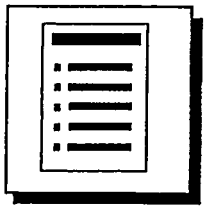
Business Plan

Supplemental Draft Environmental Impact Statement
Volume 2 — Appendices



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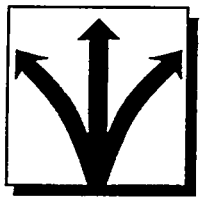

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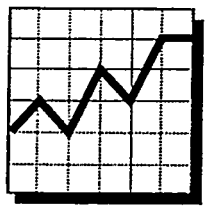

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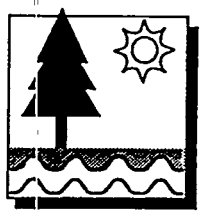


Environmental Impacts

Bonneville
POWER ADMINISTRATION

DOE/EIS-0183
February 1995

Contents, Volume 2

Appendix A: BPA Products and Services

Appendix A: BPA Products and Services

These products and services are subject to change. They represent BPA's proposed products and services as of early 1995. Changes in BPA's marketing plans, new power sales contracts agreements, market conditions, or customer's needs could result in additions, modifications, or deletions to this list.

Power Products and Services

Title	Explanation
Tier 1	A product that serves the basic firm power needs of preference, Federal agency, and DSI customers.
Basic Tier 2	A product that serves the basic firm power needs of preference, Federal agency, and DSI customers; different from Tier 1 only in terms of price.
Enhanced Tier 2 Product	A product available to all customers to meet all or part of their Tier 2 needs with terms and conditions chosen by the customer.
"Green" Tier 2	Cost-based requirements for power service comparable to other Tier 2 products, supplied by renewable resources, as a supplement or substitute for other Tier 2 service. Not offered in the 1995 Rate Case, but to be offered within the study period for the Business Plan EIS.
Load Shaping	A basic power product that assumes the customer's planning risk by providing coverage for the monthly difference between a customer's actual and forecasted retail loads.
Load Regulation	A basic power product that provides instantaneous (second-to-second) regulation of firm power supply for a customer's actual real-time load.
Eccentric Load Following	A basic power product to meet any specific customer load with the ability to change more than 50 MW in level at a rate greater than 50 MW per minute, regardless of the change.
Control Area Reserve Service for Non-Federal Resources	Provides (Automatic Generation Control) control services and reserve obligations to support a customer's resource located within BPA's control area.
Control Area Reserve Service for Interruptible Purchases/ Deliveries	BPA would provide the Regulating Margin Operating Reserve (spinning and non-Spinning) obligations associated with Interruptible Energy amounts for the accounts of entities (in the BPA load control area) which do not operate a control area.
Supplemental Control Area Reserve Service	Ancillary control area (regulating margin and spinning reserve) services to supplement the automatic generation control of another utility.
One to Four Hour Supplemental Operating Reserve Service	BPA would carry Non-Spinning Operating Reserves for another controlling utility as part of its non-spinning operation reserve obligation.
Generation Guarantee	An insurance product whereby BPA would protect a customer or consumer from the risks inherent in operating a generating resource by managing the resource for them.
Resource Back-Up	A reserve product purchased on a planning basis to provide planned maintenance and/or forced outage reserves, either separately or as part of a package of resource integration or generation support services.

Power Products and Services (continued)

Title	Explanation
Real Time Delivery of Operating Reserve Energy	The reserve product a customer would purchase on a real-time basis when its own reserves and other reserves were not sufficient during an emergency or when a customer wanted to request a preschedule change in less than 30 minutes prior to the hour.
Emergency Power	BPA would provide firm capacity and/or energy to a scheduling customer for a specified period as requested by the customer in order to address system problems including load overruns, forced outages, resource under-performance, etc.
Shaping Services	On a case-by-case basis, BPA would provide shaping of the output of the customer's resource or purchase its load in accordance with contract terms.
Energy Shaping Among Months	BPA will shape the delivery of monthly amounts of firm energy produced from its resources from one month to another to enable the customer to shape its annual energy purchases from BPA to match its expected load.
Flexibility	The customer would be allowed to postpone a portion of its purchases of BPA firm power to later months of the same Operating Year in an amount up to 5 percent of its remaining firm resource capability for the year.
Preschedule Change Services	Customer purchases the right to make changes from preschedules for firm requirements power by notice 30 minutes prior to any clock hour.
Scheduled Purchase Reduction Service	Customer would have the right to displace purchases of BPA capacity or energy at any time at a set price specified in the rate schedules.
Voltage (Reactive) Support	BPA will provide, on demand, leading or lagging reactive power (demand energy) to satisfy the customer's reactive power requirements.
Miscellaneous Power Service Charges	These charge(s) are for power-related services such as brokering, scheduling amounts of power for interchange with other control areas to or from the account of a customer that does not operate a control area, and the accounting for such transactions.
Extended Full Requirements Package	Service is intended to meet the needs for customers for a longer period than the basic Tier 1 and Tier 2 products.
Residential Rate under existing Residential Purchase and Sale Agreement (RSPA)	Will be a "blend" and will include for both Tier 1 and Tier 2: demand, energy, operating reserves for Federal system resources, and demand and energy charges for reactive power cost imposed on BPA.
Residential Rate under new RPSA	Will cease being a blended rate. It will include for both Tier 1 and Tier 2: demand, energy, operating reserves for Federal system resources, and demand and energy charges for reactive power cost imposed on BPA.

Transmission Products and Services

Title	Explanation
Formula Transmission Firm	Distance-based service (N-1 Criteria).
Integration of Resources Firm	Multiple point-to-point service (N-1 Criteria).
Point-to-Point Firm - Comparability Tariff	Primarily for transmitting power for other than Native Load (over the Network) but can be used as an alternative to other rates over the Network. Provides service comparable to BPA use of the system.
Network Firm - Comparability Tariff	For service to Native Load only. Provides service comparable to BPA use of the system.
Network Energy Transmission	As-available Transmission on Network without specified points of interconnection.
Southern Intertie Firm	Firm Transmission on Southern Intertie (N-1 Criteria).
Southern Intertie Nonfirm	As-available Transmission on Southern Intertie.
Capacity Ownership	Ownership-like rights to new BPA facilities (available for Intertie only).
Northern Intertie Transmission	For all service on Northern Intertie.
Townsend-Garrison Transmission	For firm Transmission on Eastern Intertie.
Eastern Intertie Nonfirm	For as-available Transmission on Eastern Intertie.
Advance Funding	Service to integrate customer generation into BPA's Main Grid.
Reservation	Option guaranteeing future rights to transmission capacity.
Use-of-Facilities	Service primarily over radial lower voltage facilities.

Energy Services

Title	Explanation
DSM Consulting Services	
DSM Program Administration	Preparation of completion reports, proposals, training programs. Project and rebate program administration.
DSM Program Planning and Design	Cost and savings projections; DSM planning; new program design.
Building/Equipment Design Assistance	Design assistance for commercial buildings; system design assistance for agricultural end users; heat pump assistance.
Energy Analysis	Building monitoring and high bill complaints; energy analysis of agricultural systems; energy analysis of commercial buildings, utility distribution systems, and industrial facilities.
Technical Assistance	On-site technical assistance for residential, commercial, and industrial DSM applications. Tailored scheduling services for irrigation scheduling.
Savings Verification and Evaluation	Program evaluations; evaluation planning; project verification; training; verification planning.
DSM Financial Services	
Loans to Customers for Conservation	Loans for up to full project costs, for energy-saving projects in customer facilities or service areas, with repayment by energy service charge on monthly power bill.
Shared Savings Agreements	Financing up to full project costs, for energy-saving projects in customer facilities or service areas, with repayment by energy service charge on monthly power bill.
Other Energy Services	
Equipment Rental	Flow meters, soil probes, pump testing equipment for irrigators; end use meters in commercial and residential applications; infrared scanners, blower doors, etc.
Power Factor Improvement Analysis	Identify, analyze, and improve power factor; on-site or classroom training; software and guidebooks.
Power Quality Engineering	Identify, diagnose, and prevent or resolve power quality problems; software and on-site or classroom training.
Laboratory Services	Provides testing, analysis and consulting services in the fields of electrical, mechanical, electronics, and civil engineering and chemistry.

Appendix B:
Rate Design

Appendix B: Rate Design

SECTION 1

1.1 Purpose of Report

The purpose of this report is to evaluate the probable market responses and environmental impacts that could result from changes in the design of rates for the Bonneville Power Administration (BPA). The direct effects of BPA's pricing (rate design and price levels) for electricity are economic. There are no direct environmental impacts from pricing. Environmental impacts potentially result from utility and end-use consumer response to the "price signals" of BPA's rate levels and rate designs. For the purposes of this study, these responses are called "market responses." Market responses include changes in operation and acquisition of power and transmission resources by wholesale utility customers of BPA, as well as behavioral changes by end users of electric service. The rate design changes that are evaluated relate to BPA's wholesale power and transmission services.

This report is intended to be a source document for BPA's Business Plan Environmental Impact Statement (BP EIS). It evaluates various rate design attributes that could be associated with the alternative scenarios under analysis. This report does not consider the impacts that might result from changes in BPA's products and services or from modifications to policies, contractual terms, billing determinants (i.e., the units to which a rate is applied), or cost basis (i.e., the measurement of costs or revenue requirements that rates are designed to collect).

The rate designs for wholesale power and transmission services are discussed separately because of the different nature of these two groups of products and services. These discussions are, however, parallel in structure. The analysis of likely market responses and of physical and socioeconomic environmental impacts is mainly qualitative. Finally, many technical terms are used in this report that are common to the industry; a glossary and list of acronyms are provided in Attachment A.

1.2 Organization of Report

This report is composed of six sections. Besides the discussion of purpose in section 1, the report also contains:

- **Section 2** — provides background regarding the Federal system and BPA customers.
- **Section 3** — describes BPA ratemaking and the objectives considered in the design of rates.
- **Section 4** — presents a general description of both current and alternative rate design attributes.

- **Section 5** — evaluates the various rate attributes in terms of their effect on wholesale power load and transmission system usage by market segments served by BPA. This evaluation includes analysis of the effect on each market segment's response to each attribute in terms of its usage as well as operational (short-term) and investment (long-term) decisions at the wholesale level. This section also identifies the anticipated physical and socioeconomic impacts that may result from these decisions.
- **Section 6** — evaluates the end-use market responses assuming that rate attributes considered at the wholesale level are also passed through to the retail level.

SECTION 2

2.1 Background

2.1.1 Introduction

BPA was created by an act of Congress in 1937 to market electric power from the Bonneville Dam located on the Columbia River and to construct facilities necessary to transmit such power. Congress has since designated BPA to be the marketing agent for power from all of the federally-owned hydroelectric projects in the Pacific Northwest (PNW). BPA is one of five regional Federal power marketing agencies within the Department of Energy (DOE).

BPA's primary enabling legislation includes the following Federal statutes: the Bonneville Project Act of 1937 (the Project Act); the Flood Control Act of 1944; Public Law 88-552 (the Regional Preference Act); the Federal Columbia River Transmission System Act of 1974 (the Transmission System Act); and the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (the Northwest Power Act).

BPA now markets electric power from 30 federally owned hydroelectric projects, most of which are located in the Columbia River Basin, and from several non-federally owned and operated projects. BPA sells and exchanges firm power, nonfirm energy, peaking capacity, and related power services. BPA also constructed, operates, and maintains a high-voltage transmission system comprising approximately 80 percent of the bulk transmission capacity in the PNW. BPA uses this transmission system to deliver power to its customers and makes transmission capacity available to transmit non-Federal power. This latter service is called wheeling.

BPA's primary customer service area is the PNW, an area comprised of Oregon, Washington, Idaho, western Montana, and small portions of California, Nevada, Utah, and Wyoming. Electric power sold by BPA accounts for about half of the electric power consumed within the region. BPA markets the majority of this power to approximately 130 utilities for resale to consumers in the region. BPA also sells significant amounts of power for direct consumption to 16 industrial customers located in the region, and provides relatively small amounts of power for direct consumption to certain Federal agencies in the region.

BPA exports Federal power that is surplus to the needs of the region to the Pacific Southwest (PSW), primarily California. BPA also has contracts for certain power services with Canadian utilities, primarily the British Columbia Hydro and Power Authority (BC Hydro).

If so requested by a utility customer, BPA is obligated by Federal law to meet a utility customer's firm loads in the region in excess of that portion of the utility customer's loads served with other power resources. To meet these load requirements, BPA has authority to acquire power resources and implement conservation measures, among other things. Federal law requires BPA to exchange less expensive Federal power for more expensive power from Northwest utility customers for the benefit of residential power users (known as the Residential Exchange); to protect, mitigate and enhance fish and wildlife; and to meet other responsibilities.

2.1.2 The Federal System

The Federal Columbia River Power System (Federal System) includes those portions of the Federal investment in the regional hydroelectric projects which have been allocated to power generation. Such projects were constructed and are operated by the United States Army Corps of Engineers (COE) or the United States Bureau of Reclamation (BOR). The Federal System also includes power from non-federally owned generating resources.

The Federal System also includes BPA's transmission system, which is comprised of 23,776 km (14,774 mi) of high-voltage transmission lines, 400 substations, and other related facilities. BPA transmits its power and provides wheeling and other power services to its customers over this system. Included in this transmission system are the Pacific Northwest-Pacific Southwest Intertie (PNW/PSW Intertie), the Eastern Intertie, and the Northern Intertie.

BPA uses its portion of the PNW/PSW Intertie primarily to export Federal power that is surplus to the region's needs to the PSW. Most of the energy sold by BPA over the Intertie is nonfirm energy, although BPA also exports some firm power. The PNW/PSW Intertie is used for other power transactions, including energy and peaking capacity exchanges. BPA makes its transmission capacity available to BPA's utility customers and other eligible entities to the extent it is in excess of BPA's own needs.

2.1.2.1 Characteristics of the Federal System

Hydroelectric power from the federally owned hydroelectric projects comprises approximately 85 percent of BPA's firm power supply. BPA's large resource base of hydroelectric power results in operating and planning characteristics that differ from those of major utilities that lack a substantial hydroelectric base.

The COE and BOR operate the federally owned hydroelectric projects in the region to serve multiple statutory purposes. These purposes may include flood control, irrigation, navigation, recreation, municipal water supply, fish and wildlife protection, and power generation. BPA takes into account the nonpower purposes for each project and other factors in assessing the amount of power it has available to market from these projects.

The amount of power annually produced by a hydro-based system such as the FCRPS varies with annual precipitation and other weather conditions. This annual variability has led BPA to classify power it has available into two types, firm power and nonfirm energy, based on certainty of occurrence.

"Firm power" is defined as electric power that is continuously available from the Federal System even during the most adverse water conditions. The amount of firm power that can be produced by the Federal System and marketed by BPA is based on "critical water" assumptions, the worst low-water period on record for the Columbia River Basin. Firm power can be relied on to be available when needed. Firm power has two components, peaking capacity and firm energy. Peaking capacity refers to the ability to deliver electric power to a particular load at the time such power is demanded. This is distinguishable from firm energy, which refers to the amount of electric energy delivered to a customer over a period of time. The Federal System is estimated to be capable of producing about 8,800 average megawatts (aMW) of firm energy, including firm energy purchases.

Another characteristic of the hydro-based Federal System is that its ability to provide peaking capacity is large relative to its ability to produce firm energy. The peaking capacity surplus of the Federal System means that its ability to serve firm loads is, and is expected to continue to be, limited primarily by its ability to produce firm energy. By contrast, most other utilities are constrained in serving firm loads by limitations on their peaking capacity.

"Nonfirm energy" is energy the Federal System can produce in excess of firm energy. The amount of nonfirm energy varies from year to year depending on Columbia River Basin precipitation, thermal plant performance, and other factors. In an average water year, BPA would have about 2,400 aMW of nonfirm energy available to market, while in wet years the amount of nonfirm energy available may be as much as 8,000 aMW. In some years, BPA may have very little nonfirm energy available to market from the Federal System.

2.1.3 BPA's Customers

BPA has power sales contracts and transmission agreements with four major classes of customers: preference customers, direct service industries (DSIs), investor-owned utilities (IOUs), and

extraregional customers. BPA also sells relatively small amounts of power to several Federal agencies within the region.

2.1.3.1 Preference Customers

Certain municipalities, qualifying utility districts, and consumer-owned utilities (rural electric cooperatives) (collectively, preference customers) are entitled to a statutory preference and priority (the Public Preference) in the purchase of available BPA power. These customers are eligible to purchase power at BPA's Priority Firm Power (PF) rate for most of their loads. The Public Preference requires that BPA meet a preference customer's request for available BPA power in preference to a competing request from a nonpreference entity for the same power.

BPA has firm power sales contracts (that expire in 2001) with over 100 preference customers. As a group, preference customers account for the largest share of firm power sold by BPA. The number of preference customers may change because BPA is required to sell firm power to meet loads within the region served by qualifying preference entities who request such power.

2.1.3.2 Direct Service Industries (DSIs)

BPA sells power to 16 DSIs within the region that contract for the purchase of power from BPA for direct consumption. Eight DSIs that produce or fabricate aluminum consume approximately 90 percent of the power BPA sells to this class of customers. BPA's existing power sales contracts with DSIs expire in 2001. In contrast to BPA's preference customers and IOU customers, BPA has no statutory obligation to provide power to the DSIs beyond the term of their existing contracts. However, each DSI may have a state statutory right to power from BPA's utility customers in whose service area the DSI is located. Thus, BPA's customers may become obligated to serve DSI loads currently served by BPA. These customers may subsequently increase the amount of power requested from BPA by a corresponding amount.

The power sold by BPA to DSIs is called "industrial firm power," which is, by definition, subject to interruption by BPA under conditions established by contract. BPA's ability to interrupt portions of power deliveries to the DSIs serves as a reserve from which BPA may meet the firm requirements of other customers and helps assure stability of the Federal System.

2.1.3.3 Investor-Owned Utilities (IOUs)

All of the IOUs in the region have signed long-term firm power sales contracts that obligate BPA, upon compliance with certain notice requirements, to deliver power in amounts requested by the IOUs to meet portions of their loads in the region. These utilities have not elected to place loads on BPA under these agreements, with minimal exception.

BPA provides wheeling services to regional IOUs and derives about 10 to 16 percent of its revenues from this customer class. BPA sells relatively small amounts of nonfirm energy to various regional IOUs. BPA also has contracts with several IOUs for the sale of peaking capacity.

Residential Exchange. The Northwest Power Act created the Residential Exchange Program to extend the benefits of low-cost Federal power to residential power users in the region. The Residential Exchange Program does not involve the actual delivery of power by any party. In effect, the program results in cash payments by BPA to exchanging utilities and lowers power rates paid by their residential power users.

Under the Residential Exchange Program, BPA purchases power offered by an exchanging utility at its "average system cost," which is a measure of the costs that the exchanging utility incurs for power. The exchanging utility is entitled to the return of an identical amount of power from BPA for the purpose of resale to the exchanging utility's residential users in the region. The power from BPA is provided at a PF rate. If an exchanging utility's average system cost is lower than the applicable BPA rate, the utility may avoid the exchange. BPA makes cash payments to the exchanging utility in the amount of the net difference between the exchange value of the power sold by BPA, and the cost of power BPA purchases.

