served with electricity, but which also have another energy source such as gas, oil, or hog fuel, to substitute when BPA nonfirm electricity is not available. The policy responds to BPA's need to: (1) improve BPA revenues by stimulating nonfirm energy sales that would not otherwise take place; (2) allow DSIs and BPA's utility customers, and their qualified consumers, to enjoy the benefit of lower cost energy when it is available, and thereby improve the region's economy; and (3) utilize BPA nonfirm hydroelectric resources that might otherwise be wasted. The revised proposed policy was described more completely in the EA (DOE/EA-0239, p. 1 and Appendix B) and in the FEDERAL REGISTER "Notice of Revised Proposed Nonfirm Energy Policy for Consumer Alternate Fuel Loads and Request for Comments" (49 FR 35853).

As a consequence of public comment on the FEDERAL REGISTER notice, BPA intends to incorporate seven substantive changes into the final policy. Environmental impacts of the policy with these changes are within the range of impacts analyzed in the EA (see pp. 4-5 of this FONSI). The policy changes are as follows:

1. The policy will allow a utility serving an alternate fuel load to use nonfirm energy from its own resources or imported from another utility to serve the load under certain limited circumstances designed to avoid adverse effects on BPA operations or power marketing programs or existing contractual obligations. This use of a utility's nonfirm energy or nonfirm energy from another utility's system was mentioned as an alternative in the EA (see p. 7).

2. The policy will allow BPA to provide firm service, when BPA has no nonfirm energy available, to a qualifying load for a limited period in the event an uncontrollable force or maintenance at the consumer's facilities prevents operation of the alternate fuel source. The policy will also allow BPA to use its firm surplus energy, at the request of the customer and when firm surplus in excess of all other markets is available, to serve qualified loads for a period not to exceed 72 hours after nonfirm energy availability ceases. Use of firm surplus energy in this manner will help consumers participating in the policy while changing over to their alternate fuel energy source.

3. The policy will include provisions to encourage new qualified loads, to a limited degree, by considering investments in new electric capability at facilities already having alternate fuel capability as a negative component of the avoided costs when making nonfirm energy sales under a displacement rate, such as the Displacement Rate in BPA's Nonfirm Energy Rate Schedule (NF-83). Although this was not specifically addressed as an alternative in the EA, it falls generically under the alternative termed "Affirmative Action to Develop Interruptible Loads" (EA pp. 6 and 19).

4. Initial contracts offered under the policy would expire June 30, 1989, and not June 30, 1987, as stated in the EA (p. B-2). Longer contract duration was addressed as an alternative in the EA (pp. 7-8 and 21). Also, since delay in policy implementation has occurred, the new initial contract termination date does not dramatically extend the contract term from that conceived at the time policy development began.

5. The final policy will allow displacement, when BPA has nonfirm energy available, of cogeneration existing at the time of publication of the final policy and from which the consumer utilizes all of the electrical and thermal (and/or mechanical) energy output. This type of cogeneration is in reality merely a category of alternate fuel load in which part of the energy in the alternate fuel is converted to electrical energy prior to use.

6. The final policy will not require a varhour meter for an alternate fuel load, unless there is a BPA operational or planning need.

7. A minimum 4-month notice period will be provided for installation of communication equipment. Delaying installation of communication equipment was discussed as an alternative in the EA (pp. 8 and 22) and was part of the revised proposed policy. Only the notice period is new, and is necessary for customers to secure and install the equipment.

The above changes have been circulated for public review as part of an addendum to the Staff Evaluation of the Record.

Reasons Why the Proposed Policy Will Not Have a Significant Impact on the Human Environment

The potential environmental effects of the proposed policy stem from: (1) changes to produce more energy in the operation of Federal hydroelectric dams in the PNW and other resources from which BPA secures electric energy; (2) changes in the operation and economic viability (including incentives for new development) of facilities served under the policy; and (3) changes in the amount of nonfirm energy available to lower priority customer classes for other uses. These potential impacts were discussed in Chapter 3 of the EA (pp. 9-18). Public and governmental agency review of the EA did not reveal any further environmental concerns.

The changes which will be made in the final policy will not substantially change the impacts of the policy as they were described in the EA. These changes may slightly enhance the effectiveness of the policy by making its terms more attractive to potential customers, but the analysis of potential impacts of the policy was based on the assumption that 1400 MW of qualifying

nonfirm load would be served under the policy (EA, p. 9). This substantially exceeds the amount of load for which nonfirm service, even under the policy with the above changes, is likely to be requested. In fact, a report on Marketing Nonfirm Electrical Power to Pacific Northwest Manufacturing Industries, prepared for the Northwest Power Planning Council by Ekono, Inc., in July 1984 found that even with certain guarantees of nonfirm energy availability and price not provided by the policy, only about 1200 MW of nonfirm load would be realized. Since all impacts of the policy become greater in magnitude as more nonfirm load is served, the assumption of 1400 MW of load results in analysis which is environmentally conservative.

The longer contract duration to be offered under the final policy only extends the duration of the impacts which occur.

Amounts of firm service which may be provided to alternate fuel loads under the second policy change (see p. 2 of this FONSI) will be negligible in relation to BPA's total loads and in relation to the total energy marketed to alternate fuel loads, will be contingent on BPA's ability to supply it in any case, and will not noticeably affect operation of BPA's resources.

For the above reasons, the Department of Energy (DOE) has determined that it is not necessary to supplement the EA prior to implementing the final policy.

1. Impact of resource operation changes - Operation of PNW Federal hydroelectric projects will be changed to meet additional demand for nonfirm energy under the policy. However, no significant impacts will occur because operational changes will occur within existing constraints of the hydroelectric projects. Also, BPA will mitigate potential fish passage problems related to spill by foregoing nonfirm energy sales which would conflict with any fish passage spills which the Federal dam operators determine to provide, pursuant to Sections 404(a) and (b) of the Regional Council's Program, until effective juvenile fish bypass systems are in operation (EA, pp. 9-11).

BPA's thermal resource operations will not be increased as a result of the policy because: (1) two of these resources (Trojan and Washington Nuclear Project No. 2) have variable costs low enough that they tend to be operated to the maximum extent under any circumstances; and (2) BPA simply cannot substantially influence operation of the other two (the Hanford Generating Project and a 50-MW share of the Boardman Coal plant) to increase generation upon demand (EA, p. 10).

2. Impacts related to facilities served - Past study of how availability and cost of electric energy have influenced the siting of industry in the PNW indicates that the proposed policy will not influence development of new industrial plants (EA, p. 12). Addition of new electric facilities, such as electric boilers, at existing facilities or incorporation of such facilities into new projects would have only minor impacts (EA, pp. 11-12).

Under the policy, some PNW consumers may, at times, displace use of fossil fuel, hog fuel, or other nonelectric energy sources and use nonfirm electric energy instead when it is lower cost. In marginal cases, this may slightly enhance a business's financial viability. When nonfirm energy is substituted, the impacts of use of the alternate fuel, such as air pollution and solid

waste generation, do not occur. However, this benefit is not significant to the PNW since: (1) industrial, commercial, and institutional consumers which might be served under the policy are regulated by environmental agencies; (2) fuel burning operations of these consumers do not generally result in substantial environmental damage in the PNW; (3) loads served by the policy will be dispersed over the BPA service area; and (4) loads will only be served part of the time (EA, pp. 13-14).

3. Impacts related to changes in nonfirm energy availability - Since PNW public utilities and municipalities have priority to purchase BPA nonfirm energy, serving alternate fuel consumers on their systems would reduce the amount of BPA nonfirm energy available to lower-priority customers, namely PNW investor-owned utilities and utilities outside the region, mainly in California (EA, pp. 15-16). For the PNW investor-owned utilities, the decreased availability of BPA nonfirm energy means, primarily, a reduced chance of their coal-fired resources being displaced (especially in January, March, April, and July). The increase in coal plant impacts caused by less displacement is not environmentally significant because displacements are temporary, the coal plants are subject to environmental regulation, and the coal plants do not result in impacts which are abnormally severe for such facilities (EA, pp. 15-16). California utilities tend to use BPA nonfirm energy to displace gas- and/or oil-fired resources. Increases in emissions of air pollutants and other environmental impacts as a consequence of decreased generating resource displacement in California are not significant because the changes are only small portions of the total amounts of pollutants released by, and the cumulative impact of, other facilities and activities affecting the California environment (EA, pp. 16-18 and Appendix E).

Related Documents

On March 15, 1983, BPA requested comments on interim principles for sales of nonfirm energy for interruptible industrial and irrigation loads (48 FR 10903).

On July 12, 1983, BPA issued its proposed policy for sales of nonfirm energy to utilities for alternate fuel industrial loads. The proposed policy was published in the FEDERAL REGISTER on July 22, 1983 (48 FR 33518). BPA mailed a summary of comments on the proposed policy to the public on November 23, 1983.

BPA issued a Revised Proposed Nonfirm Energy Policy for Consumer Alternate Fuel Loads on September 10, 1984. The revised proposed policy was published in the FEDERAL REGISTER on September 12, 1984 (49 FR 35853). This revised proposed policy considered comments received on the Proposed Policy for Nonfirm Energy Sales for Utilities' Industrial Loads, and BPA's experience under interim alternate fuel nonfirm energy contracts. The FEDERAL REGISTER Notice of the revised proposed policy also notified interested parties of the availability of a Staff Evaluation of the Record and a proposed generic contract for alternate fuel loads.

An Addendum to Staff Evaluation of the Official Record was distributed for public comment January 21, 1985. Comments were due February 5, 1985. This addendum discussed several new issues brought up through public review of the FEDERAL REGISTER Notice and recommended a number of changes to the policy.

Public Availability

Copies of the EA were sent on September 10, 1984, to potentially affected utilities and agencies, and other organizations and individuals who expressed interest in BPA power marketing actions. Copies of this finding will be sent to all persons and agencies who were sent copies of the EA. Copies are also available upon request from BPA (address below).

Determination

Based on the information in the EA, the review of the EA by government agencies, utilities, interested groups, and individuals, and consideration of the environmental implications of the policy changes described herein, it is the determination of DOE that the final policy is not a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA, 42 U.S.C. 4321 et. seq., and, therefore, an environmental impact statement will not be required.

For Further Information Contact: Anthony R. Morrell, Environmental Manager, Bonneville Power Administration, P.O. Box 3621-SJ, Portland, Oregon 97208, telephone (503) 230-5136.

Issued in Washington, D.C., on _____, 1985.

ROBERT C. ODLE, JR.
Acting Assistant Secretary for Policy,
Safety, and Environment

RDS

EQ 4-2
alpha "A"

July 10, 1984

PGC

Anthony R. Morrell, Environmental Manager - SJ
THRU: Janet W. McLennan, Assistant Power Manager /s/
for Natural Resources and Public Services - PG
Gabrielle Foulkes, Acting Environmental Coordinator /s/
Office of Power and Resources Management - PGC

Transmittal of Revised Environmental Assessment on the Policy for Nonfirm Energy Service to Loads with Alternate Fuel Capability

Attached are 10 copies of the revised subject Environmental Assessment (EA). These copies are the same as the one given to you on July 6, 1984, by Randy Seiffert for advance transmittal to DOE, with the exception that a few typographical errors have been corrected.

A May 22, 1984, version of this EA was previously nearly through the 568 process for transmittal to DOE when, on June 5, 1984, the United States Supreme Court ruled on the case of the Aluminum Company of America et al., vs. Central Lincoln Peoples' Utility District et al. This ruling ~~which~~ essentially reversed the Central Lincoln I decision. Because analysis of the impacts of the policy was based on priorities for nonfirm service to various customer classes according to Central Lincoln I, the analysis was partially invalidated by the Supreme Court decision. The document has now been revised to reflect priorities for nonfirm energy service consistent with the Supreme Court decision.

The substantive changes to the document are as follows:

1. A new, short chapter (1.4.3) was added which describes the Supreme Court decision.

2. Under the Supreme Court decision, DSI first quartile service is the top priority market for BPA nonfirm energy, contrary to the assumption in prior versions of the EA that alternate fuel loads of preference customers would receive top priority in accordance with Central Lincoln I. Service to the four quartiles of DSI load will no longer be affected by the policy. There may still be some marginal effects on amounts of BPA nonfirm energy the DSIs might have available to buy (beyond their contracted demands for industrial firm power) to use for production increases and so forth. Environmental impacts from changes in DSI operations are now negligible, whereas under the former assumptions, there would have been a minor benefit to the physical environment through increased amounts or frequency of curtailment of DSI first quartile. The text of the EA, particularly Chapter 3.1.4.2.1, was changed to reflect the preceding.

{original report attached}

3. As a consequence of DSI first quartile load receiving first priority for BPA nonfirm energy, the average amount of nonfirm energy available to alternate fuel loads (assuming a total of 1400 MW of preference customer alternate fuel load) is decreased slightly, from about 6.7×10^9 kWh to about 6.4×10^9 kWh. This will slightly reduce the environmental benefits which might result in the Northwest from substitution of nonfirm electrical energy for alternate fuels which pollute when burned. However, there was no need for substantive text changes in the discussion of impacts from reduced use of alternate fuels.

The Supreme Court decision did not change the priorities of nonfirm energy service to Northwest investor-owned utilities or export markets, or, therefore, the average amounts of BPA nonfirm energy which will be available to them. Thus, there was no need to change the parts of the document relating to nonfirm energy sales to these markets and the environmental impacts thereof.

Please initiate a new 568 for formal transmittal of the revised EA to DOE.

RSeiffert:klm (WP-PGC-2987K)

cc:
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Official File - PGC

Attachment (10 copies)

ENVIRONMENTAL ASSESSMENT

on

BONNEVILLE POWER ADMINISTRATION'S PROPOSED POLICY FOR SALES OF NONFIRM ENERGY FOR SERVICE TO LOADS WITH ALTERNATE FUEL CAPABILITY

OFFICE OF POWER AND RESOURCES MANAGEMENT
BONNEVILLE POWER ADMINISTRATION
AUGUST 1984

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EXECUTIVE SUMMARY

Bonneville Power Administration's (BPA) proposed policy (hereafter policy) to sell nonfirm energy to utilities and direct service industries (DSIs) for service to their loads which have alternate fuel capability formalizes procedures for serving a new market for BPA nonfirm energy. This market was first served under interim arrangements in 1983, and consists of DSIs and regional 1/ utility customers who find it economical at times to displace oil, gas, or other fuel usage with nonfirm electrical energy. Any load of one average megawatt (MW) or more which can be fully served by an alternate fuel and which is operated by a DSI or a consumer of a regional utility customer will be eligible for nonfirm service under the policy. This policy requires utilities (or their consumers) and DSIs to install separate metering and special communications equipment and to sign new nonfirm energy contracts. Because of these requirements and the initial contracts' June 30, 1987 expiration, BPA does not expect to serve large amounts of interruptible load during the initial phase of this policy. This ameliorates the potential environmental impacts of the policy and allows BPA, utilities, and consumers to gradually learn, with reduced financial risk, about operating under the policy. Upon expiration of the initial contracts, modifications to the policy may be made, if necessary, and new, long-term contracts will presumably be offered.

Most of the utilities seeking nonfirm service under the policy for their consumers are public bodies and cooperatives, known as preference customers.

Potential environmental impacts of the policy derive from: (1) changes in the operations of consumers and DSIs served under the policy; (2) changes in the operations of those entities which will experience reduced availability of nonfirm energy; and (3) changes in operation of the Federal Columbia River Power System (FCRPS) to provide an increased amount of nonfirm energy in order to meet the expanded nonfirm energy market. Effects on FCRPS operations are primarily reflected as impacts on fish, wildlife, and recreation resources. Analysis performed indicates there will be no new operational impacts on these resources. Operating constraints and agreements are in place which will prevent significant harm to anadromous fish from the policy's implementation. BPA intends to take additional actions in the future to protect and enhance anadromous fish.

Impacts related to changes in availability of nonfirm to various markets depend on whether a customer class gains or loses access to nonfirm energy and on what the energy is used for. There will be environmental benefits since BPA nonfirm electrical energy will substitute for use of fuels which produce air pollutants and, perhaps, solid waste.

1/ Words underlined when first used in this document are defined in the Glossary, Appendix A.

The IOUs and export markets use BPA nonfirm energy to displace polluting thermal resources, and thus the reduced availability of nonfirm energy to these markets could have negative environmental impacts. Environmental impacts of the policy are summarized in Table 1. All the impacts are minor; either the impact is insignificant in magnitude or the impact is a change in an aspect of the environment which is not in itself significant, e.g., a reduction in air pollution from types of sources which generally have only minor effect on overall air quality.

Pending public and governmental agency review, it will be concluded that implementation of the policy does not significantly affect the quality of the human environment and, therefore, does not require preparation of an environmental impact statement (EIS).

TABLE 1

SUMMARY OF ENVIRONMENTAL IMPACTS OF THE POLICY

Source of Impact	Effect of Policy	Principal Environmental Impacts		
		Adverse	Beneficial	Neither Clearly Adverse or Beneficial
Federal Hydrosystem Operations	More nonfirm energy will be generated, reducing spill.	Reservoir levels will tend to be lower which results in generally less favorable conditions for fish, wildlife, and recreation. Spill reductions potentially increase turbine mortality.		Flows will be altered, but not in a consistent fashion.
Thermal Resource Operations				
a. Northwest	The likelihood of displacing Northwest thermal resources is decreased slightly.	Operational impacts (primarily air pollution, thermal discharges, solid and nuclear waste requiring disposal, and consumption of coal and nuclear fuel) may occasionally occur at times when, in the absence of the policy, thermal resources would be shut down.		
b. California	Less BPA nonfirm energy may be available to California utilities so that they may need to operate their thermal resources more.	Operational impacts (primarily air pollution, water consumption, thermal discharges, and fossil fuel consumption of California thermal resources may increase.		
Alternate Fuel Loads	BPA nonfirm energy will become available and economic at times to consumers and DSIs with qualified alternate fuel loads, allowing them to temporarily shut down alternate fuel combustion equipment.		Shutting down alternate fuel combustion sources temporarily eliminates the environmental impacts of their operation (principally air pollution, fuel consumption, and, in some cases, generation and disposal of solid waste).	

Chapter 1

INTRODUCTION

This Chapter of the Environmental Assessment (EA) briefly describes the policy and discusses some key features, particularly those which could affect the environment. Additional information on the policy can be found in Appendix B.

1.1 NEED

The proposed policy responds to BPA's need to: (1) improve BPA revenues by stimulating nonfirm energy sales that would not otherwise take place; (2) allow DSIs and BPA's utility customers, and their qualified consumers, to enjoy the benefit of lower cost energy when it is available, and thereby improve the region's economy; and (3) utilize BPA nonfirm hydroelectric resources that might otherwise be wasted. In responding to these needs, conversion of existing firm electrical load to nonfirm load must be avoided because it would result in loss of firm sales and associated revenues.

In addition, the policy responds in part to the Northwest Power Planning Council's Northwest Conservation and Electric Power Plan (see Chapter 4.2).

1.2 OVERVIEW OF THE POLICY AND POLICY IMPLEMENTATION

BPA proposes to make nonfirm energy available to its Northwest utility customers and DSIs for service to loads which can use an alternate fuel source when BPA determines that nonfirm energy is not available. As the result of an analysis of short-term nonfirm energy agreements in 1983 and earlier, BPA has learned that loads once served with firm power are either being lost to alternate fuels or are being shut down altogether. The amount of firm power that was sold had previously varied depending on market conditions and/or the availability of cheaper alternate fuel. Until recent firm power rate increases, firm power was generally competitive with alternate fuels. By making nonfirm energy accessible to these loads, BPA hopes to provide intermittent service to some electric loads which would have been lost to the region, and eventually encourage development of new interruptible loads.

1.3 SCOPE OF POLICY

The proposed policy and this EA are restricted in scope to providing only for sales of nonfirm energy to utilities and DSIs for service to interruptible loads, sized at one average megawatt (MW) demand or greater, with alternate fuel capability. Qualifying loads are most likely to be boilers used for process heat in the pulp and paper, wood products, chemical, and food processing industries; and space heating for large industrial plants, commercial facilities (office buildings or complexes, shopping centers, central heating plants, etc.), and institutions (large hospitals, universities, etc.). BPA may propose other policies for marketing of nonfirm for other specific applications at later times, and will undertake appropriate National Environmental Policy Act (NEPA) compliance activities in conjunction with those policies.

1.4 BACKGROUND

This section describes elements which are fundamental to understanding the policy and to its development. Additional information and a summary of the issues related to the sale of surplus power are found in a BPA brochure, Issue Backgrounder: Surplus Power (BPA, 1983d).

1.4.1 Grades and Availability of Power

BPA projects its ability to serve firm loads based on a historical record of streamflow, known as the critical period, projections of hydroelectric generation resources, and realistic projections of generation by BPA's thermal resources. Studies made on this basis determine Firm Energy Load Carrying Capability (FELCC). FELCC is the amount of energy BPA can be confident of supplying to customers to serve firm loads, that is, loads which are to be served with maximum reliability. If obligated "firm" loads exceed FELCC, BPA would be deficit, would possibly have to allocate power among customers, or would need to acquire resources to attain a firm load/resource balance. If FELCC exceeds expected firm obligations as in the current situation, BPA is capable of serving more firm load than its customers have and attempts to market the excess firm power as "surplus firm." During most years, more water is available for generation by the Federal dams from which BPA markets power than under critical period conditions, and more than enough is available to refill the reservoirs. The additional energy which can be generated under these circumstances is "nonfirm" energy. It cannot be sold as firm, because it varies in quantity and at times is not available at all. Nonfirm energy is most likely to be available in the late spring and early summer when snow melting in the mountains causes high flows in the rivers and the Northwest's peak winter electrical loads are over.

Implementation of the Northwest Power Planning Council's (Council) Water Budget will, on the average, increase nonfirm energy capability by 432 average annual MW (while sacrificing 510 average MW of firm energy capability) (BPA, 1983a, pp. 22-25).

Nonfirm energy may be generated in two situations. One is when there is a high probability of having more than enough water available (1) to meet firm loads; (2) to refill reservoirs; and (3) to meet all other constraints on the hydroelectric system such as the Water Budget, fish passage, and navigation. Under these conditions, a decision may be made to use available surplus water to generate marketable nonfirm power. The second situation occurs when water must be released from reservoirs because of high flows and/or operational constraints such as flood control, reservoir levels, and the Water Budget. In the first situation, a decision is made to take a limited risk that water conditions will not turn out as well as predicted, in order to produce marketable nonfirm energy to generate BPA revenue or to accomplish some goal such as being able to displace a more costly resource. In the second situation, the water would be wasted if nonfirm energy were not generated. The water, which must be released because of high flows or operating constraints, would otherwise be simply discharged over the spillway, or spilled, instead of being sent through the turbines. There are circumstances when water must be spilled instead of being used to generate energy: (1) when

the rate at which water must be released exceeds the capacity of the turbines; (2) when there is no market for all the nonfirm energy which could be generated at existing flow levels; and (3) when necessary, at specific dams and during certain times of year, in order to reduce fatalities of downstream migrating smolts.

1.4.2 Historic Sales and Uses of Nonfirm Energy

Historically, BPA sales of nonfirm energy have been made to four types of customers. Pacific Northwest IOUs and generating preference customers have purchased energy at the nonfirm energy rate to displace high cost thermal resources and/or to serve their own interruptible loads. DSIs use BPA nonfirm energy for service to their First Quartile at the Industrial Firm Power (IP) rate, and for production increases and other purposes. Utilities outside the region buy BPA nonfirm energy under the nonfirm energy rate schedule. Sales of nonfirm energy to these various markets for fiscal year 1977 through 1983 are shown in Table 2.

1.4.3 Supreme Court Decision Regarding Priority for BPA Nonfirm Energy

The Supreme Court of the United States recently ruled on the case of the Aluminum Company of America et al., v. Central Lincoln Peoples' Utility District et al., No. 82-1071 (decided June 5, 1984). The Supreme Court reversed the decision of the United States Court of Appeals for the Ninth Circuit, and determined the validity of DSIs power sales contract provisions relating to service to the DSIs First Quartile. These contracts provide that the DSIs First Quartile service may be restricted "at any time and for any reason in order to protect Bonneville's ability to meet its Firm Obligations." Conversely, BPA does not have the contractual right to restrict service to the DSIs First Quartile in order to serve a nonfirm load. This in effect gives the DSIs First Quartile priority over other markets for BPA nonfirm energy.

1.4.4 Interim Contracts

BPA made sales of nonfirm energy to six Northwest utilities for service to alternate fuel loads on an interim basis in January 1983, and later expanded these interim offers to include one DSI (see Appendix C).

TABLE 2

BPA NONFIRM ENERGY SALES FOR FISCAL YEARS 1977-1983 1/ 2/

Customer Class		FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	FY 83
Northwest	1000 kWh	22,724	249,818	604,399	55,680	112,252	30,969	436,493
Preference Customers	$	77,315	772,329	1,986,611	307,187	636,709	538,144	3,973,573
Northwest	1000 kWh	791,764	8,616,030	4,659,730	2,877,447	7,063,797	6,019,076	9,226,036
IOUs	$	2,659,476	27,489,140	14,435,790	17,452,859	52,810,691	48,162,417	80,404,837
DSIs 3/	1000 kWh	6,108,921	6,614,688	6,447,501	6,355,116	7,041,761	5,456,834	6,627,011
	$	15,586,683	16,030,328	18,601,375	29,031,620	43,808,532	87,408,763	125,812,440
Export Markets	1000 kWh	0	5,046,237	392,517	4,339,336	8,767,541	15,221,784	18,902,771
	$	0	16,934,356	751,298	28,552,782	64,024,452	118,942,784	175,241,869
Total	1000 kWh	6,932,409	20,526,773	12,104,147	13,627,579	22,985,351	26,728,663	35,323,311
	$	18,323,474	61,226,153	35,775,074	75,344,448	161,280,384	255,052,108	385,432,719

1/ From BPA Fiscal Year Generation and Sales Statistics for Fiscal Years 1978 through 1983.
2/ Actual dollar amounts; not corrected for inflation.
3/ Values for DSIs computed by multiplying their total Industrial Firm sales by 0.25 to approximate the amount of nonfirm which constituted their First Quartile, and adding any additional amounts of nonfirm energy purchased.

Chapter 2

ALTERNATIVES

This Chapter discusses alternatives on two levels. The first and more fundamental level is that of alternatives to the broad scope of the policy. The no action alternative, for example, is an alternative on this level. The second level is that of alternatives to specific features of the policy which could be varied within some limits while not substantially changing the overall scope of the policy. Alternatives to these features may influence the policy's effectiveness and may incur different environmental impacts. Examples are different provisions relating to conversion from nonfirm to firm service and different standards for consumers to qualify for nonfirm service. Most of the variation in environmental impacts among the alternatives are consequences of differences in effectiveness, and therefore can be identified only in terms of general trends.

2.1 ALTERNATIVE POLICIES

This section discusses alternatives to the broad scope of the policy.

2.1.1 No Action Alternative

Under this alternative, consumers of BPA's requirements customers would not be provided access to BPA nonfirm energy through their serving utilities and DSIs would not have access to BPA nonfirm energy to serve alternate fuel loads. BPA nonfirm energy would continue to be marketed to the same customers under the same circumstances and for the same purposes as prior to the interim contracts (see Chapter 1.4.2). The interim contracts would not be renewed or renegotiated. This alternative does not provide an opportunity for increased sales of nonfirm energy and, therefore, does not potentially improve BPA's revenues or help hold down other rates. Thus it does not fulfill the need as discussed in Chapter 1.1. It is also not responsive to the Council's Two-Year Action Plan (see Chapter 4.2). Because the nonfirm market would not be expanded under this alternative, some surplus power which could be generated on the FCRPS would remain unmarketable resulting in increased spill. Consumers would use higher cost fuels, or, in borderline situations of profitability, might shut down causing unemployment and reducing their contribution to the economy.

2.1.2 Nonfirm Sales to Utilities for Service to Consumers with Minimal Restrictions

This alternative represents a case where BPA wishes to make sales of nonfirm energy to its utility customers for service to consumers, but chooses to impose only minimal control over such sales. As in the proposal, the DSI or utility and/or consumer would have to provide a means to measure nonfirm deliveries for billing purposes and provide communications, and BPA would provide notice of availability of nonfirm energy. BPA would grant contracts to utilities for service to their interruptible consumers and to DSIs, and devise a means of allocating nonfirm when demand exceeds availability. However, there would be no restrictions in the policy on switching from firm to nonfirm service and vice versa, and no requirement for alternate fuel

capability. BPA would let DSIs and utilities and their consumers decide on the economics of providing metering, billing, and communications for delivery of nonfirm energy to a particular load, and would, therefore, not impose a lower limit on the size of interruptible load eligible for nonfirm service. There would also be no limit on utility markup.

Under this alternative, many aspects of the proposed policy will be subject to individual negotiation between utilities and consumers. For example, provisions which restrict switching from firm to nonfirm power will be subject to negotiation between the consumer and the serving utility. Utilities which have an incentive to avoid loss of firm load, such as some generating utilities, will restrict switching. Other utilities may be inclined to allow a consumer to use cheaper nonfirm when available if: (1) they can change their contract demand easily, or (2) the utility is a metered customer. Utilities will always receive some markup on the nonfirm energy, which is an incentive for them to make it available to customers.

This alternative would result in some, and possibly substantial, loss of firm load to BPA and, therefore, reduce revenues. It would also make BPA planning more difficult since firm loads could be added and dropped in an unpredictable fashion.

2.1.3 Affirmative Action to Develop Interruptible Loads

This alternative is the same as the proposal except that BPA would take the additional action of providing further incentives for the installation of interruptible electric loads in the region's existing and future industrial plants, commercial facilities, and institutions. Such incentives could include providing direct funding or low cost financing for such installations, BPA payment for metering and communications equipment required by the policy, grants to explore innovative ways of using nonfirm energy, and/or other means. This alternative would require commitment of BPA funds which are currently not budgeted. BPA may wish to pursue this alternative, to extent authorized by law, some time in the future, but this alternative would require more time to implement. BPA does not wish to forego sales of nonfirm energy under the policy in the meantime.

2.2 ALTERNATIVES TO FEATURES OF THE POLICY

This section discusses alternatives to specific features of the policy which do not change its overall scope but which may influence the effectiveness, the amount of energy which might be sold under the policy, and ultimately, its environmental effects.

2.2.1 Qualifications of Consumer Loads Eligible for Nonfirm Service

Several possibilities exist with respect to requirements which consumers must meet in order to qualify for nonfirm energy under the policy. The case of minimal qualifications in all possible aspects is described as an "alternative policy" in Chapter 2.1.2. This section discusses the range of options which could conceivably affect the environmental consequences of the policy.

Eligibility of Firm Loads - In its policy, BPA could conceivably allow industrial, commercial, and institutional firm loads to switch to nonfirm, either temporarily or permanently. BPA could also develop criteria other than those proposed governing changes from firm to nonfirm service and back.

Class of Load - BPA could make the policy applicable only to industrial consumers served by utilities, or could limit the policy in some other way to exclude one or more classes of consumers or the DSIs.

Alternate Fuel Supply - BPA has the options to: (1) not require an alternate fuel supply; (2) restrict the type of alternate fuel supply; (3) allow a utility customer to serve a consumer's nonfirm loads with its own nonfirm energy at any time or only when BPA nonfirm is unavailable; (4) allow electricity furnished by another utility, which is not a customer of BPA, to serve as an alternate fuel; or (5) require some level of alternate fuel supply which is less than the capacity to utilize nonfirm energy.

A special case is consumers who want to rely on cogeneration facilities as their alternate fuel supply. BPA is considering developing a separate policy for selling nonfirm energy to consumers which have cogeneration resources.