2.1.3.4 Pacific Southwest (PSW) Customers

BPA sells and exchanges power over the PNW/PSW Intertie to several PSW utilities, which use most of such power to serve California loads. These sales and exchanges are comprised of firm capacity and nonfirm energy surplus to BPA's regional requirements.

PSW utilities account for the greatest share of purchases of nonfirm energy from BPA and sales of nonfirm energy account for the greatest share of revenues from BPA's exports. The amount of nonfirm energy that BPA has available to export depends on precipitation and other power supply factors in the Northwest, the available transmission capacity of the PNW-PSW Intertie, and other factors that may constrain exports notwithstanding the availability of power.

BPA sells power out of the region at rates with flexible prices subject to limits based on BPA's costs that enable BPA to make additional sales in a competitive marketplace. Revenues that BPA obtains from exporting firm power and nonfirm energy out of the region also depend on the price the PSW utilities are willing to pay. These revenues are affected by the weather and other factors that affect demand in the PSW, and the cost and availability of alternatives to BPA's power. The cost of alternative power is frequently dependent on the cost of oil- and gas-fired generation.

BPA has had and expects to have power exchanges with PSW utilities to take advantage of differing system and load characteristics. For example, BPA has contracts to sell power to several California utilities. These sales would convert, upon the occurrence of certain conditions, to power exchanges of peaking capacity that is surplus to Northwest needs in return for energy from the California utilities. This gives BPA the option to increase available firm energy by about 160 aMW if needed to serve Northwest loads. In this kind of transaction, BPA would provide energy and capacity to meet daytime peak California loads and, during off-peak hours, the California utilities would return more electric energy than had been supplied by BPA.

2.1.4 Customer Segments

For the purposes of analyzing market responses, customers are grouped into marketing segments in the same manner a done in the BP EIS. These customer segments are: "non-marketing," which is made up of the DSIs and most preference customers; "marketing," which is made up of IOUs in the PNW, independent power producers (IPPs) and some large preference customers; and "extraregional," which is made up of customers in the PSW. Marketing is defined as buying electric power products for purposes other than meeting firm load obligations, or selling electric power products to buyers other than retail customers for whom the seller has public utility responsibility.

SECTION 3

3.1 BPA's Rates and Rate Design

BPA is required by law to establish rates for the sale of power and transmission services in accordance with sound business principles to produce revenues that recover BPA's costs. Rates established by BPA are subject to confirmation and approval by the Federal Energy Regulatory Commission (FERC) under several statutory standards.

As with any product or service, the level of the rates BPA must charge in order to recover its costs affects the level of use its customers make of its services. This is a fundamental aspect of rate setting for any utility. BPA influences the use of its services through the way it designs its rates. Although BPA is constrained in the total revenue it can receive through its rates, it can design rates that recognize various characteristics of its costs, including marginal costs (i.e., the cost associated with new power and transmission that BPA incurs to meet new load). In doing so, it can send the "price signal" it wants its customers to receive and consider in making decisions as to how to use BPA's

services. BPA can send different price signals to meet different objectives it might have regarding how customers use its services.

This section discusses BPA's current rate development process, BPA's current rates, rate design components and attributes, and load shape objectives that could be accomplished through rate design.

Note that this report assumes no changes in BPA's legal obligations. It also assumes no changes in BPA's rate development process discussed below.

3.2 BPA's Rate Development Process

BPA's rate development process generally centers around five major studies: the Revenue Requirement Study, the Cost of Service Analysis, the Wholesale Power Rate Development Study, the Transmission Rate Development Study, and the Segmentation Study.

The Revenue Requirement Study determines the amount of revenue BPA will need during the rate test period to pay all its expenses and costs, including the amortization of the Federal investment in the Federal System over a reasonable number of years. Annual interest expense, repayments of the Federal investment, and annual operating expenses of the Federal System are all determined and functionalized between generation and transmission in the Revenue Requirement Study. The revenue requirement is set to recover those costs and expenses by function. BPA also considers the need to protect against risks and uncertainties as well as to achieve and maintain a sound financial position. The Segmentation Study further allocates costs to different facility segments of the FCRTS.

A Cost of Service Analysis is prepared to assign costs to each of BPA's customer classes. Generally, generation and transmission costs are classified between capacity and energy, apportioned between seasons, time differentiated and allocated to rate classes. This process aids in determining the adequacy of current rates, designing new rates, and, as required by statute, equitably allocating the costs of the Federal transmission system between Federal and non-Federal power using the system.

A Wholesale Power Rate Development Study and a Transmission Rate Development Study are performed to design power and transmission rates, respectively. BPA's transmission rates are for wheeling non-Federal power over the Federal transmission system. These studies modify the results of the Cost of Service Analysis to reflect BPA's rate design objectives and the results of other studies, and to comport with contractual and statutory requirements. BPA's rate design objectives include, but are not limited to, cost recovery, rate stability, practicality, fairness, and efficiency. "Load shape" objectives are explained in this section at paragraph 3.5.

3.3 BPA's Current Power Rates

The Northwest Power Act requires that BPA establish rates to recover its costs. Within that cost recovery context, specific and general directives provide for the recovery of specified resources and other costs from particular customer classes. BPA's principal power rates are discussed below.

Priority Firm Rate. BPA's low-cost Federal Base System Resources are allocated first to BPA's PF rate, which is available for the loads of preference customers (except New Large Single Loads; see Other Firm Power Rates below), the loads of some Federal agencies, and Residential Exchange utility qualifying loads. Federal Base System Resources are a statutorily designated set of resources comprised of: (1) the federally-owned hydroelectric projects included in the Federal System; (2) resources acquired by BPA under long-term contracts in force on the effective date of the Northwest Power Act; and (3) electric power resources acquired by BPA to replace reductions in the capability of other Federal Base System Resources. BPA has not acquired resources to replace any loss of capability of a Federal Base System Resource. (The term "Federal Base System Resources" should not be confused with the term "Federal System.") The PF rate recovers the costs of that portion of the Federal Base System Resources needed to meet priority firm loads until sales at the PF rate exceed the amount of power available from Federal Base System Resources; it thereafter recovers the costs of Residential Exchange power and then the costs of additional resources used to meet the rate pool's loads as well as other miscellaneous costs.

The Northwest Power Act shields BPA's preference customers and Federal agency customers, but not Residential Exchange customers, from certain costs resulting from the passage of the Northwest Power Act. Costs consequently not recoverable from the protected customers are recovered from all other power sold by BPA, including power sold under the Residential Exchange. At times, BPA has had two PF rates, one lower rate for BPA's preference customers, and a higher PF rate for use in the residential exchange program.

Rates for Industrial Customers. The Industrial Firm Power (IP) rate for power sold to BPA's DSI customers is now calculated in reference to the greater of: (1) BPA's PF rate plus a margin; or (2) a floor rate based on BPA's DSI rates in effect in the year before June 30, 1985. The rates embody a credit for DSI reserves. An alternative Variable Industrial (VI) rate is available to aluminum smelter DSIs. This rate is linked to the market price of aluminum, bound by low and high limits to the rate.

Other Firm Power Rates. BPA's rates for other firm power sales within the region are based on the cost of such resources as BPA may decide are applicable to such sales. Similar criteria apply to rates established for firm power sold to meet "New Large Single Loads" of preference customers or Federal agency customers. A New Large Single Load is a load associated with a new or existing facility which the utility was not committed to serve prior to September 1, 1979, and which will result in an increase in power requirements of the customer serving that load of 10 aMW or more in any consecutive 12-month period. BPA currently has a New Resources (NR) rate for power it may sell to meet New Large Single Loads, if any, and does sell to regional IOUs. BPA currently sells no power to meet New Large Single Loads.

BPA also sells similarly priced surplus firm power outside the Northwest, primarily to California, under short-term firm power rates that allow for flexible prices, or under long-term contract rates. Firm power unmarketable under these arrangements may be sold at prices that more closely approximate nonfirm energy prices.

Nonfirm Energy Rates. Nonfirm energy is priced in accordance with the statutory standards applicable to such sales, as discussed above. Nonfirm energy is available within and without the PNW, with most sales made to California utilities.

3.4 Rate Design Components and Attributes

BPA designs rates that recover its projected costs and implement its overall pricing objectives. The rate design generally has various components that include charges and billing units. The rate design components also generally include adjustments to these charges or billing units. Typically, BPA rate components include: a demand charge, which is applied to the customer's peak rate of power or transmission use, measured in kilowatts (kW), during a given month; an energy charge applied to the customer's overall take of energy, measured in kilowatt-hours (kWh), during the given month; and often, one or more additional adjustments.

The configuration of the demand and energy charges and the bases for adjustments to these charges are referred to as "rate attributes" in this study. For example, the demand charge in most of BPA's current rate schedules varies according to the time of day. This TOD aspect of the demand charge is defined here as its attribute. Such attributes reflect BPA's costs and pricing policies. section 4 describes the attributes assessed in this report.

3.5 Load Shape Objectives of Rate Design

BPA can design rates with the objective of influencing customers to change their use of BPA services in a way that causes a desired change in the shape, or pattern, of BPA's overall load curve. If rate designs result in price signals that change usages and load shape, there may be environmental impacts associated with these changes. There are different load shape objectives for power service and wheeling service.

3.5.1 Wholesale Power

These load shape objectives are associated with increasing the efficient use of generation and transmissions resources, by influencing electric usage by customers. These load shape objectives are graphically represented in figure B-1.

For wholesale power supply, the load shape changes fall into five general categories of objectives:

Peak Clipping. The objective of peak clipping is to decrease the size of the system peak loads. This helps to defer the need for new capacity and avoid the relatively higher operating costs incurred to meet peak loads.

Valley Filling. The objective of valley filling is to use available capacity during off-peak periods. This can defer the need to shut down generating facilities at night and make use of off-peak generation associated with minimum allowable streamflows.

Load Shifting. The objective of load shifting is to combine the benefits of peak clipping with those of valley filling by shifting load from peak periods to off-peak periods.

Strategic Conservation. The objective of strategic conservation is to reduce loads during both peak and off-peak periods to reduce overall energy usage and, in many cases, the size of the system peak.

Strategic Load Growth. The objective of strategic load growth is to increase loads regardless of whether they are on- or off-peak. This objective is employed when a utility has excess capacity available to market.

3.5.2 Wheeling Service

Wheeling rates can be designed with the objective of influencing loads on the transmission system. However, wheeling loads are relatively inelastic in that they are not very responsive to rates[1] (except for wheeling loads that require construction of new facilities). As a result, BPA designs its wheeling rates with the primary objective of reflecting cost of service rather than influencing or reshaping use of the transmission system by its wheeling customers.

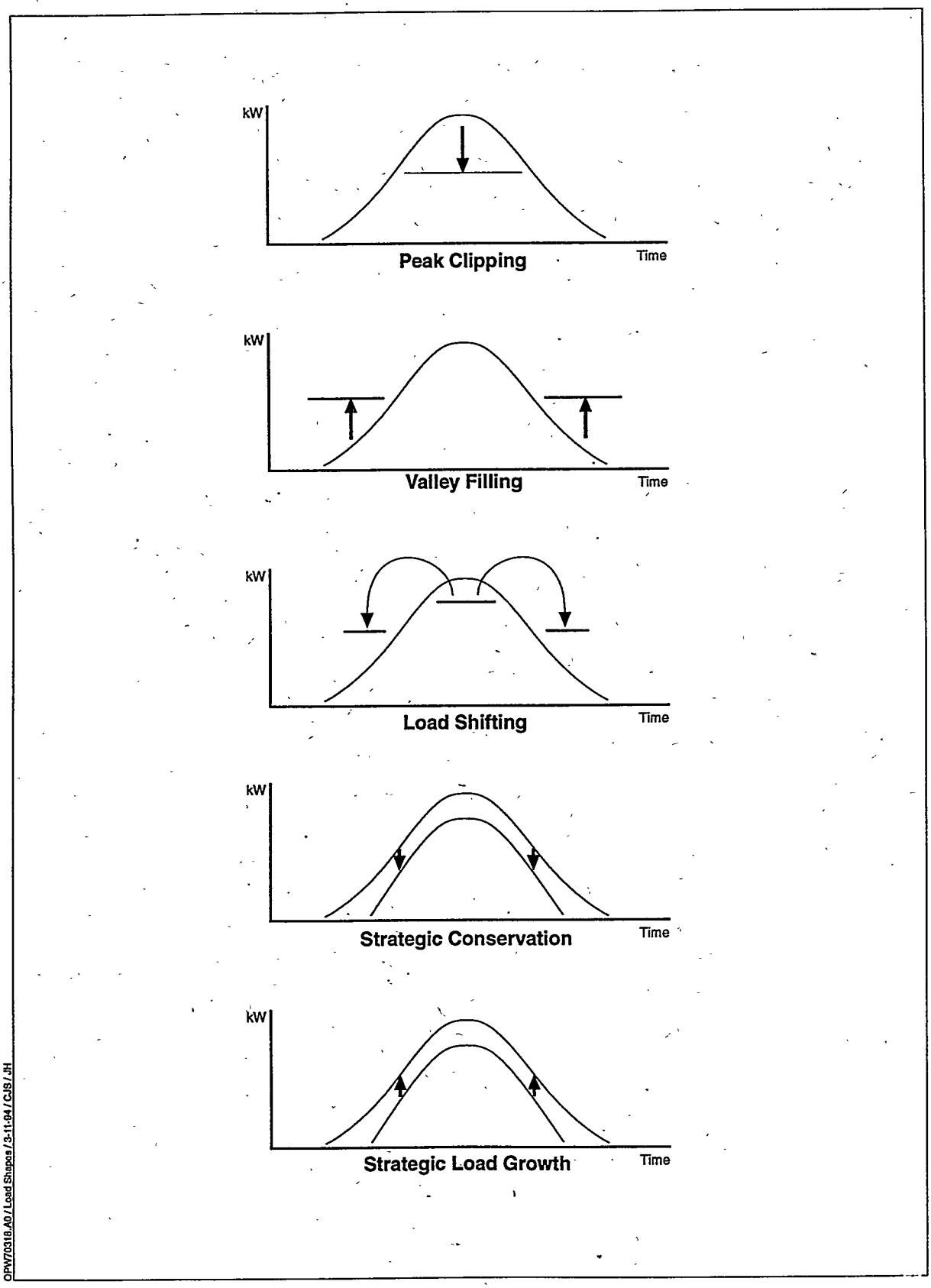
Nonetheless, load shaping objectives might become more important to BPA as demands on its transmission system increase in response to new requests for transmission service, including requests made pursuant to the Energy Policy Act of 1992 (EPA-92). This legislation enables any electric utility, power marketing agency, or other wholesale generator of power to ask FERC to order owners of transmission facilities to provide wheeling services, even if the new service would require expansion of the transmission facilities consistent with provisions of the Act.

Rate design objectives to influence wheeling loads could include the following:

- **Affect Distance.** This objective affects the length of the path over which power is being wheeled. Typically, long-distance wheeling is more costly than short-distance wheeling.
- **Affect Duration.** This objective affects the time period for reserving capacity (e.g., full year, portions of a year, or spot market) as well as its probability of interruption.
- **Relieve Congestion.** This objective relieves transmission paths that are congested by affecting either the use or direction of power flow.
- **Affect Development Decisions.** This objective affects development and location decisions involving transmission facilities and generation resources.

[1]BPA, 1993 Wholesale Power and Transmission Rate Adjustment, Final Environmental Assessment.

Figure B-1: Alternative Load Shape Objectives for Power Supply Rate Design



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SECTION 4

4.1 Rate Design Attributes

BPA's rates generally include a demand charge, an energy charge, or both. Often, these rates also include adjustments to the charges or bases for the charges. The attributes of these charges and adjustments can affect how customers use BPA's services.

This section reviews current as well as alternative rate design attributes available to BPA. This review includes a description of each attribute's form and the associated objective for affecting customer loads, if such an objective exists. Rate design attributes that would have little or no effect on customer loads are also identified. The market response to and resulting environmental impact from rate attributes that could affect loads on BPA are discussed in sections 5 and 6.

Alternative rate design attributes for BPA's wholesale power and transmission services were identified for evaluation in this study primarily through five sources:

- BPA's existing rate design.
- Written comments (hereafter called "scoping comments") received by BPA between August 24 and September 13, 1993, regarding BPA rate issues and preliminary power sales contract alternatives. Copies of the scoping comments are available from the Public Involvement Office at BPA.
- A survey of rate design for Federal, state, and provincial power marketing agencies conducted for this study. Documentation of the survey of power marketing agencies is included as Attachment B.
- A literature search.
- FERC staff reports, inquiries, and notices that pertain specifically to transmission rates.

4.1.1 Wholesale Power

4.1.1.1 Current BPA Rates

BPA has five major power rate schedules: the Priority Firm Power (PF) rate that is available to BPA's "preference" customers for regional loads and for utilities participating in the residential exchange; the Industrial Firm Power (IP) and Variable Industrial Power (VI) rates that are available to the DSIs; the New Resources Firm Power (NR) rate that is available for the net requirements of the region's IOUs and New Large Single Loads; the Surplus Firm Power (SP) rate that is available for sales of surplus firm power both inside and outside the region; and the Nonfirm Energy (NF) rate that is available at BPA's discretion for sale of nonfirm energy both inside and outside the region.

BPA sells power and energy services under numerous other rate schedules; however, these constitute less than 1 percent of BPA's revenue requirements and therefore are not expected to affect the environment to any great extent, even if the rate design were changed. These additional power and energy services include Special Industrial (SI), Emergency Capacity (CE), Share-the-Savings (SS), Power Shortage (PS), and Reserve Power (RP) rates.

Table B-1 summarizes BPA's current wholesale power rate components and rate design attributes and indicates which attributes are incorporated into BPA's current rate schedules.

Table B-1: Wholesale Power Rate Design Components and Attributes Included in Current BPA Rate Schedules

Rate Components, Attributes	PF Priority Firm	IP Industrial Power	VI Variable Industrial	SI Special Industrial	CE Emergency Capacity	NR New Resources	SP Surplus Power	NF Nonfirm Energy	SS Share Savings	PS Power Shortage	RP Reserve Power
Demand Charge											
Flat					X						
Tiered											
Declining											
Inverted											
Time of Use											
Time of Day	X	X	X	X		X	X				X
Seasonal											
Real Time											
Marginal Cost/ Marginal Value							X	X			
Streamflow											
Market-driven											
Indexed											
Flexible					X		X			X	
Negotiated											
Caps										X	
End Use											
Regional											
Project-Specific											
Energy Charge											
Flat							X	X	X		X
Tiered											
Declining											
Inverted											

Table B-1 (continued): Wholesale Power Rate Design Components and Attributes Included in Current BPA Rate Schedules

Rate Components, Attributes	PF Priority Firm	IP Industrial Power	VI Variable Industrial	SI Special Industrial	CE Emergency Capacity	NR New Resources	SP Surplus Power	NF Nonfirm Energy	SS Share Savings	PS Power Shortage	RP Reserve Power
Wright											
Time of Use											
Time of Day											
Seasonal	X	X	X	X		X					
Real Time											
Marginal Cost											
Streamflow											
Market-driven											
Indexed-Customer Product Price			X								
Indexed-Generation Fuel								X	X		
Flexible							X	X		X	
Negotiated								X			
Caps								X		X	
End Use											
Regional											
Project-Specific											
Adjustments											
Discounts											
Low Density	X					X					
Irrigation	X					X					
Prepayment											
Surcharges											
Guarantee								X			
Energy Return	X					X					
Conservation	X					X					
Intertie Charges					X		X	X			
Unauthorized Charge	X	X	X	X		X					
Interim Rate Adj.	X	X	X	X		X	X	X			
Energy Tax Adj.	X	X	X	X		X	X	X		X	
Exchange Adj.	X										

4.2 Available Wholesale Power Rate Attributes

In this section, each of the rate attributes listed in table B-1 is described in terms of its form and associated objectives for affecting loads. The same attributes generally apply to both the demand and the energy charges, and, as a result, the attributes for both types of charges are discussed together. This discussion is followed by a review of rate attributes that adjust charges to customers (adjustments).

The first attribute described for each type of charge is a "flat rate." This attribute is used here as a baseline against which the effects of other rate design attributes are evaluated.

4.2.1 Demand and Energy Charges

4.2.1.1 Flat Rates

With a flat rate design, a single price is charged for each unit of usage, regardless of a customer's volume or time of use. Under such a design, rates simply reflect the allocated unit cost of providing service to each customer class. For most, if not all, rate schedules in the utility industry, customers are charged a flat rate per month of service. A flat energy charge consists of a single price per kWh, and a flat demand charge consists of a single price per kW of billing demand.

The primary objectives of a flat rate design are to reflect the cost of service, be simple and understandable, and be fair in the apportionment of cost of service among consumers. In meeting these objectives, flat rates are devoid of load shape objectives.

4.2.1.2 Tiered Rates

Tiered rates set different prices per unit of power taken in different blocks or tiers of usage within a given billing period (usually 1 month). Tiered rates that decrease with each successive block of additional power are generally called **declining block rates**, and tiered rates that increase with each successive block of additional power are generally called **inverted rates**. Declining block rates generally reflect conditions in which higher consumption of electricity results in relatively lower costs per unit delivered, while inverted rates imply that higher consumption of electricity results in higher costs per unit delivered. Under the Public Utility Regulatory Policy Act (PURPA) of 1978, declining block rates for energy charges are forbidden except to the extent that a "utility demonstrates that the costs which are attributable to such energy component decreases as such consumption increases during such period."[2] However, most of BPA's public agency customers are not covered by the PURPA restriction on declining block rates. In 1992, only 17 of BPA's 113 public agency were affected by this section of PURPA. Several of BPA's public agency customers serve their ultimate consumers using declining block rates.

The objective of a declining block rate is to increase consumption among customers or to create strategic load growth, while the objective of an inverted rate is to reduce consumption or to achieve strategic conservation. Because the declining block rate does not promote efficient use of energy, it is not considered further in this study for implementation by BPA.

4.2.1.3 Wright Rates

A Wright rate is a type of energy charge that sets a different price for energy on the basis of different ranges in the customer's monthly load factor.[3] In its traditional form, different prices are charged for different preset levels of kWh per kW of demand. In "Electric Utility Rate Economics," by Russell Caywood, an example of the Wright rate is given in which, for a billing month, a certain rate applies for the first 50 kWh per kW of demand, another rate applies for the next 100 kWh per kW of demand,

[2]This provision applies to all electric utilities with annual sales of 500 million kWh or more.

[3]Load factor is the ratio of a customer's average load to its peak load.

and yet another rate applies for all kWh over 150 kWh per kW of demand. Assuming 720 hours in a given month, this translates into tiered energy charges changing at monthly load factors of 7 percent and 21 percent. Traditionally, Wright rate designs have had lower charges per kWh for higher levels of load factor.

As described in Attachment B, one area office of the Western Area Power Administration (WAPA) charges a higher rate per kWh for energy sold at a monthly load factor above 60 to 70 percent. WAPA bases this increased charge on the fact that it has to purchase higher cost energy to meet energy requirements above its own monthly system load factor.

The load shape objective of the Wright rate is to shift load. The traditional approach was oriented towards peak reduction and valley filling. The WAPA objective, however, is to strategically reduce valley load to reduce purchased power costs.

4.2.1.4 Time-of-Use Rates

Time-of-use (TOU) rates price electric service at different levels for different periods of use. The primary objective of TOU rates is to reflect the utility's costs at the time service is taken. Typically, rates are set higher during peak periods (periods of relatively high demand) when the utility's unit costs are relatively high, and lower during off-peak periods when the utility's unit costs are relatively low.

TOU rates include **time-of-day** (TOD) rates, which set prices at different levels for defined hours during the day, and **seasonal rates**, which set prices at different levels for defined seasons of the year. These rates differ from real-time rates in that prices and rating periods (the time that any given price is in effect) are fixed, whereas with real-time rates, the prices, rating periods, or both vary with time as discussed below.

The objective of TOU rates is to create economic efficiency by providing a basis for utility customers to shape their loads in accordance with utility costs as reflected in the TOU rates. As such, the load objective is to shift customer load from a utility's peak periods to its off-peak periods.

BPA currently has a TOD attribute in its demand charge and a seasonal attribute in its energy charge.

4.2.1.5 Real-Time Rates

Real-time rates are prices for utility services that change to reflect the utility's marginal cost or marginal value of service at the time the service is used. As such, they are an extension of TOU rates. However, unlike TOU rates, the price level and the rating periods of real-time rates are not necessarily fixed; they can change to reflect utility costs that change from day to day or from season to season. Real-time prices are estimated and posted much closer to the time of consumption (often the day before) and can have much shorter durations of applicability (an hour, a day, or a week) than TOU rates. As stated in "Customer Response to Rate Options," by the Electric Power Research Institute (EPRI), "...in some cases, signals are sent announcing peak time, and the price is calculated after the fact based on the actual marginal cost incurred. In other cases, prices are transmitted at regular intervals or customers telephone the utility in the morning to request a listing of hourly rates for the coming day."[4]

The primary objective for real-time rates is economic efficiency. As EPRI notes, "...if customers are apprised in advance of anticipated system conditions in terms of price, they will respond to price changes in accordance with economic laws of demand, increasing consumption as price falls and decreasing consumption as price rises, thereby adjusting their electricity usage to changing system capacity on a continuous basis." As such, the load shape objective of real-time rates is to shift loads from periods of relatively high utility cost to periods of relatively low utility cost.

[4]EPRI, "Customer Response to Rate Options," January 1991, p. 2-6.

A real-time rate could be developed, for example, with the objective of shifting load to reduce the duration of BPA's peak load (or its sustained peak load).[5] Sustained peak load refers to peak load for a continuous period of several hours. During sustained peak loads, BPA could price demand and energy at a high enough rate to encourage customers to seek alternative sources of supply and/or take measures to reduce the size of the load on BPA during sustained peak periods.

4.2.1.6 Streamflow Rates

For a hydro-based power system, such as that in the PNW, the availability of water is a major, although not the only, driver of power costs. (Other major drivers of power costs in the PNW are temperature, the economy, oil and gas prices, thermal generation availability, intertie availability and the demand and supply of electricity from California.) Streamflow rates could be used to reflect the availability (or scarcity) of water by tying rates to existing or predicted hydrological conditions as they develop during the operating year.

When hydropower generation is scarce due to low streamflows, rates would be higher, and rates would be lower when hydropower generation is plentiful due to high streamflows. In many ways streamflow rates are similar to, and could be considered a subset of, real-time rates. Streamflow-based rates can take many forms, some of which BPA has or is using in its current rate structure.

BPA's current seasonalized PF-93 rate is an example of streamflow-based rates at the most fundamental level. BPA's PF-93 rate is about 25 percent higher in the months of September through March than it is during the months of April through August.

Another example of streamflow rates (which are or have been in place among many IOUs in the PNW) is a power cost adjustment clause. To the extent that streamflows affect the cost of power on the wholesale market, reduced streamflows cause power costs to increase, and vice versa, for utilities purchasing power from other utilities. Increases or decreases in power costs are reflected, with a 3- to 6-month lag, in rates to ultimate consumers.

Other possible streamflow-based rate structures are a rate that changes monthly based on historical or projected streamflow data, and a streamflow rate which changes daily, or even hourly, based solely on the availability of water. Such a rate would be similar to real-time rates discussed previously.

4.2.1.7 Market-Driven Rates

Market-driven rates are designed to respond to economic conditions that are outside the utility's control. These rates can be used to retain existing load for the utility, build new load, or simply reflect trends in the marketplace. Market-driven rate designs evaluated as part of this study include economic development rates, fixed-term rates, indexed rates, flexible rates, negotiated rates, rate caps, end-use rates, regional rates, and project-specific rates. Note that these rates are not mutually exclusive rate attributes. That is, a rate could contain one or more of these attributes.

Economic development rates are designed to stimulate economic activity within the utility service area, either by inducing businesses to move into the service territory or by enabling existing businesses to expand output. The primary social objectives of economic development rates are job creation and retention, maintenance and enhancement of utility customers' economic health, and assistance with the implementation of economic development public policy.[6]

Fixed-term rates lock in a given rate for a specified period. At the retail level, these rates are established primarily with large industrial customers. At the wholesale level they could be negotiated between two utilities or a utility and an end-user. The primary objective of fixed-term contracts is

[5]Although BPA currently has a substantial surplus to meet its single-hour peak load, it does have limits on the length of time it can continue to meet, or "sustain," the load. As a result, BPA's "loss of load probability" increases significantly during periods of extreme winter weather conditions.

[6]EPRI, "Survey of Innovative Rates, 1991." April 1992.

consistency from the buyer's perspective and load growth or load retention from the seller's perspective.

Indexed Rates. An indexed rate sets prices for electric services according to a formula based on the price level for some other commodity or commodities or on the costs incurred by the utility.

The primary objective of rates set on the basis of other commodities is to allow electric prices to respond to changes in market conditions, including the price level of the customers' products. BPA currently has rates that are indexed to another commodity. The VI rate is indexed to the world price of aluminum. One of BPA's surplus sales contract rates is tied to the price of its customers' generation fuels. Rates tied to a customer product price are essentially load retention rates, and, as such, can be viewed as providing strategic load growth.

The primary objective of rates tied to the utility's costs is simply to allow the utility to recover its costs in an administratively efficient manner. These rates can be indexed to individual utility costs that can vary unpredictably and have significant financial effect on the utility. Under these circumstances, an indexed rate not only improves the utility's cost recovery ability, but also meets an objective of energy efficiency in that the consumer receives a rapid price signal that the cost of energy has changed. An example of such a rate index is the "fuel adjustment clause" or the "power cost adjustment clause" that many electric utilities employ to index their rates to their costs for fuel and/or wholesale power. On a broader scale, rates can be indexed to a utility's overall costs. For example, BPA has surplus firm power rates that are tied to BPA's average system cost. A related form of indexed rate is one that ties one rate to another. For example, BPA has surplus sales rates that are directly tied to its average PF rate.

Flexible Rates. The flexible rate attribute enables the seller to determine the price for specific services. The objective of this attribute is to enhance marketability, and, therefore, the actual rate may be higher or lower than the cost-based rate. Currently this attribute is included in the NF and SP rate schedules and may be applied to either the demand or energy charge or both.

A related rate concept is **negotiated rates,** where the rate is set jointly by BPA and its customer. It is currently included in the NF and SP rate schedules. An example of a negotiated rate attribute is a fixed-term rate that could be negotiated between a utility and its customer. The cost of electricity is a known factor for the duration of the contract, and the monthly bill varies only with usage.[7] The rates can be "frozen" at a specific level or changed according to a predetermined schedule during the contract.

Rate Caps. Caps or limits on rate levels are currently used in the VI rate, the SP rate, the unauthorized increase charge, and some of the NF rate schedule options. The objective of caps is to limit the range of prices for market-driven rates. Caps are modifications of rate attributes that allow prices to vary with market conditions in that they limit the range of price variance.

End-Use Rates. End-use wholesale rates are currently used by the Tennessee Valley Authority (TVA). Wholesale rates are established for each of the end-use (or retail) customer classes (e.g., residential, small commercial, large commercial/industrial, and street lighting). Each wholesale customer is then charged according to the volume of retail sales it makes to its end-use customers.

This rate attribute is not an option for BPA because BPA does not have the authority to set rates at the retail level.

Regional Rates. Regional rates are based on regional prices for electric service. These rates are based on an index composed of the average prices for similar services offered by a number of utilities within a given region. Typically, regional rates are established for industrial energy service, but they also could be established for other services, including wholesale service within a given region. The

[7]EPRI, "Survey of Innovative Rates, 1991." April 1992.

primary objective of this type of rate is to maintain load in a competitive fashion. Beyond this strategic load growth objective, this rate design does not have load shape modification as an objective.

Project-Specific Rates. Under project-specific rates, wholesale customers are billed for power as if it were delivered from a specific project, and the prices for the service are based on the costs associated with the project. Both WAPA and the New York Power Authority currently have project-specific rates. Most project-specific rates are the result of individual projects being separately legislated for government sponsorship, with sales contracts established as part of the foundation for project feasibility. There are no load shaping objectives associated with project-specific rates.

4.2.2 Adjustments

4.2.2.1 Discounts

Low-Density Discount. The low-density discount (LDD) is a discount applied to the PF and NR power bills of utilities with low system densities. The LDD was made available pursuant to Section 7(d)(1) of the Northwest Power Act. Utilities that receive the LDD serve relatively few customers within an extended service territory. The objective of the LDD is to mitigate adverse impacts of BPA's power rates on utilities with low density systems. Currently, the size of the discount is either 3, 5, or 7 percent, depending on the characteristics of the utility.

Irrigation Discount. The irrigation discount (ID) is an adjustment under BPA's PF and NR power rate schedules. The ID is available to qualifying irrigation load during the months of April through October and is applied to end-use irrigation sales. Participating utilities are required to pass the discount through, in its entirety, to qualifying irrigation end-users. It will continue to be in effect during April through October for the 1993 rate period. Currently, a discount of 4.71 mills per kilowatt-hour (mills/kWh) is applied to the charges of qualifying irrigation energy purchased under the PF-93 and NR-93 rate schedules.

Prepayment Discount. A discount for prepayment is a rate attribute that works like a loan from the customer to the utility. Instead of paying interest, the utility repays the customer for the use of the funds through lower power costs (lower total bill); the "principal" or prepayment is repaid through credits on power bills over a predetermined period.

In its 1991 "Survey of Innovative Rates," EPRI found one utility that provides a discount to large customers that prepay for electrical service. Kansas Gas and Electric Company has established a rider to its rate schedules that functions as a mutually beneficial financing instrument. The utility negotiates with customers for prepayments and the associated discounts as the utility's funding needs require.

4.2.2.2 Surcharges

Guarantee Surcharge. This is a surcharge applied to nonfirm energy to guarantee delivery. This option is available at BPA's discretion under the NF rate schedule for nonfirm sales and is available for any amount or duration of purchase that BPA considers prudent.

Energy Return Surcharge. This is a seasonally differentiated surcharge applied to the PF and NR rate schedules. This surcharge is intended to account for the reduction in BPA's peaking capability when energy returns are made at a rate that exceeds a specified amount. Energy returns are typically associated with capacity purchases. Because there is no limit on the amount of energy that can be returned during any given hour under the power sales contract, a surcharge to the PF and NR rate schedules was needed. The surcharge is a mills/kWh charge applied to energy returns that exceed 60 percent of the difference between a customer's billing demand and its estimated average energy requirement for the billing month.

Conservation Surcharge. This is a surcharge that is applied to customers who have not implemented the model conservation standards specified in the Northwest Power Planning Council's (Council) 1991 Northwest Conservation and Electric Power Plan (Power Plan) or otherwise achieve savings comparable to these standards. The surcharge is applied based on a recommendation by the

Council but at the Administrator's discretion; BPA has not yet invoked this surcharge. The surcharge would be applied to a customer's monthly charge for power purchased under either the PF or NR rate schedules. This surcharge was developed by BPA with guidance from the Council and is intended to satisfy requirements for such a charge pursuant to Section 4(f)(2)(2) of the Northwest Power Act.

4.2.2.3 Unauthorized Increase Charge

This is a charge that is applied to the amount of unscheduled or unrequested power that is purchased in excess of a customer's firm power entitlement. This charge is intended to be a disincentive to exceed contract entitlements and to compensate BPA in the event power has to be purchased to serve the unauthorized load. It is currently set at 100 mills/kWh.

4.2.2.4 Interim Rate Adjustment

This attribute is an automatic increase in wholesale power rates if BPA's financial reserves fall to a level that puts BPA's financial obligations to the United States Treasury at risk. This attribute is included in BPA's major power rates (except CE, SS, NF, and RP schedules).

4.2.2.5 Energy Tax Adjustment

This is a charge that may be applied to energy charges as a result of a Federal proposal to apply an energy tax on the production of electricity. This charge would be applied to most customers if an energy tax were enacted. It is anticipated that the charge would be applied to various sources of energy based upon their different Btu (British thermal unit) content. Therefore, the total increase in BPA's cost as a result of the energy tax would be applied to hydro, nuclear, and other (e.g., imported power) generation. This adjustment is a pass-through cost to wholesale power users.

4.2.2.6 Residential Exchange

The residential exchange, mandated by the Northwest Power Act, is not a true surcharge or adjustment; rather, it is a mechanism used by BPA to extend the benefits of low-cost Federal power to the residential and small farm load of participating IOUs and public utilities.

BPA calculates the difference between the "exchanging" utility's average system cost (ASC) and BPA's PF rates. The utility's average system cost is the average cost of its production and transmission resources, including costs of purchased power and conservation measures. When the utility's ASC is greater than the PF rate, BPA pays the difference to the utility. The utility must pass on the benefits to its residential and small farm consumers in the form of lower rates. Through the residential exchange, utilities are therefore able to "regionalize" a portion of the cost of conservation and resource programs to the extent that those costs cause their ASCs to be greater than BPA's PF rate.

4.3 Wheeling

BPA's transmission system is used primarily for delivering Federal power and non-Federal power to markets in the PNW region. This system also is used to import power from and export power to other regions and transmit power through the region. The Federal Columbia River Transmission System (FCRTS) is classified into nine segments. This segmentation is the basis for determining the costs associated with the different facilities and thus for the rates charged for use of such facilities. The network segment facilitates bulk power transfers between service areas. The generation-integration segment consists of all facilities that connect the Federal power plants to the network. The fringe segment is used primarily to transmit Federal power to BPA's power customers, and three different delivery segments are used to supply power at relatively low delivery voltages to BPA's power customers. Finally, three intertie segments connect the FCRTS to Eastern Montana, California, and Canada. Not all of these segments are considered in the development of BPA's wheeling rates; only the costs associated with the intertie segments and the integrated network segment (about 30 percent) have been directly associated with wheeling rates.