Size of Eligible Nonfirm Load - The size of the load for which it is economical to attempt to secure nonfirm energy depends, among other things, on the cost of providing the metering and communications facilities required by the policy, and the ability to schedule and restrict power. The proposed limit of 1 average MW is the approximate lower limit of the amount of load BPA has found practical to schedule, but it may not be cost-effective to provide the metering and communications facilities for loads this small. BPA could alternatively set a size limit larger than 1 average MW.

2.2.2 River Conditions Under Which Nonfirm Energy Would Be Sold

BPA proposes to offer to contracted utilities and DSIs nonfirm energy in amounts and at times determined by BPA. Such times include conditions of spill, imminent spill, and other conditions under which BPA elects to market nonfirm energy. BPA has the options of: (1) restricting sales of nonfirm under this policy to times of spill only; (2) restricting sales of nonfirm to times of spill or imminent spill only; or (3) of establishing some other standards as part of the policy by which it would be decided when to offer nonfirm under the policy and how much nonfirm to make available. BPA would use the flexibility available under the policy and the nonfirm energy (NF-83) rate schedule or its replacement to maximize its revenues within its operational, planning, and legal constraints.

2.2.3 Duration of Contracts

BPA is proposing to enter into contracts which expire June 30, 1987. Contracts of shorter duration would discourage utilities and/or their consumers and DSIs from seeking nonfirm service under the policy.

A longer contract duration could inhibit timely resolution of problems which may arise with implementation of this new policy. The proposed contracts would expire at a time when resources are expected to be available to serve the loads as firm if consumers found nonfirm service under the policy unsuitable and wanted to apply for firm service.

2.2.4 Notification and Scheduling

BPA intends to give maximum practicable notice of any change in price, amount, or duration of availability of nonfirm, but reserves the right to change the price, amount, or duration of availability at the end of any hour.

A second aspect of the notification and scheduling issue is the requirement for 24-hour day and night telephone numbers and eventual requirement for a hard copy terminal with an auto-answer modem. The costs of these requirements may inhibit some utilities and/or consumers from contracting to receive nonfirm energy, but because of the reservation by BPA to provide as little as one hour notice, some means of rapid communication is necessary. As an alternative, BPA could choose not to implement the requirement for a hard copy terminal and an auto-answer modem until the number of utilities entering into agreements for nonfirm energy under the policy exceeds the number that BPA can manage to give prompt notice by calling each utility individually. Under this approach though, a utility and consumer, in a situation where the costs of automatic communication equipment are the incremental difference in making nonfirm service economical or not economical, would have to gamble on whether BPA would get enough nonfirm customers to require the automatic communications equipment, and BPA would risk losing nonfirm customers at the point automatic communications equipment was required.

Chapter 3

ENVIRONMENTAL IMPACTS

This chapter discusses the environmental impacts of the proposal and alternatives. Potential environmental impacts result because of changes in operation of resources to generate more nonfirm energy to be marketed under the policy, because of the use of nonfirm energy by qualified consumers, and because of the effect the policy may have on availability of nonfirm energy to current nonfirm energy markets, specifically Northwest IOUs, utilities and municipalities in California, and DSIs purchases of nonfirm energy to supplement their contracted supply of BPA Industrial Firm energy.

3.1 IMPACTS OF THE PROPOSAL

The amount of alternate fuel nonfirm load which may be served under the policy (or either of the alternative policies) is uncertain. However, for purposes of analysis, service to 1400 MW of alternate fuel nonfirm load on Northwest preference agency systems was assumed. Based on the Ekono report (1982), which investigated electric boiler capacity in the BPA service area as alternate fuel load, and experience from negotiating the interim contracts, this amount of alternate fuel nonfirm load is substantially higher than what BPA actually expects to serve under this policy, but it is the Council's current maximum goal (see Chapter 4.2). It also represents a "maximum case" since all impacts of the policy decrease in magnitude as the amount of alternate fuel nonfirm loads served by Northwest preference customer systems becomes smaller. This is both because some impacts occur in proportion to the amount of alternate fuel load, and because preference customers have first priority to nonfirm energy after DSIs First Quartile service, which thus increases effects on lower priority customer classes.

3.1.1 Changes in System Operations

3.1.1.1 Hydro System

The effects on system operations have been determined through two 40-year hydroregulation studies: a no action alternative hydroregulation study and a hydroregulation study with 1400 MW of additional nonfirm load. The only difference between these two studies is the additional 1400 MW of nonfirm load.

Analysis of the studies show that operating the FCRPS to serve an additional 1400 MW of nonfirm load would result in reduced elevations at the major storage reservoirs in all months. Flows also would be affected. They may increase or decrease at any particular FCRPS dam in any month, depending on the water year. However, even with 1400 MW of additional nonfirm load, there would be no impact on the ability of the system to provide the Water Budget. Serving the additional nonfirm load does not result in any flow or elevation exceeding the established specific operational constraints of any project.

The various changes in system operations primarily affect fish, wildlife, and recreational opportunities on the reservoirs, discussed in Chapter 3.1.2.

Environmental impacts of operation of the FCRPS have been analyzed in BPA's Final Role EIS (BPA, 1980b, pp. IV-3-30), BPA's Environmental Assessment: Proposed Power System Changes to Implement the Water Budget (BPA, 1983a), and in environmental documents prepared by others addressing the construction and operation of individual Federal hydroelectric projects.

3.1.1.2. Thermal System

BPA has contractually secured portions of the output of four thermal resources to contribute to its FELCC in the near term. These are 60 percent of the output of the Hanford Generating Project (HGP); 30 percent of the output of the Trojan nuclear plant; 10 percent of the output of the Boardman coal plant; and the entire output of Washington Nuclear Project No. 2, due to commercially operate in 1984. Impacts of each of these resources were addressed in BPA's Final Role EIS (BPA, 1980b, pp. IV-43-48) and other documents (BPA, 1977b; 1980a).

The HGP operates only when the New Production Reactor (NPR) is operated. Operation of the NPR is governed by the U.S. Department of Energy for purposes of plutonium production, and is beyond the control of BPA.

Trojan is an inexpensive resource to operate, and is likely to operate at all times possible since Portland General Electric (PGE) is able to sell the power at a price sufficient to recover the costs. PGE manages the plant, so BPA has only limited influence as to when it operates. During exceptional years, like 1983, when there is a very large amount of FCRPS nonfirm energy sufficient to displace the plant and serve available nonfirm loads, Trojan could be shut down, assuming no unacceptable conflict with maintenance schedules or refueling activities. The policy will not affect such occurrences since there is so much nonfirm energy available under these circumstances. The projected variable cost of operating the Washington Public Power Supply System nuclear plant, WNP-2, is also low enough that the plant's operation will be unaffected by this policy.

The Boardman Coal Plant is managed by PGE and is run according to their markets for power. In the event PGE wants to shut down the plant at a time when BPA still requires delivery of all or part of its 50 MW share, PGE merely delivers to BPA equivalent energy derived from other of its resources. On the other hand, the policy will make it slightly less likely that Boardman will be displaced since less BPA nonfirm energy would be available for such purposes (see Chapter 3.1.4.2.2).

Therefore, operation of BPA's thermal resources will not be affected significantly by the policy.

3.1.2 Fish, Wildlife, and Recreation Impacts

As discussed in Chapter 3.1.1, meeting additional nonfirm load will result in no new impacts to fish and wildlife resources or recreational pursuits in that the hydrosystem and individual hydro projects will not operate beyond established constraints. However, within those constraints, certain impacts which now occur in the course of normal operations may, under the policy, occur with greater frequency and duration, or to a greater degree at a given

time. The lower reservoir elevations resulting under the policy may sometimes cause recreational uses and facilities (boat launch ramps, campgrounds, fishing, swimming, picnicking) to be of lesser value than they would otherwise have been.

Lower reservoir levels may also affect resident fish and wildlife, depending on which reservoirs are affected, and when and by how much more the reservoirs are lowered. However, because these impacts occur at times during normal operations, depending on such things as natural runoff, flood control, irrigation demand, and demand for power, and the effects are within existing constraints, BPA does not consider any additional impact due to the proposed policy to be significant.

A potential impact to anadromous fish resources is reduction of spill at Federal dams. The Council's Fish and Wildlife Program (Program) (Section 404(a) and (b)) requires operators of hydroelectric projects without effective bypass systems to provide spill which will achieve a level of smolt survival comparable to or better than that achievable by the best available bypass system. BPA will mitigate the potential for spill reductions by incorporating spill programs into power planning and operations and will do nothing that could hinder provision of fish passage spill provided for under the annual spill program developed in accordance with Section 404(a) and (b) of the Council's Program. Therefore, no significant effects on juvenile downstream migrant anadromous fish should be caused by spill reduction resulting from meeting additional nonfirm loads. At this time, BPA is initiating a process to develop a spill policy and procedures.

3.1.3 Development of New Nonfirm Loads

The policy (or any alternative policy) which makes nonfirm energy for displacing alternate fuels available to consumers through local utilities and/or to DSIs may induce construction of new facilities to use such energy. The number and types of these facilities will depend on: (1) the economic incentive to use nonfirm, which in turn depends on nonfirm availability; (2) the price at which sales would be made; (3) a number of specific aspects of the policy including metering and notification requirements, allocation provisions, and standards for an alternate fuel supply; and (4) external factors such as the cost of alternate fuels. In general, anything that increases the economic incentive for use of nonfirm energy, or increases its availability at a given competitive price, or makes it available for more applications will tend to cause more new nonfirm loads to be developed.

The relatively short initial contract duration, the requirements for metering and communications equipment, the requirement for an alternate fuel, and current costs of alternate fuel do not provide substantial incentive for development of new facilities for use of nonfirm energy.

The addition of electrically operated alternate facilities to existing industrial plants, institutions, and commercial establishments, or incorporation of such facilities into new projects is expected to have minor effects on their appearance, requirements for space, employment, or resources required for construction. Electric facilities which would be served under the policy would generally not produce air pollution or solid waste, but some (e.g., electric boilers) would have water pollution implications which are essentially the same as the alternate fuel facilities for which they are substituted.

An argument can be made that the availability of nonfirm service may be the incremental factor in making a new industrial plant or commercial or institutional facility financially viable, and, therefore, would "enable" it. BPA has analyzed the effects of prices for firm electric energy on the location of industrial facilities (BPA, 1974, pp. IV-36 and 37; BPA, 1977a, Apendix C, pp. IV-68-73; BPA, 1979, pp. V-30-32). The conclusion was generally that electricity prices in the Northwest seemed to have significant influence only on the siting of aluminum plants in the region, rather than outside the region. Aluminum plant location is not likely to be influenced by this policy because the major part of their energy requirement (i.e., that required for the electrolytic reduction of alumina to aluminum metal) must be in electrical form and would not qualify as an alternate fuel load. While prices for firm electric power have been a factor in the siting of other energy intensive industries nationwide, other factors, such as availability of raw materials, and labor, have strong and often overriding influence.

Costs and/or availability of nonfirm energy should have even less influence on industrial siting than do prices for firm electric power. Therefore, BPA concludes that: (1) the nondependability of nonfirm energy; (2) the relatively short duration of nonfirm contracts being offered initially; (3) the potential for long-term changes in cost, both for nonfirm energy and alternate fuels; (4) the 30 or so years planned life of most industrial plants or other major developments; (5) the general uncertainty of economic predictions; and (6) the many other factors relevant to decisions to invest in new facilities such as taxes, availability of labor, raw materials, and transportation are such that it is unlikely that availability of nonfirm service would be the deciding factor in new facility investment or siting.

Nevertheless, BPA will monitor the loads seeking service under this policy, and will reevaluate the policy and/or undertake additional environmental analysis if it appears that the policy is providing an identifiable incentive for new industrial or commercial development in the region.

3.1.4 Changes in Utility and Consumer Operations

The availability of an additional 1400 MW of nonfirm load to serve would result in a decrease in the amount of unusable water, or spill, on the system. Thus, generation is available to meet at least some of an additional nonfirm market. The additional nonfirm energy market established by the policy is assumed for purposes of this analysis to be preference customer load. Although DSIs could also contract to receive nonfirm energy under the policy, collectively they now have little load which could qualify, and are not likely to develop a large amount of new qualifying nonfirm load. The assumption that nonfirm energy is used to serve preference customers' loads tends to maximize the potential effects on customer classes of lower priority. When substantial amounts of nonfirm energy are available, there is no effect on any other market. However, when nonfirm energy is limited, energy is delivered, if requested, to preference customers before being offered to IOUs or for export. A 1400 MW alternate fuel market for BPA nonfirm energy on preference customers' systems could result in decreased sales to these lower priority users of nonfirm.

3.1.4.1 Impacts on Consumers Served by the Policy

The availability of nonfirm service to utilities' consumers and to DSIs may affect the operations of the qualified facilities which secure nonfirm service, which may in turn alter their environmental impacts. However, the environmental impacts of these facilities generally are limited through existing regulations.

Environmental impacts from use of the alternate fuel, principally, air pollution and land use for disposal of ash (for solid fuels), will not occur while using nonfirm electrical power. Fuel will also be conserved in the Northwest. Approximate fuel savings in the Northwest and estimated reductions in air pollutant emissions and ash requiring disposal are shown in Table 3 on the basis of 1000 kWh of electricity sold to displace various fuel types. To put Table 3 into perspective, if 1400 MW of alternate fuel load existed to be served under the policy, BPA would expect to sell about 6.4×10^9 kWh to the alternate fuel market in an average year.

While reductions of air pollutant emissions and ash would be beneficial to air quality and reduce requirements for disposal of solid waste, it is doubtful that they would be significant to the region since fuel usage in industrial and large commercial and institutional applications is regulated by environmental control agencies and is not generally a direct cause of ambient air quality standard violations in the region. Furthermore, the alternative fuel loads are likely to be dispersed over the region, so there would be little cumulative effect. At best, use of nonfirm energy would provide only temporary relief of isolated cases where fuel usage at a facility is causing elevated pollutant levels or has excessive visual emissions.

3.1.4.2 Implications of Reduced Nonfirm Energy Availability to Other Customers

The new preference market for nonfirm energy created by the policy would, under some circumstances, reduce the amount of nonfirm energy available to other purchasers of nonfirm energy (the DSIs when purchasing nonfirm energy under contracts other than their contracts for Industrial Firm power; IOUs; Northwest scheduling, preference utilities; and utilities outside the Region) and potentially increase the cost of at least some of the nonfirm energy they would be able to secure. The following discusses the environmental implications of such changes in availability and cost.

3.1.4.2.1 DSIs - The DSIs historically have used nonfirm energy for service to their First Quartile at the Industrial Firm (IP) rate, for production increases, and for other purposes other than alternate fuel loads. The Supreme Court recently confirmed the priority of the DSIs First Quartile when served under the 1981 DSIs power sales contracts over other nonfirm loads (see Chapter 1.4.3). Therefore, Industrial Firm service to the DSIs is not affected by this policy. The policy may reduce the amount of nonfirm energy available for purchase by the DSIs other than under their Industrial Firm power sales contracts with BPA. However, this would not have a substantive environmental affect because: (1) the amount of Industrial Firm energy available is unchanged, and during times when nonfirm energy might be marketed under the policy, the DSIs would have sufficient Industrial Firm energy to maintain normal operation; (2) amounts of supplemental nonfirm energy purchased are small relative to their Industrial Firm energy purchases; and (3) supplemental nonfirm energy purchases are temporary and short term. Thus the effect of the policy on DSIs operations, and, therefore, on their environmental impacts, is not significant.

TABLE 3

ESTIMATED REDUCTIONS IN AIR POLLUTANT EMISSIONS, SOLID WASTE DISPOSAL REQUIREMENTS, AND FUEL USAGE IN THE NORTHWEST BY DISPLACEMENT OF ALTERNATE FUELS BY NONFIRM ELECTRICAL ENERGY (per 1,000 kWh of electricity sold) 1/ 2/

Pollutant	Fuel			
	Natural Gas	Distillate (No. 2) Oil	Residual (No. 6) Oil	Hog Fuel
Particulate, lb/1000 kWh	0.022 to 0.066	0.059	0.57 4/	2.1
Sulfur Oxides, lb/1000 kWh	0.0026	1.3 3/	7.7 4/	0.71
Carbon Monoxide, lb/1000 kWh	0.075	0.15	0.14	0.95
Hydrocarbons, lb/1000 kWh	0.013 (as CH_4)	0.030 (as CH_4)	0.028 (as CH_4)	0.95
Nitrogen Oxides, (as NO_2) lb/1000 kWh	0.53 to 1.0	0.65	1.7	4.7
Ash for Land Disposal lb/1000 kWh	---	---	---	4.7
Fuel Savings	4400 cu. ft. 4.4×10^6 BTU	30 gal 4.2×10^6 BTU	28 gal. 4.2×10^6 BTU	950 lb. 5/ 4.7×10^6 BTU

1/ Derived principally from emission factors contained in Compilation of Air Pollutant Emmision Factors, Third Edition, Part A, U.S. Environmental Protection Agency, 1977.
2/ Assumes generation of the nonfirm energy does not result in air pollutant emissions or ash (i.e., results entirely from hydroelectric sources).
3/ Assumes average sulfur content of 0.39 percent by weight.
4/ Assumes average sulfur content of 1.75 percent by weight.
5/ Containing 50 percent moisture.

DSIs purchases of nonfirm energy under the policy to serve alternate fuel loads have essentially the same impacts as if any other consumer used nonfirm energy to serve an alternate fuel load (see Chapter 3.1.4.1).

3.1.4.2.2 Investor-Owned Utilities - Sales of nonfirm energy to IOUs are subject to the priority of DSI First Quartile service under the Industrial Firm power sales contracts, entered into pursuant to the Pacific Northwest Electric Power Planning and Conservation Act, and preference customers' nonfirm energy sales. IOUs purchase BPA nonfirm energy to displace high cost thermal resources, to serve their own nonfirm loads, to meet occasional load overruns, and to increase their operating flexibility. The resources displaced by the IOUs are: (1) combustion turbines; (2) small thermal resources; (3) imports from the East (i.e., coal plants in Wyoming and eastern Montana); and (4) Northwest large coal-fired and nuclear generation.

Under current conditions, there is usually enough nonfirm available (either from BPA or the IOUs) to displace the combustion turbines and many of the small thermal resources. These resources are currently utilized only under extreme conditions such as when demands are very high during severe winter weather and hydroelectric generation is reduced because of low flows.

The variable costs of other resources operated or purchased by Northwest IOUs are low enough that they are not generally displaced unless BPA offers nonfirm energy under the Displacement rate.

Serving alternate fuel load under the policy decreases the likelihood of displacing any resource at any time. The average amount of BPA nonfirm available for displacing IOUs coal, nuclear, and other generating plants decreases by more than 20 percent in all but February, May and June. In terms of magnitude, however, the change is small in August through December because these are months of low availability of BPA nonfirm energy. In February, May, and June, there are substantial amounts, on the average, of Displacement rate nonfirm energy even with serving 1400 MW of nonfirm alternate fuel load under the policy.

The principal effect of the policy is a reduced chance of Northwest coal, and to a lesser degree, nuclear resources being shut down in any month, but especially in January, March, April, and July if as much as 1400 MW of alternate fuel load is served.

BPA has addressed the impacts of the region's principal nonhydroelectric resources in its "Role EIS" (BPA 1980b, pp. IV-43-59), and has generically addressed the impacts of other resources in the "Role EIS" and other documents. Operating these resources has adverse environmental effects, including air pollution, water pollution, thermal discharges, generation of solid and nuclear waste, and consumption of fuel. Reducing the chances of displacing resources, assuming that they would otherwise be shut down instead

of being operated to produce energy for export markets, has an adverse environmental impact. However, since displacements are temporary, and the resources are regulated and do not result in environmental effects which are abnormally severe for such facilities, the impacts of reduced likelihood of displacement are not considered significant.

3.1.4.2.3 Export Markets - Nonfirm energy which is not marketable within the region is available for purchase by public and private utilities outside the region, mainly to California utilities.

BPA nonfirm energy (and other Northwest purchases) is used by Southwest utilities to displace their own resources in the most economic fashion they can. Typically, oil and gas fired thermal generating plants are displaced first.

Use of BPA nonfirm energy in the Southwest saves the gas and oil which would otherwise be used to operate these generating plants. Since this policy expands Northwest nonfirm energy markets, less nonfirm energy will be available to sell to the Southwest. Columns 3 and 4 of Table 4 compare the amounts of energy which could be saved in the two regions by 1000 kWh of BPA nonfirm energy if used in one region versus the other. The differences are attributable to (1) transmission losses incurred in sending electrical energy to California markets; and (2) lower thermal efficiency of using fuel to generate electricity as opposed to using it in direct heating or industrial applications typical of the Northwest alternate fuel loads. However, since the policy increases the total market for BPA nonfirm energy, and since fuel savings occur in the Northwest when serving alternate fuel loads, it appears that overall conservation of fuel will occur. On the average, savings in fuel in the Northwest from increased use of BPA hydroelectric energy exceeds the increase in consumption for generation in California.

Environmental impacts of generation in California could also increase because of reduced availability of BPA nonfirm energy for export as a result of the policy. These impacts are principally air pollution, and of lesser importance, thermal discharges to the Pacific Ocean and water consumption.

The analysis presented in Appendix E indicates that as a consequence of serving 1400 MW of alternative fuel nonfirm load in the Northwest, the potential increases in air pollutant emissions, water consumption, and thermal discharges which may occur in California would not have a significant impact. For example, the largest change in quantity of an air pollutant emitted within any affected California air basin, as far as could be determined from the analysis, is a potential increase of 2.9 percent in sulfur oxides emissions in the South Central Coast air basin. (Since California utilities are now generally using gas instead of oil, sulfur oxides emissions are presumably now less than that predicted in the analysis.) Water consumption and thermal discharge increases are both less than 2 percent of the total potential quantities.

TABLE 4

COMPARISON OF ENERGY SAVINGS IN NORTHWEST WITH POTENTIAL ENERGY SAVINGS IN CALIFORNIA

CALIFORNIA			NORTHWEST
Energy Which Could be Delivered to Southwest in Lieu of Serving Northwest Alternate Fuel Load 1/ (per 1000 kWh available in the Northwest)	Average Heat Rate of California Resources Which Might be Displaced 2/ (per 1000 kWh generated)	Fuel Which Could Be Saved in California by Displacing Resources There With BPA Nonfirm Energy (per 1000 kWh available in the Northwest)	Fuel Which Could be Saved in the Northwest from Displacing Alternate Fuel Load With BPA Nonfirm Energy 3/ (per 1000 kWh available in the Northwest)
870 kWh to 940 kWh	9.61×10^6 BTU to 11.38×10^6 BTU	8.36×10^6 BTU to 10.7×10^6 BTU	Gas: 4.4×10^6 BTU (4400 cu. ft.)
		(57 to 73 gal. of residual oil or 8,360 to 10,700 cu. ft. of gas)	Oil: 4.2×10^6 BTU (28 gal. residual oil or 30 gal. distillate)
			Hog Fuel: 4.7×10^6 BTU (950 lb. 4/)

1/ Based on intertie transmission losses of 6 to 13 percent (Stanford Research Institute, 1976, p. 30).
2/ From Stanford Research Institute, 1976, p. 31.
3/ From Table 1 of this EA.
4/ At 50 percent moisture.

It should also be pointed out that when BPA nonfirm energy is being used to serve Northwest alternate fuel loads, energy may still be available to the California entities from other sources (e.g., Northwest IOUs, B.C. Hydro, or other Southwest utilites) which could reduce the impacts of the policy in California. The California entities may also seek to purchase BPA firm surplus. BPA will undertake appropriate NEPA compliance activities in conjunction with any long-term sales of its firm surplus.

3.2 IMPACTS OF ALTERNATIVE POLICIES

This section will discuss the environmental impacts of the alternative policies described in Chapter 2.1 relative to the environmental impacts of the policy.

3.2.1 Impacts of the No Action Alternative

Under the no action alternative, BPA operations and marketing will evolve in the absence of any policy to market nonfirm energy to serve alternate fuel loads. Thus, compared to BPA's historic (pre-1983) role, the no action alternative has no environmental impact. The environmental impacts of BPA operations and marketing may change as a consequence of other evolving operational and marketing practices, policies, and external factors, but would not change as a consequence of deviations from pre-1983 practices for marketing nonfirm energy to alternate fuel loads. Under the no action alternative, the six utilities and their consumers, and the one DSI with interim contracts would lose access to BPA nonfirm energy to serve alternate fuel loads for the foreseeable future.

Adverse and beneficial environmental impacts of the policy will not occur if the no action alternative is chosen.

3.2.2 Impacts of Nonfirm Sales to Utilities for Service to Consumers with Minimal Restrictions

Since this alternative places fewer restrictions on the sale of nonfirm energy to utilities, more nonfirm energy could be sold to this market under this alternative than under the policy. However, it is impossible to determine quantitatively by how much sales would increase. Also, the types of loads served with the nonfirm energy could be more varied. Some loss of firm load is likely to occur, and because there would be no requirement for alternate fuel capability, some nonfirm energy may be used for seasonal loads or production increases which occur solely because nonfirm energy is available.

Impacts relating to the generation and delivery of nonfirm energy might be exacerbated under this alternative compared to the policy. Since loads served under this approach may differ from those which would be served under the policy, some of its environmental benefits, namely conservation of fossil and other fuels in the Northwest and the resulting reduction in impacts (i.e., air pollution, ash disposal) may not occur. Also since nonfirm energy marketed under this alternative may be used to operate load or support increased production which would not otherwise be operated, there is a potential for incurring additional environmental impact, since these load or production increases are likely to produce air pollutants, water pollutants, and solid waste.

Since more nonfirm energy would likely be sold to the Northwest preference agency market under this alternative than under the policy, impacts to the IOUs and extraregional utilities would likely be greater in magnitude (see Chapter 3.1.4.2).

Consumers would have greater freedom to switch between firm and nonfirm service under this alternative than under the proposal, and this freedom may: (1) increase the difficulty in projecting future regional electrical and other energy resource needs; and (2) increase the risk of over or underdevelopment of future electrical energy resources, having environmental impacts as addressed in BPA's Final Role EIS (BPA, 1980b, pp. IV-113-115).

3.2.3 Impacts of Affirmative Action to Develop Interruptible Loads

This alternative could lead to greater sales of nonfirm energy to serve interruptible loads of Northwest utilities since BPA would encourage the development of such loads. The impacts of generating nonfirm energy will, therefore, be increased relative to what is expected under the proposal and the benefits associated with conservation of fossil and other fuels in the Northwest may also be enhanced in comparison with those expected under the proposed policy.

Since more nonfirm energy would likely be sold to the Northwest preference agency market under this alternative than under the policy, effects on other customer classes would likely be greater in magnitude.

3.3 IMPACTS OF ALTERNATIVES TO FEATURES OF THE PROPOSED POLICY

Chapter 2.2 described alternatives to specific features of the policy, which remain within the overall scope of the policy. This section addresses the impacts of those alternatives.

3.3.1 Eligibility of Firm Loads

Policy terms which allow for loads currently served with firm power to receive nonfirm energy, but prevent such loads from reverting to firm service later could: (1) reduce demand for firm energy; (2) increase demand for nonfirm energy; (3) decrease BPA revenues; and (4) increase the amount of surplus firm power BPA has to market.

Export markets would have to cope with a reduced availability of BPA nonfirm energy, and might therefore seek other sources of firm or nonfirm energy, purchase BPA firm surplus, or take whatever other alternative they believe to be most economical. If they chose to buy BPA surplus firm, Northwest nonfirm consumers would receive a greater degree of interruptibility in their service, and impacts of the use of alternate fuels in the Northwest would be relatively larger.

If consumers were permitted to unilaterally return to firm service after switching to nonfirm, marketing of surplus firm would be more difficult since potential extraregional surplus firm customers would realize that BPA may have to withdraw surplus firm sales in order to return to firm service for

Northwest consumers. If load growth had eliminated all surplus firm, new resources would have to be secured (with consequent environmental impacts of construction and operation, as generically addressed in BPA, 1980b, pp. IV-116-207) in order to serve consumers' loads returning to firm service.

3.3.2 Class of Load

The class of load (i.e., whether it is industrial, commercial, or other) eligible to receive nonfirm energy makes very little difference environmentally as long as the requirement for alternate fuel capability and the size of load limit is maintained. The impacts in the Northwest will be a reduction in emissions of air pollutants, ash disposal, and the operational impacts of the infrastructure supplying the fuel. There is no generic difference in generating nonfirm for one class of load versus another.

Where the class of load eligible does make a difference is in the amount of nonfirm which may be marketed under the policy. The policy incorporates the most liberal approach, that is no specific restriction on class, which allows for serving a greater amount of load under the policy. This results in more extensive environmental benefits from saving fuel in the Northwest, increased environmental impacts of generating and marketing nonfirm power, and larger effects on lower priority nonfirm energy customers.

3.3.3 Alternate Fuel Supply

Less restrictive requirements for alternate fuel capability would tend to increase the amount of nonfirm load to be served under the policy and the amount of nonfirm sales. This would also increase the impacts of generating nonfirm and impacts on other market classes. More restrictive requirements, such as using nonfirm to displace only the most polluting of the fuel burning facilities, would be difficult to impose and may even encourage use of "dirty" fuels by consumers who want to qualify for nonfirm energy service.

Not having a requirement for an alternate fuel supply would create a potential for consumers to use nonfirm energy to augment their firm power supplies to temporarily increase production, or for industries to be constructed solely to utilize nonfirm when it is available. Lack of an alternate fuel supply requirement may cause cyclical employment situations; hardship for firms who may contract for nonfirm energy without full realization of its limitations, and their employees; and, ultimately, political pressure to provide relief to the affected firms and their employees by providing some grade of firm power. Allowing firm electricity purchased from a utility which is not a customer of BPA to serve as an alternate fuel would potentially harm other ratepayers of that utility since it would have to maintain or secure resources to sell when BPA nonfirm energy is unavailable.

3.3.4 Size of Eligible Firm Load

The minimum size for a load eligible for nonfirm service under the policy is 1 average MW. Expanding eligibility to smaller loads may slightly increase the total amount of nonfirm load served under the policy, but the limiting factors are the cost of the metering and communication equipment and BPA's inability to practically schedule small amounts of energy. Increasing the

size limit to above 1 average MW would reduce the total load eligible for nonfirm service and, therefore, nonfirm sales under the policy. This would reduce both the adverse and beneficial environmental impacts of the policy.

3.3.5 River Conditions Under Which Nonfirm Energy Would Be Sold

Restricting sales of nonfirm to alternate fuel loads to periods of spill and/or imminent spill only would reduce the nonfirm sales to these loads by about the amount of nonfirm energy which might be available under nonspill conditions on the FCRPS at the Spill rate or a lower rate. Nonfirm energy is likely to be abundant and available for an extended period of time when the FCRPS is in a spill or imminent spill mode, and such a restriction would tend to mitigate problems with allocating nonfirm and with consumers' inability to adapt to rapid changes in nonfirm availability.

Such a restriction could deny access to some nonfirm energy by alternate fuel consumers if alternate fuel costs escalate rapidly. The environmental and economic benefits would decrease as a consequence of sales to alternate fuel loads, and would limit increases in the impacts of the policy on California.

This kind of restriction would not affect river operations and related resources such as fish, wildlife, and recreation any differently than under the policy since nonfirm generation would still be optimized to meet available nonfirm markets.

Operations with this kind of restriction would be different than under the policy if the FCRPS is in a nonspill condition and capable of generating nonfirm, but the non-alternate fuel markets for nonfirm are not sufficient to use the nonfirm that could be generated. This would result in exactly the same operation in this circumstance as would occur under the no action alternative.