4.4 Current Transmission (Wheeling) Rates

BPA has eight major transmission rate schedules:

- The Formula Power Transmission (FPT) rate is a distance-related and facility-type specific rate that is available for full and partial-year firm transmission service over BPA's network.
- The Integration of Resources (IR) rate is a flat, or postage-stamp, rate that is available for firm transmission service over BPA's network.
- Three intertie rates (Northern, Southern, and Eastern) are available for firm and/or nonfirm transmission scheduled over these facilities. (In addition, the Townsend-Garrison Transmission (TGT) contract rate is designed to recover the cost of specific facilities on the Eastern Intertie.)
- The Energy Transmission (ET) rate is available for short-term firm (less than 1 year) or nonfirm transmission on BPA's network.
- The Market Transmission (MT) rate is a market-based rate for transactions using the FCRTS pursuant to the Western Systems Power Pool agreement.
- The Use-of-Facilities (UFT) rate is applicable for transmission over FCRTS facilities constructed for specific purposes.

Table B-2 summarizes BPA's current wheeling rates, components, and rate design attributes and indicates which attributes are incorporated into BPA's current rate schedules.

4.5 Alternative Wheeling Rate Attributes

Each of the rate attributes listed in table B-2 is described below in terms of its form and its objective for affecting use of transmission facilities. Demand and energy charge attributes are reviewed first, followed by a review of rate adjustments. The first attribute described is a postage stamp rate design which is used as a baseline in this report against which the effects of other rate design attributes are evaluated.

4.5.1 Demand and Energy Charges

4.5.1.1 Postage Stamp Rates

Postage stamp rates are typically stated in terms of a flat unit cost per kW or kWh of transmission capacity reserved. They are neither distance-related nor direction-related. The price per unit is the same regardless of the distance between the integration and delivery points. The price is also the same whether the flow is in the direction of the prevailing flow or in the opposite direction. The objective of this attribute is to encourage wheeling transactions, and it is often used in highly integrated power systems. The transmission system user may be allowed to vary its wheeling schedule as well as the points of delivery (i.e., load center) without paying any additional charges.

BPA's IR wheeling rate is an example of a postage stamp rate. (Although the IR rate applies only to the network segment of BPA's system, a postage stamp rate could be developed that would include more of BPA's transmission segments.)

Table B-2: Wheeling Rate Design Components and Attributes Included in Current BPA Rate Schedules

Rate Schedules								
COMPONENT/ ATTRIBUTE	**IR** Integration of Resources	**FPT** Formula Power Trans.	**IS** Intertie South Firm and Nonfirm	**IN** Intertie North	**IE** Intertie East	**ET** Energy Trans.	**MT** Market Trans.	**UFT** Use-of-Facilities
Demand Charge								
Postage Stamp	X		X					
Distance-Related		X						
Facility-Specific								X
Market-Driven							X	
Zonal								
Tiered								
Partial Year		X						
Cap							X	
Energy Charge								
Postage Stamp	X		X	X	X	X		
Distance-Related								
Facility-Specific								
Market-Driven							X	
Zonal								
Tiered								
Partial Year								
Cap							X	
Adjustments								
Surcharges								
Discounts	X							

4.5.1.2 Distance-Related Rates

Two general forms of distance-based rates are used. One form, the MW-mile method, is based on the ratio of the power flow of the wheeling transaction to the total transmission system capacity. The other form, the facility-by-facility method, is based on the ratio of the power flow of the wheeling transaction relative to the capacity of a specific transmission path. Distance-based rates (also called "point-to-point" or "contract path" rates) are typically stated in terms of a unit cost per MW-mile ($/MW-mile). Therefore, the rate reflects the amount of power being wheeled as well as the distance that the power is traveling. The objective of distance-related rates is to reflect the relatively higher cost of wheeling power over long distances. Longer distances require more facilities and can result in higher power losses than short-distance wheeling. BPA's FPT rate is an example of a distance-based rate.

With distance-related rates there is a clear association between each contract path and its cost. This can therefore affect decisions that are sensitive to the distance that power is traveling. It can also add incentive to locate new generation resources closer to load centers.[8]

4.5.1.3 Facility-Specific Rates

Facility-specific rate attributes consider the actual cost and usage of specific facilities. The form of this rate reflects the specific usage and, therefore, could be based on a unit capacity charge ($/MW), or an energy charge (mills/kWh), or both. Regardless of the form, the objective of facility-specific rates is to recover the costs of the specific facilities used for a given transaction.

BPA currently has a facility-specific rate schedule called Use-of-Facilities (UFT). The actual charges are typically set by contract based on the cost of specifically identified facilities. Typically, the cost of lower voltage facilities used to deliver non-Federal power is collected under the UFT rate.

Another BPA facility-specific rate is the FPT rate, which includes charges designed to recover costs based on the type of facilities used. (As discussed above, the FPT rate also includes a distance-related charge.) Finally, BPA's TGT contract rate is a facility-specific rate that is used to recover the cost of the Townsend-Garrison transmission line.

4.5.1.4 Market-Driven Rates

Market-driven rates are designed so that they vary according to market conditions. With market-driven rates, transmission capacity is rationed among competing customers by price. BPA's MT rate, a market rate, conforms to the rate developed by the Western Systems Power Pool for transactions pursuant to that pool's agreement.

Although this rate form is typically used for short-term transactions, there might be appropriate applications for using market-driven rates for longer time periods. For example, transmission capacity could be auctioned for specified periods of time to clear constraints on surplus capacity.

Again, because the rate attribute objective is to respond to market conditions, the rates could fluctuate with various conditions on the transmission system. For example, users of the transmission system may be willing to pay a higher rate for wheeling over relatively constrained facilities or paths, or for a higher level of "firmness." Market-driven rates also could fluctuate with power market conditions. For example, under a share-the-savings power rate, the wheeling provider could share in the savings that result from a power transaction.

Market-driven rates also could affect plans for expansion of the transmission system. First, when expansion cannot be done in time to accommodate all uses, market-driven rates can be used to ration the existing capacity until new capacity is available. Second, market-driven rates could be used to ration facilities that could be expanded except that projected demand does not justify the investment. Third, where embedded cost-based rates do not appear to justify expansion, market-based rates may

[8]FERC Notice of Technical Conference and Request for Comments, June 1993.

provide the revenue to make expansion economically feasible. Finally, where buyers have transmission alternatives, market-driven rates may provide the best basis for ensuring competitiveness for wheeling services.

4.5.1.5 Zonal Rates

Zonal rates are stated in terms of unit cost per kilowatt of transmission capacity reserved ($/kW) for each geographic zone through which power is traveling. A zonal rate attribute can be used to price-differentiate wheeling transactions according to the point of integration, its path, and its point of delivery. Zonal rates can be used to set relatively high prices for transmission between certain zones to discourage some uses of the system. Conversely, they could be set relatively low for transmission between other zones to encourage use of the system.

The design of a zonal attribute is driven by the configuration of the transmission system where the rate applies. The Regional Transmission Agreement for the New England Power Pool has developed four categories of zonal rates that are applied "depending upon the effect of a given transaction on the regional transmission system: (1) favorable; (2) neutral; (3) unfavorable- single interface; and, (4) unfavorable-multiple interface." An evaluation of the transaction is performed to determine how it affects the transmission system, and rates are based on these effects.

Another example of zonal rates involves the British National Grid Company. Here, "the same non-vintage price" is charged to all customers wheeling in the same "geographic zones." In this case, the effects of various transactions are not taken into consideration. Instead, there is a general understanding that some areas are more constrained than others and the rates are designed accordingly.

4.5.1.6 Tiered Rates

A tiered attribute could be designed in many different ways. Here it is assumed that the objective would be to price-differentiate between the age of facilities. The rate form would be composed of tiers (or blocks) of transmission system capacity that could be applied on either a capacity ($/kW) or energy (mills/kWh) basis. The tiers could be inverted, which means that rates would increase as usage increases. The objective of such a rate attribute would be to discourage usage. Alternatively, the rates could decrease with increased tiers of usage in an attempt to encourage usage.

A tiered rate attribute might be appropriate to signal the cost of facility expansion. In this case, the rate for the first tier would be based on the cost of existing facilities, while the rate for the second tier could be based on the cost of the facility expansion. Rate tiers could also be set to complement the tiers applied to power sales. In this way, tiering of power rates would drive the tiering of transmission rates.

4.5.1.7 Partial Year Rates

The objective of a partial year attribute is to allow transmission capacity reservations to be made for various periods of time rather than for complete years.[9] The form of a partial year attribute is a charge per kW ($/kW-week or $/kW-month). These charges could be simply a weekly or monthly proportion of an annual charge ($/kW-year) or be based on other factors like value. BPA has a partial year attribute in its FPT rate schedule. This attribute could be used to increase the overall usage of specific transmission facilities.

[9]In a way, a partial year attribute is an alternative to allowing the reassignment of reserved capacity, although it might not be as flexible as reassignment could be.

4.5.2 Adjustments

4.5.2.1 Surcharges

Transmission rate surcharges could be applied to various wheeling rates in any number of ways. A surcharge could be made in the form of a percentage premium (on the base rate) or an incremental charge per kW or kWh. A charge could be set as a function of the capacity reserved for a particular transaction in order to signal the increasing costs associated with relatively large transactions. In addition, a charge could be applied that increases exponentially with the distance of the transaction to signal that long-distance wheeling is increasingly costly for a system to provide. If a surcharge is intended to affect the location or type of resource being developed, a rate surcharge could be applied simply as a percentage increase (e.g., 10 percent) for that particular resource's wheeling needs. There might even be reason to apply a surcharge (e.g., in the form of a percentage increase) to affect where power is being delivered, which would presumably discourage the development of resources located far from the load centers to be served.

Comments that BPA received during its scoping process suggested that a transmission rate surcharge should be used for transmission of generation that is not subject to integrated planning or that "violates" the Council's Power Plan or its Columbia River Basin Fish and Wildlife Program (F&W Program).

4.5.2.2 Discounts

Transmission rate discounts are designed to encourage certain usage patterns. The structure of a discount could vary depending upon the particular objectives that the utility is interested in accomplishing. BPA's IR rate, which is a postage stamp rate, has a discounted capacity charge ($/kW) available for transactions that are shorter than 75 miles. The IR rate discount is intended to prevent an incentive for wheeling customers to construct short-distance parallel lines to avoid the IR demand charge.

Scoping comments submitted to BPA suggested that discounts should be considered for transmission access involving conservation (transfers of power between utilities that together are developing conservation) and priority resources. It was also suggested that this could encourage conservation measures, in the form of conservation transfers and the development of specific generating resources. Conservation transfers involve utilities developing conservation for other utilities in exchange for the generation "freed-up" as a result of the conservation. Specific resources that could be favored would be those outlined by the resource priorities specified in Section 4 of the Northwest Power Act.

SECTION 5

In this section, BPA customer reactions, or market responses, to various rate design attributes are evaluated and described. This is followed by an evaluation of the environmental impacts that could reasonably be expected from these market responses.

5.1 Market Responses and Environmental Impacts at the Wholesale Level

Market responses to rate attribute changes are evaluated here with the assumption that all would occur exclusively at the wholesale level. That is, the analysis is based on BPA's wholesale utility customers not changing their own retail rate designs to conform with the alternative BPA rate attributes. If such a change were made, the wholesale utilities would also receive a market response from end-use consumers. The consumer response to such a "pass-through" of BPA rate designs to retail rates is discussed in section 6.

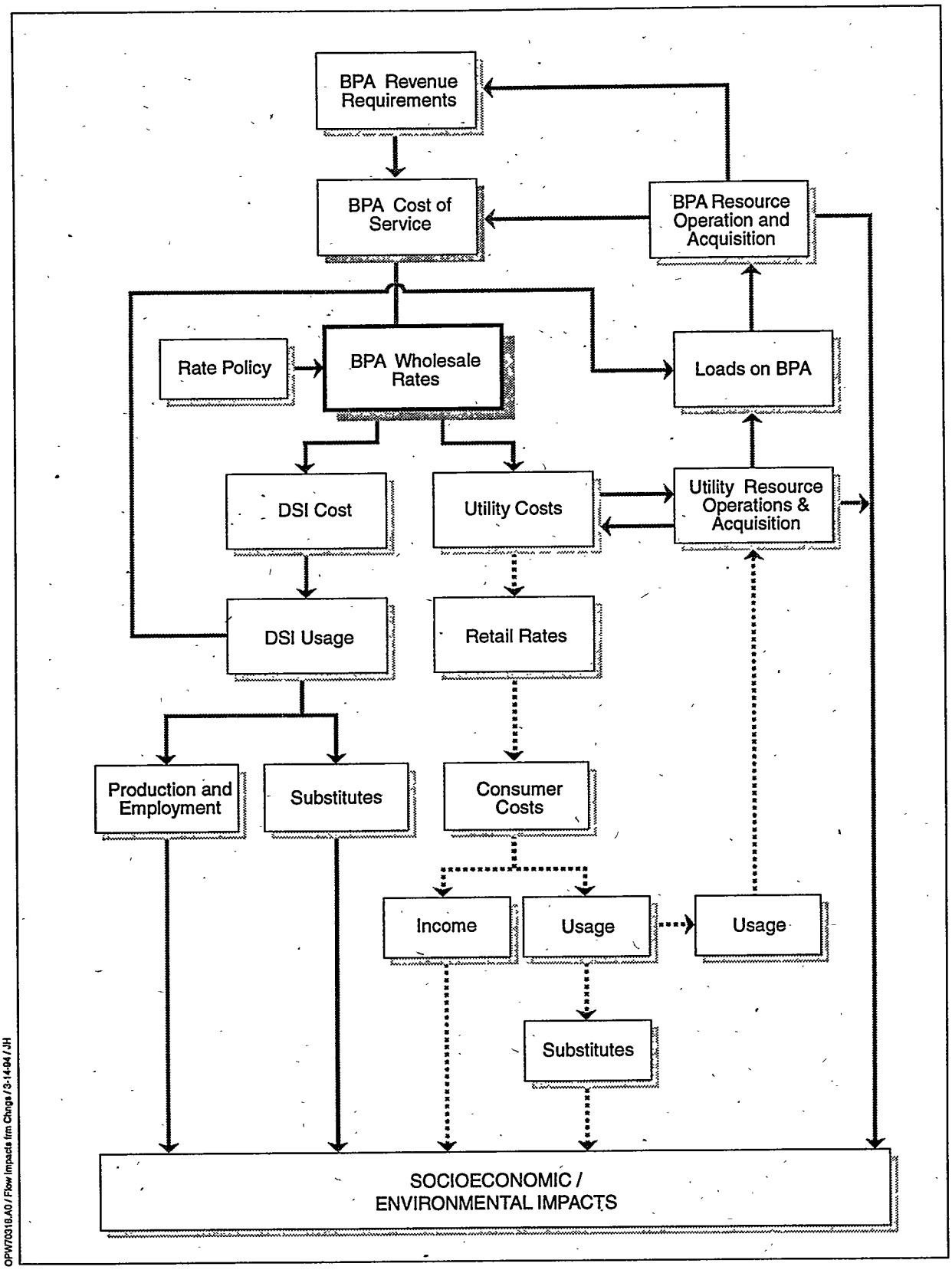
As discussed in section 3, BPA sets rates according to its overall revenue requirements, cost of service, and rate policy. The flow of impacts in response to changes in BPA rates is shown in figure B-2 and is described in the following paragraphs.

Changes in BPA rate design directly affect power costs to BPA's customers, which include utilities and DSI customers. Changes in DSI power costs can affect their decisions regarding power usage, which in turn affects loads on BPA. The DSIs are able to change their usage through either reduction in production or substitutes for BPA power, primarily in the form of conservation. Substitutes can also include generation of electric energy from an alternative source. Changes in production and substitutes of conservation or alternative energy generation may have socioeconomic and environmental impacts. BPA rate change impacts on utility customer cost can affect the utility's resource operation and acquisition decisions and may result in a change in retail rates paid by consumers. The changes in utility resource operations and acquisition are made to reduce overall costs for the utility and result in changes in loads on BPA. These changed loads on BPA in turn affect BPA's resource operation and acquisition decisions. These changes may have environmental consequences and can affect BPA's overall revenue requirements and cost of service.

Changes in retail utility costs may be passed through to end users by way of changes in the utility's retail rates, changes in overall price levels, or changes in rate design. Resulting effects on consumer costs affect consumers' income levels in terms of disposable incomes for residential customers and operating incomes for businesses. These, in turn, result in socioeconomic and environmental impacts. A change in costs also affects consumers' usage of electricity through fuel substitutions and changes in production and overall usage. This affects retail loads, which affect utility resource operation and acquisition.

The exact market response to changes in BPA rate design cannot be predicted; a range of possible market responses exists. In this section, market responses and environmental impacts that could reasonably occur are identified and discussed. Both short- and long-term responses are considered. Short-term responses include changes in operations; long-term responses include changes in power and transmission resource investment.

Figure B-2: Flow of Impacts From Changes in BPA Rates



For this evaluation, BPA's customers were grouped into four market segments: non-marketing customers, DSIs, marketing customers, and extraregional customers. The non-marketing customer segment is composed of BPA's regional customers that currently have little or no generating resources and are, therefore, neither marketers of wholesale power nor users or providers of wheeling services. The DSIs are situated similarly to the non-marketing customers; however, because they are industries, not utilities, they are likely to respond differently to some rate attributes. The marketing customer segment is composed of the region's IOUs and publicly owned utilities that have their own generating resources and, therefore, have alternatives to BPA power and wheeling services. The extraregional customer segment is composed of all out-of-region customers, which are primarily utilities located in California and Canada.

The following tabulation shows BPA wholesale power sales in 1992 (excluding residential exchange).

Market Segment	Power Purchases From BPA ($ million)	Percent of Total (%)
Non-marketing Customers	625.4	39
DSIs	422.2	26
Marketing Customers	527.2	32
Extraregional Customers	42.1	3
TOTAL	1,617.0	100

5.2 Wholesale Power

Market responses to wholesale rate attributes are discussed below and summarized in Tables B-3 and B-4. Table B-3 summarizes the load effects of each market segment that could result from each of the various rate attributes analyzed. Table B-4 summarizes the resource actions that each of the market segments could take that would result in the load impacts shown in table B-3. Evaluations of market response to each rate attribute were made under the assumption that the rate attribute replaced a flat rate attribute. That is, flat rates were assumed to be the baseline for this analysis.

The responses shown in table B-3 are for each market segment's load on BPA in both the short and the long term. They are cumulative in the sense that, conceptually, the load responses by the market segments add to a total effect on BPA. The legend at the bottom of the table describes each of the abbreviations used to summarize the load effects in each of the table's cells. These load effects are the same as the load objectives described in section 3.