3.3.6 Duration of Contracts

If shorter contracts were offered, less Northwest alternate fuel load is likely to be served and development of new alternate fuel load is less likely since the time in which one could be certain of payback from such an investment would be reduced. Thus, shorter contracts would reduce both the adverse and beneficial environmental impacts of the policy. Offering longer term contracts would have the opposite effect.

3.3.7 Notification and Scheduling

If provided with a shorter period for notices of nonfirm energy availability, fewer consumers would enter into contracts under the policy and less severe environmental impacts, adverse and beneficial, would occur. An increased notice period would generally be appreciated and would be an incentive to purchase nonfirm, but BPA would be more conservative in its notification and, as a result, would offer to sell less nonfirm.

The alternative of delaying the requirement for automated communication equipment until the number of participating consumers warrants such equipment puts utilities in an uncertain situation and may inhibit some marginally sized consumer loads from contracting with their utilities for the short term. Assuming enough customers contract to make automated communications equipment necessary, there would be no long term difference from the policy.

Chapter 4

OTHER CONSIDERATIONS

In addition to their responsibilities under NEPA, Federal agencies are required to carry out the provisions of other Federal laws. Most of the Federal actions related to the policy discussed in this EA do not require a detailed response regarding the requirements in these other Federal laws. Those requirements are more concerned with specific proposals for direct Federal development, and not with a policy such as the one assessed in this EA, which will primarily alter some Federal power marketing arrangements and, to some degree, operation of some Federal power resources.

4.1 ENVIRONMENTAL MANDATES

The other Federal laws and requirements which will not be affected by the policy but which were considered during preparation of this EA include:

1. Executive Order 12372 Review - The proposed policy does not involve any direct Federal development or development directly assisted through Federal grants, contractual arrangements, loans, loan guarantees, or insurance.

2. The Coastal Zone Management Act of 1972 - The proposal and alternatives are not included in Washington's or Oregon's list of Federal activities affecting their coastal zone programs.

3. Endangered Species Act - BPA has not identified any adverse effects on endangered species associated with this proposed policy. The proposed policy analyzed in this document does not directly involve a construction activity and, therefore, does not invoke a section (7) consultation.

4. Heritage Conservation - The proposed policy will not result in direct action by BPA or impose actions upon others which would affect historical or archeological resources. Therefore, the proposal does not meet the threshold required for consultation with appropriate agencies charged with Heritage Conservation.

5. Farmlands - The proposed policy will not convert farmlands to other uses because there are no site-specific BPA actions proposed in the policy nor does the policy impose actions on others which would affect farmlands.

6. Recreation Resources - BPA's proposed policy will not adversely affect any designated or proposed wild and scenic rivers, the National Trail System, or wilderness areas. Copies of this EA are being distributed for comment to appropriate land management agencies as consultation on this matter.

7. Permits for Structures in Navigable Waters - The proposed action does not include: (a) a structure or work in, under, or over a navigable water of the United States; (b) a structure or work affecting a

navigable water of the United States; or (c) the deposit of fill material or an excavation that in any manner alters or modifies the course, location, or capacity of any navigable water of the United States.

8. Permits for Discharges into Waters of the United States - The policy and its alternatives do not involve discharge of dredge or fill material into waters of the United States

9. Permit for Right-of-Way on Public Land - Neither the policy nor any alternative includes use of public lands in a way not in accordance with the objectives of the management of those lands, or requires a Federal land managing agency permit.

10. Fish and Wildlife Laws - There are several key provisions and requirements that Federal agencies must address, including:

    -- The Fish and Wildlife Coordination Act

    -- The Fish and Wildlife Conservation Act

    -- The Pacific Northwest Electric Power Planning and Conservation Act

    -- USFWS Mitigation Policy

    Both Federal and State fish and wildlife agencies will have the opportunity to comment on this EA, and BPA will consider their comments before a finding of no significant impact is made. It is BPA's obligation under the Fish and Wildlife Conservation Act to share scientific information and any other appropriate information with States for the purpose of assisting States in developing and revising conservation plans. By sending copies of this EA to State fish and game agencies, BPA is meeting its obligations of sharing information it has with the State agencies. BPA asks that State agencies keep it informed of development of conservation plans so that information can be supplied if it is available.

11. Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands - The proposed policy is indirectly related to other entities' management of Federal and non-Federal dams and reservoirs in floodplains. That management may affect wetlands adjacent to and connected to the Columbia River and its tributaries. However, such impacts will not exceed the operational parameters (flood control, navigation, and irrigation) established for each facility. Therefore, effects on floodplains and wetlands will not exceed those incurred during normal operation.

12. Pollution Control at Federal Facilities - The proposal does not require procurement of goods, services, or materials, so the contract compliance provisions of the Clean Air Act, Clean Water Act, and other environmental laws do not apply. Implementation of the policy will not alter the current status of any electrical generating

resource with respect to compliance with environmental regulations governing air pollution, water pollution, solid waste transport and disposal, hazardous waste, drinking water standards, noise, pesticides, or polychlorinated biphenyls (PCB). With additional nonfirm sales, operations of resources and transmission facilities would not violate currently applicable standards or permit conditions. Resources would not exceed a level of environmental impact that would not have occurred otherwise at times during normal operations.

13. Energy Conservation at BPA Facilities - The proposal involves operation of BPA facilities (i.e., the transmission system) at times when sales of nonfirm energy are made under the policy. However, the proposed action will be consistent with energy conservation requirements based on the system's adherence to design standards and general operating plans.

4.2 OTHER APPLICABLE LEGISLATION

In developing and implementing this policy, BPA is guided, in part, by the Council's Northwest Conservation and Electric Power Plan (Northwest Power Planning Council, 1983). The pertinent elements of the Council's Plan are contained in Chapter 10, Two Year Action Plan, Program No. 15 and are as follows:

> "The objective of this program is to develop additional markets for interruptible energy in the Northwest. The effort to develop additional means of retaining the economic benefits of low-cost secondary energy in the region is the most important single regional energy-related economic issue over which the region has control, and it should be treated accordingly."

BPA has been requested by the Council to:

- "Initiate a policy to develop, to the fullest extent possible, regional markets for secondary energy including industrial and irrigation markets;" and

- "Set an initial goal of 900 to 1,400 megawatts (MW) of potential interruptible load in the industrial sector and conduct further investigations to determine whether more potential is available."

The Bonneville Project Act, as amended, 16 U.S.C., Chapter 12B, and the Federal Columbia River Transmission System Act, Public Law 93-454, direct BPA to encourage the widest possible diversified use of all electric energy that can be generated and marketed at the lowest possible rates consistent with sound business principles. The Pacific Northwest Preference Act, Public Law 88-552, requires that before BPA can export energy from the region, BPA must determine that there is no market for such energy in the Northwest at any established rate (16 U.S.C. 837a; and 837b).

Providing low cost nonfirm energy to consumers which historically have not had access to it is expected to enhance BPA revenues which will, in turn, help hold down rates for all grades of BPA power. In this manner, implementation of the policy carries out the directives of the Bonneville Project Act, as amended, the Transmission System Act, and the Regional Act.

Chapter 5

CONSULTATION

5.1 POLICY DEVELOPMENT PROCESS

Over the past several years, BPA rates for electric power in the Northwest have escalated rapidly. In order to increase BPA revenues, BPA began to look for new ways to market nonfirm energy in the Northwest.

1. On November 30, 1982, BPA requested public recommendations on ways it could effectively market surplus firm energy (47 FR 53928). A number of the 58 respondents suggested BPA investigate ways to market nonfirm energy in the Northwest as an alternative to firm energy sales outside the region.

2. In March 1983, BPA completed drafting principles for selling nonfirm energy to its Northwest utility customers for industrial and irrigation loads with substitute energy sources. BPA made sales of this type available to Northwest utilities beginning in January 1983 on an interim basis. BPA discussed the interim principles with representatives of preference utilities, IOUs, the DSIs, and industrial consumers of Northwest utilities. BPA requested public comment on these principles in a FEDERAL REGISTER Notice on March 15, 1983 (48 FR 10903).

3. Meetings have been held as part of the policy development. BPA staff met with members of the Association of Public Agency Customers (APAC) and other industries to discuss ideas for the long-term policy, and also met informally with private utilities who are exploring these markets themselves.

4. A Notice of Proposed Policy for Nonfirm Energy Sales for Utilities' Industrial Loads was published in the FEDERAL REGISTER on July 22, 1983 (48 FR 33518). Public involvement meetings on the proposal were held in Portland, Seattle, and Spokane, and written and oral comments were accepted through August 31, 1983. This EA addresses the policy which resulted from the July 22, 1983 proposal, as modified to take into account the comments received.

5.2 ENVIRONMENTAL ASSESSMENT DISTRIBUTION

The following is a general list of agencies and organizations who will receive a copy of this EA for review and comment.

Federal Agencies

US Environmental Protection Agency, San Francisco, CA
Seattle, WA
Denver, CO
US General Accounting Office, Portland, OR
USA Corps of Engineers, Portland, OR, and Pomeroy, WA
USDA, Forest Service, Portland, OR, and Missoula, MT

USDOC, National Marine Fisheries Service, Rufus, OR, and Pasco, WA
USDOE, Western Area Power Administration, Loveland, CO
Sacramento, CA
Golden, CO
Salt Lake City, UT
USDOI, Bureau of Indian Affairs, Warm Springs, OR
Lapwai, ID
USDOI, Bureau of Reclamation, Boise, ID
USDOI, National Parks Service, Seattle, WA
USDOJ Attorney's Office, Portland, OR

State Agencies

California: Air Resources Board
Bay Area Air Quality Management District
Department of Water Resources/Energy
Energy Commission
Public Utilities Commission
South Coast Air Quality Management District

Idaho: Public Utilities Commission
Department of Fish and Game
Division of Financial Management Clearinghouse
Department of Health and Welfare

Montana: Department of Community Affairs
Department of Fish, Wildlife, and Parks
Department of Natural Resources and Conservation

Nevada: Public Service Commission

Oregon: Department of Agriculture
Department of Energy
Department of Fish and Wildlife
Department of Transportation, Parks, and Recreation
Employment Division
Intergovernmental Relations Division
Public Utility Commission
State Executive Department
Department of Environmental Quality

Utah: Department of Health

Washington: Department of Commerce and Economic Development
Department of Ecology
Department of Fisheries
Department of Game
Office of Financial Management
Office of the Governor

Interest Groups

Association of Public Agency Customers

Citizens for a Solar Washington
Coalition for Safe Power
Columbia River Inter-Tribal Fish Commission
Confederated Salish and Kootenai Tribes
Fair Electric Rates Now
Forelaws on Board
Idaho Environmental Council
Idaho Wildlife Federation
League of Women Voters of Oregon
National Wildlife Federation
Natural Resources Defense Council
Northwest Conservation Act Coalition
Northwest Indian Fisheries Commission
Oregon Safe Energy
Oregon Wildlife Federation
Seattle Comm. to Stop Rising Fuel Prices
WASHPIRG

Other Interested and Affected Parties

BPA Customers
Businesses
City and County Governments
Individuals
Law Offices
Universities

Chapter 6

CONCLUSIONS

The policy for marketing nonfirm energy to utilities for service to interruptible loads which have an alternate, nonelectrical energy source for use when BPA nonfirm energy is unavailable will have no new environmental impacts as a consequence of physical changes in operation of the FCRPS. The policy may have minor environmental impacts resulting from changes in operation of generating plants and of qualified consumers' facilities induced by changes in the availability of BPA nonfirm energy to various market classes. Based on the analysis in this EA, the impacts are not expected to be environmentally significant even assuming as much as 1400 MW of nonfirm load served under the policy.

BPA has reviewed all aspects of this policy for compliance with legislative and executive mandates adopted to safeguard the integrity of the human environment. BPA has consulted formally and informally with other agencies and entities which may be affected by the policy.

In review of the policy, BPA has not identified any unresolved conflicts over alternative uses of available resources affected by this policy. No controversial circumstances or conditions will be created or furthered by this policy.

Unless public and agency review of this environmental assessment reveals sufficient information to the contrary, it will be concluded that implementing the proposed policy is not an action significantly affecting the quality of the human environment, and an environmental impact statement will not be prepared.

APPENDIX A

GLOSSARY

Appendix A

GLOSSARY

ADVANCE ENERGY - Electric energy delivered at BPA's option to industrial customers in lieu of restricting Industrial Firm Power (power that may be delivered to industries on a contract basis), at times when FCRPS controlled reservoirs are on storage control. This energy may be subject to later return if needed to meet BPA's firm loads. This arrangement improves the availability of service and results in greater sales revenues to BPA.

AVERAGE MEGAWATTS (MW) - A measure of average power over a given time period. To determine the average megawatts, divide the total megawatt hours measured in the time period by the number of hours in the period, e.g., if 10 megawatt hours of electric energy are measured over a 5-hour period, then 2 average megawatts would be the average rate of which power is delivered. The term is also commonly used to express an amount of energy. Ten average annual MW would be the amount of energy that a 10 MW generator would produce running full time at capacity for a year, or the amount a 20 MW generator would produce operating at capacity for 1/2 year, or the amount a 20 MW generator would produce operating at 1/2 capacity for a whole year.

BASE HISTORICAL FIRM LOAD - That portion of a consumer's load which data indicates has been firm in the past. BPA proposes not to serve load which has historically been firm with nonfirm energy. BPA may make exceptions to the extent that a lower base firm load level would more accurately reflect long-range trends. For example, if an industrial consumer has shut an electric boiler down because electric rate increases have made an alternate fuel more economical, the base firm load may be adjusted accordingly.

COGENERATION - The simultaneous production of electrical energy and other useful energy, such as usable heat, from a fuel source.

CRITICAL PERIOD - That portion of the historical 40-year streamflow record which, when combined with draft of all available reservoir storage, will produce the least amount of energy being generated according to seasonal load patterns.

DEMAND METER - A device that indicates and/or records the maximum number of kilowatts used during a period of time which is the demand for energy.

DISPLACEMENT RATE - One of the rates at which nonfirm energy may be marketed. It may be implemented after nonfirm energy markets at higher rates are satisfied, and is intended for displacement of coal and nuclear resources and service to alternative fuel loads with a decremental cost lower than the other nonfirm rates.

ENERGY METER - A meter which measures the total kilowatthours of energy that a customer uses.

FELCC SHIFT - A planning action, under the Coordination Agreement, in which the Coordinated System generates more FELCC in one portion of the critical period while generating less FELCC in another portion of the critical period. Usually FELCC is shifted into the first year of the critical period, resulting in deeper draft of reservoirs.

FIRST QUARTILE - The quarter of industrial firm power operating demand under the 1981 DSI power sales contracts with BPA which can be restricted at any time and for any reason in order to protect BPA's ability to meet its firm obligations, and as otherwise provided in Section 7 of the 1981 DSI-BPA power sales contracts.

PREFERENCE CUSTOMERS - Cooperatives and public bodies (states, public utility districts, counties, municipalities, and Federal customers) in the Northwest, because they have been given preferential rights to FCRPS generated hydroelectric power by Congress.

REGIONAL, REGION, PACIFIC NORTHWEST, NORTHWEST - Refers to the BPA service area as defined by the Pacific Northwest Electric Power Planning and Conservation Act as follows:

> ". . . the area consisting of the States of Oregon, Washington, and Idaho, the portion of the State of Montana west of the Continental Divide, and such portions of the States of Nevada, Utah, and Wyoming as are within the Columbia River drainage basin; and . . . any contiguous areas, not in excess of seventy-five air miles from the area referred to in subparagraph (A), which are a part of the service area of a rural electric cooperative customer served by the Administrator on the effective date of this Act which has a distribution system from which it serves both within and without such region."

SPILL RATE - A rate for BPA nonfirm energy equal to 11.0 mills per kilowatthour, as provided in he 1983 Rate Schedule.

STANDARD RATE - A rate for BPA nonfirm energy equal to 18.5 mills per kilowatthour, as provided in the 1983 Rate Schedule.

VARHOUR METER - A device which measures the reactive energy in a circuit.

WATER BUDGET - Provides certain volumes of water to achieve desired flows at Priest Rapids and Lower Granite control points during April 15 to June 15 to increase the flow velocities of the water between dams to reduce spring period migration time for juvenile salmon and steelhead.

APPENDIX B

DESCRIPTION OF NONFIRM POLICY FEATURES

Appendix B

DESCRIPTION OF NONFIRM POLICY FEATURES

B.1 QUALIFICATIONS OF LOAD FOR NONFIRM SERVICE

Under the policy, BPA intends to make nonfirm service available only for the part of the alternate fuel load which is in excess of each consumer's or DSI's base historical firm load level. Furthermore, the level of nonfirm service will not exceed the difference between historical firm service levels and the equivalent electrical capacity of the required alternate fuel source. BPA would discount recent electrical load operating level fluctuations in determining historical firm load levels if the fluctuations do not reflect long range trends. In determining base firm load levels and nonfirm load levels, BPA would avoid loss of firm load to nonfirm energy service.

A qualifying alternate fuel source is, generally, a nonelectrical way of fully meeting the energy need for which nonfirm electric energy from BPA would be used. The alternate fuel source must be capable of providing at least as much energy as the nonfirm electrical energy at the maximum demand. Since the alternate fuel source must be nonelectrical, a load which requires its energy to be in electrical form (e.g., an electric arc steel furnace or a city streetlight system) would not qualify for service under this policy.

B.2 TERM

Nonfirm contracts offered under this policy would last through June 30, 1987, a time approximately equal to BPA's 42-month critical period, starting at the beginning of policy development. This allows sufficient time to gain experience under this policy and allows later contracts to be brought in line with any subsequent nonfirm policy development. At the end of the second and third years, the initial contracts will require review of BPA's and the utilities' expectations regarding their ability and intent to negotiate future agreements for nonfirm energy. Resources to provide firm service may be available upon expiration of the initial contracts. If customers taking nonfirm energy under the policy desire to receive firm service after the term of the contract, they would be required to give BPA 2-years notice of such intent (unless BPA waives this requirement), or longer notice as may be required under sections 8 and 9 of the Regional Act utility power sales contracts.

B.3 NOTIFICATION AND SCHEDULING

B.3.1 Notification of Nonfirm Energy Availability

Under the policy, BPA would notify each utility and DSI purchaser when it had nonfirm energy available for their nonfirm alternate fuel loads. The notification would include estimated price, duration, and amount of nonfirm energy available. These estimates would not be guarantees and would be subject to change at any time (except if the customer paid extra and was buying nonfirm energy under the Guaranteed Delivery provisions of the NF-83 Rate Schedule). However, BPA is obligated to provide the best estimates based

on current information. BPA would inform each participating utility of any revisions in its estimates with maximum practicable notice. It would be the responsibility of the purchaser and the consumer to respond to any change in availability.

B.3.2 Purchase of Nonfirm Energy

During periods of nonfirm energy availability, nonscheduling purchasers can be required, in accordance with the policy, to notify BPA's schedulers by noon of each workday prior to the delivery of nonfirm energy to a load. However, BPA schedulers may, from time to time, require less frequent communications in certain circumstances.

Scheduling purchasers would follow appropriate scheduling procedures specified in their power sales contracts.

B.3.3 Transition to Alternate Fuel

At times when BPA no longer has any nonfirm energy available, any energy taken for the nonfirm load would be billed at the charge for unauthorized increases under the applicable BPA power rate schedule.

BPA intends to give maximum practicable notice to purchasers of any change in nonfirm availability. BPA generally knows about a week in advance when spill energy will no longer be available. After the spill condition, nonfirm energy often continues to be available, but it is generally more difficult to forecast the availability of this nonspill type of nonfirm energy. However, BPA proposes in this policy to reserve the right to give notice of termination of nonfirm availability, effective at the end of any hour.

BPA could have provided a short, fixed notice period of the end of nonfirm availability. However, the result of a fixed notice period would merely be that BPA would be more conservative in giving notice and, thus, nonfirm availability might sometimes extend beyond the end of the notice period.

In the event of a sudden loss of generating capacity or transmission, BPA would give notice if possible, but there is little which can be done to mitigate the effects of an unexpected change of availability of this sort.

BPA offers a guaranteed delivery option in the current rate schedule for nonfirm energy. The delivery is generally guaranteed through the next 4 days but is subject to restriction in the event of a system emergency. A purchaser could take advantage of such an offer under nonfirm contracts concluded in accordance with this policy.

B.4 FACILITIES

Purchasers who take advantage of the proposed nonfirm service would be responsible for installation of metering and communication equipment required by the policy. BPA does not propose to recover the cost of such facilities from nonfirm revenues. However, BPA may install the facilities for the purchaser at the purchaser's or the consumer's expense.

B.4.1 Metering

In order to segregate the amounts of nonfirm energy from amounts of firm power delivered at the point of delivery, an hourly recording demand meter, and an energy meter are required, and a varhour meter may be required at each consumer's nonfirm load served under the policy. Installation of these meters at the load provides a means of computing the amount of nonfirm energy for which the purchaser will be billed and verifies that the nonfirm energy got to the consumer's nonfirm load.

BPA has implemented a program to install remote reading equipment on point-of-delivery meters. This would require the purchaser to install remote reading capability at the point of metering. This will allow BPA to prepare billings quickly and will allow BPA's Division of Power Supply daily access to amounts of nonfirm energy actually taken. The purchaser would also have to provide a dedicated telephone line as part of the remote reading equipment.

Costs of metering and remote reading equipment and installation can be as much as $6,200 if all new equipment must be used and the metering and remote reading equipment are installed at separate times. Installing both at once is less expensive at about $5,500. Costs of the metering equipment alone is about $2,700 including installation.

B.4.2 Communications

BPA expects to install an automatic communications system which will facilitate notification of nonfirm availability. The purchaser would be required to have a hard copy terminal with auto answer modem to receive messages from BPA. The cost of the terminal is about $1500. A separate phone line would also be required. More frequent communication from BPA would result because of the ease of operation. If a purchaser or consumer had any question about a message received, it could call BPA. If a purchaser and a consumer desire, an additional communication terminal could be installed at the consumer's facility.

B.5 ALLOCATION

In the event that demand for nonfirm energy exceeded the supply, BPA would allocate the available nonfirm energy in accordance with the Bonneville Project Act and the Pacific Northwest Preference Act (P.L. 88-552). This means that (1) Northwest markets will be served first (e.g., prior to serving Southwest markets); (2) within the Northwest, DSI First Quartile will be served first, after which preference customers will be given preferential access to nonfirm energy; and (3) within a customer class (e.g., among preference customers), nonfirm energy will be equitably allocated. DSI alternate fuel loads will not be treated like DSI First Quartile loads, and DSI alternate fuel loads will not have priority over Northwest preference customers' alternate fuel load demands for nonfirm energy.

B.6 APPLICATION FOR FIRM SERVICE

By definition, BPA is not obligated to make nonfirm energy available. In 1983, the region enjoyed a good water year with an abundance of nonfirm energy. This abundance has been increased by BPA's firm load underruns. As

conditions change, consumers may wish to convert nonfirm loads to firm service. BPA is not obligated to allow such a conversion before the expiration or termination of the nonfirm contract, but may allow such a conversion prior to that time (see Appendix B.2).

Limiting the electrical loads served under the policy to receiving only nonfirm service for the duration of the contract prevents switching from firm power (when firm power is economical) to nonfirm energy (when nonfirm is available and economical) and vice versa. Allowing such switching could effectively result in serving a firm load, for which BPA has a firm planning obligation, with nonfirm energy, and would be detrimental to both BPA revenues and planning.

For any subsequent nonfirm contracts, BPA might require different notice for firm service to loads, especially if BPA is no longer in a surplus condition.

B.7 RATES

B.7.1 Wholesale Rates

BPA cannot determine a rate for nonfirm energy in this policy. Rates for BPA wholesale power, including rates for nonfirm energy, are determined in a separate wholesale power rate adjustment process independent from the development of this proposed final policy. New rates resulting from the last such process took effect November 1, 1983, and will continue through June 30, 1985. The final step in setting these rates was the preparation of the "1983 Final Rate Proposal Wholesale Power Rate Design Study" (BPA, 1983b) which describes the rates and their uses. The new rates were also the subject of the "Bonneville Power Administration 1983 Wholesale Power Rate Final Environmental Impact Statement" (BPA, 1983c).

B.7.2 Retail Rates

BPA has not proposed inserting a provision in the policy which would limit a purchasing utility's markup of nonfirm energy.

BPA encourages any consumer considering entering into a contract for nonfirm service with its utility pursuant to this policy to negotiate an upper limit to the markup for the duration of the contract.

Under the interim nonfirm agreements (see Chapter 1.4.3), BPA felt that a limitation on the amount of markup a utility attempted to pass through to a consumer would be unnecessary, since utilities and their consumers would generally negotiate to develop a mutually satisfactory rate. However, BPA received comments from certain consumers that their utilities were attempting to pass through too high a markup on the nonfirm, resulting in delays in

entering into an interim agreement. Utility markup in their nonfirm retail rates could cause those rates to be uncompetitive with alternate fuels. BPA encourages utility purchasers of nonfirm to consider adopting retail nonfirm rates designed to be competitive with alternate fuels.

APPENDIX C

CUSTOMERS TO WHICH NONFIRM ENERGY HAS BEEN SOLD UNDER THE INTERIM CONTRACTS

Appendix C

CUSTOMERS TO WHICH NONFIRM ENERGY HAS BEEN SOLD UNDER THE INTERIM CONTRACTS

a. Umatilla Electric Cooperative contracted for up to 40 average MW of nonfirm energy, beginning January 9, 1983, for three potato processing plants. All three plants have natural gas-fired boilers as alternate fuel sources.

b. The City of Port Angeles contracted for approximately 7 average MW of nonfirm energy, beginning February 1, 1983, for an electric boiler at a Crown Zellerbach paper mill. The mill can use wood waste in lieu of electricity.

c. Cowlitz County Public Utility District contracted on February 25, 1983, for approximately 75 average MW of nonfirm energy for electric boilers at Longview Fibre and Weyerhaeuser mills. These mills can also use wood waste as fuel. Kalama Chemical, Inc. was later added on December 1, 1983, to the contract in order to receive approximately 14 average MW of nonfirm energy. This consumer can utilize oil or gas as an alternate energy supply.

d. Tillamook County People's Utility District contracted for approximately 3 average MW of nonfirm energy since June 11, 1983, for service to a boiler at the Tillamook cheese factory. The cheese factory can use oil as an alternate fuel.

e. Snohomish County Public Utility District contracted for approximately 45 total average MW of nonfirm energy for service to the electric boiler loads of the Weyerhaeuser Kraft Paper and Lumber Manufacturing Facility and the Boeing Commercial Airplane Company since May 11, 1983. Weyerhaeuser can run alternate fuel boilers with natural gas, oil, or black liquor, a by-product of kraft pulp production. Boeing can fire boilers with natural gas or oil in lieu of electricity.

f. Lewis County Public Utility District contracted for approximately 3 average MW of nonfirm energy between June 9, 1983, and November 1, 1983, for service to the American Crossarm and Conduit Company. Lewis received nonfirm service under the curtailment provisions of the interim nonfirm principles which stated that loads which were curtailed or not operating on March 1, 1983, or for which an announcement of such curtailment had been made, were eligible for nonfirm service under the principles if the consumer signed an affidavit attesting that the load would not operate unless nonfirm energy were made available.

g. Kaiser Aluminum and Chemical Corporation, a DSI, contracted for nonfirm energy beginning January 12, 1984 to operate a 10-MW boiler at their Mead, Washington, aluminum reduction plant. The plant can alternatively fire gas to meet its steam needs.

APPENDIX D

ASSUMPTIONS USED IN DETERMINING CHANGES IN BPA NONFIRM ENERGY AVAILABILITY TO VARIOUS MARKETS

Appendix D

ASSUMPTIONS USED IN DETERMINING CHANGES IN BPA NONFIRM ENERGY AVAILABILITY TO VARIOUS MARKETS

The secondary energy analysis performed for this EA assumed that:

1. 1400 MW of alternate fuel nonfirm load is contracted for under the policy;

2. all of the load is on Northwest preference agency systems;

3. all preference agency nonfirm load consists of alternate fuel load (i.e., the preference agencies serve no other nonfirm loads);

4. the Spill rate is effective whenever BPA has over 2500 MW of nonfirm energy to market, and the Standard rate is effective at other times; and

5. the consumers served with nonfirm energy under the policy utilize as much nonfirm energy as they can for 1400 MW of load whenever it is available at the Spill or a lower rate and buy 20 percent of this amount when the Standard rate is in effect.

The first three assumptions tend to maximize the impacts of the policy on other customer classes. The third and fifth assumptions reflect a realistic marketing situation in that BPA implements its nonfirm rates to maximize revenues, and the alternate fuel is generally more economical than nonfirm energy at the Standard rate. Under these assumptions, the secondary energy analysis performed for this EA showed that in an average year about 732 average MW (6.42×10^6 MWh) would be used by the Northwest alternate fuel market.

APPENDIX E

IMPACTS ON THE CALIFORNIA ENVIRONMENT

Appendix E

IMPACTS ON THE CALIFORNIA ENVIRONMENT

The Stanford Research Institute (SRI) study (1976) entitled Environmental and Socioeconomic Impacts of Sales of Secondary Electrical Energy to California Utilities was prepared under contract to BPA to provide information for BPA's Role EIS. Although now somewhat outdated, the data it contains and the methodologies used in its preparation can still be used for an "order of magnitude" assessment of the impacts of the proposed final policy on water consumption, air quality, and thermal pollution in California. This analysis assumed that the Western Area Power Administration's intertie capacity was fully utilized for firm energy deliveries. The results of the analyses are summarized in Tables E-1 and 2; Figure E-1 shows the air basins referred to in Table E-2.

The SRI report (1976) projected the impacts of the sales of BPA nonfirm energy for the 1975 calendar year in which 9.2 million MWh were sold to the California utilities. Table 20 of the SRI report showed the impacts by pollutant of that sale on the five air basins (shown in Table E-2 and Figure E-1 of this EA) as a percentage of total emissions in each year for 1973. Depending on the basin and pollutant, emissions reductions by the 1975 sale ranged from 1 to 17 percent of the 1973 emissions. The largest impact in terms of percent of the 1973 emissions was the 17 percent decrease for sulfur oxides in the South Central Coast air basin, which represented an impact of reducing sulfur oxide emissions that year in that basin by about 1825 tons. If 1825 tons represented 17 percent of the 1973 sulfur oxide emissions in the South Central Coast air basin, the total emissions for that year must have been about 10,735 tons. The impact on sulfur oxide emissions in the South Coast air basin of serving 1400 MW of alternate fuel nonfirm load in the Northwest is, on the average, an increase of about 315 tons per year, as projected using the data and methodology of the SRI study. This amount represents about 2.9 percent of the 1973 total emissions. A similar comparison can be made for other pollutants and air basins by using Table 20 of the SRI study. Where such a comparison can be derived from this table, the average increase in potential emissions projected as a consequence of serving 1400 MW of alternate fuel nonfirm load is also given in terms of percent of 1973 total air basin emissions on Table E-2. As can be seen, these percentages are quite small. Even allowing for changes in the total amounts of emissions in the five California air basins since 1973, and changes in the emissions from California generating plants which might be displaced (which are likely to have been reduced through improved air pollution control), the impacts of serving 1400 MW of alternate fuel load does not appear to have significant impact on air quality in California.