Table B-3: Probable Load Response by Market Segment to Alternative BPA Rate Design Attributes for Wholesale Power

Rate Component, Attribute			Term	Market Segments: Non-marketing Customers	DSIs	Marketing Customers	Extra-Regional Customers	Total
Demand Charge								
	Tiered							
		Inverted	Short	0	0	PC	PC	PC
			Long	PC	PC	PC	PC	PC
	Time of Use							
		Time of Day	Short	0	0	LS-D	LS-D	LS-D
			Long	LS-D	LS-D	LS-D	LS-D	LS-D
		Seasonal	Short	0	0	LS-S	LS-S	LS-S
			Long	LS-S	LS-S	LS-S	LS-S	LS-S
	Real Time							
		Marginal Cost/Market Value	Short	0	0	LS-D&S	LS-D&S	LS-D&S
			Long	LS-D&S	LS-D&S	LS-D&S	LS-D&S	LS-D&S
		Streamflow	Short	0	0	LS-CM	LS-CM	LS-CM
			Long	LS-CM	LS-CM	LS-CM	LS-CM	LS-CM
	Market-driven							
		Indexed-Customer Product Price	Short	0	LG	0	0	LG
			Long	0	LG	0	0	LG
		Flexible	Short	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG
			Long	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG
		Negotiated	Short	0	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG
			Long	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG
Energy Charge								
	Tiered							
		Inverted	Short	0	C	C	C	C
			Long	C	C	C	C	C
	Wright		Short	0	0	LS-D	LS-D	LS-D
			Long	0	0	LS-D	LS-D	LS-D
	Time of Use							
		Time of Day	Short	0	0	LS-D	LS-D	LS-D
			Long	LS-D	LS-D	LS-D	LS-D	LS-D
		Seasonal	Short	0	0	LS-S	LS-S	LS-S
			Long	LS-S	LS-S	LS-S	LS-S	LS-S
	Real Time							
		Marginal Cost/Market Value	Short	0	0	LS-D&S	LS-D&S	LS-D&S
			Long	LS-D&S	LS-D&S	LS-D&S	LS-D&S	LS-D&S
		Streamflow	Short	0	0	LS-CM	LS-CM	LS-CM
			Long	LS-CM	LS-CM	LS-CM	LS-CM	LS-CM
	Market-driven							
		Indexed-Customer Product Price	Short	0	LG	0	0	SLG
			Long	0	LG	0	0	SLG
		Flexible	Short	0	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG
			Long	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG
		Negotiated	Short	0	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG
			Long	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG	LS/C/LG
Adjustments								
	Discounts							
		Low Density	Short	LG	0	0	0	LG
			Long	LG	0	0	0	LG
		Irrigation	Short	VF	0	0	0	VF
			Long	VF	0	0	0	VF
	Surcharges							
		Conservation	Short	0	0	0	0	O
			Long	C	0	C	0	C

Legend
0 = Insignificant or No Effect
PC = Peak Clip
VF = Valley Fill
LS = Load Shift
LS-D = Load Shift-Daily Loads
LS-S = Load Shift-Seasonal
LS-CM = Load Shift From Months of Critical Water Conditions to Months of Noncritical Water Conditions
C = Conservation
LG = Load Growth

Table B-4: Potential Resource Response by Market Segment to Alternative BPA Rate Design Attributes for Wholesale Power

Rate Component, Attribute	Term	Resource Operation and Acquisition by Market Segment					
		Non-marketing Customers	DSIs	Marketing Customers	Extra-Regional Customers	Resource Operation & Acquisition by BPA	Net Effect on Regional Resources
Demand Charge							
Tiered							
Inverted	Short	0	0	+PO	+PO	-PO	-PO
	Long	+PR	+PR	+PR	+PR	-PR	-PR
Time of Use							
Time of Day	Short	0	0	+PO/-OPO	+PO/-OPO	-PO/+OPO	-PO/+OPO
	Long	+PR	+PR	+PR	+PR	-PR	-PR
Seasonal	Short	0	0	+PO/=OPO	-PR/+OPO	-PO/+OPO	-PR/+OPO
	Long	+BR	+BR	+BR	-BR	-BR	-BR
Real Time							
Marginal Cost/Market Value	Short	0	0	+PO/-OPO	+PO/-OPO	-PO/+OPO	-PO/+OPO
	Long	+PR	+PR	+PR	+PR	-PR	-PR
Streamflow	Short	0	0	RS	RS	RS	RS
	Long	+PR/+BR	+PR/+BR	+PR/+BR	+PR/+BR	-PR/-BR	-PR/-BR
Market-driven							
Indexed-Customer Product Price	Short	0	0	0	0	+BR	+BR
	Long	0	0	0	0	+BR	+BR
Flexible	Short	0	0	+-PO/+-OPO	+-PO/+-OPO	+-PO/+-OPO	+-PO/+-OPO
	Long	+/-PR	+/-PR	+/-PR	+/-PR	+/-PR	+/-PR
Negotiated	Short	0	0	+-PO/+-OPO	+-PO/+-OPO	+-PO/+-OPO	+-PO/+-OPO
	Long	+/-PR	+/-PR	+/-PR	+/-PR	+/-PR	+/-PR
Energy Charge							
Tiered							
Inverted	Short	0	0	+PO/+OPO	+PO/+OPO	-PO/-OPO	-PO/-OPO
	Long	+BR	+BR	+BR	+BR	-BR	-BR
Wright	Short	0	0	-OPO	-OPO	+OPO	+OPO
	Long	0	0	-BR	-BR	+BR	+BR
Time of Use							
Time of Day	Short	0	0	+PO/=OPO	+PO/-OPO	-PO/+OPO	-PO/+OPO
	Long	+PR	+PR	+PR	+PR	-PR	-PR
Seasonal	Short	0	0	+PO/-OPO	-PO/+OPO	-PO/+OPO	-PO/+OPO
	Long	+BR	+BR	+BR	-BR	-BR	-BR
Real Time							
Marginal Cost/Market Value	Short	0	0	+PO/-OPO	+PO/-OPO	-PO/+OPO	-PO/+OPO
	Long	+PR	+PR	+PR	+PR	-PR	-PR
Streamflow	Short	0	0	RS	RS	RS	RS
	Long	+PR/+BR	+PR/+BR	+PR/+BR	+PR/+BR	-PR/-BR	-PR/-BR
Market-driven							
Indexed-Customer Product Price	Short	0	0	0	0	+BR	+BR
	Long	0	0	0	0	+BR	+BR
Flexible	Short	0	0	+-PO/+-OPO	+-PO/+-OPO	+-PO/+-OPO	+-PO/+-OPO
	Long	+/-BR	+/-BR	+/-BR	+/-BR	+/-BR	+/-BR
Negotiated	Short	0	0	+-PO/+-OPO	+-PO/+-OPO	+-PO/+-OPO	+-PO/+-OPO
	Long	+/-BR	+/-BR	+/-BR	+/-BR	+/-BR	+/-BR
Adjustments							
Discounts							
Low Density	Short	0	0	0	0	+PO/+OPO	+PO/+OPO
	Long	0	0	0	0	+PR/+BR	+PR/+BR
Irrigation	Short	0	0	0	0	+OPO	+OPO
	Long	0	0	0	0	0	0
Surcharges							
Conservation	Short	0	0	0	0	0	0
	Long	+BR	0	+BR	0	-BR	0

Legend
+ = Increase
- = Decrease
0 = Insignificant or No Effect
PO = Peak Operations (for time-of-day; on-peak hours; for seasonal winter months)
OPO = Off-Peak Operations (for time-of-day; off-peak hours; for seasonal; summer months)
PR = Peak Resources (in the form of demand-side management; gas-fired combustion turbine generation)
BR = Base-load Resources (in the form of conservation programs; cogeneration; combined-cycle gas turbines)
RS = Reshape operations without reference to peak or off-peak load conditions

In table B-4, short- and long-term resource effects from each of the rate attributes shown are summarized for each market segment and for the region as a whole. As noted above, the reaction of each market segment to any given rate attribute can be described in terms of a change in the loads they place on BPA and therefore Federal resources. Because BPA's non-marketing, marketing, and extraregional customer segments would still need to meet the unchanged loads of end-use consumers from non-Federal resources, their loads on BPA would change only to the extent that they could change at least part of their power supply to or from other resources. Because the DSIs are end-use consumers, changes in their loads on BPA could come from a change in alternative power resources or a change in end-use consumption due to changes in production levels. Or, in either case, conservation/efficiency measures could change load levels and shapes.

Table B-4 shows the power resource responses each segment could make. An important distinction to make in reviewing this table is that resource changes within BPA's market segments result in the opposite resource effect on BPA. For example, if a customer in one market segment were to respond to a new BPA rate attribute by acquiring a new base-load resource through a programmatic conservation program or rights to generated power, BPA would see its load from this customer reduced, and with it the need for base-load resources on BPA would be reduced. Thus, although there would be an increase in the customer's base-load resources, there would be an equal reduction in the long-term resource requirements of BPA.

Under these circumstances, all resource responses within BPA market segments would generally, over the long term, cancel out within the PNW region, with two exceptions. First, as noted above, the DSIs could respond to a new rate attribute with a change in production. This would result in a change in BPA loads and the resources needed to meet them. The net power resource effect would be a change in BPA resource requirements. Second, resource changes by extraregional customers would be out of the PNW region by definition, and the effect these changes would have on BPA would also be net to the region.

Resource effects shown in table B-4 indicate increases and decreases in peaking and base-load resources that could happen in response to the various rate attributes shown. The symbols shown in the table cells are as follows:

+	Increase in operation or acquisition of the resource.
-	Decrease in operation or acquisition of the resource.
0	Insignificant or no effect.
PO	Peak Operations: Operations of peaking and base-load resources during peak periods. For time-of-day-related rates, this includes resources operated during daily peak periods; for season-related rates, this includes resources operated during seasonal peak periods.
OPO	Off-peak Operations: Operations of primarily base-load resources during off-peak periods. For time-of-day-related rates, this includes resources operated during daily off-peak periods; for season-related rates, this includes resources operated during seasonal off-peak periods.
PR	Peaking Resources: Acquisition of peaking resources. This could include demand-side management (DSM) or development of peaking power plants, or contract purchase of output from these plants.
BR	Base-load Resources: Acquisition of base-load resources. This could include conservation programs or development of base-load power plants, or contract purchase of output from these plants.

In the text that follows, each rate attribute is evaluated in terms of market response possibilities and the environmental impacts that could result from these responses.

5.3 Demand and Energy Charges

5.3.1 Tiered Rates - Inverted

Market Response. BPA is considering adopting inverted rates in its rate designs.[10] BPA's design would probably not establish tiers at fixed monthly kW demand or kWh energy sales levels as is typically the case for inverted rate design at the retail level. Rather, BPA would establish charges in the first tier for a given percentage of each customer's historical power requirements (capacity and energy). In the analysis of this rate attribute that follows, it is assumed that this first tier amount is less than each customer's current load on BPA. A second tier would serve the remainder of the customers' historical load level and any load growth above historical load levels. With such a design attribute, each customer would face the second-tier rate and would, therefore, make load and resource decisions on the basis of this price signal from BPA.

Implementing such an inverted rate, all else being equal, would motivate customers in each market segment to decrease BPA purchases at the second-tier rate. In the short term, utility customers would have an incentive to optimize the power generation of their own resources, if they have any, and to seek purchases from alternative suppliers that might have power available at a lower price than the BPA second-tier price.

In the long term, all BPA customers could seek alternative supply- and demand-side resources to avoid the second-tier rate. Utilities that are successful in developing resources to entirely avoid purchasing power under the second-tier rate would have less incentive than under current rates to further seek alternative resources. This is because, under a revenue-neutral pricing scheme, the first block would necessarily be lower than the current rate in order to make the second block higher than the current rate, all other factors being equal. However, to the extent that an inverted rates structure is coupled with an overall rate increase and the Tier 1 price increases, utilities would have more incentive to seek alternative resources. The higher Tier 2 price would provide incentives to implement new, or revise existing, conservation programs. DSIs, for example, would choose between continuing to take second-tier power at the increased price, seeking alternative supplies from other wholesalers, or reducing load through reduced operations or increased efficiency/conservation measures.

By reducing loads (by either purchasing non-Federal power or, in the DSIs' case, reducing production), the operation of existing Federal facilities may be reduced in the short term and the need for both new peaking and base-load resources may be reduced in the long term. On balance, the region as a whole may have a reduced need for new non-Federal resources as a result of net reductions in Federal load from the DSIs and extraregional customers.

Environmental Impacts. Assuming that a tiered rate design involves both a lower priced first tier that is smaller than each customer's current loads on BPA and a higher priced second tier, as described above, the environmental impacts associated with this rate design attribute would be caused by a shift in new resource development from BPA to other suppliers and from reductions in extra-regional and DSI loads on the Federal system. To the extent that utilities other than BPA evaluate the costs and benefits of generation resources by using a higher real discount rate than the 3 percent used by the Council and BPA, they might acquire fewer capital-intensive resources, such as conservation, and instead acquire more combustion turbines (CTs) (typical environmental impacts of CTs are described in section 4.4 of the BP EIS).

Reductions in purchases of Federal power by extraregional customers could mean increased operation of thermal resources in the PSW, which could lead to increased air emissions in that region.

[10]BPA, its customers, and other interested parties have established a work group dedicated to the development of tiered rate alternatives.

Increased second-tier costs would increase marginal production costs for the DSIs. Depending on world markets for aluminum and other DSI products, such increases in energy costs could cause some DSIs to attempt additional conservation or efficiency measures or to reduce production. According to the 1993 Wholesale Power and Transmission Rate Adjustment Final Environmental Assessment (EA) (BPA, July 1993), among the aluminum DSIs, those with smelters using the "old prebake" technology (such as the Reynolds Troutdale smelter, currently closed) would be most vulnerable.

Closing or reducing production at aluminum and nonaluminum DSI facilities would have minor beneficial effects on the environment through reduced emissions of air and water pollutants and solid waste. However, because these facilities' environmental impacts are regulated, the closure of these facilities should have a minor direct environmental impact. Socioeconomic impacts—loss of jobs and local income—could be significant. The amount of job and income loss would depend on many factors, including world commodity prices and the production costs and economic viability of each DSI customer.

5.3.2 Wright Rates

Market Response. As described in section 4, the Wright rate is a tiered energy charge that can either increase or decrease with increasing demand blocks. This attribute sends a price signal to customers to modify their load factor. The traditional form of this rate is a declining block under which the energy charge per kWh decreases with increasing load factors. The load and resource responses by BPA customers shown in tables B-3 and B-4, respectively, relate to this traditional rate form. The general response to this Wright rate by BPA's customers could be to rely more on their own peaking resources and less on their own base-load resources so that their power purchase from BPA would have a higher load factor. No significant response by the non-marketing customer segment is anticipated.

In the short term, BPA's marketing and extraregional customers would have an incentive to rely less on their own resources during off-peak periods in order to capitalize on the lower energy charge associated with higher levels of load factor. This would result in increased off-peak operations by BPA. Many DSI customers already place a high-load-factor load on BPA because this load shape is the most economic for aluminum production. Therefore, no response is anticipated for this segment. On a regional scale, off-peak operations could increase because of more reliance by extraregional customers on BPA during off-peak periods. From a long-term perspective, the Wright rate may provide incentives for marketing and extraregional customers to rely more on BPA to serve off-peak loads, thereby possibly reducing incremental needs for their own base-load resources. Under these circumstances, there could be a marginal increase in base-load resources in the region.

If the Wright rate were inverted, like the rate used by WAPA, the results would be opposite to those described above. Marketing and extraregional customers would have incentive to rely more on their own base-load resources and less on those of BPA.

Environmental Impacts. The environmental impacts of a Wright rate attribute are difficult to predict. However, to the extent that the traditional form of a Wright rate would shift peak loads from BPA to its customers (or vice versa for the WAPA form), the primary impact, in the long term, would be to influence whether BPA or other utilities would be responsible for developing new generation or conservation resources. As noted above in the discussion of tiered rates, the new conservation and generation resources developed by BPA may be somewhat different from those developed by other utilities, BPA might be more likely to acquire more capital-intensive resources such as conservation, and other utilities might acquire less capital-intensive resources such as CTs. (See section 4.4 of the BP EIS for typical environmental impacts of CTs and other likely generation and conservation resources.)

5.3.3 Time-of-Use Rates

5.3.3.1 Time of Day

Market Response. As noted in table B-1, BPA currently has a time-of-day demand charge in the rate schedules through which most of its power is sold. This attribute signals customers that BPA's marginal cost for on-peak capacity is greater than marginal cost for capacity during off-peak periods. This price signal encourages BPA's customers with their own generation to minimize peak demands on BPA by operating their own resources during peak periods, to the extent practical. In the long term, it encourages customers to develop DSM programs aimed at reducing peak period load. Currently, some DSIs are investigating ways to reduce loads during peak periods through time-of-day shifts in operations and use of peaking resources (CTs) to meet peak loads.[11]

To the extent that the time-of-day demand charge becomes more costly than alternative peaking generation, each of BPA's market segments could invest in these alternative programs and thereby reduce peak loads on BPA. On the other hand, the lower cost of power during off-peak periods could encourage customers to shift some load to these periods.

If the time-of-day attribute in BPA's demand charges were eliminated or phased out, incentives opposite to those described above could result. Customers might rely less on their own peaking resources and more on BPA to provide those resources, and incentives for DSM programs and alternative peaking generation would be reduced.

Implementation of a time-of-day attribute for the energy charge would signal BPA's customers that the marginal cost of on-peak energy is greater than that of off-peak energy. This price signal would be expected to affect loads placed on BPA and resource development decisions for all of BPA's customers. In the short term, marketing and extraregional customers would, to the extent practical, rely more on their own peaking resources. In the long term, BPA's non-marketing and marketing customers could develop resources that shift load to off-peak (e.g., DSM) or be used to meet on-peak loads (e.g., gas-fired CTs). DSI customers would have even more incentive to install the DSM programs and peaking resources described above.

The predicted effect on BPA is to decrease peak operations and increase off-peak operations in the short term and decrease the need for peaking resources in the long term. The net impact to the region could be slight reductions in peak operations and increases in off-peak operations to reflect actions taken by extraregional customers. Increased peaking operations by marketing customers would be offset by a corresponding decrease in peaking operations by BPA. In the long term, the net reduction in the need for peaking resources in the region as a whole would be due to DSM programs implemented by the DSIs and reductions in peak demand by extraregional customers. Actions taken by regional utilities would replace those that otherwise would have been taken by BPA.

Environmental Impacts. TOD rate attributes that increase the cost to BPA customers of peak load service could tend to shift peak loads from BPA to others. In the short term, BPA's on-peak loads could decline and its nighttime off-peak loads might increase.

In the longer term, utilities other than BPA would probably develop more resources to meet peak loads. It is likely that peak resources would include DSM programs designed to clip or shift daily peak loads. The generating resources would probably be CTs. DSIs could react by implementing DSM and efficiency improvements, to the extent that they could shape their loads. The environmental impacts of these resources are identified in section 4.4 of the BP EIS. To the extent that PSW extraregional customers decrease their purchases of on-peak power from the PNW, there could be some increases in air emissions by thermal resources in the PSW as PSW utilities operate more of their thermal resources on peak rather than purchase from the PNW.

[11]Final Draft, BPA Strategic Marketing Plan, February 1994.

A phase-out of BPA's existing TOD rate attribute for its demand charge would tend to shift peak loads onto BPA. The effects would be the opposite of those just described: peak daily loads would increase, and nighttime loads would decrease. In the longer term, BPA might need to acquire peaking resources such as CTs or conservation programs designed to clip or shift daily peak loads.

5.3.3.2 Seasonal Rates

Market Response. As noted in table B-1, BPA currently has a seasonal energy charge that applies to most of its sales. This seasonal attribute signals that BPA's marginal cost of energy is higher in the winter than in the summer. BPA marketing customers respond to this signal by "reshaping" energy generation from their own facilities to minimize their winter purchases from BPA, to the extent practical.[12] The seasonal energy charge gives BPA customers more incentive to implement conservation programs that are dedicated to reducing winter loads. Implementation of such programs would tend to reduce the need for BPA to develop baseload resources.