TABLE E-1

POTENTIAL INCREASES OF WATER CONSUMPTION
AND THERMAL DISCHARGES RESULTING FROM
DECREASED AVAILABILITY OF BPA NONFIRM ENERGY 1/ 2/

Utility	Average Annual Increase in Water Consumption 106 gal/year	Average Annual Increase in Thermal Discharges, 109 BTU/year
Pacific Gas and Electric Co.	206	1760
Southern California Edison Co.	190	1640
San Diego Gas and Electric Co.	39.2	337
Los Angeles Dept. of Water and Power	87.1	752
Burbank Public Service Dept.	10.7 3/	93.2
Glendale Public Service Dept.	11.7 3/	98.1
Pasadena Water and Power Dept.	6.1	52.5
TOTAL	550.8	4,732.8

1/ Assumes 1400 MW of alternate fuel nonfirm load in the Northwest.
2/ Table 21 of the SRI report indicates a total potential water use by the resource of the seven utilities as being about 2.9 x 1010 gal/year, and total potential thermal discharges of about 3.6 x 1014 BTU/year.
3/ Uses recycled water from municipal sewage.

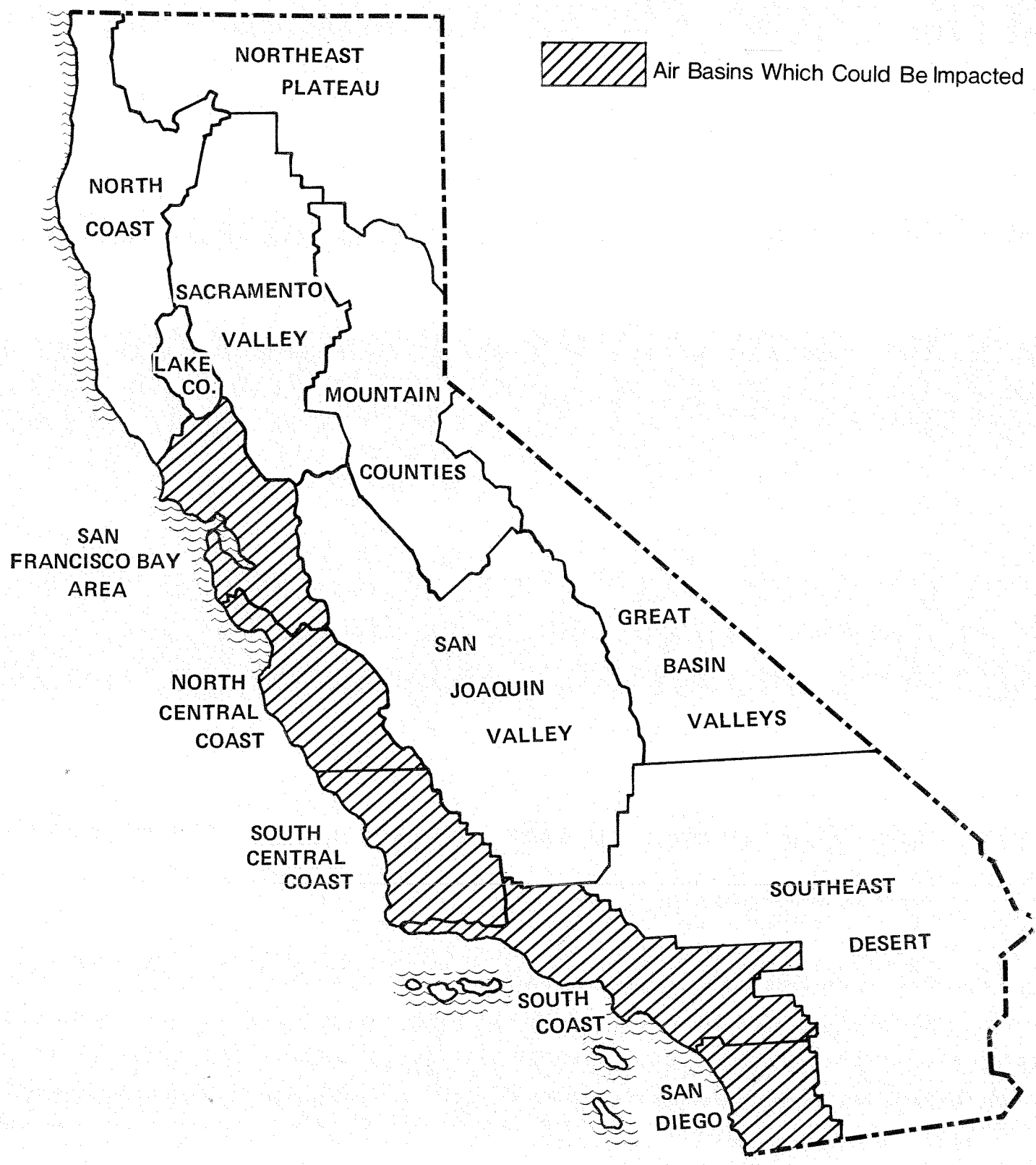
TABLE E-2

POTENTIAL INCREASES OF AIR POLLUTANT EMISSIONS RESULTING FROM DECREASED AVAILABILITY OF BPA NONFIRM ENERGY

Air Basin	Particulate		Sulfur Oxides		Carbon Monoxide 3/	Hydrocarbons 3/	Nitrogen Oxides	
	average tons/year	Percent of 1973 total 2/	average tons/year	Percent of 1973 total 2/	Average Tons/year	Average tons/year	average tons/year	Percent of 1973 total 2/
San Francisco Bay Area 1/	92.0	0.19	1030	0.94	0.615	33.8	880	0.37
North Central Coast 1/	56.5	0.22	630	3.5	0.378	20.8	540	1.5
South Central Coast 1/	28.3	0.31	315	2.9	0.185	10.4	271	1.3
South Coast	249	0.24	2820	1.4	1.69	92.8	1160	0.24
San Diego	33.5	3/	372	1.8	0.223	12.3	90.3	3/
TOTAL	459.3		5167		3.091	170.1	2941.3	

1/ Pacific Gas and Electric Company emissions divided among these three basins in proportion to the capacities of the plants in each region as listed in Table 21 of the SRI report (1976).
2/ Percent of 1973 total emissions are derived from Table 20 of the SRI study (1976).
3/ Data to calculate percentage of 1973 emissions not available from Table 20 of the SRI study (1976).

FIGURE E1
CALIFORNIA AIR BASINS



APPENDIX F

REFERENCES

Appendix F

REFERENCES

Bonneville Power Administration, 1974, Final Environmental Impact Statement: Wholesale Power Rate Increase, August 15.

Bonneville Power Administration, 1977a, Draft Environmental Impact Statement: The Role of the Bonneville Power Administration in the Pacific Northwest Power Supply System Including Its Participation in the Hydro-Thermal Power Program, July.

Bonneville Power Administration, 1977b, Environmental Assessment of Continued Operation of the Hanford Generating Project, Washington Public Power Supply System, Richland, Washington, September 5.

Bonneville Power Administration, 1979, Final Environmental Impact Statement: 1979 Wholesale Rate Increase, October.

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Bonneville Power Administration, 1980b, Final Environmental Impact Statement: The Role of the Bonneville Power Administration in the Pacific Northwest Power Supply System Including Its Participation in a Hydro-Thermal Power Program, (Role EIS), December.

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Bonneville Power Administration, 1983b, 1983 Final Rate Proposal Wholesale Power Rate Design Study, September.

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Bonneville Power Administration, 1983d, Issue Backgrounder: Surplus Power, November.

Ekono, Inc., 1982, Utilization of Electric Boilers as a Sink for Surplus Power in the Bonneville Power Administration Service Area, prepared for the Northwest Power Planning Council, November 19.

Northwest Power Planning Council, 1982, Columbia River Basin Fish and Wildlife Program, Final, November.

Northwest Power Planning Council, 1983, 1983 Northwest Conservation and Electric Power Plan, Vol. 1, April 27.

Stanford Research Institute, 1976, Environmental and Socioeconomic Impacts of Sales of Secondary Electrical Energy to California Utilities, May.

U.S. Environmental Protection Agency, 1977, Compilation of Air Pollutant Emission Factors, Third Edition, Part A, August.

Bonneville Power Administration
U.S. Department of Energy

EQ 4-2 alpha
"Alt. Fuel..."

BPA

DATE : JUL 26 1984

In reply refer to : SJ

UNITED STATES GOVERNMENT

Memorandum

TO : Larry C. Larson
Assistant Administrator - ACT

FROM : Anthony R. Morrell
Environmental Manager - SJ

Anthony R. Morrell

SUBJECT: Transmittal of Environmental Assessment (EA) on BPA's Proposed Policy for Sales of Nonfirm Energy for Service to Loads with Alternate Fuel Capability

Attached is our memorandum to the Assistant Secretary for Policy, Safety, and Environment (AS/PE) requesting that he approve the subject EA.

Please forward attached items after removing your copies:

1. Memorandum to AS/PE.

2. Environmental Assessment (two copies for you and five copies for AS/PE).

Thank you for your assistance. Please call Tom McKinney ? at FTS 429-4721 if you have any questions.

2 Attachments

TMcKinney:jh (WP-SJ-28810)

cc:
Environmental Coordinator - PGC + Randy
Official File - SJ
x-4721

EQ 4-2 alt. fuel
Nonfirm Policy EA
-general

DATE FEB 27 1985

U.S. DEPARTMENT OF ENERGY BONNEVILLE POWER ADMINISTRATION

TRANSMITTAL FOR ADMINISTRATOR'S ACTION

TYPE OF DOCUMENT AND ADDRESSEE: Final Nonfirm Energy Policy for Consumer Alternate Fuel Loads

ROUTING ORDER	ROUTING SYM	TO	DATE IN	DATE OUT	INITIALS
X	PK	TNoguchi			
X	PS	BGriffin			
X	PGC	RFox		3/7	RDF
1.	PK	JMcLennan			
	PK	WPollock Info. Copy			
X	D	FINANCIAL MANAGEMENT			
	E	ENGINEERING & CONSTRUCTION			
	K	CONSERVATION			
X	O	REGIONAL OPERATIONS			
2.	P	POWER AND RESOURCES MANAGEMENT			
	S	MANAGEMENT SERVICES			
X	AP	GEN. COUNSEL			
X	AL	EXTERNAL AFFAIRS			
	OD	GOVERNMENT AFFAIRS			
	AD	SPECIAL ASST TO THE ADMIN			
3.	A	EXEC ASST ADMINISTRATOR			
4.	A	DEPUTY ADMINISTRATOR			
5.	A	ADMINISTRATOR			

ORIGINATOR AND TYPIST: AUKitchen/CCombs:lk

ROUTING: PKL

EXT: 3555

CCO No. _____, Date Due _____

SUMMARY

Transmittal for approval by the Administrator is this Federal Register Notice of the Final Nonfirm Energy Policy for Consumer Alternate Fuel Loads.

approval contingent on corrections marked on pp. 13, 15, 16, 17, 31, 32.

Simultaneous: Due C.O.B. Wednesday, March 6, 1985

Roy initialed 3/7/85

☒ **Washington, D.C., Office contacted through** L. Larson (NAME) _____ (DATE)

☐ **Not applicable for this document.**

☐ This document involves a change in Administration policy.

☐ Return for mailing processing.
☒ Call when signed. Name: Lois or Margaret Ext. 3564
☐ Document will be transmitted by facsimile as soon as signed.
☐ Document will be telecommunicated as soon as signed.
☒ Special instructions: If any questions, please call Aleka Kitchen Ext. 3555

U.S. DEPARTMENT OF ENERGY — BONNEVILLE POWER ADMINISTRATION

DATE 8/10/84

TRANSMITTAL FOR ADMINISTRATOR'S ACTION

TYPE OF DOCUMENT AND ADDRESSEE: Revised Proposed Nonfirm Energy Policy for Consumer Alternate Fuel Loads.

ROUTING ORDER	ROUTING SYM	TO	DATE IN	DATE OUT	INITIALS
X	PK	TNoguchi			
X	PGC	GFoulkes	8/10	8/17	gff
	AC	LLarson (Info Copy)			
	PS	LDean (Info Copy)			
	PL	SMelton (Info Copy)			
	PN	DHoffard (Info Copy)			
1	PG	JMcLennan			
X	D	FINANCIAL MANAGEMENT			
	E	ENGINEERING & CONSTRUCTION			
	K	CONSERVATION			
X	O	REGIONAL OPERATIONS			
2	P	POWER AND RESOURCES MANAGEMENT			
	S	MANAGEMENT SERVICES			
X.	AP	GEN. COUNSEL			
X	AL	EXTERNAL AFFAIRS			
	0-12	INTERGOV'TAL RELATIONS			
	AD	SPECIAL ASST. TO THE ADMIN.			
3	A	EXEC. ASST. ADMINISTRATOR			
4	A	DEPUTY ADMINISTRATOR			
5	A	ADMINISTRATOR			

ORIGINATOR AND TYPIST: CCombs/DJAnderson/PLivesley — ROUTING: PKL — EXT: 4114

CCO No. _____, Date Due _____

SUMMARY

Transmitted for approval by the Administrator is the Revised Proposed Nonfirm Energy Policy for Consumer Alternate Fuel Loads. The 568 includes the FEDERAL REGISTER Notice, Staff Evaluation of the Record, and generic contract.

EQ 4-2 alt. Fuel Nonfirm Policy EA - general

INFORMATION COPY:
WPollock - PH
GFuqua - PR

SIMULTANEOUS REVIEW: DUE BY COB 8/17/84.

Please see attached marked copy, especially pages 1+2 of the PM Briefing Memo, and the other page marked with yellow slips. I've highlighted in yellow those which I consider important. The EA needs a 45 day comment period rather than the 30 days ~~herein~~ stated herein. The comment period on the policy could be shorter, but there would be little point to such inconsistency.

(WP-PKL-4585b)

☐ **Washington, D.C., Office contacted through** _____ NAME _____ DATE

☒ **Not applicable for this document.**

☐ This document involves a change in Administration policy.

☒ Mail original/return all copies.
☐ Mail original and all copies.
☐ Return for mailing/processing.
☒ Call when signed. Name: ~~Lois Kirk~~ Ext. ~~4114~~
☐ Document will be transmitted by facsimile as soon as signed.
☐ Document will be telecommunicated as soon as signed.
☒ Special instructions: If any questions, call C. Combs, Ext. 3559

Forward original and one copy with accompanying material

BPA 568 JAN. 1983

OREGON PROJECT REVIEW ACKNOWLEDGMENT

EQ 1-2 "A"

State Clearinghouse
Intergovernmental Relations Division
155 Cottage Street N.E.
Salem, Oregon 97310

Phone (503) 378-3732 or Toll Free in Oregon 1-800-422-3600

APPLICANT: BPA

PROJECT TITLE: Energy Policy

DATE RECEIVED: 9/19/84

PNRS #: OR 840919-039-5

BE SURE TO PLACE PNRS # ON YOUR APPLICATION BEFORE SUBMITTING TO FEDERAL AGENCY.

Your project notice has been assigned the file title and number that appear above. Please use it in correspondence and, if applicable, enter it in Block 3A on the 424 form for the project. Your project notice must also be submitted for review to any affected areawide clearinghouse.

A ~~45~~ 30 day review of your project began on the above date.

[ ] FEDERAL GRANT

[ ] HUD HOUSING

[ ] DIRECT FEDERAL DEVELOPMENT

[X] ENVIRONMENTAL ASSESSMENT

[ ] DRAFT ENVIRONMENTAL IMPACT STATEMENT

[ ] FINAL EIS

[ ] STATE PLAN/AMENDMENT

State Clearinghouse use only:
St. Agency Due Date: _____
Federal Agency _____
County: _____

PNRS #3
Revised 5/84

Your project notice was circulated to state agencies checked below:

ECONOMIC DEV. & CONSUMER SVCS
- __ Agriculture
- X Soil and Water
- X Economic Development
- __ Fire Marshal
- __ Housing
- __ Labor
- __ Real Estate

EDUCATION
- __ Education
- __ Educ. Coordinating
- __ Higher Education

EXECUTIVE
- __ Budget

HUMAN RESOURCES
- __ Adult and Family Services
- __ Children's Services
- __ Community Services
- __ Corrections
- __ Employment
- __ Health
- __ Mental Health
- __ Senior Services
- __ Vocational Rehabilitation

NATURAL RESOURCES
- X Governor's Office
- X DEQ
- X Energy
- X Fish and Wildlife
- X Forestry
- X Geology
- X Lands
- X LCDC
- X Water Resources

TRANSPORTATION
- __ Aeronautics
- __ Director
- __ Highway Division
- __ Historic Preservation
- __ Parks Division
- __ Public Transit

MISCELLANEOUS
- __ Dev. Disabilities Council
- __ Extension Service
- __ Other

RECEIVED
SEP 20 1984
B P A
MAIL CENTER

Shirley Price

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

PGC

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage Street N.E., Salem, Oregon 97310
Phone Number: 378-3732
Toll Free Number: 1-800-422-3600

sent 9/17/84

REQUEST FOR ADDITIONAL INFORMATION

4-2-alt. fuel - fyi

.DATE: September 12, 1984

.APPLICANT: U.S. Dept. of Energy (BPA)

.PROJECT TITLE: Notice of Revised Proposed Nonfirm Energy Policy for Consumer Alternate Fuel Loads and Request for Comments. BPA File No: NF-Ind-2

We have received your Notice of Intent to apply for Federal funds. The information received was incomplete and the following is requested in order to facilitate a prompt review.

NOTE: THE STATE CLEARINGHOUSE REVIEW WILL NOT BEGIN UNTIL THE REQUESTED INFORMATION IS SUPPLIED.

_____ Eight (8) copies of Form 424.

_____ Eight (8) copies of PNRS #1 Form.

_____ Eight (8) copies of narrative.

_____ Eight (8) copies of small (8-1/2 x 11) map showing project and affected area.

XX Twelve (12) copies for EA and EIS's required.

_____ Mailing address and contact person for federal funding agency.

_____ Other: _____

PNRS #3
Revised 5/84

RECEIVED
SEP 13 1984
ENVIRONMENTAL
S J

SSRF-548

AD-MAIL, INC.

905 N.W. 17th AVENUE • PORTLAND, OREGON 97209 • 223-1101

MAILING INSTRUCTIONS

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BILLING INFORMATION

Bonneville Power Administration
COMPANY NAME

P.O. Box 3621
ADDRESS

Portland, OR 97208
CITY STATE ZIP

Routing - PGC Lauri or Shirley 230-4261 Acct. 71210
P.O. NUMBER CUSTOMER CONTACT PHONE

JOB DESCRIPTION

Job Due Date 3/12

Description FONSI - Nonfirm

INSTRUCTIONS

ADDRESSING — ☒ Provided by Customer: (Description)

☐ Provided by Ad-Mail: (Description)

3-12

9:00

PRINTING — ☐ Description:

BINDERY — ☒ Folding:

☒ Inserting: 2 enclosures per envelope

☐ Collating:

☐ Other (Description):

MAILING — ☐ Affix Labels:

☐ Metering: ☐ First Class ☐ Second Class ☐ Reg. Bulk Rate ☐ Non-Profit ☐ Other (Explain)

☐ Other (Description):

Miscellaneous — ☒ Deliver Back Leftovers ☐ We will pick up Leftovers ☐ Postage Advance Check Attached (Amount):

ENVELOPE COUNT - ~500

U.S. DEPARTMENT OF ENERGY — BONNEVILLE POWER ADMINISTRATION

Printing & Reproduction Order Form

Job No. 44965

Priority high

Date 3/8/85

Date Wanted 3/12

Requisition # _____

Routing PGC Name Lauri Croff Extension 4261

Title of Copy Letter - Nonfirm FONSI # Originals 1 Copies ea 530

- [x] Quick Copy
  - [x] 1 or [x] 2 sides of sheet
- [ ] Litho
  - [ ] PMT prints
- [ ] Photography
  - [ ] Photographer
    Date_____
    Time_____
  - [ ] Develop slides
  - [ ] Develop film
  - [ ] Contact prints
  - [ ] Enlarge or Reduce
    _____% of original
    or finished size
  - [ ] Color Xerox
- [ ] Direct Print
  - [ ] TA4 Auto Positive
  - [ ] TC4 Contact paper
  - [ ] C4 Contact film
  - [ ] TC5 Contact paper
  - [ ] Photac film
  - [ ] KA film
  - [ ] Ozalid Transparency
  - [ ] Sepia
  - [ ] Vellum
  - [ ] Electrostatic Printing
- [x] Bindery
  - [x] Collate
  - [x] Staple
    - [x] Upper left
    - [ ] _____ staples on side
  - [ ] Hole punch
    _____# Holes
  - [ ] Fold
    - [ ] letterfold
    - [ ] other, explain
  - [ ] Pad
    - [ ] top
    - [ ] bottom
    - [ ] left side
    - [ ] right side
    - [ ] sets

Special Instructions

Must have by noon 3/12/85 for mailing to public.

* this job is part of job no. 44966 and envelope order 004505. Ad-Mail form also sent

Please deliver 50 copies to PGC - rest (about 480) to Ad-Mail. Thanks!

Send 2 copies of this order to Printing and Reproduction with order.

☆GPO 693-547 **BPA 100** REV. APRIL 1981

Delivery: _____
Press out: _____
Dylux out: _____
OK to Repro: _____
Galley out: _____
Job Started: _____

Trimmed size: Width _____ Height _____ ☐ Front & Back ☐ Head to Foot ☐ Side to Side
☐ Xerox ☐ QC ☐ Offset ☐ Litho; Old job # _____ ☐ File Specified by: _____

STOCK

No. of shs.	Parent Size & grain	Wt.	Kind of stock	Color	Date ordered	No. press sheets out	Press sheet Size & grain	No. forms on sheet	No. press sheets	Overs

MISC. COSTS		COST		SPECIAL COSTS		COST	
Stock:				Freight:			
				Postage:			
Ink:							
Neg File Chg:							

DIRECT PRINT

No. Orig.	No. Each	Size	Sq. Feet

PHOTO

Originals	No. Each	Size	No. Slides

PRESS

Color of ink	Press No.	Forms	IMPS	Amount ink used

____ shs. ____ sides ____ x ____ - _____
____ shs. ____ sides ____ x ____ - _____

SPECIAL INSTRUCTIONS:

Employee	Date	Kind of work	Time	O.T.	Sta. No.	Employee	Date	Press	Kind of work	Time	O.T.	Sta. No.	Employee	Date	Kind of work	Time	O.T.	Sta. No.

DELIVERY

Originals sent to: ☐ Customer ☐ Litho File ☐ Graphics ☐
Dist. List # _____ ☐ 1st Class ☐ Bulk ☐ Other
SHIP TO:

Date Shipped _____
By _____
Packages _____
Cartons _____
Weight _____ pounds

Ship Via: ☐ Customer pick-up; ☐ Shuttle Bus; ☐ Autofreight; ☐ UPS; ☐ Collect; ☐ Prepaid

U.S. DEPARTMENT OF ENERGY — BONNEVILLE POWER ADMINISTRATION

Printing & Reproduction Order Form

Job No. 44966

Priority high

Date 3/8/85

Date Wanted 3/12

Requisition # _____

Routing PGC Name Lauri Croff Extension 4261

Title of Copy FONSI - Nonfirm # Originals 5 Copies ea 530

Special Instructions

Must have by noon 3/12 for mailing to public.

- [x] Quick Copy
  - [ ] 1 or [x] 2 sides of sheet
- [ ] Litho
  - [ ] PMT prints
- [ ] Photography
  - [ ] Photographer
    - Date _____
    - Time _____
  - [ ] Develop slides
  - [ ] Develop film
  - [ ] Contact prints
  - [ ] Enlarge or Reduce
    - _____% of original or finished size
  - [ ] Color Xerox
- [ ] Direct Print
  - [ ] TA4 Auto Positive
  - [ ] TC4 Contact paper
  - [ ] C4 Contact film
  - [ ] TC5 Contact paper
  - [ ] Photac film
  - [ ] KA film
  - [ ] Ozalid Transparency
  - [ ] Sepia
  - [ ] Vellum
  - [ ] Electrostatic Printing
- [x] Bindery
  - [x] Collate
  - [x] Staple
    - [x] Upper left
    - [ ] _____ staples on side
  - [ ] Hole punch
    - _____ # Holes
  - [ ] Fold
    - [ ] letterfold
    - [ ] other, explain
  - [ ] Pad
    - [ ] top
    - [ ] bottom
    - [ ] left side
    - [ ] right side
    - [ ] sets

x this job is part of job no. 44965 and envelope order 004505. Ad-Mail form also sent.

Please deliver 50 copies to PGC - rest (about 480) to Ad-Mail. thanks

Send 2 copies of this order to Printing and Reproduction with order.

☆GPO 693-547 **BPA 100** REV. APRIL 1981

Delivery: _____
Press out: _____
Dylux out: _____
OK to Repro: _____
Galley out: _____
Job Started: _____

Trimmed size: Width _____ Height _____ ☐ Front & Back ☐ Head to Foot ☐ Side to Side
☐ Xerox ☐ QC ☐ Offset ☐ Litho; Old job # _____ ☐ File Specified by: _____

STOCK

No. of shs.	Parent Size & grain	Wt.	Kind of stock	Color	Date ordered	No. press sheets out	Press sheet Size & grain	No. forms on sheet	No. press sheets	Overs

MISC. COSTS		COST		SPECIAL COSTS		COST	
Stock:				Freight:			
				Postage:			
Ink:							
Neg File Chg:							

DIRECT PRINT

No. Orig.	No. Each	Size	Sq. Feet

PHOTO

Originals	No. Each	Size	No. Slides

PRESS

Color of ink	Press No.	Forms	IMPS	Amount ink used

____ shs. ____ sides ____ x ____ ____
____ shs. ____ sides ____ x ____ ____

SPECIAL INSTRUCTIONS:

Employee	Date	Kind of work	Time	O.T.	Sta. No.	Employee	Date	Press	Kind of work	Time	O.T.	Sta. No.	Employee	Date	Kind of work	Time	O.T.	Sta. No.

DELIVERY

Originals sent to: ☐ Customer ☐ Litho File ☐ Graphics ☐
Dist. List # _____ ☐ 1st Class ☐ Bulk ☐ Other
SHIP TO:

Date Shipped _____
By _____
Packages _____
Cartons _____
Weight _____ pounds

Ship Via: ☐ Customer pick-up; ☐ Shuttle Bus; ☐ Autofreight; ☐ UPS; ☐ Collect; ☐ Prepaid

Goes w/Repro orders 44965 + 6
ad-mail form attached

Nonfirm FONSI

U.S. DEPARTMENT OF ENERGY—BONNEVILLE POWER ADMINISTRATION

BPA LIST MAINTENANCE AND ADDRESSING SERVICE

DATE 2/21/85

NO. 004505

SUBJECT OF MAIL	DATE OF MAIL	DATE NEEDED
Envelopes	~~2/21/85~~ 3/12	~~2/22/85~~ 3/12
REQUESTOR'S NAME	**ROUTING**	**EXTENSION**
Shirley Price	PGC	5379

I. REVISION/NEW REQUEST

- ☐ Revise according to attached
- ☐ Add new addresses (attached)
- ☒ Printout (Fill out Section II)
- ☐ Format new mail list (Fill out Special Inst.)

II. TYPE OF PRINTOUT

Envelopes:
- ☐ 4″ × 9½″ franked
- ☒ 4″ × 9½″ G-135 permit
- ☐ 9½″ × 12″ franked
- ☐ 9½″ × 12″ G-135 permit
- ☐ Other _____

*Labels:
- ☐ Continuous, plain
- ☐ 4″ franked
- ☐ 4″ G-135 permit
- ☐ Other _____

Hard Copy:
- ☐ Single column, 1 side
- ☐ Single column, duplex (front & back)
- ☐ Other (memo, manual distribution, etc.)

*Please write justification for labels in Special Instructions.

III. FORMAT OF PRINTOUT (Does not apply to IV. D. below)

- ☐ Numeric by Zip code
- ☐ Alpha by name
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Refer to User Manual for examples of printout.
All address fields will be printed unless otherwise specified.

IV. FILES (Fill out Section A, B, C, or D below)

SECTION A—From the BPA master mail list—check list(s) desired

- ☐ Agencies
- ☐ Businesses
- ☐ Clearinghouses
- ☐ Commissioners/Planning Boards
- ☐ Congressional (Federal)
- ☐ Customers
- ☐ Individuals (U.S. Citizens)
- ☐ Interest Groups
- ☐ Landowners
- ☐ Legislative
- ☐ Libraries
- ☐ Media
- ☐ Schools
- ☐ Technical
- ☐ ALL LISTS

If only part of the list is required, indicate which selections should be made.

- ☐ Specification Field _____
- ☐ Interest Field _____
- ☐ State _____
- ☐ County _____
- ☐ Area/District _____
- ☐ Other _____

SECTION B—Internal Distribution

- ☐ Administrator, Asst. Admin.
- ☐ Division Directors, Br. & Section Chiefs
- ☐ Supervisors/Managers
- ☐ Admin. Officers/Techs
- ☐ All Employees
- ☐ All Portland Employees
- ☐ All Vancouver Employees
- ☐ Routing (specify) _____
- ☐ Other _____

SECTION C—OTHER LIST MAINTAINED BY GRAPHICS AND PRINTING SERVICES BRANCH

File Name: _____
Selection: _____
Sort: _____
Special Instructions: _____

SECTION D—LISTS NOT MAINTAINED BY GRAPHICS AND PRINTING SERVICES BRANCH

- ☐ Submitted on diskette (enclosed)
- ☐ Telecommunicated (to be filled out when received)

Document Number(s): _____

List Processing File Name: _____

V. SPECIAL INSTRUCTIONS

Please print doc # 5285A there are 426 addresses
Thanks
Annette

•GPO 1984 704-128 BPA 1626 MAR 1982

PGC

MAR 12 1985

To Interested Parties:

Enclosed is a copy of the Finding of No Significant Impact (FONSI) on Bonneville Power Administration's (BPA) Proposed Policy for Sales of Nonfirm Energy for Service to Loads with Alternate Fuel Capability. BPA prepared and distributed an Environmental Assessment (EA) on this policy September 12, 1984. Following public review of the EA and the proposed policy, BPA, in consultation with its customers and the public, made several changes to the policy. These changes are discussed in the FONSI.

Based upon the EA and the revised policy, a FONSI has been made. Because the proposed policy is not a major Federal action significantly affecting the human environment, an Environmental Impact Statement will not be prepared.

Any questions regarding this FONSI should be directed to me at the above address, or call 503-230-4261. If you would like a copy of the revised policy, call our Public Involvement office at 503-230-3478 in Portland, toll-free 800-452-8429 in Oregon, or toll-free 800-547-6048 in other western states.

Sincerely,

/s/ Roy B. Fox

Roy B. Fox
Environmental Coordinator
Office of Power and Resources Management

Enclosure

SPrice:ljc (WP-PGC-3291K)

cc:
L. Baker - ALP
O. Schmidt - APG-12
S. Jensen - APP
J. Luce - APP
Area Managers - OK, OP, OS, OW
District Managers - OKK, OKN, OPG, OWI, OWL
J. McLennan - PG
R. Seiffert - PGC
R. Harper - PJI
T. Noguchi/J. Pyrch - PK
C. Combs/A. Kitchen - PKLC
R. Lamb - PR
D. Faulkner - PS
A. Morrell - SJ
K. Pierce - SJ
Official File - PGC

Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

In reply refer to: PGC

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EQ 4-2

ENVIRONMENTAL ASSESSMENT

on

BPA'S PROPOSED POLICY FOR SALES OF NONFIRM
ENERGY FOR SERVICE TO LOADS WITH
ALTERNATE FUEL CAPABILITY

OFFICE OF POWER AND RESOURCES MANAGEMENT
BONNEVILLE POWER ADMINISTRATION
JUNE 1984

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EXECUTIVE SUMMARY

BPA's proposed policy (hereafter policy) to sell nonfirm energy to utilities and direct service industries (DSIs) for service to their loads which have alternate fuel capability formalizes procedures for serving a new market for BPA nonfirm energy. This market was first served under interim arrangements in 1983, and consists of DSIs and regional 1/ utility customers who find it economical at times to displace oil, gas, or other fuel usage with nonfirm electrical energy. Any load of one average megawatt (MW) or more which can be fully served by an alternate fuel and which is operated by a DSI or a consumer of a regional utility customer will be eligible for nonfirm service under the policy. This policy requires utilities (or their consumers) and DSIs to install separate metering and special communications equipment and to sign new nonfirm energy contracts. Because of these requirements and the initial contracts' June 30, 1987 expiration, BPA does not expect to serve large amounts of interruptible load during the initial phase of this policy. This ameliorates the potential environmental impacts of the policy and allows BPA, utilities, and consumers to gradually learn, with reduced financial risk, about operating under the policy. Upon expiration of the initial contracts, modifications to the policy may be made, if necessary, and new, long-term contracts will presumably be offered.

Most of the utilities seeking nonfirm service under the policy for their consumers are public bodies and cooperatives, known as preference customers. Nonfirm energy will be provided for this market first, in accordance with applicable law. This could affect service to the DSI First Quartile, and nonfirm sales to Pacific Northwest investor-owned utilities (IOUs) and export markets.

Potential environmental impacts of the policy derive from: (1) changes in the operations of consumers and DSIs served under the policy; (2) changes in the operations of those entities which will experience reduced availability of nonfirm energy; and (3) changes in operation of the Federal Columbia River Power System (FCRPS) to provide an increased amount of nonfirm energy in order to meet the expanded nonfirm energy market. Effects on FCRPS operations are primarily reflected as impacts on fish, wildlife, and recreation resources. Analysis performed indicates there will be no new operational impacts on these resources. Operating constraints and agreements are in place which will prevent significant harm to anadromous fish from the policy's implementation. BPA intends to take additional actions in the future to protect and enhance anadromous fish.

Impacts related to changes in availability of nonfirm to various markets depend on whether a customer class gains or loses access to nonfirm energy and on what the energy is used for. There will be environmental benefits since BPA nonfirm electrical energy will substitute for use of fuels which produce air pollutants and, perhaps, solid waste. There will probably be negligble change to the physical environment as a result of reduced DSI nonfirm

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1/ Words underlined when first used in this document are defined in the Glossary, Appendix A.

availability, since the reduction is small and the DSIs probably would seek Industrial Replacement Energy (IRE) more frequently to maintain production. The IOUs and export markets use BPA nonfirm energy to displace polluting thermal resources, and thus the reduced availability of nonfirm energy to these markets could have negative environmental impacts. Environmental impacts of the policy are summarized in Table 1. All the impacts are minor; either the impact is insignificant in magnitude or the impact is a change in an aspect of the environment which is not in itself significant, e.g., a reduction in air pollution from types of sources which generally have only minor effect on overall air quality.

Pending public and governmental agency review, it will be concluded that implementation of the policy does not significantly affect the quality of the human environment and, therefore, does not require preparation of an environmental impact statement (EIS).

TABLE 1

SUMMARY OF ENVIRONMENTAL IMPACTS OF THE POLICY

Source of Impact	Effect of Policy	Principal Environmental Impacts		
		Adverse	Beneficial	Neither Clearly Adverse or Beneficial
Federal Hydrosystem Operations	More nonfirm energy will be generated, reducing spill.	Reservoir levels will tend to be lower which results in generally less favorable conditions for fish, wildlife, and recreation. Spill reductions potentially increase turbine mortality.		Flows will be altered, but not in a consistent fashion.
Thermal Resource Operations				
a. Northwest	The likelihood of displacing Northwest thermal resources is decreased slightly.	Operational impacts (primarily air pollution, thermal discharges, solid and nuclear waste requiring disposal, and consumption of coal and nuclear fuel) may occasionally occur at times when, in the absence of the policy, thermal resources would be shut down.		
b. California	Less BPA nonfirm energy may be available to California utilities so that they may need to operate their thermal resources more.	Operational impacts (primarily air pollution, water consumption thermal discharges, and fossil fuel consumption) of California thermal resources may increase.		
DSI Operations (except alternate fuel loads)	Less BPA nonfirm energy will be available to the DSIs, potentially causing temporary curtailment of DSI loads to a slightly greater degree or for longer periods than if the alternate fuel loads were not served.		At times when DSIs' operations are curtailed, their physical impacts (principally air pollution, water pollution, solid waste generation and disposal, consumption of fuels and raw materials) will be reduced.	
Alternate Fuel Loads	BPA nonfirm energy will become available and economic at times to consumers and DSIs with qualified alternate fuel loads, allowing them to temporarily shut down alternate fuel combustion equipment.		Shutting down alternate fuel combustion sources temporarily eliminates the environmental impacts of their operation (principally air pollution, fuel consumption, and, in some cases, generation and disposal of solid waste).	

Chapter 1

INTRODUCTION

This Chapter of the Environmental Assessment (EA) briefly describes the policy and discusses some key features, particularly those which could affect the environment. Additional information on the policy can be found in Appendix B.

1.1 NEED

The proposed policy responds to BPA's need to: (1) improve BPA revenues by stimulating nonfirm energy sales that would not otherwise take place; (2) allow DSIs and BPA's utility customers, and their qualified consumers, to enjoy the benefit of lower cost energy when it is available, and thereby improve the region's economy; and (3) utilize BPA nonfirm hydroelectric resources that might otherwise be wasted. In responding to these needs, conversion of existing firm electrical load to nonfirm load must be avoided because it would result in loss of firm sales and associated revenues.

In addition, the policy responds in part to the Northwest Power Planning Council's Northwest Conservation and Electric Power Plan (see Chapter 4.2).

1.2 OVERVIEW OF THE POLICY AND POLICY IMPLEMENTATION

BPA proposes to make nonfirm energy available to its Northwest utility customers and DSIs for service to loads which can use an alternate fuel source when BPA determines that nonfirm energy is not available. As the result of an analysis of short-term nonfirm energy agreements in 1983 and earlier, BPA has learned that loads once served with firm power are either being lost to alternate fuels or are being shut down altogether. The amount of firm power that was sold had previously varied depending on market conditions and/or the availability of cheaper alternate fuel. Until recent firm power rate increases, firm power was generally competitive with alternate fuels. By making nonfirm energy accessible to these loads, BPA hopes to provide intermittent electric service to some loads which would have been lost to the region, and eventually encourage development of new interruptible loads.

1.3 SCOPE OF POLICY

The proposed policy and this EA are restricted in scope to providing only for sales of nonfirm energy to utilities and DSIs for service to interruptible loads, sized at one average megawatt (MW) demand or greater, with alternate fuel capability. Qualifying loads are most likely to be boilers used for process heat in the pulp and paper, wood products, chemical, and food processing industries; and space heating for large industrial plants, commercial facilities (office buildings or complexes, shopping centers, central heating plants, etc.), and institutions (large hospitals, universities, etc.). BPA may propose other policies for marketing of nonfirm for other specific applications at later times, and will undertake appropriate National Environmental Policy Act (NEPA) compliance activities in conjunction with those policies.

1.4 BACKGROUND

This section describes elements which are fundamental to the understanding and development of the policy. Additional information and a summary of the issues related to the sale of surplus power are found in a BPA brochure, Issue Backgrounder: Surplus Power (BPA, 1983d).

1.4.1 Grades and Availability of Power

BPA projects its ability to serve firm loads based on a historical record of streamflow, known as the critical period, projections of hydroelectric generation resources, and realistic projections of generation by BPA's thermal resources. Studies made on this basis determine Firm Energy Load Carrying Capability (FELCC). FELCC is the amount of energy BPA can be confident of supplying to customers to serve firm loads, that is, loads which are to be served with maximum reliability. If obligated "firm" loads exceed FELCC, BPA would be deficit, would possibly have to allocate power among customers, or would need to acquire resources to attain a firm load/resource balance. If FELCC exceeds expected firm obligations as in the current situation, BPA is capable of serving more firm load than its customers have and attempts to market the excess firm power as "surplus firm." During most years, more water is available for generation by the Federal dams from which BPA markets power than under critical period conditions, and more than enough is available to refill the reservoirs. The additional energy which can be generated under these circumstances is "nonfirm" energy. It cannot be sold as firm, because it varies in quantity and at times is not available at all. Nonfirm energy is most likely to be available in the late spring and early summer when snow melting in the mountains causes high flows in the rivers and the Northwest's peak winter electrical loads are over.

Implementation of the Northwest Power Planning Council's (Council) Water Budget will, on the average, increase nonfirm energy capability by 432 average annual MW (while sacrificing 510 average MW of firm energy capability) (BPA, 1983a, pp. 22-25).

Nonfirm energy may be generated in two situations. One is when there is a high probability of having more than enough water available (1) to meet firm loads; (2) to refill reservoirs; and (3) to meet all other constraints on the hydroelectric system such as the Water Budget, fish passage, and navigation. Under these conditions, a decision may be made to use available surplus water to generate marketable nonfirm power. The second situation occurs when water must be released from reservoirs because of high flows and/or operational constraints such as flood control, reservoir levels, and the Water Budget. In the first situation, a decision is made to take a limited risk that water conditions will not turn out as well as predicted, in order to produce marketable nonfirm energy to generate BPA revenue or to accomplish some goal such as being able to displace a more costly resource. In the second situation, the water would be wasted if nonfirm energy were not generated when the water, which must be released because of high flows or operating constraints, were simply discharged over the spillway, or spilled, instead of being sent through the turbines. There are circumstances when water must be spilled: when the rate at which water must be released exceeds the capacity

of the turbines; when there is no market for all the nonfirm energy which could be generated at existing flow levels; and when necessary, at certain dams and times of year, to reduce fatalities of downstream migrating smolts.

1.4.2 Historic Sales and Uses of Nonfirm Energy

Historically, BPA sales of nonfirm energy have been made: (1) to the Pacific Northwest IOUs and generating preference customers at the nonfirm energy rate to displace high cost thermal resources and/or to serve their own interruptible loads; (2) to the DSIs for service to their First Quartile at the Industrial Firm Power (IP) rate, and for production increases and other purposes; and (3) to utilities outside the region under the nonfirm energy rate schedule. Sales of nonfirm energy to these various markets for fiscal year 1977 through 1983 are shown in Table 2.

1.4.3 Interim Contracts

BPA made sales of nonfirm energy to six Northwest utilities for service to alternate fuel loads on an interim basis in January, 1983, and later expanded these interim offers to include one DSI (see Appendix C).

TABLE 2

BPA NONFIRM ENERGY SALES FOR FISCAL YEARS 1977-1983 1/ 2/

Customer Class		FY 77	FY 78	FY 79	FY 80	FY 81	FY 82	FY 83
Northwest	1000 kWh	22,724	249,818	604,399	55,680	112,252	30,969	436,493
Preference Customers	$	77,315	772,329	1,986,611	307,187	636,709	538,144	3,973,573
Northwest	1000 kWh	791,764	8,616,030	4,659,730	2,877,447	7,063,797	6,019,076	9,226,036
IOUs	$	2,659,476	27,489,140	14,435,790	17,452,859	52,810,691	48,162,417	80,404,837
DSIs 3/	1000 kWh	6,108,921	6,614,688	6,447,501	6,355,116	7,041,761	5,456,834	6,627,011
	$	15,586,683	16,030,328	18,601,375	29,031,620	43,808,532	87,408,763	125,812,440
Export Markets	1000 kWh	0	5,046,237	392,517	4,339,336	8,767,541	15,221,784	18,902,771
	$	0	16,934,356	751,298	28,552,782	64,024,452	118,942,784	175,241,869
Total	1000 kWh	6,932,409	20,526,773	12,104,147	13,627,579	22,985,351	26,728,663	35,323,311
	$	18,323,474	61,226,153	35,775,074	75,344,448	161,280,384	255,052,108	385,432,719

1/ From BPA Fiscal Year Generation and Sales Statistics for Fiscal Years 1978 through 1983.
2/ Actual dollar amounts; not corrected for inflation.
3/ Values for DSIs computed by multiplying their total Industrial Firm sales by 0.25 to approximate the amount of nonfirm which constituted their First Quartile, and adding any additional amounts of nonfirm energy purchased.

Chapter 2

ALTERNATIVES

This Chapter discusses alternatives on two levels. The first and more fundamental level is that of alternatives to the broad scope of the policy. The no action alternative, for example, is an alternative on this level. The second level is that of alternatives to specific features of the policy which could be varied within some limits while not substantially changing the overall scope of the policy. Alternatives to these features may influence the policy's effectiveness and may incur different environmental impacts. Examples are different provisions relating to conversion from nonfirm to firm service and different standards for consumers to qualify for nonfirm service. Most of the variation in environmental impacts among the alternatives are consequences of differences in effectiveness, and therefore can be identified only in terms of general trends.

2.1 ALTERNATIVE POLICIES

This section discusses alternatives to the broad scope of the policy.

2.1.1 No Action Alternative

Under this alternative, consumers of BPA's requirements customers would not be provided access to BPA nonfirm energy through their serving utilities and DSIs would not have access to BPA nonfirm energy to serve alternate fuel loads. BPA nonfirm energy would continue to be marketed to the same customers under the same circumstances and for the same purposes as prior to the interim contracts (see Chapter 1.4.2). The interim contracts would not be renewed or renegotiated. This alternative does not provide an opportunity for increased sales of nonfirm energy and, therefore, does not potentially improve BPA's revenues or help hold down other rates. Thus it does not fulfill the need as discussed in Chapter 1.1. It is also not responsive to the Council's Two-Year Action Plan (see Chapter 4.2). Because the nonfirm market would not be expanded under this alternative, some surplus power which could be generated on the FCRPS would remain unmarketable resulting in increased spill. Consumers would use higher cost fuels, or, in borderline situations of profitability, might shut down causing unemployment and reducing their contribution to the economy.

2.1.2 Nonfirm Sales to Utilities for Service to Consumers with Minimal Restrictions

This alternative represents a case where BPA wishes to make sales of nonfirm energy to its utility customers for service to consumers, but chooses to impose only minimal control over such sales. As in the proposal, the DSI or utility and/or consumer would have to provide a means to measure nonfirm deliveries for billing purposes and provide communications, and BPA would provide notice of availability of nonfirm energy. BPA would grant contracts to utilities for service to their interruptible consumers and to DSIs, and devise a means of allocating nonfirm when demand exceeds availability. However, there would be no restrictions in the policy on switching from firm to nonfirm service and vice versa, and no requirement for alternate fuel

capability. BPA would let DSIs and utilities and their consumers decide on the economics of providing metering, billing, and communications for delivery of nonfirm energy to a particular load, and would, therefore, not impose a lower limit on the size of interruptible load eligible for nonfirm service. There would also be no limit on utility markup.

Under this alternative, many aspects of the proposed policy will be subject to individual negotiation between utilities and consumers. For example, provisions which restrict switching from firm to nonfirm power will be subject to negotiation between the consumer and the serving utility. Utilities which have an incentive to avoid loss of firm load, such as some generating utilities, will restrict switching. Other utilities may be inclined to allow a consumer to use cheaper nonfirm when available if: (1) they can change their contract demand easily, or (2) the utility is a metered customer. Utilities will always receive some markup on the nonfirm energy, which is an incentive for them to make it available to customers.

This alternative would result in some, and possibly substantial, loss of firm load to BPA and, therefore, reduce revenues. It would also make BPA planning more difficult since firm loads could be added and dropped in an unpredictable fashion.

2.1.3 Affirmative Action to Develop Interruptible Loads

This alternative is the same as the proposal except that BPA would take the additional action of providing further incentives for the installation of interruptible electric loads in the region's existing and new industrial plants, commercial facilities, and institutions. Such incentives could include providing direct funding or low cost financing for such installations, BPA payment for metering and communications equipment required by the policy, grants to explore innovative ways of using nonfirm energy, and/or other means. This alternative would require commitment of BPA funds which are currently not budgeted. BPA may wish to pursue this alternative some time in the future, but this alternative would require more time to implement. BPA does not wish to forego sales of nonfirm energy under the policy in the meantime.

2.2 ALTERNATIVES TO FEATURES OF THE POLICY

This section discusses alternatives to specific features of the policy which do not change its overall scope but which may influence the effectiveness, the amount of energy which might be sold under the policy, and ultimately, its environmental effects.

2.2.1 Qualifications of Consumer Loads Eligible for Nonfirm Service

Several possibilities exist with respect to requirements which consumers must meet in order to qualify for nonfirm energy under the policy. The case of minimal qualifications in all possible aspects is described as an "alternative policy" in Chapter 2.1.2. This section discusses the range of options which could conceivably affect the environmental consequences of the policy.

Eligibility of Firm Loads - In its policy, BPA could conceivably allow industrial, commercial, and institutional firm loads to switch to nonfirm, either temporarily or permanently. BPA could also develop criteria other than those proposed governing changes from firm to nonfirm service and back.

Class of Load - BPA could make the policy applicable only to industrial consumers served by utilities, or could limit the policy in some other way to preclude one or more classes of consumers or the DSIs.

Alternate Fuel Supply - BPA has the options to: (1) not require an alternate fuel supply; (2) restrict the type of alternate fuel supply; (3) allow a utility customer to serve a consumer's nonfirm loads with its own nonfirm energy at any time or only when BPA nonfirm is unavailable; (4) allow electricity furnished by another utility, which is not a customer of BPA, to serve as an alternate fuel; or (5) require some level of alternate fuel supply which is less than the capacity to utilize nonfirm energy.

A special case is consumers who want to rely on cogeneration facilities as their alternate fuel supply. BPA is considering developing a separate policy for selling nonfirm energy to consumers which have cogeneration resources.

Size of Eligible Nonfirm Load - The size of the load for which it is economical to attempt to secure nonfirm energy depends, among other things, on the cost of providing the metering and communications facilities required by the policy, and the ability to schedule and restrict power. The proposed limit of 1 average MW is the approximate lower limit of the amount of load BPA has found practical to schedule, but it may not be cost-effective to provide the metering and communications facilities for loads this small. BPA could alternatively set a size limit larger than 1 average MW.

2.2.2 River Conditions Under Which Nonfirm Energy Would Be Sold

BPA proposes to offer to contracted utilities and DSIs nonfirm energy in amounts and at times determined by BPA. Such times include conditions of spill, imminent spill, and other conditions under which BPA elects to market nonfirm energy. Although there may be legal constraints, BPA has the options of: (1) restricting sales of nonfirm under this policy to times of spill only; (2) restricting sales of nonfirm to times of spill or imminent spill only; or (3) of establishing some other standards as part of the policy by which it would be decided when to offer nonfirm under the policy and how much nonfirm to make available. BPA would use the flexibility available under the policy and the nonfirm energy (NF-83) rate schedule or its replacement to maximize its revenues within its operational, planning, and legal constraints.

2.2.3 Duration of Contracts

BPA is proposing to enter into contracts which expire June 30, 1987. Contracts of shorter duration would discourage utilities and/or their consumers and DSIs from seeking nonfirm service under the policy.

A longer contract duration could inhibit timely resolution of problems which may arise with implementation of this new policy. The proposed contracts would expire at a time when resources are expected to be available to serve the loads as firm if consumers found nonfirm service under the policy unsuitable and wanted to apply for firm service.

2.2.4 Notification and Scheduling

BPA intends to give maximum practicable notice of any change in price, amount, or duration of availability of nonfirm, but reserves the right to change the price, amount, or duration of availability at the end of any hour.

A second aspect of the notification and scheduling issue is the requirement for 24-hour day and night telephone numbers and eventual requirement for a hard copy terminal with an auto-answer modem. The costs of these requirements may inhibit some utilities and/or consumers from contracting to receive nonfirm energy, but because of the reservation by BPA to provide as little as one hour notice, some means of rapid communication is necessary. As an alternative, the requirement for a hard copy terminal and an auto-answer modem could not be implemented until the number of utilities entering into agreements for nonfirm energy under the policy exceeds the number that BPA can manage to give prompt notice by calling each utility individually. Under this approach though, a utility and consumer, in a situation where the costs of automatic communication equipment are the incremental difference in making nonfirm service economical or not economical, would have to gamble on whether BPA would get enough nonfirm customers to require the automatic communications equipment, and BPA would risk losing nonfirm customers at the point automatic communications equipment was required.

Chapter 3

ENVIRONMENTAL IMPACTS

This chapter discusses the environmental impacts of the proposal and alternatives. Potential environmental impacts result because of changes in operation of resources to generate more nonfirm energy to be marketed under the policy, because of the use of nonfirm energy by qualified consumers, and because of the effect the policy may have on availability of nonfirm energy to current nonfirm energy markets, specifically the DSIs, Northwest IOUs, and utilities and municipalities in California.

3.1 IMPACTS OF THE PROPOSAL

The amount of alternate fuel nonfirm load which may be served under the policy (or either of the alternative policies) is uncertain. However, for purposes of analysis, service to 1400 MW of alternate fuel nonfirm load on Northwest preference agency systems was assumed. Based on the Ekono report (1982), which investigated electric boiler capacity in the BPA service area as alternate fuel load, and experience from negotiating the interim contracts, this amount of alternate fuel nonfirm load is substantially higher than what BPA actually expects to serve under this policy, but it is the Council's current maximum goal (see Chapter 4.2). It also represents a "maximum case" since all impacts of the policy decrease in magnitude as the amount of alternate fuel nonfirm loads served to Northwest preference customer systems becomes smaller. This is both because some impacts occur in proportion to the amount of alternate fuel load, and because preference customers have first priority to nonfirm energy, which thus increases effects on other customer classes.

3.1.1 Changes in System Operations

3.1.1.1 Hydro System

The effects on system operations have been determined through two 40-year hydroregulation studies: a no action alternative hydroregulation study and a hydroregulation study with 1400 MW of additional nonfirm load. The only difference between these two studies is the additional 1400 MW of nonfirm load.

Analysis of the studies show that operating the FCRPS to serve an additional 1400 MW of nonfirm load would result in reduced elevations at the major storage reservoirs in all months. Flows also would be affected. They may increase or decrease at any particular FCRPS dam in any month, depending on the water year. However, even with 1400 MW of additional nonfirm load, there would be no impact on the ability of the system to provide the Water Budget. Serving the additional nonfirm load does not result in any flow or elevation exceeding the established project specific constraints of any project.

The various changes in system operations primarily affect fish, wildlife, and recreational opportunities on the reservoirs, discussed in Chapter 3.1.2.

Environmental impacts of operation of the FCRPS have been analyzed in BPA's Final Role EIS (BPA, 1980b, pp. IV-3-30), BPA's Environmental Assessment: Proposed Power System Changes to Implement the Water Budget (BPA, 1983a), and in environmental documents prepared by others addressing the construction and operation of individual Federal hydroelectric projects.

3.1.1.2. Thermal System

BPA has contractually secured portions of the output of four thermal resources to contribute to its FELCC in the near term. These are 60 percent of the output of the Hanford Generating Project (HGP); 30 percent of the output of the Trojan nuclear plant; 10 percent of the output of the Boardman coal plant; and the entire output of Washington Nuclear Project No. 2, due to be commercially operable in the summer of 1984. Impacts of each of these resources were addressed in BPA's Final Role EIS (BPA, 1980b, pp. IV-43-48) and other documents (BPA, 1977b; 1980a).

The HGP operates only when the New Production Reactor (NPR) is operated. Operation of the NPR is governed by the U.S. Department of Energy for purposes of plutonium production, and is beyond the control of BPA.

Trojan is an inexpensive resource to operate, and is likely to operate at all times possible since Portland General Electric (PGE) is able to sell the power at a price sufficient to recover the costs. PGE manages the plant, so BPA has only limited influence as to when it operates. During exceptional years, like 1983, when there is a very large amount of FCRPS nonfirm energy sufficient to displace the plant and serve available nonfirm loads, Trojan could be shut down, assuming no unacceptable conflict with maintenance schedules or refueling activities. The policy will not affect such occurrences since there is so much nonfirm energy available under these circumstances. The projected variable cost of operating the Washington Public Power Supply System nuclear plant, WNP-2, is also low enough that the plant's operation will be unaffected by this policy.

The Boardman Coal Plant is managed by PGE and is run according to their markets for power. In the event PGE wants to shut down the plant at a time when BPA still requires delivery of all or part of its 50 MW share, PGE merely delivers to BPA equivalent energy derived from other of its resources. On the other hand, the policy will make it slightly less likely that Boardman will be displaced since less BPA nonfirm energy would be available for such purposes (see Chapter 3.1.4.2.2).

Therefore, operation of BPA's thermal resources will not be affected significantly by the policy.

3.1.2 Fish, Wildlife, and Recreation Impacts

As discussed in Chapter 3.1.1, meeting additional nonfirm load will result in no new impacts to fish and wildlife resources or recreational pursuits in that the hydrosystem and individual hydro projects will not operate beyond established constraints. However, within those constraints, certain impacts which now occur in the course of normal operations may, under the policy, occur with greater frequency and duration, or to a greater degree at a given

time. The lower reservoir elevations resulting under the policy may sometimes cause recreational uses and facilities (boat launch ramps, campgrounds, fishing, swimming, picnicking) to be of lesser value at times than they would otherwise have been.

Lower reservoir levels may also affect resident fish and wildlife, depending on where, at what time of year, and how much more the reservoirs are lowered. However, because these impacts occur at times during normal operations, depending on such things as natural runoff, flood control, irrigation demand, and demand for power, and the effects are within existing constraints, BPA does not consider any additional impact due to the proposed policy to be significant.

A potential impact to anadromous fish resources is reduction of spill at Federal dams. The Council's Fish and Wildlife Program (Program) (Section 404(a) and (b)) requires operators of hydroelectric projects without effective bypass systems to provide spill which will achieve a level of smolt survival comparable to or better than that achievable by the best available bypass system. BPA will mitigate the potential for spill reductions by incorporating spill programs into power planning and operations and will do nothing that could hinder provision of fish passage spill provided for under the annual spill program developed in accordance with Section 404(a) and (b) of the Council's Program. Therefore, no significant effects on juvenile downstream migrant anadromous fish should be caused by spill reduction resulting from meeting additional nonfirm loads.

3.1.3 Development of New Nonfirm Loads

The policy (or any alternative policy) which makes nonfirm energy for displacing alternate fuels available to consumers through local utilities and/or to DSIs may induce construction of new facilities to use such energy. The number and types of these facilities will depend on: (1) the economic incentive to use nonfirm, which in turn depends on nonfirm availability; (2) the price at which sales would be made; (3) a number of specific aspects of the policy including metering and notification requirements, allocation provisions, and standards for an alternate fuel supply; and (4) external factors such as the cost of alternate fuels. In general, anything that increases the economic incentive for use of nonfirm energy, or increases its availability at a given competitive price, or makes it available for more applications will tend to cause more new nonfirm loads to be developed.

The relatively short initial contract duration, the requirements for metering and communications equipment, the requirement for an alternate fuel, and current costs of alternate fuel do not provide substantial incentive for development of new facilities for use of nonfirm energy.

The addition of electrically operated alternate facilities to existing industrial plants, institutions, and commercial establishments, or incorporation of such facilities into new projects is expected to have minor effects on their appearance, requirements for space, employment, or resources required for construction. Electric facilities which would be served under the policy would generally not produce air pollution or solid waste, but some (e.g., electric boilers) would have water pollution implications which are essentially the same as the alternate fuel facilities for which they are substituted.

An argument can be made that the availability of nonfirm service may be the incremental factor in making a new industrial plant or commercial or institutional facility financially viable, and, therefore, would "enable" it. BPA has analyzed the effects of prices for firm electric energy on the location of industrial facilities (BPA, 1974, pp. IV-36 and 37; BPA, 1977a, Apendix C, pp. IV-68-73; BPA, 1979, pp. V-30-32). The conclusion was generally that electricity prices in the Northwest seemed to have significant influence only on the siting of aluminum plants in the region, rather than outside the region. Aluminum plant location is not likely to be influenced by this policy because the major part of their energy requirement (i.e., that required for the electrolytic reduction of alumina to aluminum metal) must be in electrical form and would not qualify as an alternate fuel load. While prices for firm electric power have been a factor in the siting of other energy intensive industries nationwide, other factors, such as availability of raw materials, and labor, have strong and often overriding influence.

Costs and/or availability of nonfirm energy should have even less influence on industrial siting than do prices for firm electric power. Therefore, BPA concludes that: (1) the nondependability of nonfirm energy; (2) the relatively short duration of nonfirm contracts being offered initially; (3) the potential for long-term changes in cost, both for nonfirm energy and alternate fuels; (4) the 30 or so years planned life of most industrial plants or other major developments; (5) the general uncertainty of economic predictions; and (6) the many other factors relevant to decisions to invest in new facilities such as taxes, availability of labor, raw materials, and transportation are such that it is unlikely that availability of nonfirm service would be the deciding factor in new facility investment or siting.

Nevertheless, BPA will monitor the loads seeking service under this policy, and will reevaluate the policy and/or undertake additional environmental analysis if it appears that the policy is providing an identifiable incentive for new industrial or commercial development in the region.

3.1.4 Changes in Utility and Consumer Operations

The availability of an additional 1400 MW of nonfirm load to serve would result in a decrease in the amount of unusable water, or spill, on the system. Thus, generation is available to meet at least some of an additional nonfirm market. The additional nonfirm energy market established by the policy is assumed for purposes of this analysis to be preference customer load. Although DSIs could also contract to receive nonfirm energy under the policy, collectively they now have little load which could qualify, and are not likely to develop a large amount of new qualifying nonfirm load. The assumption that nonfirm energy is used to serve preference customers' load tends to maximize the potential impacts on other customer classes. When substantial amounts of nonfirm energy are available, there is no effect on any other market. However, when nonfirm energy is limited, the first energy delivered, if requested, is to preference customers. This could result in decreased sales to the other users of nonfirm.

3.1.4.1 Impacts on Consumers Served by the Policy

The availability of nonfirm service to utilities' consumers and to DSIs may affect the operations of the qualified facilities which secure nonfirm service, which may in turn alter their environmental impacts. However, the environmental impacts of these facilities generally are limited through existing regulations.

Environmental impacts from use of the alternate fuel, principally, air pollution and land use for disposal of ash (for solid fuels), will not occur while using nonfirm electrical power. Fuel will also be conserved in the Northwest. Approximate fuel savings in the Northwest and estimated reductions in air pollutant emissions and ash requiring disposal are shown in Table 3 on the basis of 1000 kWh of electricity sold to displace various fuel types. To put Table 3 into perspective, if 1400 MW of alternate fuel load existed to be served under the policy, BPA would expect to sell about 6.7×10^9 kWH to the alternate fuel market in an average year.

While reductions of air pollutant emissions and ash would be beneficial to air quality and reduce requirements for disposal of solid waste, it is doubtful that they would be significant to the region since fuel usage in industrial and large commercial and institutional applications is regulated by environmental control agencies and is not generally a direct cause of ambient air quality standard violations in the region. Furthermore, the alternative fuel loads are likely to be dispersed over the region, so there would be little cummulative effect. At best, use of nonfirm energy would provide only temporary relief of isolated cases where fuel usage at a facility is causing elevated pollutant levels or has excessive visual emissions.

3.1.4.2 Implications of Reduced Nonfirm Energy Availability to Other Customers

The new preference market for nonfirm energy created by the policy would, under some circumstances, reduce the amount of nonfirm energy available to the historic purchasers of nonfirm energy (namely the DSIs, IOUs, Northwest scheduling, preference utilities, and utilities outside the Region) and potentially increase the cost of at least some of the nonfirm energy they would be able to secure. The following discusses the environmental implications of such changes in availability and cost.

3.1.4.2.1 DSIs - The DSIs use nonfirm energy for service to their First Quartile at the Industrial Firm (IP) rate. Under terms of the proposed policy, the DSIs, collectively, could lose part of the nonfirm energy available to them for service to their First Quartile.