Elimination or phasing out of the seasonal attribute would remove these price signals and would likely lead to increased regional winter loads through reduction or elimination of load reshaping by BPA's marketing customers and an overall reduction in conservation investment. It would also affect the energy demand by the extraregional customer segment because its marginal cost of power is typically higher in the summer than the winter. The current seasonal energy rate attribute attracts extraregional loads primarily from the PSW in the form of seasonal exchanges. Seasonal exchanges with the PSW tend to reduce seasonal peak operation in both the PNW and PSW, increase seasonal off-peak operations, and in the long term, support more efficient development of baseload resources for both regions' loads and exchanges.[13]

Historically, BPA had a seasonal attribute for its demand charge. Currently, however, there is no such distinction. Re-implementation of a seasonal demand charge would provide a signal similar to that discussed for BPA's existing seasonal energy charge.

Environmental Impacts. The current seasonal rate attribute under the PF and NR rates increases the costs to all of BPA's customers of serving winter loads and tends to shift winter loads away from BPA in both the short and the long terms. In the short term, BPA's PNW marketing customers tend to operate their own hydroelectric and thermal resources more; to the extent that PNW thermal resources (CTs and coal) are operated more, air emissions are increased. In the longer term, marketing utilities' new generating and conservation resources tend to be targeted to meet winter peak loads. It is likely that CTs will be used in a combination of base- and peak-load operations in the PNW (see the BP EIS, section 4.4, for typical environmental impacts). Both marketing and non-marketing PNW customers also have increased incentives to invest in residential and other conservation that reduces winter loads.

Eliminating the seasonal rate attribute could lead to reduced sales to the PSW. In turn, this could lead to the increased operation of existing marginally expensive thermal resources (such as coal or some older CTs) in the short term, and to the development of new peaking resources in the PSW in the long term. Given their cost and operational characteristics, it is probable that CTs would also be developed as peaking resources in the PSW. In both the short and long term, the result could be small increases in air pollution in the PSW.

5.3.4 Real-Time Rates

5.3.4.1 Marginal Cost-Based

Market Response. Real-time rates based on BPA's marginal costs would signal relatively high costs associated with meeting BPA peak loads and relatively low costs of meeting loads during

[12]BPA, 1987 Final Rate Proposal, Marginal Cost Analysis, July 1987.

[13]1993 Electricity Report.

off-peak periods. Given that the rate would change from day to day and from season to season, this form of real-time rate could shift loads from daily peak to daily off-peak periods and from seasonal peaks to seasonal off-peak periods. The customer segments with generating resources and marketing experience would probably be most affected in the short term. Over the long term, all customers could have incentive to develop both peak resources to avoid BPA's high rates during its annual peaks and seasonally (winter) oriented base-load resources (such as heating and lighting conservation) to avoid higher winter charges. On the other hand, lower cost during off-peak periods could result in less incentive for customers to develop base-load resources, so that the incentive to develop winter-oriented base-load resources noted above could be offset by the tendency for customers to want to rely on BPA to serve base-load needs. The net effect on BPA could be decreased peak operations and increased off-peak operations in the short term and diminished need for peak resources in the long term.

Environmental Impacts. In order to signal the costs associated with meeting peak loads, marginal cost pricing would tend to shift the responsibility for developing resources to meet peak loads from BPA to other utilities. The same generation and conservation resources types are likely to be developed by such utilities (e.g., CTs and peak-clipping DSM programs); however, to the extent that utilities other than BPA evaluate the costs and benefits of generation resources by using a higher real discount rate than the 3 percent used by the Council and BPA, they might acquire less capital-intensive resources such as conservation, and instead acquire more CTs.

5.3.4.2 Market Value-Based

Market Response. BPA could also implement real-time rates set on the basis of avoided cost or some other measurement of value at the time power is produced and delivered. Although there might be greater fluctuation in rates tied to market value than those tied to marginal cost, the overall market response is predicted to be essentially the same as that described above for real-time rates based on marginal cost.

Environmental Impacts. Environmental impacts would be similar to those described above for the marginal cost-based rate attribute.

5.3.4.3 Streamflow-Based

Market Response. While streamflows are an important determinant of the price of power in the PNW, they are not the only factor. Basing the price of electricity solely on the level of streamflows ignores how the price of electricity is set in the wholesale market. Under this pricing formula, there could be long periods of time when BPA's streamflow rate and the wholesale market price of electricity would be different. In the short term, marketing and extraregional customers would do some "reshaping" of their own resources and modify purchases to respond to streamflow rates and to any disparity between streamflow rates and the market price of electricity. Non-marketing customers do not have the same flexibility and the resulting load changes from such customers would be small. Because streamflows are volatile, this rate would create greater pricing volatility and uncertainty for BPA customers than rates fixed for specified periods of time.

For example, if the PNW experienced an abnormally wet year, a streamflow-based pricing formula would set the price of electricity low to signal the low "value" of water. If this occurred during a abnormally cold winter, with the PSW DC Intertie out of service and one or more large thermal resources not operating, BPA would substantially underprice electricity in relationship to demand. In such a situation, demand for electricity would be very high, and the ability of the power system to supply electricity to meet this demand would be severely constrained. The low rates called for in this situation under a streamflow-based rate formula would signal BPA customers to increase power consumption at a time when the opposite signal should be sent.

Another concern with streamflow rates is revenue stability. BPA's cost structure is about 85 percent fixed and does not change with the amount of electricity sold. Streamflow-based electricity rates that change monthly (or more often), would add significant financial risk to BPA because of the increased variability of BPA's revenues.

Environmental Impacts. BPA's rates do not affect hydro system operations for nonpower purposes. Hydro system operations for non-power purposes have priority over power purposes; BPA rates, even if they result in demand changes, will not change those priorities. BPA, the COE, and the BOR are currently undertaking a review of the operations of the Columbia River system in terms of its multiple uses and within the context of the efforts to improve the survival of sensitive anadromous fish stocks. The river operations constraints that are developed through the System Operation Review (SOR) process will constrain hydroelectric system operations in order to protect anadromous fish and balance hydroelectric generation with other uses of the system. If BPA were to institute streamflow-based rates, there would be no significant impact on hydro operations, which would continue to be governed by the constraints established through the SOR process.

However, BPA rate designs such as streamflow rates could help offset some of the economic impacts of nonpower operations. If streamflow rates were developed to be complementary to hydro system operation constraints designed to improve anadromous fish survival, lower prices could encourage demand when hydro surpluses are available. That could allow BPA to recoup revenue that might otherwise be lost due to nonpower operations. In this way, streamflow rates could help offset the economic impacts of such operations through revenues gained.

5.3.5 Market-Driven Rates

The market responses to each of the three types of market-driven rates are discussed separately below. The environmental impacts would not differ significantly among the three rate variations and are discussed as a group following the market response sections.

5.3.5.1 Indexed-Customer Product Price Rates

As discussed in section 4, BPA currently has a rate that is indexed to a customer group's product price. The VI rate is available to BPA's DSI aluminum producers. The energy charge is indexed to the world price of aluminum, so that during a strong market, when aluminum prices are high, VI customers pay relatively higher prices for energy, and during a weak market, when aluminum prices are low, VI customers pay relatively lower prices for energy. The rate has caps, or limits, on how high or low the rate per kWh can be set.

Generally, rates indexed to customer product prices reduce business risk to the customer: business cycle swings are mitigated by corresponding changes in the cost of doing business. As a result, customers are more likely to continue production at more constant levels than they would absent the rate attribute. This results in a more stable load for the wholesale supplier. In BPA's case, the VI rate has resulted in more stable aluminum production in the PNW and, with it, higher and more stable loads on BPA. In addition, the high nighttime loads of the DSIs permit increased sales of capacity because the DSI loads permit the nighttime return of capacity sold during the day that could not otherwise be returned due to minimum streamflow constraints.

In the short term, this rate increases operation of BPA resources during both peak and off-peak periods. In the long term, sustained DSI loads result in a greater need for base-load resources.

A demand charge indexed to a customer product price would give an incentive similar to that for an energy charge indexed to a customer product price. By itself, such an indexed demand charge would not give as strong a price signal as the indexed energy charge. This is because the demand charges are generally smaller than the energy charge on DSI bills. Nonetheless, it could provide adequate rate relief to keep industrial production at higher levels than they would otherwise be during periods of weak markets for the industry.

The VI rate is currently scheduled to be phased out by June 1996. If this occurs as scheduled, the results would be opposite those shown in tables B-3 and B-4. Aluminum DSI loads could be reduced, thereby reducing BPA peak and off-peak operations in the short term and need for base-load resources in the long term.

5.3.5.2 Flexible Rates

Under flexible rates, BPA could price its power services to meet a variety of objectives. As such, it could establish rates that meet any of the load shape objectives, including peak clipping, valley filling, load shifting, strategic conservation, or strategic load growth. This range is illustrated in table B-3, with the term "load shifting" meant to also capture peak clipping and valley filling.

Depending on BPA's flexible pricing policy objectives, resource operation and acquisition by BPA's market segments could vary from increased to decreased operation and acquisition levels. As with resource responses described for other rate attributes, resource operation and acquisition by BPA could largely offset actions taken by the market segments. That is, to the extent these market segments respond to flexible BPA rates by changing operations or acquisition patterns, this change would be reflected in loads on BPA, and BPA would respond by making a corresponding change in its resource operation and acquisition patterns that would compensate for the load shift. The net change to the region would result from changes in DSI and extraregional loads on BPA.

5.3.5.3 Negotiated Rates

Negotiated rates differ from flexible rates in that with flexible rates BPA can unilaterally change rates, while negotiated rates require agreement on the rate by both BPA and the customer(s) buying the service. Otherwise, negotiated rates are similar to flexible rates in that they can be set to meet a variety of objectives and can have a wide range of effects. As shown in tables B-3 and B-4, negotiated rates are characterized as potentially having the same load and resource effects as flexible rates.

5.3.5.4 Environmental Impacts

Environmental impacts of market-driven rates depend on the nature of the rate. For example, implementation of a market-based DSI rate (e.g., continuation of the current DSI VI rate after its current expiration date of June 1996) would provide some stability to aluminum DSIs' production costs and increase DSI loads compared to what they would be without the rate. There would be two main environmental effects:

- The continuation of atmospheric emissions in the PNW from DSI operations, and the preservation of employment and incomes in the aluminum industry and in the communities where aluminum smelters are located. The magnitude of job and income savings would depend on many factors in addition to the market-based rate (such as world commodity prices and the production costs at each facility).
- An increase in long-term conservation and generation resource development (see chapter 4 of the BP EIS for typical environmental impacts of conservation and generation resources).

Other types of market-driven rates would have environmental effects that could vary considerably according to the intent of their design and the customer group affected.

5.3.6 Adjustments

5.3.6.1 Discounts

BPA extends discounts to some of its power customers as discussed below. Unlike the rate attributes for demand and energy charges, which typically affect the wholesale utility's purchase pattern, these discounts change rate levels for end-use consumers. As such, load responses are generated at the end-use level and do not necessarily reflect resource decisions by BPA's customers. Load changes at the consumer level are simply reflected in load changes by BPA's customers, which, in turn, affect BPA's operation and acquisition of resources.

5.3.6.2 Low-Density Discount

Market Response. The low-density discount (LDD) has had the effect of making Federal power more affordable to sparsely populated areas where distribution costs are relatively high. It is likely that the reduced cost to these customers through the LDD has resulted in increased power usage by

customers of the utilities benefiting from the LDD. On the other hand, the cost of the LDD is allocated to all power sales. That is, the cost of the LDD is reflected in increased rates to all customers who purchase power from BPA. The size of the LDD revenue deficiency is small relative to BPA's overall revenue requirements (1 to 2 percent), and the impact on the power rates is small. Nonetheless, this added cost to other BPA power customers could result in reduced loads. The trade-off between increased loads from utilities receiving the LDD and decreased loads by utilities that pay for it is unknown. However, the net effect could be increased load growth, and therefore the LDD is listed as such in table B-3 for non-marketing customers only. This additional load would slightly increase the need for peaking and base-load resources by BPA and in the region in general.

If the LDD were eliminated, it would have the same effect as a rate increase to those utilities that currently benefit from the discount. That is, power supply costs for utilities that currently have PF charges discounted by 3, 5, and 7 percent would be increased by 3.1, 5.3, and 7.5 percent, respectively ([1/(1-percentage discount)]-1). On average, power supply costs to these utilities would increase by 7.0 percent. On the basis of price elasticity estimates included in the joint BPA/Council Long-Term Forecasting Model (LTFM) for publicly owned utilities, these utilities could reduce loads by 1.0 percent in the short term and 2.5 percent in the long term. However, because the elasticity estimates include all publicly owned utilities, not just rural utilities, these load response estimates may be overstated. This is because elasticities for larger, urban utilities are estimated to be higher than those for smaller, rural utilities.

Considering the distribution costs that these utilities add to their power supply costs to establish retail rates, the percentage increase in retail rates by utilities directly affected by an elimination of the LDD would be less than the percentage increase in wholesale power costs. For example, if wholesale power costs represented one-half of the revenue requirements of a utility qualifying for the LDD, elimination of the LDD could increase the utility's revenue requirements and ultimately their rates by 1.6, 2.6, or 3.8 percent, depending on the applied level of discount.

Under BPA's current cost allocation methodology, the cost of the LDD is allocated to all power sales. Accordingly, if the discount is eliminated, the revenue requirements from other power sales would be reduced and the power demand and energy charges would be set at a lower level than they would be if the LDD were to be continued. Because the LDD is small ($24 million, which is 1 percent of total power revenue requirements), the impact on power rates would be small. Nonetheless, this small reduction in PF demand and energy charges would likely result in an increase in the load of PF customers that currently do not qualify for the LDD. Although the exact effects are uncertain, these increases in PF loads would at least partially offset load reductions by utilities that lose the LDD.[14]

Environmental Impacts. The environmental effects of continuing the LDD would be associated with the continued lower costs of operation to utilities now receiving the discounts and the slightly higher costs experienced by other BPA customers. Elimination of the current LDD would most directly affect the customers that now benefit from the discount, by increasing their power costs. It is possible that for some marginal rural utilities, the elimination of the discount could increase their costs to the point at which their operation no longer would be cost-effective and they would go out of business or be absorbed into larger utilities. In the long term, to the extent that utilities that now receive the LDD pass through the increased costs of power to their end-use consumers, there would probably be a small increase in price-induced conservation. Nearly 70 percent of the utilities receiving the discount are located east of the Cascade Mountains and include many irrigation and other agricultural customers. The conservation savings, therefore, might be concentrated in the irrigation and residential sectors. The magnitude of the increase is likely to be small, given that the maximum predicted reduction in loads due to the elimination of the LDD is 2.5 percent.

5.3.6.3 Surcharges - Conservation

Market Response. In general, power rate surcharges could be used to affect a customer's load profile. For example, a surcharge could be used to clip peaks and shift loads much the same as

[14]BPA, 1993 Final Rate Proposal, Documentation for the Wholesale Power Rate Development Study.

TOU rate attributes. Surcharges could also be used to affect a customer's resource development decisions, similar to the conservation surcharge (CS) BPA has developed pursuant to the Council's guidance based on Section 4(f)(2) of the Northwest Power Act.

The responses that would result from the implementation of a surcharge depend on the design of the surcharge. For example, a utility that has not developed adequate conservation resources faces the CS surcharge. The presence of the surcharge, therefore, encourages a reduction in load due to conservation development. This type of conservation could serve as a base-load resource for BPA's customer segments and relieve the need for BPA to develop such resources.

Environmental Impacts. The predominant environmental effect of a CS is economic. Adding the surcharge to the wholesale rates for power purchases or exchanges will cause higher electric bills for ratepayers of any surcharged utility. Retail rate increases would depend on the utilities' allocation of the surcharge among their various customer classes. The surcharge could lead some consumers to invest in conservation or implement alternative load reduction strategies, while some businesses may choose to pass the price effects of the surcharge along to their customers in the form of higher prices. No other effects are expected to result from BPA's surcharge policy besides the economic effect of higher wholesale rates for electric power.[15]

5.4 Transmission Services

As discussed in BPA's 1993 Wholesale Power and Transmission Rate Adjustment Final Environmental Assessment (1993 Rates EA)(DOE/EA-0838):

> BPA transmission rate increases do not affect the environment directly. Effects on the environment could occur indirectly, but only if the economic effect of the rate change were substantial relative to power costs and market factors, or independent transmission facility construction costs. Specifically, changes in BPA's transmission rates result in changes in the cost of transmission to utilities. In turn, the increased cost of transmission service is compared to the cost of independent facility construction which could ultimately lead to utility decisions to construct specific transmission facilities.
>
> Additionally, changes in the cost of transmission service are added to the cost of a utility's wheeled power which may ultimately affect decisions on the amount of power generated or wheeled.

A change in rate attributes could affect the level of transmission rates. Responses to various transmission rate attributes (and, thus, rate level changes) are difficult to anticipate because transmission costs historically have been small relative to a utility's total cost of power unless full incremental costs of new major transmission facilities are assessed. Factors other than the cost to transmit power may substantially influence a party's decision to construct new transmission facilities. Factors such as "reliability considerations of the potential facilities in the utility's system, ability of the utility to plan and manage a significant construction project, acquisition of right of way, regulatory approvals and environmental issues, and concerns of local interest groups and ratepayers . . . tend to significantly decrease the feasibility of an independent utility construction project." (1993 Rates EA.) Also, because transmission costs tend to be small compared to the power cost, the effect of a change in rate attributes on resource operations is limited.

Responses to transmission rate attributes could influence behavior in combination with other factors. For example, some of the attributes considered might tend to affect the use of a particular transmission facility and thereby relieve congestion. Other attributes might suggest a change in longer-term planning decisions by raising issues about a resource type or resource location. Others

[15]BPA, An Environmental Assessment on BPA's Proposal to Apply the Council-Recommended Conservation Surcharge, 1984.

might simply "tilt" the relative price between various resource alternatives, making one alternative less cost-effective due to the wheeling attributes that the utility, IPP, or other entity could face. Although responses to wheeling rate attributes are uncertain, the potential responses are identified here because they could affect market response and have environmental impacts.

This section describes market responses to various attributes BPA could choose in designing its rates. Potential responses to alternative rate attributes are evaluated in terms of how market segments could change their use of the BPA transmission system. The market response to each attribute was evaluated on the basis of baseline postage stamp (flat) rates.

5.4.1 Demand and Energy Charges

5.4.1.1 Distance-Related

Market Response. The non-marketing and DSI customer segments purchase Federal power at rates that include a transmission component. If the rate design was changed to reflect a distance-related transmission component, the overall cost of delivered power would increase or decrease depending on the customer's location. Customers that experience an increase in the cost of power may be more likely to consider resource alternatives; however, the change in the total cost of power would be so small, it is unlikely that DSI customers would purchase alternative resources due only to rate design change. A change in the overall cost of power could affect the business decisions of the DSIs, which may be more sensitive to price changes than utilities, depending on the state of the aluminum market.