The largest potential percentage loss occurs in September and amounts to an average of 6 percent. The DSIs have the right to use FELCC shift or Advance Energy during the period July through December if they feel there will not be sufficient nonfirm energy. During the remaining months, the reduced availability of nonfirm to the DSIs for their First Quartile loads will either be replaced by power purchases on the open market, most likely with IRE, and/or result in the DSIs curtailing their loads by reducing production at times when they would not otherwise do so, or by greater amounts.

TABLE 3

ESTIMATED REDUCTIONS IN AIR POLLUTANT EMISSIONS, SOLID WASTE DISPOSAL REQUIREMENTS, AND FUEL USAGE IN THE NORTHWEST BY DISPLACEMENT OF ALTERNATE FUELS BY NONFIRM ELECTRICAL ENERGY (per 1,000 kWh of electricity sold) 1/ 2/

Pollutant	Fuel			
	Natural Gas	Distillate (No. 2) Oil	Residual (No. 6) Oil	Hog Fuel
Particulate, lb/1000 kWh	0.022 to 0.066	0.059	0.57 4/	2.1
Sulfur Oxides, lb/1000 kWh	0.0026	1.3 3/	7.7 4/	0.71
Carbon Monoxide, lb/1000 kWh	0.075	0.15	0.14	0.95
Hydrocarbons, lb/1000 kWh	0.013 (as CH_4)	0.030 (as CH_4)	0.028 (as CH_4)	0.95
Nitrogen Oxides, (as NO_2) lb/1000 kWh	0.53 to 1.0	0.65	1.7	4.7
Ash for Land Disposal lb/1000 kWh	---	---	---	4.7
Fuel Savings	4400 cu. ft. 4.4×10^6 BTU	30 gal 4.2×10^6 BTU	28 gal. 4.2×10^6 BTU	950 lb. 5/ 4.7×10^6 BTU

1/ Derived principally from emission factors contained in Compilation of Air Pollutant Emmision Factors, Third Edition, Part A, U.S. Environmental Protection Agency, 1977.

2/ Assumes generation of the nonfirm energy does not result in air pollutant emissions or ash (i.e., results entirely from hydroelectric sources).

3/ Assumes average sulfur content of 0.39 percent by weight.

4/ Assumes average sulfur content of 1.75 percent by weight.

5/ Containing 50 percent moisture.

BPA analyzed the environmental impacts of the DSI loads in Appendix C of its "Draft Role EIS" (BPA, 1977a, Appendix C, pp. IV-118-212) and its "Final Role EIS," (BPA, 1980b, pp. IV-79-96). While BPA is aware of some improvements made by some of the DSIs in their pollution control technology since the time of the "Role EIS," the DSIs' operations, nevertheless, continue to have adverse environmental impacts on the physical environment. Reductions in the amount of power available to them, or an increase in its costs, which would tend to force more frequent or greater restrictions of their operations, would tend to lessen the adverse effects of their operations on the physical environment. These impacts include air pollution, water pollution, solid waste generation and disposal, and consumption of fuels and raw materials.

3.1.4.2.2 Investor-Owned Utilities - Northwest IOUs have third priority to BPA nonfirm energy after preference agencies and the DSIs' First Quartile. They purchase BPA nonfirm energy to displace high cost thermal resources, to meet occasional load overruns, and to increase their operating flexibility. The resources displaced by the IOUs are: (1) combustion turbines; (2) small thermal resources; (3) imports from the East (i.e., coal plants in Wyoming and eastern Montana); and (4) Northwest large coal-fired and nuclear generation.

Under current conditions, there is usually enough nonfirm available (either from BPA or the IOUs) to displace the combustion turbines and many of the small thermal resources. These resources are currently utilized only under extreme conditions such as when demands are very high during severe winter weather and hydroelectric generation is reduced because of low flows.

The variable costs of other resources operated or purchased by Northwest IOUs are low enough that they are not generally displaced unless BPA offers nonfirm energy under the Displacement rate.

Serving alternate fuel load under the policy decreases the likelihood of displacing any resource at any time. The average amount of BPA nonfirm available for displacing IOU coal, nuclear, and other generating plants decreases by more than 20 percent in all but February, May and June. In terms of magnitude, however, the change is small in August through December because these are months of low availability of BPA nonfirm energy. In February, May, and June, there are substantial amounts, on the average, of Displacement rate nonfirm energy even with serving 1400 MW of nonfirm alternate fuel load under the policy.

The principal effect of the policy is a reduced chance of Northwest coal, and to a lesser degree, nuclear resources being shut down in any month, but especially in January, March, April, and July if as much as 1400 MW of alternate fuel load is served.

BPA has addressed the impacts of the region's principal nonhydroelectric resources in its "Role EIS" (BPA 1980b, pp. IV-43-59), and has generically addressed the impacts of other resources in the "Role EIS" and other documents. Operating these resources has adverse environmental effects, including air pollution, water pollution, thermal discharges, generation of solid and nuclear waste, and consumption of fuel. Reducing the chances of displacing resources, assuming that they would otherwise be shut down instead

of being operated to produce energy for export markets, has an adverse environmental impact. However, since displacements are temporary, and the resources are regulated and do not result in environmental effects which are abnormally severe for such facilities, the impacts of reduced likelihood of displacement are not considered significant.

3.1.4.2.3 Export Markets - Nonfirm energy which is not marketable within the region is available for purchase by public and private utilities outside the region, mainly to California utilities.

BPA nonfirm energy (and other Northwest purchases) is used by Southwest utilities to displace their own resources in the most economic fashion they can. Typically, oil and gas fired thermal generating plants are displaced first.

Use of BPA nonfirm energy in the Southwest saves the gas and oil which would otherwise be used to operate these generating plants. Since this policy expands Northwest nonfirm energy markets, less nonfirm energy will be available to sell to the Southwest. Columns 3 and 4 of Table 4 compare the amounts of energy which could be saved in the two regions by 1000 kWh of BPA nonfirm energy if used in one region versus the other. The differences are attributable to (1) transmission losses incurred in sending electrical energy to California markets; and (2) lower thermal efficiency of using fuel to generate electricity as opposed to using it in direct heating or industrial applications typical of the Northwest alternate fuel loads. However, since the policy increases the total market for BPA nonfirm energy, and since fuel savings occur in the Northwest when serving alternate fuel loads, it appears that overall conservation of fuel will occur. On the average, savings in fuel in the Northwest from increased use of BPA hydroelectric energy exceeds the increase in consumption for generation in California.

Environmental impacts of generation in California could also increase because of reduced availability of BPA nonfirm energy for export as a result of the policy. These impacts are principally air pollution, and of lesser importance, thermal discharges to the Pacific Ocean and water consumption.

The analysis presented in Appendix E indicates that as a consequence of serving 1400 MW of alternative fuel nonfirm load in the Northwest, the potential increases in air pollutant emissions, water consumption, and thermal discharges which may occur in California would not have a significant impact. For example, the largest change in quantity of an air pollutant emitted within any affected California air basin, as far as could be determined from the analysis, is a potential increase of 2.9 percent in sulfur oxides emissions in the South Central Coast air basin. (Since California utilities are now generally using gas instead of oil, sulfur oxides emissions are presumably now less than that predicted in the analysis.) Water consumption and thermal discharge increases are both less than 2 percent of the total potential quantities.

TABLE 4

COMPARISON OF ENERGY SAVINGS IN NORTHWEST WITH
POTENTIAL ENERGY SAVINGS IN CALIFORNIA

CALIFORNIA			NORTHWEST
Energy Which Could be Delivered to Southwest in Lieu of Serving Northwest Alternate Fuel Load 1/ (per 1000 kWh available in the Northwest)	Average Heat Rate of California Resources Which Might be Displaced 2/ (per 1000 kWh generated)	Fuel Which Could Be Saved in California by Displacing Resources There With BPA Nonfirm Energy (per 1000 kWh available in the Northwest)	Fuel Which Could be Saved in the Northwest from Displacing Alternate Fuel Load With BPA Nonfirm Energy 3/ (per 1000 kWh available in the Northwest)
870 kWh to 940 kWh	9.61×10^6 BTU to 11.38×10^6 BTU	8.36×10^6 BTU to 10.7×10^6 BTU (57 to 73 gal. of residual oil or 8,360 to 10,700 cu. ft. of gas)	Gas: 4.4×10^6 BTU (4400 cu. ft.) Oil: 4.2×10^6 BTU (28 gal. residual oil or 30 gal. distillate) Hog Fuel: 4.7×10^6 BTU (950 lb. 4/)

1/ Based on intertie transmission losses of 6 to 13 percent (Stanford Research Institute, 1976, p. 30).
2/ From Stanford Research Institute, 1976, p. 31.
3/ From Table 1 of this EA.
4/ At 50 percent moisture.

It should also be pointed out that when BPA nonfirm energy is being used to serve Northwest alternate fuel loads, energy may still be available to the California entities from other sources (e.g., Northwest IOUs, B.C. Hydro, or other Southwest utilites) which could reduce the impacts of the policy in California. The California entities may also seek to purchase BPA firm surplus. BPA will undertake appropriate NEPA compliance activities in conjunction with any long-term sales of its firm surplus.

3.2 IMPACTS OF ALTERNATIVE POLICIES

This section will discuss the environmental impacts of the alternative policies described in Chapter 2.1 relative to the environmental impacts of the policy.

3.2.1 Impacts of the No Action Alternative

Under the no action alternative, BPA operations and marketing will evolve in the absence of any policy to market nonfirm energy to serve alternate fuel loads. Thus, compared to BPA's historic (pre-1983) role, the no action alternative has no environmental impact. The environmental impacts of BPA operations and marketing may change as a consequence of other evolving operational and marketing practices, policies, and external factors, but would not change as a consequence of deviations from pre-1983 practices for marketing nonfirm energy to alternate fuel loads. Under the no action alternative, the six utilities and their consumers, and the one DSI with interim contracts would lose access to BPA nonfirm energy to serve alternate fuel loads for the foreseeable future.

Adverse and beneficial environmental impacts of the policy will not occur if the no action alternative is chosen.

3.2.2 Impacts of Nonfirm Sales to Utilities for Service to Consumers with Minimal Restrictions

Since this alternative places fewer restrictions on the sale of nonfirm energy to utilities, more nonfirm energy could be sold to this market under this alternative than under the policy. However, it is impossible to determine quantitatively by how much sales would increase. Also, the types of loads served with the nonfirm energy could be more varied. Some loss of firm load is likely to occur, and because there would be no requirement for alternate fuel capability, some nonfirm energy may be used for seasonal loads or production increases which occur solely because nonfirm energy is available.

Impacts relating to the generation and delivery of nonfirm energy might be exacerbated under this alternative compared to the policy. Since loads served under this approach may differ from those which would be served under the policy, some of its environmental benefits, namely conservation of fossil and other fuels in the Northwest and the resulting reduction in impacts (i.e., air pollution, ash disposal) may not occur. Also since nonfirm energy marketed under this alternative may be used to operate load or support increased production which would not otherwise be operated, there is a potential for incurring additional environmental impact, since these load or production increases are likely to produce air pollutants, water pollutants, and solid waste.

Since more nonfirm energy would likely be sold to the Northwest preference agency market under this alternative than under the policy, impacts to the other customer classes, (i.e., DSIs, IOUs, and extraregional utilities) would likely be greater in magnitude (see Chapter 3.1.4.2).

Consumers would have greater freedom to switch between firm and nonfirm service under this alternative than under the proposal, and this freedom may: (1) increase the difficulty in projecting future regional electrical and other energy resource needs; and (2) increase the risk of over or underdevelopment of future electrical energy resources, having environmental impacts as addressed in BPA's Final Role EIS (BPA, 1980b, pp. IV-113-115).

3.2.3 Impacts of Affirmative Action to Develop Interruptible Loads

This alternative could lead to greater sales of nonfirm energy to serve interruptible loads of Northwest utilities since BPA would encourage the development of such loads. The impacts of generating nonfirm energy will, therefore, be increased relative to what is expected under the proposal and the benefits associated with conservation of fossil and other fuels in the Northwest may also be enhanced in comparison with those expected under the proposed policy.

Since more nonfirm energy would likely be sold to the Northwest preference agency market under this alternative than under the policy, effects on other customer classes would likely be greater in magnitude.

3.3 IMPACTS OF ALTERNATIVES TO FEATURES OF THE PROPOSED POLICY

Chapter 2.2 described alternatives to specific features of the policy, which remain within the overall scope of the policy. This section addresses the impacts of those alternatives.

3.3.1 Eligibility of Firm Loads

Policy terms which allow for loads currently served with firm power to receive nonfirm energy, but prevent such loads from reverting to firm service later could: (1) reduce demand for firm energy; (2) increase demand for nonfirm energy; (3) decrease BPA revenues; and (4) increase the amount of surplus firm power BPA has to market.

Export markets would have to cope with a reduced availability of BPA nonfirm energy, and might therefore seek other sources of firm or nonfirm energy, purchase BPA firm surplus, or take whatever other alternative they believe to be most economical. If they chose to buy BPA surplus firm, Northwest nonfirm consumers would receive a greater degree of interruptibility in their service, and impacts of the use of alternate fuels in the Northwest would be relatively larger.

If consumers were permitted to unilaterally return to firm service after switching to nonfirm, marketing of surplus firm would be more difficult since potential extraregional surplus firm customers would realize that BPA may have to withdraw surplus firm sales in order to return to firm service for

Northwest consumers. If load growth had eliminated all surplus firm, new resources would have to be secured (with consequent environmental impacts of construction and operation, as generically addressed in BPA, 1980b, pp. IV-116-207) in order to serve consumers' loads returning to firm service.

3.3.2 Class of Load

The class of load (i.e., whether it is industrial, commercial, or other) eligible to receive nonfirm energy makes very little difference environmentally as long as the requirement for alternate fuel capability and the size of load limit is maintained. The impacts in the Northwest will be a reduction in emissions of air pollutants, ash disposal, and the operational impacts of the infrastructure supplying the fuel. There is no generic difference in generating nonfirm for one class of load versus another.

Where the class of load eligible does make a difference is in the amount of nonfirm which may be marketed under the policy. The policy incorporates the most liberal approach, that is no specific restriction on class, which allows for serving a greater amount of load under the policy. This results in more extensive environmental benefits from saving fuel in the Northwest, increased environmental impacts of generating and marketing nonfirm power, and larger effects on lower priority nonfirm energy customers.

3.3.3 Alternate Fuel Supply

Less restrictive requirements for alternate fuel capability would tend to increase the amount of nonfirm load to be served under the policy and the amount of nonfirm sales. This would also increase the impacts of generating nonfirm and impacts on other market classes. More restrictive requirements, such as using nonfirm to displace only the most polluting of the fuel burning facilities, would be difficult to impose and may even encourage use of "dirty" fuels ~~for~~ by consumers who want to qualify for nonfirm energy service.

Not having a requirement for an alternate fuel supply would create a potential for consumers to use nonfirm energy to augment their firm power supplies to temporarily increase production, or for industries to be constructed solely to utilize nonfirm when it is available. Lack of an alternate fuel supply requirement may cause cyclical employment situations; hardship for firms who may contract for nonfirm energy without full realization of its limitations, and their employees; and, ultimately, political pressure to provide relief to the affected firms and their employees by providing some grade of firm power. Allowing firm electricity purchased from a utility which is not a customer of BPA to serve as an alternate fuel would potentially harm other ratepayers of that utility since it would have to maintain or secure resources to sell when BPA nonfirm energy is unavailable.

3.3.4 Size of Eligible Firm Load

The minimum size for a load eligible for nonfirm service under the policy is 1 average MW. Expanding eligibility to smaller loads may slightly increase the total amount of nonfirm load served under the policy, but the limiting factors are the cost of the metering and communication equipment and BPA's inability to practically schedule small amounts of energy. Increasing the

size limit to above 1 average MW would reduce the total load eligible for nonfirm service and, therefore, nonfirm sales under the policy. This would reduce both the adverse and beneficial environmental impacts of the policy.

3.3.5 River Conditions Under Which Nonfirm Energy Would Be Sold

Restricting sales of nonfirm to alternate fuel loads to periods of spill and/or imminent spill only would reduce the nonfirm sales to these loads by about the amount of nonfirm energy which might be available under nonspill conditions on the FCRPS at the Spill rate or a lower rate. Nonfirm energy is likely to be abundant and available for an extended period of time when the FCRPS is in a spill or imminent spill mode, and such a restriction would tend to mitigate problems with allocating nonfirm and with consumers' inability to adapt to rapid changes in nonfirm availability.

Such a restriction could deny access to some nonfirm energy by alternate fuel consumers if alternate fuel costs escalate rapidly. The environmental and economic benefits would decrease as a consequence of sales to alternate fuel loads, and would limit increases in the impacts of the policy on California.

One of the impacts of such a restriction is to possibly permit increased DSI operations at times when they would otherwise be at reduced operation due to power limitations (rather than poor markets for their products). This would marginally increase the environmental impacts of DSI operation. It would not affect river operations and related resources such as fish, wildlife, and recreation any differently than under the policy since nonfirm generation would still be optimized to meet available nonfirm markets.

Operations would be different if the FCRPS is in a nonspill condition and capable of generating nonfirm, but the DSI and/or extraregional markets for nonfirm are not sufficient to use the nonfirm that could be generated. This would result in exactly the same operation in this circumstance as would occur under the no action alternative.

3.3.6 Duration of Contracts

If shorter contracts were offered, less Northwest alternate fuel load is likely to be served and development of new alternate fuel load is less likely since the time in which one could be certain of payback from such an investment would be reduced. Thus, shorter contracts would reduce both the adverse and beneficial environmental impacts of the policy. Offering longer term contracts would have the opposite effect.

3.3.7 Notification and Scheduling

If provided with a shorter notice period, fewer consumers would enter into contracts under the policy and less severe environmental impacts, adverse and beneficial, would occur. An increased notice period would generally be appreciated and would be an incentive to purchase nonfirm, but BPA would be more conservative in its notification and, as a result, would offer to sell less nonfirm.

The alternative of delaying the requirement for automated communication equipment until the number of consumers warrants puts utilities in an uncertain situation and may inhibit some marginally sized loads from contracting for the short term. Assuming enough customers contract to make automated communications equipment necessary, there would be no long term difference from the policy.

Chapter 4

OTHER CONSIDERATIONS

In addition to their responsibilities under NEPA, Federal agencies are required to carry out the provisions of other Federal laws. Most of the Federal actions related to the policy discussed in this EA do not require a detailed response regarding the requirements in these other Federal laws. Those requirements are more concerned with specific proposals for direct Federal development, and not with a policy such as the one assessed in this EA, which will primarily alter some Federal power marketing arrangements and, to some degree, operation of some Federal power resources.

4.1 ENVIRONMENTAL MANDATES

The other Federal laws and requirements which will not be affected by the policy but which were considered during preparation of this EA include:

1. Executive Order 12372 Review - The proposed policy does not involve any direct Federal development or development directly assisted through Federal grants, contractual arrangements, loans, loan guarantees, or insurance.

2. The Coastal Zone Management Act of 1972 - The proposal and alternatives are not included in Washington's or Oregon's list of Federal activities affecting their coastal zone programs.

3. Endangered Species Act - BPA has not identified any adverse effects on endangered species associated with this proposed policy. The proposed policy analyzed in this document does not directly involve a construction activity and, therefore, does not invoke a section (7) consultation.

4. Heritage Conservation - The proposed policy will not result in direct action by BPA nor impose actions upon others which would affect historical or archeological resources. Therefore, the proposal does not meet the threshold required for consultation with appropriate agencies charged with Heritage Conservation.

5. Farmlands - The proposed policy will not convert farmlands to other uses because there are no site-specific BPA actions proposed in the policy nor does the policy impose actions on others which would affect farmlands.

6. Recreation Resources - BPA's proposed policy will not adversely affect any designated or proposed wild and scenic rivers, the National Trail System, or wilderness areas. Copies of this EA are being distributed for comment to appropriate land management agencies as consultation on this matter.

7. Permits for Structures in Navigable Waters - The proposed action does not include: (a) a structure or work in, under, or over a navigable water of the United States; (b) a structure or work affecting a

navigable water of the United States; or (c) the deposit of fill material or an excavation that in any manner alters or modifies the course, location, or capacity of any navigable water of the United States.

8. Permits for Discharges into Waters of the United States - The policy and its alternatives do not involve discharge of dredge or fill material into waters of the United States

9. Permit for Right-of-Way on Public Land - Neither the policy nor any alternative includes use of public lands in a way not in accordance with the objectives of the management of those lands, or requires a Federal land managing agency permit.

10. Fish and Wildlife Laws - There are several key provisions and requirements that Federal agencies must address:

    -- The Fish and Wildlife Coordination Act

    -- The Fish and Wildlife Conservation Act

    -- The Pacific Northwest Electric Power Planning and Conservation Act

    -- USFWS Mitigation Policy

    Both Federal and State fish and wildlife agencies will have the opportunity to comment on this EA, and BPA will consider their comments before a finding of no significant impact is made. It is BPA's obligation under the Fish and Wildlife Conservation Act to share scientific information and any other appropriate information with States for the purpose of assisting States in developing and revising a conservation plan. By sending copies of this EA to State fish and game agencies, BPA is meeting its obligations of sharing information it has with the State agencies. BPA asks that State agencies keep it informed of development of conservation plans so that information can be supplied if it is available.

11. Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands - The proposed policy is indirectly related to other entities' management of Federal and non-Federal dams and reservoirs in floodplains. That management may affect wetlands adjacent to and connected to the Columbia River and its tributaries. However, such impacts will not exceed the operational parameters (flood control, navigation, and irrigation) established for each facility. Therefore, effects on floodplains and wetlands will not exceed those incurred during normal operation.

12. Pollution Control at Federal Facilities - The proposal does not require procurement of goods, services, or materials, so the contract compliance provisions of the Clean Air Act, Clean Water Act, and other environmental laws do not apply. Implementation of the policy will not alter the current status of any electrical generating

resource with respect to compliance with environmental regulations governing air pollution, water pollution, solid waste transport and disposal, hazardous waste, drinking water standards, noise, pesticides, or polychlorinated biphenyls (PCB). With additional nonfirm sales, operations of resources and transmission facilities would not violate currently applicable standards or permit conditions. Resources would not exceed a level of environmental impact that would not have occurred otherwise at times during normal operations.

13. Energy Conservation at BPA Facilities - The proposal involves operation of BPA facilities (i.e., the transmission system) at times when sales of nonfirm energy are made under the policy. However, the proposed action will be consistent with energy conservation requirements based on the system's adherence to design standards and general operating plans.

4.2 OTHER APPLICABLE LEGISLATION

In developing and implementing this policy, BPA is guided, in part, by the Council's Northwest Conservation and Electric Power Plan (Northwest Power Planning Council, 1983), as intended by the Regional Act, Public Law 96-501. The pertinent elements of the Council's Plan are contained in Chapter 10, Two Year Action Plan, Program No. 15 and are as follows:

> "The objective of this program is to develop additional markets for interruptible energy in the Northwest. The effort to develop additional means of retaining the economic benefits of low-cost secondary energy in the region is the most important single regional energy-related economic issue over which the region has control, and it should be treated accordingly."

BPA has been requested by the Council to:

-- "Initiate a policy to develop, to the fullest extent possible, regional markets for secondary energy including industrial and irrigation markets;" and

-- "Set an initial goal of 900 to 1,400 megawatts (MW) of potential interruptible load in the industrial sector and conduct further investigations to determine whether more potential is available."

The Bonneville Project Act, as amended, 16 U.S.C., Chapter 12B, and the Federal Columbia River Transmission System Act, Public Law 93-454, direct BPA to encourage the widest possible diversified use of all electric energy that can be generated and marketed at the lowest possible rates consistent with sound business principles. The Pacific Northwest Preference Act, Public Law 88-552, requires that before BPA can export energy from the region, BPA must determine that there is no market for such energy in the Northwest at any established rate (16 U.S.C. 837a; and 837b).

Providing low cost nonfirm energy to consumers which historically have not had access to it is expected to enhance BPA revenues which will, in turn, help hold down rates for all grades of BPA power. In this manner, implementation

of the policy carries out the directives of the Bonneville Project Act, as amended, the Transmission System Act, and the Regional Act. Recognition of the alternate fuel market in the Northwest and the offer to serve this market with nonfirm energy through the policy also furthers the purposes of the Preference Act.

Chapter 5

CONSULTATION

5.1 POLICY DEVELOPMENT PROCESS

Over the past several years, BPA rates for electric power in the Northwest have escalated rapidly. In order to increase BPA revenues and assist the Northwest economy, BPA began to look for new ways to market nonfirm energy in the Northwest.

1. On November 30, 1982, BPA requested public recommendations on ways it could effectively market surplus firm energy (47 FR 53928). A number of the 58 respondents suggested BPA investigate ways to market nonfirm energy in the Northwest as an alternative to firm energy sales outside the region.

2. In March 1983, BPA completed drafting principles for selling nonfirm energy to its Northwest utility customers for industrial and irrigation loads with substitute energy sources. BPA made sales of this type available to Northwest utilities beginning in January 1983 on an interim basis. BPA discussed the interim principles with representatives of preference utilities, IOUs, the DSIs, and industrial consumers of Northwest utilities. BPA requested public comment on these principles in a FEDERAL REGISTER Notice on March 15, 1983 (48 FR 10903).

3. Meetings have been held as part of the policy development. BPA staff met with members of the Association of Public Agency Customers (APAC) and other industries to discuss ideas for the long-term policy, and also met informally with private utilities who are exploring these markets themselves.

4. A Notice of Proposed Policy for Nonfirm Energy Sales for Utilities' Industrial Loads was published in the FEDERAL REGISTER on July 22, 1983 (48 FR 33518). Public involvement meetings on the proposal were held in Portland, Seattle, and Spokane, and written and oral comments were accepted through August 31, 1983. This EA addresses the policy which resulted from the July 22, 1983 proposal, as modified to take into account the comments received.

5.2 ENVIRONMENTAL ASSESSMENT DISTRIBUTION

The following is a general list of agencies and organizations who will receive a copy of this EA for review and comment.

Federal Agencies

US Environmental Protection Agency, San Francisco, CA
Seattle, WA
Denver, CO
US General Accounting Office, Portland, OR
USA Corps of Engineers, Portland, OR
USDOC, National Marine Fisheries Service, Rufus, OR and Pasco, WA
USDOE, Western Area Power Administration, Loveland, CO
Sacramento, CA
Golden, CO
Salt Lake City, UT

USDOI, Bureau of Indian Affairs, Warm Springs, OR
Lapwai, ID
USDOI, Bureau of Reclamation, Boise, ID
USDOI, Forest Service, Portland, OR
USDOI, Forest Service, Missoula, MT
USDOI, National Parks Service, Seattle, WA
USDOJ Attorney's Office, Portland, OR

State Agencies

California: Air Resources Board
Department of Water Resources/Energy
Energy Commission

Idaho: Public Utilities Commission
Department of Fish and Game
Division of Financial Management Clearinghouse

Montana: Department of Community Affairs
Department of Fish, Wildlife, and Parks
Department of Natural Resources and Conservation

Nevada: Public Service Commission

Oregon: Department of Agriculture
Department of Energy
Department of Fish and Wildlife
Department of Transportation, Parks, and Recreation
Employment Division
Intergovernmental Relations Division
Public Utility Commission
State Executive Department

Washington: Department of Ecology
Department of Fisheries
Department of Game
Office of Financial Management
Office of the Governor

Interest Groups

Association of Public Agency Customers
Coalition for Safe Power
Columbia River Inter-Tribal Fish Commission
Confederated Salish and Kootenai Tribes
East Multnomah Co. League of Women Voters
Fair Electric Rates Now
Forelaws on Board
Idaho Wildlife Federation
League of Women Voters of Oregon
National Wildlife Federation
Natural Resources Defense Council
Northwest Conservation Act Coalition

Northwest Indian Fisheries Commission
Northwest Labor Coalition of Energy
Oregon Safe Energy
Seattle Comm. to Stop Rising Fuel Prices
WASHPIRG

Other Interested and Affected Parties

Air Pollution Control Authorities, Los Angeles and San Francisco, CA
BPA Customers
Businesses
City and County Governments
Individuals
Law Offices
Universities

Chapter 6

CONCLUSIONS

The policy for marketing nonfirm energy to utilities for service to interruptible loads which have an alternate, nonelectrical energy source for use when BPA nonfirm energy is unavailable will have no new environmental impacts as a consequence of physical changes in operation of the FCRPS. The policy may have minor environmental impacts resulting from changes in operation of generating plants and of qualified consumers' facilities induced by changes in the availability of BPA nonfirm energy to various market classes. Based on the analysis in this EA, the impacts are not expected to be environmentally significant even assuming as much as 1400 MW of nonfirm load served under the policy.

BPA has reviewed all aspects of this policy for compliance with legislative and executive mandates adopted to safeguard the integrity of the human environment. BPA has consulted formally and informally with other agencies and entities which may be affected by the policy.

In review of the policy, BPA has not identified any unresolved conflicts over alternative uses of available resources affected by this policy. No controversial circumstances or conditions will be created or furthered by this policy.

Unless public and agency review of this environmental assessment reveals sufficient information to the contrary, it will be concluded that implementing the proposed policy is not an action significantly affecting the quality of the human environment, and an environmental impact statement will not be prepared.

APPENDIX A

GLOSSARY

Appendix A

GLOSSARY

ADVANCE ENERGY - Electric energy delivered at BPA's option to industrial customers in lieu of restricting Industrial Firm Power (power that may be delivered to industries on a contract basis), at times when FCRPS controlled reservoirs are on storage control. This energy may be subject to later return if needed to meet BPA's firm loads. This arrangement improves the availability of service and results in greater sales revenues to BPA.

AVERAGE MEGAWATTS (MW) - A measure of average power over a given time period. To determine the average megawatts, divide the total megawatt hours measured in the time period by the number of hours in the period, e.g., if 10 megawatt hours of electric energy are measured over a 5-hour period, then 2 average megawatts would be the average rate of which power is delivered. The term is also commonly used to express an amount of energy. Ten average annual MW would be the amount of energy that a 10 MW generator would produce running full time at capacity for a year, or the amount a 20 MW generator would produce operating at capacity for 1/2 year, or the amount a 20 MW generator would produce operating at 1/2 capacity for a whole year.

BASE HISTORICAL FIRM LOAD - That portion of a consumer's load which data indicates has been firm in the past. BPA proposes not to serve load which has historically been firm with nonfirm energy. BPA may make exceptions to the extent that a lower base firm load level would more accurately reflect long-range trends. For example, if an industrial consumer has shut an electric boiler down because electric rate increases have made an alternate fuel more economical, the base firm load may be adjusted accordingly.

COGENERATION - The simultaneous production of electrical energy and other useful energy, such as usable heat, from a fuel source.

CRITICAL PERIOD - That portion of the historical 40-year streamflow record which, when combined with draft of all available reservoir storage, will produce the least amount of energy being generated according to seasonal load patterns.

DEMAND METER - A device that indicates and/or records the maximum number of kilowatts used during a period of time which is the demand for energy.

DISPLACEMENT RATE - One of the rates at which nonfirm energy may be marketed. It may be implemented after nonfirm energy markets at higher rates are satisfied, and is intended for displacement of coal and nuclear resources and service to alternative fuel loads with a decremental cost lower than the other nonfirm rates.

ENERGY METER - A meter which measures the total kilowatthours of energy that a customer uses.

EXPORT MARKETS - Markets for electric energy or capacity which are outside the BPA service area (i.e., the Region).

FELCC SHIFT - A planning action, under the Coordination Agreement, in which the Coordinated System generates more FELCC in one portion of the critical period while generating less FELCC in another portion of the critical period. Usually FELCC is shifted into the first year of the critical period, resulting in deeper draft of reservoirs.

FIRST QUARTILE - The quarter of industrial firm power (DSI) contract demand which is nonfirm, i.e., which can be interrupted at any time for any reason and for any period, with BPA giving as much notice as practicable.

INDUSTRIAL REPLACEMENT ENERGY - Energy BPA agrees to purchase for the account of a DSI to replace power restricted by BPA and which may be stored by BPA for later use by the DSIs or used concurrently in load.

PREFERENCE CUSTOMERS - Cooperatives and public bodies (states, public utility districts, counties, municipalities, and Federal customers) in the Northwest, because they have been given preferential rights to FCRPS generated hydroelectric power by Congress.

REGIONAL, REGION, PACIFIC NORTHWEST, NORTHWEST - Refers to the BPA service area as defined by the Pacific Northwest Electric Power Planning and Conservation Act as follows:

> ". . . the area consisting of the States of Oregon, Washington, and Idaho, the portion of the State of Montana west of the Continental Divide, and such portions of the States of Nevada, Utah, and Wyoming as are within the Columbia River drainage basin; and . . . any contiguous areas, not in excess of seventy-five air miles from the area referred to in subparagraph (A), which are a part of the service area of a rural electric cooperative customer served by the Administrator on the effective date of this Act which has a distribution system from which it serves both within and without such region."

SPILL RATE - A rate for BPA nonfirm energy now equal to 11.0 miles per kilowatthour. This rate may be charged in lieu of the higher standard rate at anytime that it appears that the lower rate would increase sales sufficiently to increase BPA revenues.

STANDARD RATE - A rate for BPA nonfirm energy now equal to 18.5 mills per kilowatthour and which is the rate charged whenever it would provide optimum revenue.

VARHOUR METER - A device which measures the reactive energy in a circuit.

WATER BUDGET - Provides certain volumes of water to achieve desired flows at Priest Rapids and Lower Granite control points during April 15 to June 15 to increase the flow velocities of the water between dams to reduce spring period migration time for juvenile salmon and steelhead.

APPENDIX B

DESCRIPTION OF NONFIRM POLICY FEATURES

Appendix B

DESCRIPTION OF NONFIRM POLICY FEATURES

B.1 QUALIFICATIONS OF LOAD FOR NONFIRM SERVICE

Under the policy, BPA intends to make nonfirm service available only for the part of the alternate fuel load which is in excess of each consumer's or DSI's base historical firm load level. Furthermore, the level of nonfirm service will not exceed the difference between historical firm service levels and the equivalent electrical capacity of the required alternate fuel source. BPA would discount recent electrical load operating level fluctuations in determining historical firm load levels if the fluctuations do not reflect long range trends. In determining base firm load levels and nonfirm load levels, BPA would avoid loss of firm load to nonfirm energy service.

A qualifying alternate fuel source is, generally, a nonelectrical way of fully meeting the energy need for which nonfirm electric energy from BPA would be used. The alternate fuel source must be capable of providing at least as much energy as the nonfirm electrical energy at the maximum demand. Since the alternate fuel source must be nonelectrical, a load which requires its energy to be in electrical form (e.g., an electric arc steel furnace or a city streetlight system) would not qualify for service under this policy.

B.2 TERM

Nonfirm contracts offered under this policy would last through June 30, 1987, a time approximately equal to BPA's 42-month critical period, starting at the beginning of policy development. This allows sufficient time to gain experience under this policy and allows later contracts to be brought in line with any subsequent nonfirm policy development. At the end of the second and third years, the initial contracts will require review of BPA's and the utilities' expectations regarding their ability and intent to negotiate future agreements for nonfirm energy. Resources to provide firm service may be available upon expiration of the initial contracts. If customers taking nonfirm energy under the policy desire to receive firm service after the term of the contract, they would be required to give BPA 2-years notice of such intent (unless BPA waives this requirement), or longer notice as may be required under sections 8 and 9 of the Regional Act utility power sales contracts.

B.3 NOTIFICATION AND SCHEDULING

B.3.1 Notification of Nonfirm Energy Availability

Under the policy, BPA would notify each utility and DSI purchaser when it had nonfirm energy available for their nonfirm alternate fuel loads. The notification would include estimated price, duration, and amount of nonfirm energy available. These estimates would not be guarantees and would be subject to change at any time (except if the customer paid extra and was buying nonfirm energy under the Guaranteed Delivery provisions of the NF-83 Rate Schedule). However, BPA is obligated to provide the best estimates based

on current information. BPA would inform each participating utility of any revisions in its estimates with maximum practicable notice. It would be the responsibility of the purchaser and the consumer to respond to any change in availability.

B.3.2 Purchase of Nonfirm Energy

During periods of nonfirm energy availability, nonscheduling purchasers can be required, in accordance with the policy, to notify BPA's schedulers by noon of each workday prior to the delivery of nonfirm energy to a load. However, BPA schedulers may, from time to time, require less frequent communications in certain circumstances.

Scheduling purchasers would follow appropriate scheduling procedures specified in their power sales contracts.

B.3.3 Transition to Alternate Fuel

At times when BPA no longer has any nonfirm energy available, any energy taken for the nonfirm load would be billed at the charge for unauthorized increases under the applicable BPA power rate schedule.

BPA intends to give maximum practicable notice to purchasers of any change in nonfirm availability. BPA generally knows about a week in advance when spill energy will no longer be available. After the spill condition, nonfirm energy often continues to be available, but it is generally more difficult to forecast the availability of this nonspill type of nonfirm energy. However, BPA proposes in this policy to reserve the right to give notice of termination of nonfirm availability, effective at the end of any hour.

BPA could have provided a short, fixed notice period of the end of nonfirm availability. However, the result of a fixed notice period would merely be that BPA would be more conservative in giving notice and, thus, nonfirm availability might sometimes extend beyond the end of the notice period.

In the event of a sudden loss of generating capacity or transmission, BPA would give notice if possible, but there is little which can be done to mitigate the effects of an unexpected change of availability of this sort.

BPA offers a guaranteed delivery option in the current rate schedule for nonfirm energy. The delivery is generally guaranteed through the next 4 days but is subject to restriction in the event of a system emergency. A purchaser could take advantage of such an offer under nonfirm contracts concluded in accordance with this policy.

B.4 FACILITIES

Purchasers who take advantage of the proposed nonfirm service would be responsible for installation of metering and communication equipment required by the policy. BPA does not propose to recover the cost of such facilities from nonfirm revenues. However, BPA may install the facilities for the purchaser at the purchaser's or the consumer's expense.

B.4.1 Metering

In order to segregate the amounts of nonfirm energy from amounts of firm power delivered at the point of delivery, an hourly recording demand meter, and an energy meter are required, and a varhour meter may be required at each consumer's nonfirm load served under the policy. Installation of these meters at the load provides a means of computing the amount of nonfirm energy for which the purchaser will be billed and verifies that the nonfirm energy got to the consumer's nonfirm load.

BPA has implemented a program to install remote reading equipment on point-of-delivery meters. This would require the purchaser to install remote reading capability at the point of metering. This will allow BPA to prepare billings quickly and will allow BPA's Division of Power Supply daily access to amounts of nonfirm energy actually taken. The purchaser would also have to provide a dedicated telephone line as part of the remote reading equipment.

Costs of metering and remote reading equipment and installation can be as much as $6,200 if all new equipment must be used and the metering and remote reading equipment are installed at separate times. Installing both at once is less expensive at about $5,500. Costs of the metering equipment alone is about $2,700 including installation.

B.4.2 Communications

BPA expects to install an automatic communications system which will facilitate notification of nonfirm availability. The purchaser would be required to have a hard copy terminal with auto answer modem to receive messages from BPA. The cost of the terminal is about $1500. A separate phone line would also be required. More frequent communication from BPA would result because of the ease of operation. If a purchaser or consumer had any question about a message received, it could call BPA. If a purchaser and a consumer desire, an additional communication terminal could be installed at the consumer's facility.

B.5 ALLOCATION

In the event that demand for nonfirm energy exceeded the supply, BPA would allocate the available nonfirm energy in accordance with the Bonneville Project Act and the Pacific Northwest Preference Act (P.L. 88-552), and on a pro rata basis related to total requests for nonfirm energy within a customer class. This means that (1) Northwest markets will be served first (e.g., prior to serving Southwest markets); (2) within the Northwest, preference customers will be given preferential access to nonfirm energy; and (3) within a customer class (e.g., preference customers), nonfirm energy will be prorated according to requests for such energy. Service to DSI First Quartile loads would be given higher priority than service to DSI alternate fuel loads.

B.6 APPLICATION FOR FIRM SERVICE

By definition, BPA is not obligated to make nonfirm energy available. In 1983, the region enjoyed a good water year with an abundance of nonfirm energy. This abundance has been increased by BPA's firm load underruns. As

conditions change, consumers may wish to convert nonfirm loads to firm service. BPA is not obligated to allow such a conversion before the expiration or termination of the nonfirm contract, but may allow such a conversion prior to that time (see Appendix B.2).

Limiting the electrical loads served under the policy to receiving only nonfirm service for the duration of the contract prevents switching from firm power (when firm power is economical) to nonfirm energy (when nonfirm is available and economical) and vice versa. Allowing such switching could effectively result in serving a firm load, for which BPA has a firm planning obligation, with nonfirm energy, and would be detrimental to both BPA revenues and planning.

For any subsequent nonfirm contracts, BPA might require different notice for firm service to loads, especially if BPA is no longer in a surplus condition.

B.7 RATES

B.7.1 Wholesale Rates

BPA cannot determine a rate for nonfirm energy in this policy. Rates for BPA wholesale power, including rates for nonfirm energy, are determined in a separate wholesale power rate adjustment process independent from the development of this proposed final policy. New rates resulting from the last such process took effect November 1, 1983, and will continue through June 30, 1985. The final step in setting these rates was the preparation of the "1983 Final Rate Proposal Wholesale Power Rate Design Study" (BPA, 1983b) which describes the rates and their uses. The new rates were also the subject of the "Bonneville Power Administration 1983 Wholesale Power Rate Final Environmental Impact Statement" (BPA, 1983c).

B.7.2 Retail Rates

BPA has not proposed inserting a provision in the policy which would limit a purchasing utility's markup of nonfirm energy.

BPA encourages any consumer considering entering into a contract for nonfirm service with its utility pursuant to this policy to negotiate an upper limit to the markup for the duration of the contract.

Under the interim nonfirm agreements (see Chapter 1.4.3), BPA felt that a limitation on the amount of markup a utility attempted to pass through to a consumer would be unnecessary, since utilities and their consumers would generally negotiate to develop a mutually satisfactory rate. However, BPA received comments from certain consumers that their utilities were attempting to pass through too high a markup on the nonfirm, resulting in delays in entering into an interim agreement. Utility markup in their nonfirm retail rates could cause those rates to be uncompetitive with alternate fuels. BPA encourages utility purchasers of nonfirm to consider adopting retail nonfirm rates designed to be competitive with alternate fuels.

APPENDIX C

CUSTOMERS TO WHICH NONFIRM ENERGY HAS BEEN SOLD UNDER THE INTERIM CONTRACTS

Appendix C

CUSTOMERS TO WHICH NONFIRM ENERGY HAS BEEN SOLD
UNDER THE INTERIM CONTRACTS

a. Umatilla Electric Cooperative contracted for up to 40 average MW of nonfirm energy, beginning January 9, 1983, for three potato processing plants. All three plants have natural gas-fired boilers as alternate fuel sources.

b. The City of Port Angeles contracted for approximately 7 average MW of nonfirm energy, beginning February 1, 1983, for an electric boiler at a Crown Zellerbach paper mill. The mill can use wood waste in lieu of electricity.

c. Cowlitz County Public Utility District contracted on February 25, 1983, for approximately 75 average MW of nonfirm energy for electric boilers at Longview Fibre and Weyerhaeuser mills. These mills can also use wood waste as fuel. Kalama Chemical, Inc. was later added on December 1, 1983, to the contract in order to receive approximately 14 average MW of nonfirm energy. This consumer can utilize oil or gas as an alternate energy supply.

d. Tillamook County People's Utility District contracted for approximately 3 average MW of nonfirm energy since June 11, 1983, for service to a boiler at the Tillamook cheese factory. The cheese factory can use oil as an alternate fuel.

e. Snohomish County Public Utility District contracted for approximately 45 total average MW of nonfirm energy for service to the electric boiler loads of the Weyerhaeuser Kraft Paper and Lumber Manufacturing Facility and the Boeing Commercial Airplane Company since May 11, 1983. Weyerhaeuser can run alternate fuel boilers with natural gas, oil, or black liquor, a by-product of kraft pulp production. Boeing can fire boilers with natural gas or oil in lieu of electricity.

f. Lewis County Public Utility District contracted for approximately 3 average MW of nonfirm energy between June 9, 1983, and November 1, 1983, for service to the American Crossarm and Conduit Company. Lewis received nonfirm service under the curtailment provisions of the interim nonfirm principles which stated that loads which were curtailed or not operating on March 1, 1983, or for which an announcement of such curtailment had been made, were eligible for nonfirm service under the principles if the consumer signed an affidavit attesting that the load would not operate unless nonfirm energy were made available.

g. Kaiser Aluminum and Chemical Corporation, a DSI, contracted for nonfirm energy beginning January 12, 1984 to operate a 10-MW boiler at their Mead, Washington, aluminum reduction plant. The plant can alternatively fire gas to meet its steam needs.

APPENDIX D

ASSUMPTIONS USED IN DETERMINING CHANGES IN BPA NONFIRM ENERGY AVAILABILITY TO VARIOUS MARKETS

Appendix D

ASSUMPTIONS USED IN DETERMINING CHANGES IN BPA NONFIRM ENERGY AVAILABILITY TO VARIOUS MARKETS

The secondary energy analysis performed for this EA assumed that:

1. 1400 MW of alternate fuel nonfirm load is contracted for under the policy;

2. all of the load is on Northwest preference agency systems;

3. all preference agency nonfirm load consists of alternate fuel load (i.e., the preference agencies serve no other nonfirm loads);

4. the Spill rate is effective whenever BPA has over 2500 MW of nonfirm energy to market, and the Standard rate is effective at other times; and

5. the consumers served with nonfirm energy under the policy utilize as much nonfirm energy as they can for 1400 MW of load whenever it is available at the Spill or a lower rate and buy 20 percent of this amount when the Standard rate is in effect.

The first three assumptions tend to maximize the impacts of the policy on other customer classes. The third and fifth assumptions reflect a realistic marketing situation in that BPA implements its nonfirm rates to maximize revenues, and the alternate fuel is generally more economical than nonfirm energy at the Standard rate. Under these assumptions, the secondary energy analysis performed for this EA showed that in an averge year about 768 average MW (6.73×10^6 MWh) would be used by the Northwest alternate fuel market.

APPENDIX E

IMPACTS ON THE CALIFORNIA ENVIRONMENT

Appendix E

IMPACTS ON THE CALIFORNIA ENVIRONMENT

The Stanford Research Institute (SRI) study (1976) entitled Environmental and Socioeconomic Impacts of Sales of Secondary Electrical Energy to California Utilities was prepared under contract to BPA to provide information for BPA's Role EIS. Although now somewhat outdated, the data it contains and the methodologies used in its preparation can still be used for an "order of magnitude" assessment of the impacts of the proposed final policy on water consumption, air quality, and thermal pollution in California. This analysis assumed that the Western Area Power Administration's intertie capacity was fully utilized for firm energy deliveries. The results of the analyses are summarized in Tables E-1 and 2; Figure E-1 shows the air basins referred to in Table E-2.

The SRI report (1976) projected the impacts of the sales of BPA nonfirm energy for the 1975 calendar year in which 9.2 million MWh were sold to the California utilities. Table 20 of the SRI report showed the impacts by pollutant of that sale on the five air basins (shown in Table E-2 and Figure E-1 of this EA) as a percentage of total emissions in each year for 1973. Depending on the basin and pollutant, emissions reductions by the 1975 sale ranged from 1 to 17 percent of the 1973 emissions. The largest impact in terms of percent of the 1973 emissions was the 17 percent decrease for sulfur oxides in the South Central Coast air basin, which represented an impact of reducing sulfur oxide emissions that year in that basin by about 1825 tons. If 1825 tons represented 17 percent of the 1973 sulfur oxide emissions in the South Central Coast air basin, the total emissions for that year must have been about 10,735 tons. The impact on sulfur oxide emissions in the South Coast air basin of serving 1400 MW of alternate fuel nonfirm load in the Northwest is, on the average, an increase of about 315 tons per year, as projected using the data and methodology of the SRI study. This amount represents about 2.9 percent of the 1973 total emissions. A similar comparison can be made for other pollutants and air basins by using Table 20 of the SRI study. Where such a comparison can be derived from this table, the average increase in potential emissions projected as a consequence of serving 1400 MW of alternate fuel nonfirm load is also given in terms of percent of 1973 total air basin emissions on Table E-2. As can be seen, these percentages are quite small. Even allowing for changes in the total amounts of emissions in the five California air basins since 1973, and changes in the emissions from California generating plants which might be displaced (which are likely to have been reduced through improved air pollution control), the impacts of serving 1400 MW of alternate fuel load does not appear to have significant impact on air quality in California.

TABLE E-1

POTENTIAL INCREASES OF WATER CONSUMPTION
AND THERMAL DISCHARGES RESULTING FROM
DECREASED AVAILABILITY OF BPA NONFIRM ENERGY 1/ 2/

Utility	Average Annual Increase in Water Consumption 10^6 gal/year	Average Annual Increase in Thermal Discharges, 10^9 BTU/year
Pacific Gas and Electric Co.	206	1760
Southern California Edison Co.	190	1640
San Diego Gas and Electric Co.	39.2	337
Los Angeles Dept. of Water and Power	87.1	752
Burbank Public Service Dept.	10.7 3/	93.2
Glendale Public Service Dept.	11.7 3/	98.1
Pasadena Water and Power Dept.	6.1	52.5
TOTAL	550.8	4,732.8

1/ Assumes 1400 MW of alternate fuel nonfirm load in the Northwest.
2/ Table 21 of the SRI report indicates a total potential water use by the resource of the seven utilities as being about 2.9 x 10^{10} gal/year, and total potential thermal discharges of about 3.6 x 10^{14} BTU/year.
3/ Uses recycled water from municipal sewage.

TABLE E-2

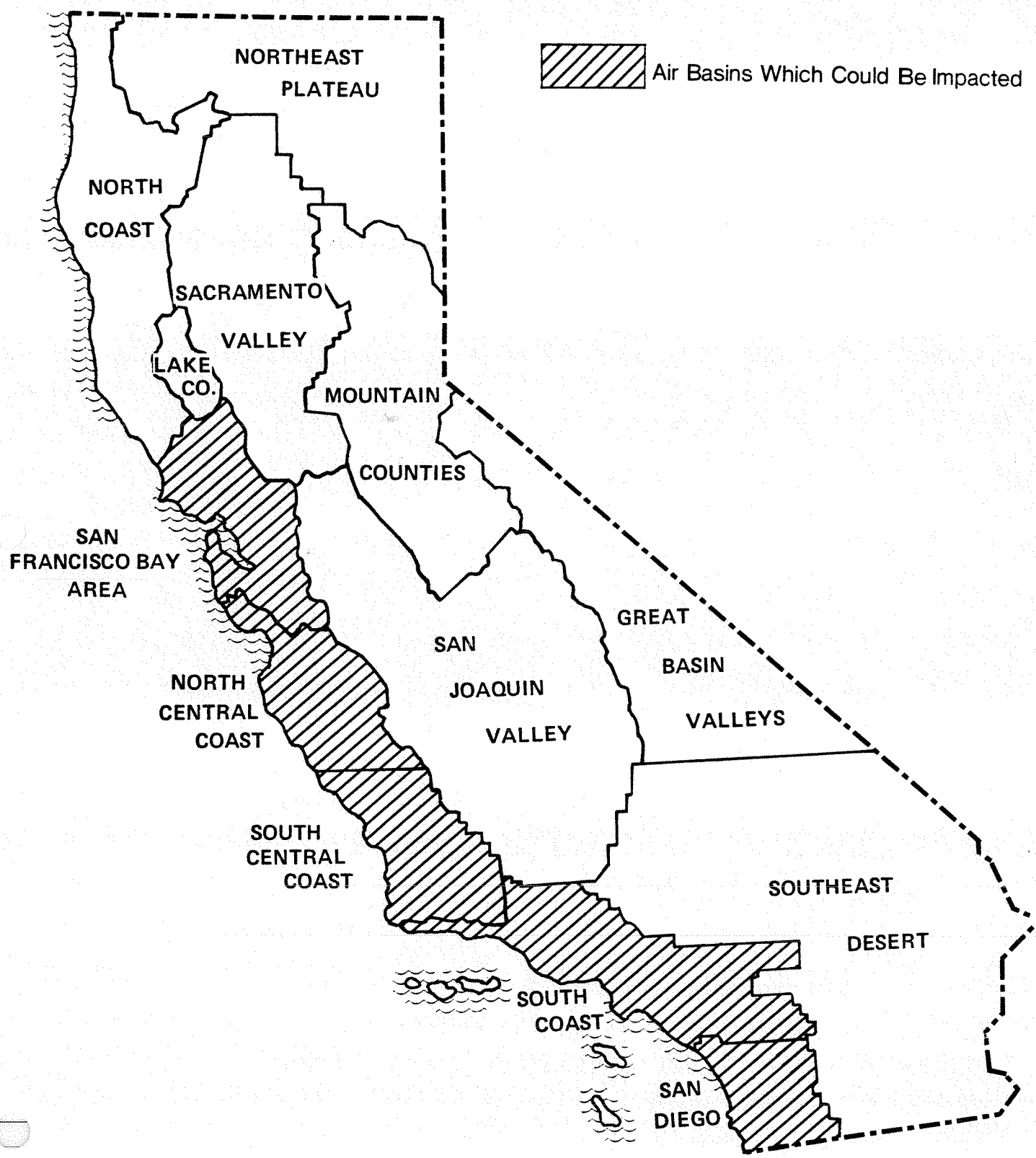
POTENTIAL INCREASES OF AIR POLLUTANT EMISSIONS RESULTING FROM DECREASED AVAILABILITY OF BPA NONFIRM ENERGY

Air Basin	Particulate		Sulfur Oxides		Carbon Monoxide 3/	Hydrocarbons 3/	Nitrogen Oxides	
	average tons/year	Percent of 1973 total 2/	average tons/year	Percent of 1973 total 2/	Average Tons/year	Average tons/year	average tons/year	Percent of 1973 total 2/
San Francisco Bay Area 1/	92.0	0.19	1030	0.94	0.615	33.8	880	0.37
North Central Coast 1/	56.5	0.22	630	3.5	0.378	20.8	540	1.5
South Central Coast 1/	28.3	0.31	315	2.9	0.185	10.4	271	1.3
South Coast	249	0.24	2820	1.4	1.69	92.8	1160	0.24
San Diego	33.5	3/	372	1.8	0.223	12.3	90.3	3/
TOTAL	459.3		5167		3.091	170.1	2941.3	

1/ Pacific Gas and Electric Company emissions divided among these three basins in proportion to the capacities of the plants in each region as listed in Table 21 of the SRI report (1976).
2/ Percent of 1973 total emissions are derived from Table 20 of the SRI study (1976).
3/ Data to calculate percentage of 1973 emissions not available from Table 20 of the SRI study (1976).

FIGURE E-1

CALIFORNIA AIR BASINS



APPENDIX F

REFERENCES

Appendix F

REFERENCES

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4-2

3-4-85

U.S. DEPARTMENT OF ENERGY
Bonneville Power Administration

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Final Policy for Sales of Nonfirm Energy for
Service to Loads With Alternate Fuel Capability

The Bonneville Power Administration (BPA) has prepared an Environmental Assessment (EA) (DOE/EA-0239) to assess environmental effects of the BPA policy for the sale of nonfirm energy to loads with alternate fuel capability.

Proposed Action

BPA proposes to establish a policy to sell some nonfirm energy to BPA's Direct Service Industry (DSI) customers and Pacific Northwest (PNW) utilities for loads greater than 1 average megawatt (MW) which have the capability of being served with electricity, but which also have another energy source such as gas, oil, or hog fuel, to substitute when BPA nonfirm electricity is not available. The policy responds to BPA's need to: (1) improve BPA revenues by stimulating nonfirm energy sales that would not otherwise take place; (2) allow DSI's and BPA's utility customers, and their qualified consumers, to enjoy the benefit of lower cost energy when it is available, and thereby improve the region's economy; and (3) utilize BPA nonfirm hydroelectric resources that might otherwise be wasted. The revised proposed policy was described more completely in the EA (DOE/EA-0239, p. 1 and Appendix B) and in the FEDERAL REGISTER "Notice of Revised Proposed Nonfirm Energy Policy for Consumer Alternate Fuel Loads and Request for Comments" (49 FR 35853).

As a consequence of public comment on the FEDERAL REGISTER notice, BPA intends to incorporate seven substantive changes into the final policy. Environmental impacts of the policy with these changes are within the range of impacts analyzed in the EA (see pp. 4-5 of this FONSI). The policy changes are as follows:

1. The policy will allow a utility serving an alternate fuel load to use nonfirm energy from its own resources or imported from another utility to serve the load under certain limited circumstances designed to avoid adverse effects on BPA operations or power marketing programs or existing contractual obligations. This use of a utility's nonfirm energy or nonfirm energy from another utility's system was mentioned as an alternative in the EA (see p. 7).

2. The policy will allow BPA to provide firm service, when BPA has no nonfirm energy available, to a qualifying load for a limited period in the event an uncontrollable force or maintenance at the consumer's facilities prevents operation of the alternate fuel source. The policy will also allow BPA to use its firm surplus energy, at the request of the customer and when firm surplus in excess of all other markets is available, to serve qualified loads for a period not to exceed 72 hours after nonfirm energy availability ceases. Use of firm surplus energy in this manner will help consumers participating in the policy while changing over to their alternate fuel energy source.

3. The policy will include provisions to encourage new qualified loads, to a limited degree, by considering investments in new electric capability at facilities already having alternate fuel capability as a negative component of the avoided costs when making nonfirm energy sales under a displacement rate, such as the Displacement Rate in BPA's Nonfirm Energy Rate Schedule (NF-83). Although this was not specifically addressed as an alternative in the EA, it falls generically under the alternative termed "Affirmative Action to Develop Interruptible Loads" (EA pp. 6 and 19).

4. Initial contracts offered under the policy would expire June 30, 1989, and not June 30, 1987, as stated in the EA (p. B-2). Longer contract duration was addressed as an alternative in the EA (pp. 7-8 and 21). Also, since delay in policy implementation has occurred, the new initial contract termination date does not dramatically extend the contract term from that conceived at the time policy development began.

5. The final policy will allow displacement, when BPA has nonfirm energy available, of cogeneration existing at the time of publication of the final policy and from which the consumer utilizes all of the electrical and thermal (and/or mechanical) energy output. This type of cogeneration is in reality merely a category of alternate fuel load in which part of the energy in the alternate fuel is converted to electrical energy prior to use.

6. The final policy will not require a varhour meter for an alternate fuel load, unless there is a BPA operational or planning need.

7. A minimum 4-month notice period will be provided for installation of communication equipment. Delaying installation of communication equipment was discussed as an alternative in the EA (pp. 8 and 22) and was part of the revised proposed policy. Only the notice period is new, and is necessary for customers to secure and install the equipment.

The above changes have been circulated for public review as part of an addendum to the Staff Evaluation of the Record.

<u>Reasons Why the Proposed Policy Will Not Have a Significant Impact on the Human Environment</u>

The potential environmental effects of the proposed policy stem from: (1) changes to produce more energy in the operation of Federal hydroelectric dams in the PNW and other resources from which BPA secures electric energy; (2) changes in the operation and economic viability (including incentives for new development) of facilities served under the policy; and (3) changes in the amount of nonfirm energy available to lower priority customer classes for other uses. These potential impacts were discussed in Chapter 3 of the EA (pp. 9-18). Public and governmental agency review of the EA did not reveal any further environmental concerns.

The changes which will be made in the final policy will not substantially change the impacts of the policy as they were described in the EA. These changes may slightly enhance the effectiveness of the policy by making its terms more attractive to potential customers, but the analysis of potential impacts of the policy was based on the assumption that 1400 MW of qualifying

waste generation, do not occur. However, this benefit is not significant to the PNW since: (1) industrial, commercial, and institutional consumers which might be served under the policy are regulated by environmental agencies; (2) fuel burning operations of these consumers do not generally result in substantial environmental damage in the PNW; (3) loads served by the policy will be dispersed over the BPA service area; and (4) loads will only be served part of the time (EA, pp. 13-14).

3. Impacts related to changes in nonfirm energy availability - Since PNW public utilities and municipalities have priority to purchase BPA nonfirm energy, serving alternate fuel consumers on their systems would reduce the amount of BPA nonfirm energy available to lower-priority customers, namely PNW investor-owned utilities and utilities outside the region, mainly in California (EA, pp. 15-16). For the PNW investor-owned utilities, the decreased availability of BPA nonfirm energy means, primarily, a reduced chance of their coal-fired resources being displaced (especially in January, March, April, and July). The increase in coal plant impacts caused by less displacement is not environmentally significant because displacements are temporary, the coal plants are subject to environmental regulation, and the coal plants do not result in impacts which are abnormally severe for such facilities (EA, pp. 15-16). California utilities tend to use BPA nonfirm energy to displace gas- and/or oil-fired resources. Increases in emissions of air pollutants and other environmental impacts as a consequence of decreased generating resource displacement in California are not significant because the changes are only small portions of the total amounts of pollutants released by, and the cumulative impact of, other facilities and activities affecting the California environment (EA, pp. 16-18 and Appendix E).

Related Documents

On March 15, 1983, BPA requested comments on interim principles for sales of nonfirm energy for interruptible industrial and irrigation loads (48 FR 10903).

On July 12, 1983, BPA issued its proposed policy for sales of nonfirm energy to utilities for alternate fuel industrial loads. The proposed policy was published in the FEDERAL REGISTER on July 22, 1983 (48 FR 33518). BPA mailed a summary of comments on the proposed policy to the public on November 23, 1983.

BPA issued a Revised Proposed Nonfirm Energy Policy for Consumer Alternate Fuel Loads on September 10, 1984. The revised proposed policy was published in the FEDERAL REGISTER on September 12, 1984 (49 FR 35853). This revised proposed policy considered comments received on the Proposed Policy for Nonfirm Energy Sales for Utilities' Industrial Loads, and BPA's experience under interim alternate fuel nonfirm energy contracts. The FEDERAL REGISTER Notice of the revised proposed policy also notified interested parties of the availability of a Staff Evaluation of the Record and a proposed generic contract for alternate fuel loads.

An Addendum to Staff Evaluation of the Official Record was distributed for public comment January 21, 1985. Comments were due February 5, 1985. This addendum discussed several new issues brought up through public review of the FEDERAL REGISTER Notice and recommended a number of changes to the policy.

nonfirm load would be served under the policy (EA, p. 9). This substantially exceeds the amount of load for which nonfirm service, even under the policy with the above changes, is likely to be requested. In fact, a report on Marketing Nonfirm Electrical Power to Pacific Northwest Manufacturing Industries, prepared for the Northwest Power Planning Council by Ekono, Inc., in July 1984 found that even with certain guarantees of nonfirm energy availability and price not provided by the policy, only about 1200 MW of nonfirm load would be realized. Since all impacts of the policy become greater in magnitude as more nonfirm load is served, the assumption of 1400 MW of load results in analysis which is environmentally conservative.

The longer contract duration to be offered under the final policy only extends the duration of the impacts which occur.

Amounts of firm service which may be provided to alternate fuel loads under the second policy change (see p. 1 of this FONSI) will be negligible in relation to BPA's total loads and in relation to the total energy marketed to alternate fuel loads, will be contingent on BPA's ability to supply it in any case, and will not noticeably affect operation of BPA's resources.