The marketing customer segment purchases wheeling services from BPA; the DSIs may purchase wheeling services in the future. A distance-related attribute that is intended to signal the relatively high cost of long-distance wheeling would tend to discourage this practice. Therefore, this rate design could, in the long term, affect decisions involving the location and selection of generating resources.

Regarding the extraregional customers, implementation of a distance-related attribute that is intended to signal the relatively high cost of long-distance wheeling would tend to discourage interaction with the PNW region in the short and long terms. This could affect utilities located in the PSW and Canada that are involved with power imports and exports and power transactions that move through the region (e.g., power generated in Canada and wheeled through the PNW to California). In the short term, interest in through-region wheeling (which would be the longest and, therefore, most costly service) would probably decrease. In the long term, this attribute could affect the relative price of local and out-of-region power and, therefore, could affect decisions regarding the location of resources.

The overall effect of a distance-related attribute could be to discourage long-distance and through-region wheeling over BPA's facilities from extraregional customers in the short term and from all marketing customers in the long term. This would relieve pressure on expansion of the network facilities that are used to support these transactions. Therefore, in the long term, there would be less need to expand the transmission system and an increased tendency to reconsider the location of resources and transmission facilities relative to the load centers they serve.

Environmental Impacts. Reductions in long-distance wheeling over BPA's facilities could lead to reduced extraregional transactions such as seasonal exchanges. Seasonal exchanges between the PNW/Canada and the PSW exploit the seasonal differences in peak loads between the north and south. The PNW and Canada are winter-peaking regions. The PSW, in contrast, is a summer peaking region (due to air-conditioning loads, among other reasons), and has surplus generating capacity during winter months. Seasonal exchanges allow the PNW and Canada to send power south in the summer and receive power back in the winter, reducing generation requirements in both regions. Reduced seasonal exchanges could lead to increased development of local generation and conservation resources, and could increase thermal resource operation in the PSW, increasing air emissions and decreasing air quality in that region. Increased local generation would most likely include cogeneration and CTs; typical environmental impacts of these generation resources are described in chapter 4 of the Resource Programs Final EIS (RPEIS) (BPA, February 1993)

(DOE/EIS-0162). Avoidance of certain environmental impacts described in the RPEIS would occur due to reduced development of transmission facilities.

5.4.1.2 Facility-Specific

Market Response. If rate design were changed to reflect a facility-specific transmission component, the overall cost of power to non-marketing customers would increase or decrease depending on the transfer agreements necessary to deliver power to a given customer and on the delivery voltage level. Currently, the costs of lower voltage transmission facilities and transfer agreements are spread over all power customers. If these costs were paid only by customers for whom low voltage facilities and transfer agreements were required, the cost of transmission would increase for these customers. Although customers that experience an increase in power cost may attempt to mitigate this situation, it is unlikely that customers would seek resource alternatives due only to a facility-specific rate design.

For DSIs that are also wheeling customers, and for marketing customers, the facility-specific rate design may discourage resource siting at long distances since more expensive facilities, and more facilities, are usually involved in transmitting power over long distances. However, the additional (relatively minor wheeling cost is often outweighed by other resource development costs and considerations. Finally, a response to the facility-specific rate design similar to that of marketing customers is anticipated for extraregional customers.

Using facility-specific pricing for new transmission facilities (incremental cost pricing) would probably encourage joint ownership and ownership-like arrangements, particularly on the interties. Such pricing gives the customer cost certainty, an important factor for all wheeling customers—regional, extraregional, utility, and non-utility.

Overall, BPA would likely experience no change in wheeling usage in the short term, but there would be interest in joint ownership and ownership-like arrangements. A facility-specific rate based on incremental cost would encourage joint ownership and ownership-like arrangements of transmission facilities. This does not necessarily mean that, on net, more facilities would be developed, but only that development would tend to be planned and executed jointly.

Environmental Impacts. The environmental impacts associated with this rate attribute are difficult to identify. To the extent that the existence of this rate attribute would allow BPA and customers to support large, capital-intensive transmission facilities, it might lead to the development of additional interties or major network transmission facilities. To the extent that such facilities supported interregional integration, increased seasonal and daily power exchanges could occur, leading, in the long term, to reduced requirements for the development of new generating resources. The typical environmental impacts of transmission and generating resources are described in chapter 4 of the BP EIS.

5.4.1.3 Market-Driven

Market Response. The non-marketing customer segment would not respond to a market-driven rate attribute because they do not typically have generation to market over transmission facilities. This is true for both the short and long term.

Although the DSI segment may be engaged in relatively short-term power transactions (specifically, when BPA service to a portion of DSI load is restricted and the DSIs need replacement power for limited periods), a market-driven wheeling rate would probably have little effect. Any effect of market-driven wheeling rates on possible DSI long-term wheeling transactions would be similar to effects on marketing customers.

The marketing customer segment has generation that is used primarily for serving their customers' firm load requirements. This segment may also have surplus firm power and secondary energy (energy that can be produced in better than critical water conditions) that can be sold within and outside the PNW region. By reflecting the value of the wheeling service to the customer, a market rate could encourage marketing customers to increase short-term transactions in the short and long term,

which would tend to increase the use of existing line capacity. For example, surplus transmission capacity could be marketed for portions of a year or portions of a day. This attribute is also expected to increase the market for interruptible transmission service, and, in general, increase the marketing flexibility of wheeling services. In the short term, this attribute is anticipated to increase wheeling in general. In the long term, no significant effect on marketing customers' transmission development decisions is expected.

Because the extraregional customer segment is also engaged in firm power and the nonfirm or economy energy markets, the increased flexibility inherent in market-driven wheeling rate attributes would tend to encourage use in the short and long terms. The result expected is increased short-term transactions.

Overall, a market-driven attribute applied to wheeling services is expected to increase short-term wheeling transactions immediately as well as in the long term. In the short term, the net effect on the region from this rate attribute would probably be increased flexibility of the wheeling market, which could increase general usage. In the long term, an overall increase in the use of the region's transmission system is anticipated, which could encourage upgrades or expansion of the network system so that it has enough capacity to handle these demands.

Environmental Impacts. This rate attribute could support increased development of transmission facilities; increased transmission capacity could in turn lead to more efficient operation of generation resources both within and outside of the region, as utilities in the PNW and other regions increasingly rely on seasonal and daily exchanges. The short-term result could be reduced operation of more expensive thermal resources in the PNW and PSW, and, in the long term, reduced development of new generating resources. Typical environmental impacts of transmission and generating resources are described in chapter 4 of the BP EIS.

5.4.1.4 Zonal

Market Response. Applying a zonal rate attribute to network wheeling services would signal price differences associated with the geographic location of generation resources in relation to load or point of delivery. For example, currently the region's load is predominately on the west side of the Cascade Mountains, whereas a significant portion of the generating resources are located on the east side. However, it is relatively costly to build transmission facilities to deliver power from east-side resources to points west of the Cascades, and relatively less expensive to build transmission facilities for west-side resources to serve local load. Zonal rates for BPA's network could be designed to reflect this cost differential. In addition, a zonal rate design could be applied to transactions that pass through the region but not to those that originate or terminate in the region.

The non-marketing and DSI customer segments could be affected if the transmission component of power rates included a zonal rate design feature. Although usage would probably not be affected, the transmission component currently embedded in power rates could be expected to increase for some power customers and decrease for others. This, in effect, would introduce price-differentiation among power customers to reflect the relative cost of serving customers situated close to or far from generation. Such an increase in the overall power cost would probably have little or limited effect on utilities' usage, but could affect the business decisions of the DSIs, which may be more sensitive to price changes than utilities. In addition, there is the possibility that some DSI customers may become wheeling customers, which then could have an effect on this market segment similar to that of marketing customers.

The precise response of the marketing customer would depend upon the objectives the attribute is intended to achieve. The general objective of relieving constraints could be achieved with this attribute. Because of the relatively lengthy planning horizon associated with conservation and generation resources and transmission facility development, there would probably be no significant response in the short term. In the long term, the market response could be that decisions regarding the location and choice of resources in relation to delivery points (the load or service territory that the power is intended to serve) and location and development of transmission facilities could be affected.

Customers may also be willing to accept lower levels of firmness (increased interruptibility) in recognition of zonal constraints.

In the short term, because the extraregional market segment is outside the PNW, a zonal rate could discourage wheeling to, from, and through the PNW region, particularly for long-distance wheeling transactions, although some transactions could be encouraged by zonal rates. As indicated for regional marketing customers, this attribute could also affect the cost-effectiveness of various power supplies. Therefore, this attribute could affect decisions regarding the location of resources, choice of resources, and location of transmission facilities.

The effect on BPA could be to reduce long-distance wheeling by extraregional customers in the short term. In the long term, BPA's wheeling customers would potentially modify the direction of a transaction, increase the use of interruptible service, and re-evaluate the cost-effectiveness of long-distance transactions.

The net effect to the region is to relieve transmission constraints, which would also relieve the need to expand the transmission system. In addition, as discussed above, a zonal attribute could affect resource choice and location decisions.

Environmental Impacts. The adoption of this rate attribute could lead to decreased development of transmission facilities and less reliance on long-distance power transactions such as daily and seasonal exchanges. The result could be somewhat increased operation of thermal resources in the PSW, and in the long term, more development (in the PNW and elsewhere) of new generating resources, particularly those that can be located close to load (e.g., CTs and cogeneration). Typical environmental impacts of transmission and generating resources are described in chapter 4 of the BP EIS.

5.4.1.5 Tiered

Market Response. Tiered or block rates that price-differentiate between existing and new transmission facilities (vintaging) would not affect the non-marketing customer segment in the short term. In the long term, this rate attribute would signal the increasing cost of system upgrades, replacements, and additions. Although transmission costs may increase for certain customers, the increase would be small compared to the total cost of power. No usage response is anticipated.

Depending upon the structure of the rate attribute, the DSI customer segment could face an increase in the cost of transmission facilities, which, then, could affect the cost of power and potentially affect usage.

There probably would be no response by the marketing customer segment in the short term. However, a tiered rate attribute could affect the relative price of purchasing wheeling services from BPA versus another transmission owner, or could affect the relative price of resource alternatives. Therefore, the response might be to shift wheeling services from BPA to non-Federal transmission providers, which would reduce use of the BPA system. This could also encourage this customer segment to develop its own transmission facilities and relocate resources to avoid the need to expand the Federal transmission system.

With a tiered rate attribute, the response of the extraregional customer segment would probably be small. However, it could affect the relative price of marketing or purchasing power with utilities in the PNW region which, in turn, could reduce demand for BPA wheeling services. This suggests that long-term development decisions could be affected in terms of determining the location of resources.

Overall, the use of rate tiers would discourage increased use or incremental wheeling over the BPA facilities. This is because some customers would seek access to other, non-Federal providers and because some transactions would become uneconomical as a result. This could relieve the need to expand the Federal transmission system.

The net effect on the region is to encourage development of resources that are close to load and, thus, avoid imposing incremental loads on the existing Federal system.

Environmental Impacts. A possible effect of tiered transmission rates would be increased transmission facility development by utilities other than BPA, and more localized generation facilities such as cogeneration and CTs (see chapter 4 of the BP EIS for typical environmental impacts of generation and high-voltage transmission development).

5.4.1.6 Partial Year

Market Response. For the non-marketing customer segment, no response in either the short or long term is expected as a result of a partial-year rate attribute. This again is primarily the result of this segment having no generating resources.

The load characteristic of the DSI customer segment does not have a seasonal character. Although a DSI might acquire a resource to serve its load only during certain times of the year, the DSI would likely attempt to market its resource during the rest of the year. Therefore, a partial-year rate attribute may increase the DSI's flexibility in marketing its resource.

The marketing customer segment would be expected to respond to this attribute positively in both the short and long terms. This rate attribute could encourage wheeling power that is seasonally generated or that could be wheeled to different loads during different seasons. This attribute could also encourage the development of resources whose generation can be exchanged between seasonally differentiated loads.

Similar to the marketing segment, the extraregional customer segment would be expected to increase wheeling services with the inclusion of a partial-year attribute. This attribute could lend itself to interregional transactions, especially involving the PSW market with its summertime peak, and the PNW and Canadian markets with their wintertime peak. As noted above, this attribute could encourage the development of generation that could be exchanged among various customers and regions.

Overall, BPA would realize an increase in partial-year transactions in the short and long term. This could increase the need to reinforce the network system as increasing demands are placed on it. The net effect on the region would be to further its seasonal and time-of-day integration both within the region and with extraregional customers. And, as noted above, there could be an increasing need to upgrade or expand the capacity of the network system as a result of a partial-year attribute. However, this may lead to some capacity that is unmarketable or less marketable during certain times of the year.

Environmental Impacts. To the extent that this attribute supports integration of generating resources inside and outside the region, it could support more efficient operation of existing and new generating resources. Increased exchanges with the PSW could displace more expensive thermal resources in that region during its peak season, thereby reducing the air quality impacts of thermal resources. Increased efficiency of a more integrated power system could also reduce the total amount of generation developed in the PNW and Canada in the long term. However, this rate attribute could also result in a need to add transmission capacity in the PNW (typical environmental impacts of transmission and generation are described in chapter 4 of the BP EIS).

5.4.2 Adjustments

5.4.2.1 Surcharges

Market Response. The response to a surcharge rate attribute would probably be limited to customer segments that wheel power: the marketing customer and extraregional customer segments. The form of the surcharge would need to be precisely defined to determine its effect; however, presumably it would have the objective of either decreasing use of BPA's transmission facilities (decrease wheeling) or affect decisions regarding the development and location of resources or transmission facilities. If significant enough in magnitude, surcharges could affect resource development decisions and could encourage non-Federal transmission facility development.

In general, surcharges would discourage wheeling by BPA's marketing customers and the extraregional market segment or affect the usage pattern, as discussed above. Some forms of surcharge could relieve pressure to expand the system.

The net effect on the region could be to discourage wheeling. In the long term, BPA might develop fewer transmission facilities; however, this could be offset by transmission expansions constructed by non-Federal entities.

Environmental Impacts. The environmental effects of surcharges would vary according to the nature and intent of the surcharge. To the extent that a surcharge discouraged wheeling overall, it could have the effect of shifting a greater share of future transmission development from BPA to other entities or of reducing total regional transmission development. To the extent that the total amount of regional transmission is reduced, more localized conservation and generation (e.g., CTs and cogeneration) might occur.

5.4.2.2 Discounts

Market Response. The market response to discounts would be limited to those customer segments that wheel power, i.e., marketing and extraregional customers. The form of the discount is critical to assessing its impact. In general, a discount could increase use or affect decisions regarding the development and location of generation or transmission facilities. Discounts for using the BPA system would also tend to discourage the development of non-Federal facilities.

In general, discounts would encourage wheeling by BPA's marketing customers and the extraregional market segment, or affect the usage pattern as discussed above. This attribute could, in fact, be used to expand specific facilities where upgrades seem appropriate.

The net effect on the region would be to encourage certain wheeling loads and potentially affect decisions regarding expansion of the transmission system and resource development.

Environmental Impacts. The environmental effects of discounts would vary according to the nature and intent of the rate attribute. To the extent that a discount encouraged wheeling overall, it could have the effect of shifting a greater share of future transmission development onto BPA or increasing total regional transmission development. To the extent that the total amount of regional transmission increases, more extraregional seasonal and daily exchanges might occur, and the total amount of new generation resources developed in the PNW and other regions might be reduced somewhat.

SECTION 6

6.1 Impacts of Rate Design Changes at the Retail Level

This section evaluates the same type of market and environmental impacts at the retail level that were evaluated in section 5 at the wholesale level. That is, the wholesale power rate attributes BPA might implement at the wholesale level are evaluated in terms of their impacts if implemented at the retail level. This assumes, therefore, that BPA's non-marketing and marketing utility customers adopt BPA rate attributes for their own retail rates.

BPA is primarily a wholesale marketer of power to retail utilities and it does not sell electricity to ultimate consumers except for the 16 DSIs and certain Federal agencies that purchase power directly from BPA. Most of the ultimate consumers of the power marketed by BPA purchase the power from retail publicly-owned and IOUs. The market response to any BPA rate change by end-use consumers other than the DSIs depends on actions taken by the utilities, which may or may not pass through BPA pricing decisions. The response to a BPA rate action depends on the portion or percentage of the utilities' total costs represented by BPA power purchases and the rate designs used by the individual utilities. In the following discussion, a change in the rate level refers to an overall increase in the cost

of power, or revenue requirements. Changes in rate design refer to changes in the means of collecting the required revenue (tiered rates, flat rates, etc.).

6.1.1 Changes in Rate Level

Some utilities rely on BPA for all their power needs and other utilities use BPA to supplement their own power supplies. There is, therefore, a broad range in the ratio of cost of BPA power to total utility costs. Based on 1992 data, this ratio ranges from less than 1 percent to as much as 60 percent.

Predicting the effect of a BPA rate increase on ultimate consumers is difficult. A hypothetical 10 percent increase in BPA rates would not lead to a 10 percent increase in the cost of power to utility retail customers. Other things being equal, the ultimate consumer could see results ranging from no change to an increase approaching 6 percent, depending on a how large a percentage BPA power costs are of the total costs of the utility. For example, if BPA purchases account for 40 percent of the total costs of a local public agency customer, a 10 percent increase in BPA power costs implies a 4 percent increase in the costs of a utility customer. This utility could pass through some or all of the increase. The utility could absorb the increase, resulting in no change in rates to ultimate customers. Several of BPA's utility customers chose to absorb the smaller BPA rate increases in the late 1980s.

6.1.2 Changes in Rate Design

Two factors make predicting potential impacts resulting from changes in the design of BPA rates a complex task. The first is that BPA has little control over the rate designs used by its public agency customers. Utilities set rates to achieve a variety of rate-making objectives. For example, BPA's current PF rate is a seasonally differentiated flat rate. However, some of BPA's public agency customers use declining block rates (that is, the retail rate is lower for larger amounts of power used by individual customers). Therefore, if BPA adopts a tiered rate for PF customers in the next rate case, it cannot predict with any certainty the number of utilities that would reflect BPA's tiered rates in their customers' retail rates. Another example is related to the large number electric space heating customers in the PNW. Many local utilities offer some form of equal payment plan to smooth out the effects of high electric bills in the heating season. Such a plan could blunt the effects of any change in the design of BPA and the local utilities' rates.

In summary, it can be very difficult to predict the relationship between a BPA rate design faced by customer utilities and the retail rate design faced by the end-use consumers.

To gain insight into possible load responses to the various rate design attributes considered in this study, end-use characteristics of each retail market sector were evaluated and a literature search was conducted to find empirical analysis on the end-use responses to alternative rate design attributes. Literature was found on load responses to inverted rates, TOD rates, and real-time rates. Findings from this literature are summarized in the discussion below. A more complete discussion of load responses to these three attributes is provided in Attachment C.

Retail market segments covered in this analysis include residential, commercial, industrial, and irrigation. Evaluation of the market responses of these segments to the various rate attributes differs organizationally from that for the wholesale market segments in section 5. Because each of the retail segments is reviewed in terms of end-use characteristics and trends, the discussion of retail market responses to rate attributes is organized by market segment rather than by rate attribute as in section 5.