For the above reasons, the Department of Energy (DOE) has determined that it is not necessary to supplement the EA prior to implementing the final policy.

1. Impact of resource operation changes - Operation of PNW Federal hydroelectric projects will be changed to meet additional demand for nonfirm energy under the policy. However, no significant impacts will occur because operational changes will occur within existing constraints of the hydroelectric projects. Also, BPA will mitigate potential fish passage problems related to spill by foregoing nonfirm energy sales which would conflict with any fish passage spills which the Federal dam operators determine to provide, pursuant to Sections 404(a) and (b) of the Regional Council's Program, until effective juvenile fish bypass systems are in operation (EA, pp. 9-11).

BPA's thermal resource operations will not be increased as a result of the policy because: (1) two of these resources (Trojan and Washington Nuclear Project No. 2) have variable costs low enough that they tend to be operated to the maximum extent under any circumstances; and (2) BPA simply cannot substantially influence operation of the other two (the Hanford Generating Project and a 50-MW share of the Boardman Coal plant) to increase generation upon demand (EA, p. 10).

2. Impacts related to facilities served - Past study of how availability and cost of electric energy have influenced the siting of industry in the PNW indicates that the proposed policy will not influence development of new industrial plants (EA, p. 12). Addition of new electric facilities, such as electric boilers, at existing facilities or incorporation of such facilities into new projects would have only minor impacts (EA, pp. 11-12).

Under the policy, some PNW consumers may, at times, displace use of fossil fuel, hog fuel, or other nonelectric energy sources and use nonfirm electric energy instead when it is lower cost. In marginal cases, this may slightly enhance a business's financial viability. When nonfirm energy is substituted, the impacts of use of the alternate fuel, such as air pollution and solid

Public Availability

Copies of the EA were sent on September 10, 1984, to potentially affected utilities and agencies, and other organizations and individuals who expressed interest in BPA power marketing actions. Copies of this finding will be sent to all persons and agencies who were sent copies of the EA. Copies are also available upon request from BPA (address below).

Determination

Based on the information in the EA, the review of the EA by government agencies, utilities, interested groups, and individuals, and consideration of the environmental implications of the policy changes described herein, it is the determination of DOE that the final policy is not a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA, 42 U.S.C. 4321 et. seq., and, therefore, an environmental impact statement will not be required.

For Further Information Contact: Roy B. Fox, Environmental Coordinator, Office of Power and Resources Management - PGC, Bonneville Power Administration, P.O. Box 3621, Portland, Oregon 97208, telephone (503) 230-4261.

Issued in Washington, D.C., on March 4, 1985.

/s/ William A. Vaughan
WILLIAM A. VAUGHAN
Acting Assistant Secretary for Policy, Safety, and Environment

AUG 2 0 1987

PGC

Addressees

Roy B. Fox, Environmental Coordinator
Office of Power Marketing - PGC

Revised Alternate Fuel Policy Public Involvement Plan

Attached for your information is the Public Involvement Plan for the Revisions to the Alternate Fuel Policy.

Attachment

Addressees:
D. Geiger - ALP
K. Johnson - ALP
J. Luce - AP
G. Tupper - O
G. Lenzen - OB
E. Sienkiewicz - P
J. McLennan - PG
S. Price - PGC
J. Pyrch - PK
D. R. Anderson - PKLC
C. Combs - PKLC
D. Erickson - PKLC
A. Morrell - SJ
K. Pierce - SJ

RSeiffert:ljc:8/19/87 (PGC-5439K)

cc:
Official File - PGC
EX-12-7-2 alt. Fuel Policy - Revised PI Plan

REVISED POLICY FOR SALES TO ALTERNATE FUEL LOADS
Public Involvement Plan
July 20, 1987

I. Introduction

BPA issued its Final Nonfirm Energy Policy for Consumer Alternate Fuel Loads (Alternate Fuel Policy) in March of 1985. This policy allowed sales of nonfirm energy to the Direct Service Industries (DSIs) and Pacific Northwest (PNW) utilities for loads greater than 1 average megawatt (MW) that have the capability of being served with electricity, but also have another energy source, such as gas, oil, or hog fuel, to substitute when BPA nonfirm electric energy is not available. The policy responded to BPA's need to: (1) improve BPA revenues by stimulating nonfirm energy sales that would not otherwise take place; (2) allow DSIs and BPA's utility customers, and their qualified consumers, to enjoy the benefit of lower-cost energy when it is available, and thereby improve the region's economy; and (3) insure that firm load was not lost by converting it to nonfirm load. Sales of nonfirm energy for this purpose had been sold for use by several industries under interim contracts prior to the policy.

An Environmental Assessment (EA) was prepared on this policy, and a Finding of No Significant Impact (FONSI) was signed by the Department of Energy on March 4, 1985. A Record of Decision on the Policy was included as the first part of the FEDERAL REGISTER Notice of Final Policy issued on March 14, 1985.

Due to the continued availability of firm surplus energy, BPA proposes revising the Alternate Fuel Policy to permit service to alternate fuel loads with surplus firm power for a fixed period as available, and to allow discretion in serving alternate fuel loads smaller than 1 average MW. Firm surplus service is currently limited to up to 72 hours after nonfirm ceases to ease transition to the alternate fuel. BPA is also proposing to extend the term of the contracts approved under the current policy to 1994 or when the Administrator declares the region is in energy load/resource balance. Present contracts terminate June 30, 1989. It should be noted that BPA has provided service to alternate fuel customers under the SP Rate Schedule for Surplus Firm Power in several instances.

Currently, six utilities and one DSI serve a total of 12 alternate fuel customers. The total capability of these loads is approximately 250 MW.

II. Public Involvement Goals

The public involvement process for this policy revision should inform the public that BPA is considering broadening its Alternate Fuel Policy in the ways described above. BPA seeks comment on the proposed revisions and suggestions as to how the policy should or might otherwise be modified to be more effective in providing revenue to BPA and helping the region's economy.

III. Preliminary Consultation

Preliminary consultation occurred through development of the existing policy and contracts. The existing policy was developed in consultation with the public, particularly members of the Association of Public Agency Customers (APAC) and other industries. The industries and utilities that were interested in purchasing power for alternate fuel loads, including those served under interim contracts, were quite interested in the details of the policy. Three public comment meetings were held. Written comments were also submitted. The EA served as a further opportunity for comment. Other entities, such as the general public, other utilities, and other governmental agencies, generally expressed little concern with the policy.

BPA review of the proposed policy changes is taking place to gain additional insights or ideas which might be developed internally before taking these ideas to the public. Informal discussions with selected utility and DSI customers may be conducted by Area Power Managers, at their discretion, during internal review of the proposed policy revisions to obtain preliminary views regarding the changes to the policy described above. A preliminary environmental review of the proposed policy changes determined that a categorical exclusion or a brief memo based on the existing EA/FONSI should be sufficient procedurally.

IV. Related BPA Processes

BPA is currently undertaking a regional wholesale power marketing effort. The goal of this effort is to enhance BPA's long-term revenue stability and system operation through power and capacity sales to IOUs and public generating utilities in the PNW.

BPA is also undertaking a regional consumer marketing program aimed at helping its metered requirements customers market additional electricity.

The revisions to the Alternate Fuel Policy could be accommodated within either of the two efforts described above. However, those processes are intended to identify and develop new programs. Since this proposal deals with an established policy with relatively uncontroversial changes, BPA proposes to revise the policy in a separate process.

V. Potential Major Issues

One key issue is that this will be another competing use, albeit a small one, for surplus firm power. Certain entities in the market for firm surplus would prefer not to see any additional competition for that power. Priority of surplus firm power service to alternate fuel loads in relation to other surplus firm buyers may also be an issue. Other issues raised during the development of the initial policy may also resurface. One of the more controversial issues was how to deal with cogeneration in the policy. Another issue was how to determine the eligibility of a consumer to obtain power under the policy.

VI. Interested Publics

Audience 1: The greatest interest in the proposed changes to the Alternate Fuel Policy will be held by those currently served under the policy. These entities are:

Utility	Load
Umatilla Electric Coop.	Lamb Weston Oregon Potato Company
Kaiser Aluminum & Chemical Corp.	Mead Primary Aluminum Smelter
Tillamook PUD	Tillamook Creamery
Cowlitz County PUD No. 1	Weyerhauser Kalama Chemical Longview Fibre
City of Port Angeles	Crown Zellerbach
Snohomish County PUD No. 1	Weyerhaeuser Scott Paper Boeing
City of Seattle	Seattle Steam

APAC can also again be expected to have a lot of interest because of their involvement in the development of the initial policy.

Audience 2: Other BPA customers and customer groups. These entities, which are expected to follow the process to change the Alternate Fuel Policy, provided little comment when the existing policy was developed. Some customers, such as California utilities, may view the changes as impacting the potential supply of surplus firm power and may have more interest in following the policy revisions.

Audience 3: Key Constituents. These include: Power Planning Council; interest group leaders; public utility commissioners; State and local governments, including their energy offices; ratepayer organizations; conservation groups; environmental interest groups; fish and wildlife groups; and Congressional representatives. These entities are those which are generally interested in all Bonneville activities, but they also showed little concern with the establishment of the initial policy. This was probably because the policy was perceived as one serving a small market and as being generally beneficial. They are expected to react similarly to the proposed policy revisions.

Audience 4: The general public. The general public provided little comment during the development of the initial policy. This audience will receive information through the Consumer Marketing program public involvement mailings and therein will be provided with instructions to contact the Public Involvement Office Reference Room for information concerning the revisions to the Alternate Fuel Policy, copies of the proposed revised policy, and how they can comment on these revisions.

VII. Decisionmaking Process

The process to revise the Alternate Fuel Policy is expected to take about 21 weeks. The process will involve publication of a Notice of Intent to change the policy in the FEDERAL REGISTER, which will include the draft revised policy, followed by a 30-day comment period. After the comment period, a decision document which will contain a description of the proposed action, a comment summary, a staff evaluation of comments, a statement of the decision, and a summary of the reasons for the decision (as specified in Section V.G of the Policy for Public Involvement) will be prepared. On the basis of the decision document, a final FEDERAL REGISTER Notice will be prepared containing the final revised policy. A schedule of the process is included as Appendix 1.

Unless the public comment process reveals new or unforeseen environmental issues, BPA expects to comply with the National Environmental Policy Act (NEPA) through use of a categorical exclusion or a Brief Memo. A statement of what NEPA compliance mechanism was used will appear in the decision document. If substantive environmental issues arise, BPA will proceed to modify its schedule for this policy revision, prepare an EA or environmental impact statement (EIS), and make its findings accordingly.

VIII. Public Involvement Activities

A Notice of Intent to change the policy, including the draft revised policy, and a cover letter noting the 30-day opportunity for comments will be mailed to Audiences 1, 2, and 3, and to any other entities which were originally included in mailings dealing with the initial development of the policy. The cover letter will indicate that BPA does not foresee the need for an EA or EIS on the proposed changes in the policy. A public comment forum will be scheduled and held in Portland during the comment period. No other public meetings are planned, but the letter distributing the proposed revised policy to various entities will indicate a willingness to hold a meeting if there is sufficient interest on the part of the public in having an opportunity to discuss this matter with BPA staff directly. The general public will be notified of BPA's intent to make changes in the Alternate Fuel Policy in the mailing of the consumer marketing program design document, and will therein be told to request the Notice of Intent from the Public Involvement Office Reference Room if they are interested or might like to comment. The Public Involvement Office will keep a list of requests so that copies of the Alternate Fuel Policy revision documents can be mailed to requesting parties when available.

The final revised policy will be sent to all those receiving the initial mailing and any others that request or comment on the Notice of Intent, and anyone who requests the final revised policy. The cover letter will note that copies of the comment letters, and the decision document are available upon request from the Public Involvement Office Reference Room.

IX. Key Review Points

Key review points in the schedule are underlined in Appendix 1.

X. Approvals

Assistant Administrator for the Office of Power Marketing	7/20/87 Date
Assistant Administrator for the Office of Regional Operations	7/22/87 Date
Public Involvement Manager	7/22/87 Date
Environmental Manager	8/18/87 Date

RSeiffert/DErickson:rds:5-27-87 (PGC-5107K)

Appendix 1

ACTIVITY SCHEDULE

Key review points are underlined.

*4/27	Memo requesting internal review of proposed policy changes - PKLC
*5/11	Comments due on internal review of policy changes
*5/18-6/1	Draft Revised Policy and FR Notice of Intent - PKLC
*6/1-6/22	Circulate Revised Policy for internal review - PKLC
*7/2	Consumer marketing program design document mailing containing information on how the public can input to the Alternate Fuel Policy revisions - PGC/PKL/ALP
7/20-7/27	Circulate FR Notice of Intent and Proposed Revised Policy on 568 and prepare letters for public mailing. - PKLC
7/28	Public Mailing of Notice of Intent and Proposed Revised Policy to Audiences 1, 2, and 3 and ALP's list of requesters - PGC
8/4	Notice of Intent and Proposed Revised Policy published in the FEDERAL REGISTER - PKLC/PGC/AC
Mid August	Public Comment Forum in Portland (exact date/time/location to be determined)
8/4-9/4	Acknowledge and distribute comments. Comments to be mailed to ALP and distributed to PKLC, PGC, J. Luce - AP, and interested others. - ALP
9/4	Close of comment period.
9/4-9/11	Review, summarize, and evaluate comments; prepare decision document and FEDERAL REGISTER Notice of Final Revised Policy - PKLC (If comments indicate need for an EA or EIS, revise policy revision schedule and begin EA or EIS. Otherwise, document categorical exclusion or prepare brief memo at this time. - PGC)
9/11-9/18	Circulate 568 for decision document and FEDERAL REGISTER Notice of Final Revised Policy (May instead do a simultaneous 568 with request for emergency publication requiring 2 days.) - PLKC
9/25	Final Revised Policy published in the FEDERAL REGISTER - PLKC/PGC/AC
9/29	Public Mailing of Final Revised Policy - PGC

The total time required to revise the Alternate Fuel Policy is approximately 21 weeks. It may be possible to shorten the process several weeks if the 568 can be processed faster, or if the internal review time period is reduced.

*Completed items.

JUL 2 0 1987

PGC

Addressees

Roy B. Fox, Environmental Coordinator
Office of Power Marketing - PGC

Revised Alternate Fuel Policy Public Involvement Plan

Attached is the Public Involvement Plan for the Revisions to the Alternate Fuel Policy. This plan has been developed with the assistance of involved staff from the Division of Customer Service, the Public Involvement office, and Regional Operations. I would appreciate your review and approval of this Public Involvement Plan by July 24, 1987. Please call Lauri Croff, extension 4261, when it is signed, and return the plan to PGC when all four approvals have been granted.

Attachment

Addressees:
D. Geiger - ALP
G. Tupper - O
E. Sienkiewicz - P
A. Morrell - SJ

RSeiffert:ljc:4236:7/29/87 (PGC-5324K)

cc:
J. Luce - AP
K. Johnson - ALP
G. Lenzen - OB
J. McLennan - PG
S. Price - PGC
J. Pyrch - PK
D. R. Anderson - PKLC
C. Combs - PKLC
D. Erickson - PKLC
K. Pierce - SJ
Official File - PGC (PI 1-11)

REVISED POLICY FOR SALES TO ALTERNATE FUEL LOADS
Public Involvement Plan
July 20, 1987

I. Introduction

BPA issued its Final Nonfirm Energy Policy for Consumer Alternate Fuel Loads (Alternate Fuel Policy) in March of 1985. This policy allowed sales of nonfirm energy to the Direct Service Industries (DSIs) and Pacific Northwest (PNW) utilities for loads greater than 1 average megawatt (MW) that have the capability of being served with electricity, but also have another energy source, such as gas, oil, or hog fuel, to substitute when BPA nonfirm electric energy is not available. The policy responded to BPA's need to: (1) improve BPA revenues by stimulating nonfirm energy sales that would not otherwise take place; (2) allow DSIs and BPA's utility customers, and their qualified consumers, to enjoy the benefit of lower-cost energy when it is available, and thereby improve the region's economy; and (3) insure that firm load was not lost by converting it to nonfirm load. Sales of nonfirm energy for this purpose had been sold for use by several industries under interim contracts prior to the policy.

An Environmental Assessment (EA) was prepared on this policy, and a Finding of No Significant Impact (FONSI) was signed by the Department of Energy on March 4, 1985. A Record of Decision on the Policy was included as the first part of the FEDERAL REGISTER Notice of Final Policy issued on March 14, 1985.

Due to the continued availability of firm surplus energy, BPA proposes revising the Alternate Fuel Policy to permit service to alternate fuel loads with surplus firm power for a fixed period and to allow discretion in serving alternate fuel loads smaller than 1 average MW. Firm surplus service is currently limited to up to 72 hours after nonfirm ceases to ease transition to the alternate fuel. BPA is also proposing to extend the term of the contracts approved under the current policy to 1994 or when the Administrator declares the region is in energy load/resource balance. Present contracts terminate June 30, 1989. It should be noted that BPA has provided service to alternate fuel customers under the SP rate in several instances.

Currently, six utilities and one DSI serve a total of 12 alternate fuel customers. The total capability of these loads is approximately 250 MW.

II. Public Involvement Goals

The public involvement process for this policy revision should inform the public that BPA is considering broadening its Alternate Fuel Policy in the ways described above. BPA seeks comment on the proposed revisions and suggestions as to how the policy should or might otherwise be modified to be more effective in providing revenue to BPA and helping the region's economy.

III. Preliminary Consultation

Preliminary consultation occurred through development of the existing policy and contracts. The existing policy was developed in consultation with the public, particularly members of the Association of Public Agency Customers (APAC) and other industries. The industries and utilities that were interested in purchasing power for alternate fuel loads, including those served under interim contracts, were quite interested in the details of the policy. Three public comment meetings were held. Written comments were also submitted. The EA served as a further opportunity for comment. Other entities, such as the general public, other utilities, and other governmental agencies, generally expressed little concern with the policy.

BPA review of the proposed policy changes is taking place to gain additional insights or ideas which might be developed internally before taking these ideas to the public. Informal discussions with selected utility and DSI customers may be conducted by Area Power Managers, at their discretion, during internal review of the proposed policy revisions to obtain preliminary views regarding the changes to the policy described above. A preliminary environmental review of the proposed policy changes determined that a categorical exclusion or a brief memo based on the existing EA should be sufficient procedurally.

IV. Related BPA Processes

BPA is currently undertaking a regional wholesale power marketing effort. The goal of this effort is to enhance BPA's long-term revenue stability and system operation through power and capacity sales to IOUs and public generating utilities in the PNW.

BPA is also undertaking a regional consumer marketing program aimed at helping its metered requirements customers market additional electricity.

The revisions to the Alternate Fuel Policy could be accommodated within either of the two efforts described above. However, those processes are intended to identify and develop new programs. Since this proposal deals with an established policy with relatively uncontroversial changes, BPA proposes to revise the policy in a separate process.

V. Potential Major Issues

One key issue is that this will be another competing use, albeit a small one, for surplus firm power. Certain entities in the market for firm surplus would prefer not to see any additional competition for that power. Other issues raised during the development of the initial policy may also resurface. One of the more controversial issues was how to deal with cogeneration in the policy. Another issue was how to determine the eligibility of a consumer to obtain power under the policy.

VI. Interested Publics

Audience 1: The greatest interest in the proposed changes to the Alternate Fuel Policy will be held by those currently served under the policy. These entities are:

Utility	Load
Umatilla Electric Coop.	Lamb Weston Oregon Potato Company
Kaiser Aluminum & Chemical Corp.	Mead Primary Aluminum Smelter
Tillamook PUD	Tillamook Creamery
Cowlitz County PUD No. 1	Weyerhauser Kalama Chemical Longview Fibre
City of Port Angeles	Crown Zellerbach
Snohomish County PUD No. 1	Weyerhaeuser Scott Paper Boeing
City of Seattle	Seattle Steam

APAC can also again be expected to have a lot of interest because of their involvement in the development of the initial policy.

Audience 2: Other BPA customers and customer groups. These entities, which are expected to follow the process to change the Alternate Fuel Policy, provided little comment when the existing policy was developed. Some customers, such as California utilities, may view the changes as impacting the potential supply of surplus firm power and may have more interest in following the policy revisions.

Audience 3: Key Constituents. These include: Power Planning Council; interest group leaders; public utility commissioners; State and local governments, including their energy offices; ratepayer organizations; conservation groups; environmental interest groups; fish and wildlife groups; and Congressional representatives. These entities are those which are generally interested in all Bonneville activities, but they also showed little concern with the establishment of the initial policy. This was probably because the policy was perceived as one serving a small market and as being generally beneficial. They are expected to react similarly to the proposed policy revisions.

Audience 4: The general public. The general public provided little comment during the development of the initial policy. This audience will receive information through the Consumer Marketing program public involvement mailings and therein will be provided with instructions to contact the Public Involvement Office Reference Room for information concerning the revisions to the Alternate Fuel Policy, copies of the proposed revised policy, and how they can comment on these revisions.

VII. Decisionmaking Process

The process to revise the Alternate Fuel Policy is expected to take about 21 weeks. The process will involve publication of a Notice of Intent to change the policy in the FEDERAL REGISTER, which will include the draft revised policy, followed by a 30-day comment period. After the comment period, a decision document which will contain a description of the proposed action, a comment summary, a staff evaluation of comments, a statement of the decision, and a summary of the reasons for the decision (as specified in Section V.G of the Policy for Public Involvement) will be prepared. On the basis of the decision document, a final FEDERAL REGISTER Notice will be prepared containing the final revised policy. A schedule of the process is included as Appendix 1.

VIII. Public Involvement Activities

A Notice of Intent to change the policy, including the draft revised policy, and a cover letter noting the 30-day opportunity for comments will be mailed to Audiences 1, 2, and 3, and to any other entities which were originally included in mailings dealing with the initial development of the policy. No public meetings are planned, but the letter distributing the proposed revised policy to various entities will indicate a willingness to hold a meeting if there is sufficient interest on the part of the public in having an opportunity to discuss this matter with BPA staff directly. The general public will be notified of BPA's intent to make changes in the Alternate Fuel Policy in the mailing of the consumer marketing program design document, and will therein be told to request the Notice of Intent from the Public Involvement Office Reference Room if they are interested or might like to comment. The Public Involvement Office will keep a list of requests so that copies of the Alternate Fuel Policy revision documents can be mailed to requesting parties when available.

The final revised policy will be sent to all those receiving the initial mailing and any others that request or comment on the Notice of Intent, and anyone who requests the final revised policy. The cover letter will note that copies of the comment letters, and the decision document are available upon request from the Public Involvement Office Reference Room.

IX. Key Review Points

Key review points in the schedule are underlined in Appendix 1.

X. Approvals

Assistant Administrator for the Office of Power Marketing	7/20/87 Date
Assistant Administrator for the Office of Regional Operations	Date
Public Involvement Manager	Date
Environmental Manager	Date

RSeiffert/DErickson:rds:5-27-87 (PGC-5107K)

Appendix 1

ACTIVITY SCHEDULE

Key review points are underlined.

*4/27	Memo requesting internal review of proposed policy changes - PKLC
*5/11	Comments due on internal review of policy changes
*5/18-6/1	Draft Revised Policy and FR Notice of Intent - PKLC
*6/1-6/22	Circulate Revised Policy for internal review - PKLC
*7/2	Consumer marketing program design document mailing containing information on how the public can input to the Alternate Fuel Policy revisions - PGC/PKL/ALP
7/20-7/27	Circulate FR Notice of Intent and Proposed Revised Policy on 568 and prepare letters for public mailing. - PKLC
7/28	Public Mailing of Notice of Intent and Proposed Revised Policy to Audiences 1, 2, and 3 and ALP's list of requesters - PGC
8/4	Notice of Intent and Proposed Revised Policy published in the FEDERAL REGISTER - PKLC/PGC/AC
Mid August	Public meeting in Portland (exact date/time/location to be determined)
8/4-9/4	Acknowledge and distribute comments. Comments to be mailed to ALP and distributed to PKLC, PGC, J. Luce - AP, and interested others. - ALP
9/4	Close of comment period.
9/4-9/11	Review, summarize, and evaluate comments; prepare decision document and FEDERAL REGISTER Notice of Final Revised Policy - PKLC
9/11-9/18	Circulate 568 for decision document and FEDERAL REGISTER Notice of Final Revised Policy (May instead do a simultaneous 568 with request for emergency publication requiring 2 days.) - PLKC
9/25	Final Revised Policy published in the FEDERAL REGISTER - PLKC/PGC/AC
9/29	Public Mailing of Final Revised Policy - PGC

The total time required to revise the Alternate Fuel Policy is approximately 21 weeks. It may be possible to shorten the process several weeks if the 568 can be processed faster, or if the internal review time period is reduced.

*Completed items.

MAY 2 7 1987

PGC

Addressees

Roy B. Fox, Environmental Coordinator
Office of Power Marketing - PGC

Revised Alternate Fuel Policy Public Involvement Plan

Attached is the Public Involvement Plan for the Revisions to the Alternate Fuel Policy. This plan has been developed with the assistance of involved staff from the Division of Customer Service, the Public Involvement office, and Regional Operations. I would appreciate your review and approval of this Public Involvement Plan by June 3, 1987.

Attachment

Addressees:
1) E. Sienkiewicz - P
2) G. Tupper - O
3) A. Morrell - SJ
4) D. Geiger - ALP

RSeiffert:rds:5/26/87 (PGC-5166K)

cc: w/attachment
J. Luce - AP
K. Johnson - ALP
G. Lenzen - OB
S. Price - PGC
J. Pyrch - PK
D. R. Anderson - PKLC
C. Combs - PKLC
D. Erickson - PKLC
K. Pierce - SJ
Official File - PGC (PI 1-11)

REVISED POLICY FOR SALES TO ALTERNATE FUEL LOADS
Public Involvement Plan
May 27, 1987

I. Introduction

BPA issued its Final Nonfirm Energy Policy for Consumer Alternate Fuel Loads (Alternate Fuel Policy) in March of 1985. This policy allowed sales of nonfirm energy to the Direct Service Industries (DSIs) and Pacific Northwest (PNW) utilities for loads greater than 1 average megawatt (MW) that have the capability of being served with electricity, but also have another energy source, such as gas, oil, or hog fuel, to substitute when BPA nonfirm electric energy is not available. The policy responded to BPA's need to: (1) improve BPA revenues by stimulating nonfirm energy sales that would not otherwise take place; (2) allow DSIs and BPA's utility customers, and their qualified consumers, to enjoy the benefit of lower-cost energy when it is available, and thereby improve the region's economy; and (3) insure that firm load was not lost by converting it to nonfirm load. Sales of nonfirm energy for this purpose had been sold for use by several industries under interim contracts prior to the policy.

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Currently, six utilities and one DSI serve a total of 12 alternate fuel customers. The total capability of these loads is approximately 250 MW.

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The public involvement process for this policy revision should inform the public that BPA is considering broadening its Alternate Fuel Policy in the ways described above. BPA seeks comment on the proposed revisions and suggestions as to how the policy should or might otherwise be modified to be more effective in providing revenue to BPA and helping the region's economy.

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City of Port Angeles	Crown Zellerbach
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The process to revise the Alternate Fuel Policy is expected to take about 18 weeks. The process will involve publication of a Notice of Intent to change the policy in the FEDERAL REGISTER, which will include the draft revised policy, followed by a 30-day comment period. After the comment period, a decision document which will contain a description of the proposed action, a comment summary, a staff evaluation of comments, a statement of the decision, and a summary of the reasons for the decision (as specified in Section V.G of the Policy for Public Involvement) will be prepared. On the basis of the decision document, a final FEDERAL REGISTER Notice will be prepared containing the final revised policy. A schedule of the process is included as Appendix 1.

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Assistant Administrator for the Office of Power Marketing	Date
Assistant Administrator for the Office of Regional Operations	Date
Public Involvement Manager	Date
Environmental Manager	Date

RSeiffert/DErickson:rds:5-27-87 (PGC-5107K)

Appendix 1

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Key review points are underlined.

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*5/11	Comments due on internal review of policy changes
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6/1-6/22	Circulate Revised Policy for internal review - PKLC
6/22	Consumer marketing program design document mailing containing information on how the public can input to the Alternate Fuel Policy revisions - PGC/PKL/ALP
6/22-7/6	Circulate FR Notice of Intent and Proposed Revised Policy on 568 and prepare letters for public mailing. - PKLC
7/8	Public Mailing of Notice of Intent and Proposed Revised Policy to Audiences 1, 2, and 3 and ALP's list of requesters - PGC
7/13	Notice of Intent and Proposed Revised Policy published in the FEDERAL REGISTER - PKLC/PGC/AC
7/13-8/11	Acknowledge and distribute comments. Comments to be mailed to ALP and distributed to PKLC, PGC, J. Luce - AP, and interested others. - ALP
8/11	Close of comment period.
8/11-8/18	Review, summarize, and evaluate comments; prepare decision document and FEDERAL REGISTER Notice of Final Revised Policy - PKLC
8/18-9/1	Circulate 568 for decision document and FEDERAL REGISTER Notice of Final Revised Policy - PLKC
9/8	Final Revised Policy published in the FEDERAL REGISTER - PLKC/PGC/AC
9/10	Public Mailing of Final Revised Policy - PGC

The total time required to revise the Alternate Fuel Policy is approximately 18 weeks. It may be possible to shorten the process several weeks if the 568 can be processed faster, or if the internal review time period is reduced.

*Completed items.

Ex 12-17-2

September 7, 1989

PUBLIC INVOLVEMENT PLAN
FOR PROPOSED POLICY ON SALES TO ALTERNATE FUEL LOADS

I. Background: BPA's Alternate Fuel Policy was issued on March 14, 1985. The Policy allows sales of nonfirm energy to alternate fuel loads of BPA's customers; these are loads which can be served with another energy source when nonfirm energy is not available. Currently, four public utilities and one DSI customer serve a total of 10 alternate fuel customers. The total capacity of these loads is over 200 megawatts.

The Alternate Fuel Policy expired on June 30, 1989. By recent contract action, contracts under the Policy were extended through December 31, 1989, or until a revised Policy is approved, whichever is earlier.

The revised Policy has undergone major changes, mainly for two reasons: (1) surplus firm power is no longer available, and (2) one original feature, the brokering of nonfirm energy, didn't work well--it was too much of an administrative burden for BPA. In the revised Policy, brokering has been eliminated, and all references to the sale of surplus firm power for displacement of alternate fuels have been deleted. However, since a supply of energy is essential for the period it takes for an alternate fuel load to switch from electricity to the alternate fuel, the Division of Power Supply is considering to sell guaranteed nonfirm energy for that transition period. In any case, sales for the displacement of alternate fuel loads will be dependent on availability of nonfirm energy.

II. Public Involvement Process: The revised Policy will be published in the FEDERAL REGISTER for public comment. Since the publication process is so lengthy, we plan to mail copies of the Policy to customers and other potentially interested parties (see list below) in September 1989, in advance of FEDERAL REGISTER publication. The availability of the proposed Policy will also be announced in the BPA Newsletter (October issue). The comments we receive from the public will assist BPA in evaluating its revised Policy and arriving at a final decision. If public comment reveals issues needing resolution, or if it appears for any reason that a final Alternate Fuel Policy may not be in place by December 31, 1989, this plan will need to be reconsidered and updated.

III. Interested Publics: Those who will be sent the proposed Alternate Fuel Policy for review and comment are:

Customers
Council
Public Utility Commissioners
Energy Offices
Interest Group Leaders

IV. Concurrence:

Roy B. Fox, Coordination and Review Manager — Date 9/7/89

Jo Ann C. Scott, Public Involvement Manager — Date 9-8-89

LBurbach (VS6-PG-8189K)