Rate attributes evaluated for impacts include all of those evaluated for wholesale power in section 5 except for market-driven rates and rate adjustments. Market-driven rates that BPA would implement at the wholesale level would likely be too specialized to wholesale markets for utilities to generalize for implementation at the retail level. Adjustment attributes reviewed for impacts at the wholesale level directly affect the overall rate level of BPA utility customers and therefore end-use consumers. Impacts associated with their effects were evaluated in sections 4 and 5.

The impacts that BPA's rate design and levels have on its utility customers vary with the proportion that BPA power supply costs contribute to each utility's overall costs. A major determinant of this ratio is the extent to which each utility relies on BPA for its wholesale power supply. This reliance ranges from 100 percent for most public nongenerating utilities (some utilities classified as "nongenerating" have minor generation capability) and DSIs, to zero for some IOUs. To add perspective in considering the influence of BPA's rate design on its utility customers' rate designs, the relative reliance of nongenerating public utilities, generating public utilities, and IOUs is presented in table B-5. Because only a small portion (4 percent) of IOU loads are purchased from BPA (excluding the residential exchange), the greatest potential for BPA rate design to be passed on to end users occurs among publicly owned utilities.

Table B-5: BPA-Purchased Power as a Percent of Total Power Supply for Pacific Northwest Regional Utilities (1994 Forecast)

	Average Megawatts (aMW)		
Utility Type	BPA Purchases	Total Power Supply	BPA Purchases as a Percent of Total Power Supply (%)
Nongenerating Publics	3,146	3,172	99
Generating Publics	1,849	3,635	51
IOUs	337*	8,628	4
TOTAL	**5,332**	**15,435**	**35**

*Excludes 4,139 aMW in residential exchange with BPA.

6.2 Residential Sector

6.2.1 Market Sector Characteristics

Residential customers in the PNW purchased 6,032 aMW from electric utilities in 1992. Of this total, 2,668 aMW, or 44 percent, was sold to residential customers of publicly owned utilities. End uses by these residential customers can be grouped into nine categories. These categories and the average monthly use per residential customer of publicly owned utilities in the region are forecasted for 1994 as follows:

End-Use Category	Use Per Customer (kWh/month)	Percent of Total Use (%)
Space Heat	5,273	33.9
Water Heat	4,014	25.8
Air Conditioning	122	0.08
Cooking	915	5.9
Drying	678	4.4
Refrigerator	1,551	10.0
Freezer	520	3.4
Lighting	708	4.6
Other	1,763	11.3
TOTAL	**15,545**	**100.0**

As this tabulation shows, space heating and water heating account for nearly 60 percent of the average electrical energy consumption per customer. About 63 percent of residential customers of publicly owned utilities and 45 percent of residential customers of IOUs have electric space heat, and about 88 percent of residential customers of publicly owned utilities and 83 percent of residential customers of IOUs have electric water heat.

Of the various uses listed above, use of electricity for space heating, water heating, and cooking can be replaced by use of other energy forms. Where it is available, natural gas is the primary substitute for electricity in these uses. When changes in BPA rate design and levels are passed on to residential customers, they will react in the general ways described above. Increases in the marginal price of electricity through either a rate design change or a general rate increase will cause some existing customers to switch from use of electricity for space heat, water heat, or cooking to use of natural gas or other fuel for these purposes. Use of wood for space heating is a ready response in that many households are equipped with wood stoves as a supplemental heating source. Besides these substitution effects, investment in conservation is a common response to increased marginal electricity prices.

Fuel choice for space and water heating in new homes depends primarily on the relative prices of the various heating systems and fuels. Because the price of electricity relative to competing fuels (primarily natural gas) has been increasing over the last 9 years, some utilities are experiencing a shift away from electric space and water heat in new single-family homes. This trend is more pronounced in areas served by IOUs, where the difference in price between electricity and natural gas is greater.[16]

Rising relative electricity prices have also had an impact on fuel choice in existing homes, including more wood heat use and switching from electric to natural gas water heating. In the 1980s there were sharp increases in electricity prices. During this time, use of wood heat rose sharply in single-family homes with electric space heating. More recently, growth in use of wood heat has slowed. Some contributing factors may be personal effort issues associated with wood use, wood and wood stove cost, relative stabilizing of electricity prices, and environmental issues and safety.[17]

In contrast to new single-family homes, the percentage of new multifamily units using electric space heating equipment over the last 9 years has remained relatively constant at 90 to 95 percent. One contributing factor to this constancy is that multifamily units are smaller than single-family homes and generally have common walls; thus, annual heating bills are relatively lower.

[16]BPA, Electricity Use in the Pacific Northwest, Utility Historical Sales by Sector, 1992 and Preceding Years, September 1993.

[17]Op. cit.

Another factor is that natural gas heat generally costs more to install in multifamily units than does electric heat. Given lower multifamily heating requirements, this additional initial cost takes longer to recover in operating cost savings than in single-family homes. In addition, owners of multifamily units who decide on equipment types are not the actual consumers of electricity and do not generally pay the electric bills associated with heating. They therefore have incentive to minimize the initial capital cost of heating equipment through the installation of comparatively inexpensive electric baseboard heating systems. There is therefore less incentive in multifamily housing stock to move toward other fuels for heating.[18]

There are no good substitutes for use of electricity for refrigeration, lighting, and "plug load" (small household appliances and equipment). Higher marginal electric prices tend to simply reduce these uses through conservation.

Rate design changes that lower marginal costs to end users have the opposite effect of changes that increase marginal costs. Electric space and water heating become more attractive relative to natural gas and other fuels, and there is more incentive for increased discretionary use and less conservation of electricity.

BPA evaluates the overall response of retail consumers to its price changes through the LTFM. This model provides estimates for residential, commercial, industrial, and irrigation end-use sectors of both the publicly owned utilities and the IOUs. For residential customers of publicly owned utilities, the LTFM estimated price elasticity of demand ranges from -0.13 to -0.15 in the short term for price increases in the range of 10 to 24 percent. The long-term elasticity for this range of price increase is about -0.31. For residential customers of IOUs in the region, the price elasticity of demand for a 10 to 24 percent price increase ranges from -0.11 to -0.13 in the short term and is about -0.30 in the long term.

6.2.2 Market Response to Rate Attributes

6.2.2.1 Tiered Rates - Inverted

Currently in the PNW, about 30 percent of residential customers of publicly owned utilities and 86 percent of residential customers of IOUs purchase power under some form of inverted rates.[19] Therefore, implementation of such a rate form regionwide would mostly affect publicly owned utilities.

The net effect on overall use of inverted rates depends on the relative price elasticities of demand for different customer subgroups within the same class and on the relative changes in the marginal price of electricity for these groups. Evidence suggests that the price elasticity of demand increases as customer use increases.[20] Assuming that most electricity consumption occurs within the tail block of an inverted rate structure, the general conclusion can be made that inverted rates are often expected to lead to overall load reduction.

6.2.2.2 Wright Rate

Specific research was not found on the load effects of this rate form. However, as noted in section 4, the Wright rate attribute is essentially a tiered rate that can either decrease or increase with increasing load factor blocks. Assuming that the blocking structure is carefully structured as described for tiered rates above, this rate form is likely to clip peak or shift loads to increase load factor in the case of decreasing rates with successive load factor blocks, or to increase peak or reduce off-peak usage in the case of increasing rates with successive load factor blocks.

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[18]Op. cit.

[19]Conservation Monitor, December 1993.

[20]EPRI, Rate Design: Traditional and Innovative Approaches, July 1990.

6.2.2.3 Time-of-Day Rates

Mandatory residential TOD rates are generally associated with a reduction in peak-period electricity consumption. However, there appears to be little evidence that mandatory TOD rates significantly increase residential electricity consumption during off-peak periods. As a result, the net effect of mandatory residential TOD rates is to reduce overall consumption during peak, and load shifting is not a common occurrence.[21]

There is statistical evidence that some load shifting does occur as a result of voluntary residential TOD rates. This is generally attributed to volunteer households having more flexibility in their use patterns than the average customer.[22] In the PNW, TOD rates could result in peak clipping by replacing with natural gas some electric use for space and water heating.

6.2.2.4 Seasonal Rates

In the PNW region, approximately 35 percent of the residential customers of publicly owned utilities and 33 percent of the residential customers of the IOUs purchase electric service under seasonal rates.[23] Under these rates, electric service is priced higher in the winter season than in the summer season.

A regionwide adoption of seasonal rates would increase the cost of electric space and water heating relative to competing energy forms. Although documentation is not available on the load impact from seasonal rates for other utilities that have adopted such rates, it is likely that the relative increase in electric heating costs during the winter would reduce electric heating load. Natural gas and wood heat would increase, as would conservation in the form of insulation, other conservation investment, and behavioral change.

6.2.2.5 Real-Time Rates

The limited information available on residential real-time pricing response indicates that peak-period load reduction occurs with real-time pricing. Residential real-time pricing might become more attractive in the future as metering and control technologies become developed for household use.[24]

6.2.2.6 Market-Driven Indexed Rates

Rates indexed to a customer product price are not relevant to service to residential customers.

Rates indexed to generation fuel costs are not likely to have a significant impact on residential consumers in the region. This is because only a small portion of power delivered to residential customers of BPA wholesale customers is from fossil fuel-fired generation.

Rates indexed to the utility's overall costs would simply affect a customer's rate level with different timing than is done currently. No load impacts would result.

6.3 Environmental Impacts

The primary impacts related to rate design effects on the residential sector would occur through residential conservation and fuel switching. There also would be socioeconomic impacts on household incomes due to increased home heating and lighting costs. The following discussion of environmental impacts is summarized from the RPEIS.

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[21]EPRI, Customer Response to Rate Options, January 1991.

[22]Op. cit.

[23]Conservation Monitor, December 1993.

[24]EPRI, Customer Response to Rate Options, January 1991.

6.3.1 Conservation

The key environmental issue related to residential conservation is the potential for house-tightening measures to increase levels of radon gas within weatherized houses. Radon gas is a naturally occurring gas that is associated with increased rates of cancer in humans. Effective mitigation measures to reduce the build-up of radon within weatherized houses are now standard elements of BPA and other regional residential sector conservation programs, and no significant health impacts from radon are expected from residential conservation.

6.3.2 Fuel Switching

According to the RPEIS, fuel switching could create some relatively low impacts on air quality. Environmental impacts resulting from the construction of new gas lines would generally be localized and temporary (during construction).

Impacts of direct use of natural gas for space heating and water heating are discussed in chapter 4, section 4.4.3, of the BP EIS.

Wood Heat

Rising retail electricity costs motivate consumers to switch fuels. Consumers switching from electricity predominantly switch to natural gas. In some areas, though, based on the availability of fuel or lack of access to natural gas, consumers may rely on wood heating to replace electrical space heating or water heating. Wood heat was widely adopted as an alternative to conventional space heating following increases in the price of other fuels in the 1970s.

Increasing wood costs and declining availability due to reduced logging activity, as well as burning restrictions during unfavorable atmospheric conditions, have greatly reduced the appeal of wood heating. Heat loss in exhaust gases and through fireplace walls, and inefficient combustion generally limit the usefulness of residential fireplaces to aesthetics and secondary heating. Wood stoves and other wood-burning appliances are generally more efficient and less polluting than fireplaces and are more often used as primary space heaters. However, due to the health risks associated with wood smoke, wood stoves are increasingly subject to certification and regulation by state and local air quality authorities. These regulations increase the costs of wood heat and reduce its availability for on-demand heating, so that alternate heat sources are necessary. Backup energy sources and equipment add to the cost of wood heating.

Residential wood heating emits significant quantities of particulate matter, carbon dioxide, and carbon monoxide, as well as sulfur and nitrogen oxides and numerous organic pollutants, including carcinogens such as benzo(a)pyrene and creosote. Health concerns relating to these pollutants have been a significant factor in the emergence of regulations restricting the use of wood heat.

Given the various concerns and impediments to wood heat, it is unlikely to supply a significant share of energy to consumers who choose to switch from electricity to other fuels. The most likely application would be in sparsely populated rural areas economically reliant on logging.

6.3.3 Socioeconomic Impacts

To the extent that residential end users cannot modify their consumption of electricity (e.g., through conservation) to reduce the cost impacts of any rate changes, their costs for home heating and lighting could increase. The extent to which any such cost changes would affect household net incomes would depend on many factors, including the degree to which retail utilities passed through any BPA rate change, the amount of electricity consumed, options for changing consumption patterns (e.g., using programmed thermostats or shutting off more lights), and the share of electricity costs in total household budgets. In general, it is likely that any rate impact associated with rate design changes would have a minor effect on most household incomes, but would have proportionately more impact on lower income households.

6.4 Commercial Sector

6.4.1 Market Sector Characteristics

The commercial sector includes a diverse group of consumers, both in terms of the types of buildings occupied and the types of activities conducted. Commercial activities include office work, retailing, restaurant service, health and hospital services, hotel service, education, warehousing, and street lighting. In 1992, PNW utility sales to the commercial sector were 4,136 aMW, or 24 percent of total regional firm sales. (Publicly owned utilities sold 1,733 aMW to this sector.) These publicly owned utility sales were distributed among commercial activities as follows:

Commercial Activity	Percent Share (%)
Office	29
Retail	20
Schools and colleges	11
Grocery	11
Restaurants	5
Health	5
Warehouse	5
Hotel	4
Miscellaneous	9
TOTAL	**100**

End uses vary significantly by business activity. However, for commercial customers of publicly owned utilities in the PNW, overall commercial usage and average end use per square foot of floor space is forecasted for customers of publicly owned utilities in the PNW for 1994 as follows:

End Use	Usage (aMW)	Percent of Total (%)	Usage per Square Foot of Floor Space (kWh)
Space heat	573.2	32.1	11.0
Water heat	34.2	1.9	0.7
Cooling	156.9	8.8	2.4
Ventilation	253.8	14.2	3.0
Cooking	4.0	0.2	0.1
Refrigeration	99.7	5.6	1.6
Lighting	540.9	30.3	6.0
Miscellaneous	120.5	6.8	1.3
TOTAL	**1,783.2**	**100.0**	**26.2**

Compared to the residential sector, commercial space and water heating represent a somewhat smaller share and lighting represents a significantly larger share of overall electric end uses within the sector. Therefore, electric use in the commercial sector is somewhat less sensitive to shifts to natural gas as the price of electricity and natural gas relative to one another shifts with time. By the same token, there is somewhat more opportunity for lighting conservation in the commercial sector.

When changes in BPA rate design and levels are passed on to commercial customers, the customers will react in the general ways described below. Increases in the marginal price of electricity through either a rate design change or a general rate increase will cause some existing customers to switch from use of electricity for space heat, water heat, or the small amounts of electric cooking in the region to use of

natural gas or other fuel for these purposes. In addition, it will create incentive to conserve though more efficient lighting, greater insulation in heating and cooling applications, and greater efficiency in refrigeration, ventilation, and other motor applications.

Rate design changes that lower marginal costs to commercial end users have the opposite effect of changes that increase marginal costs. Less incentive is created to conserve electricity in lighting and other applications, electric space and water heating become more attractive relative to natural gas and other fuels, and there is more incentive for increased discretionary use of electricity.

As mentioned above, BPA estimates the overall response to variations in electric prices in the PNW region through its LTFM. For commercial customers of publicly owned utilities, the LTFM-estimated price elasticity of demand for price increases of 10 to 24 percent ranges from -0.15 to -0.19 in the short term to about -0.50 in the long term. For commercial customers of IOUs in the region, the LTFM-estimated price elasticity of demand ranges from -0.16 in the short term to about -0.58 percent in the long term.

6.4.2 Market Response to Rate Attributes

Following is a discussion of estimated commercial load responses to the addition of specific alternative rate attributes at the retail level.

6.4.2.1 Tiered Rates - Inverted

As noted above in the discussion of residential inverted rates, the net effect on overall use of inverted rates depends on the relative price elasticities of demand for different customer subgroups within the same class, and on the relative changes in the marginal price of electricity for these groups. Evidence suggests that the price elasticity of demand increases as customer use increases. Assuming that most electricity consumption occurs within the tail block of an inverted rate structure, the general conclusion can be made that inverted rates can lead to overall load reduction.

6.4.2.2 Wright Rates

Specific research was not found on the load effects of this rate form. However, as noted in section 4, the Wright rate attribute is essentially a tiered rate that can either decrease or increase with increasing load factor blocks. Assuming that the blocking structure was carefully structured as described for tiered rates above, this rate form is likely to clip peak or shift loads to improve load factor in the case of decreasing rates with increasing load factor blocks, or increase peak or reduce off-peak usage in the case of increasing rates with increased load factor blocks.

6.4.2.3 Time-of-Day Rates

Research on the load impact of TOD rates shows that commercial and industrial customers tend to reduce loads during peak periods under TOD rates. However, overall results of econometric studies on the subject indicate that statistically significant commercial and industrial load shifting does not result from the application of TOD rates. For commercial and industrial customers, TOD rates act more as a peak-clipping program than a load-shifting program. Research also indicates that large commercial/industrial customers tend to be more responsive to TOD rate options than smaller commercial/industrial customers.[25]

6.4.2.4 Seasonal Rates

Compared to flat annual rates, seasonal rates in the PNW would increase winter season charges and provide an incentive to reduce winter use, and decrease summer charges and thereby provide an incentive to increase summer use. Under these circumstances, uses that are weighted more toward winter use, such as lighting and heating, would become more expensive and would likely be reduced. Uses that are weighted more toward summer use, such as cooling and refrigeration, would become less expensive and would likely be increased.

[25]EPRI, Customer Response to Rate Options, January 1991.

6.4.2.5 Real-Time Rates

There is strong evidence that peak clipping occurs as a result of commercial/industrial real-time pricing. However, different end uses and production processes among different industrial customers significantly affect their ability to shift load, thereby making it virtually impossible to predict overall on-peak/off-peak load response interactions.[26]

6.4.2.6 Market-Driven Indexed Rates

As is the case with indexed rates in the residential sector, rates indexed to generation fuel costs are not likely to have a significant impact on commercial customers in the region, because only a small portion of power delivered to commercial customers is from fossil fuel-fired generation. Rates indexed to some measure of commercial activity or prices would be complicated to administer given the wide range of commercial activity and the diversity of levels of commercial activity within the region (e.g., growing versus economically stagnant communities).

6.5 Environmental Impacts

The environmental impacts associated with rate design changes affecting commercial end users would be in three areas: commercial sector conservation, fuel switching, and the socioeconomic impacts associated with increased cost or load reductions.

6.5.1 Conservation

The RPEIS addresses potential environmental impacts associated with commercial sector conservation programs. In general, conservation programs would have positive environmental impacts overall due to the reduction in new generating resource development requirements; the only potential negative impacts (e.g., indoor air quality, and the use of hazardous or polluting materials) are generally effectively mitigated.

6.5.2 Fuel Switching

There is some potential for commercial end users to switch to natural gas for some heating loads. Fuel switching could have some small air quality impacts; however, these would generally be minor. There might also be minor environmental impacts associated with gas delivery (e.g., excavation for distribution pipelines), but these types of in-ground impacts are typically regulated locally and typically have minimal net environmental impacts.

6.5.3 Socioeconomic Impacts

Changes in BPA rate designs, to the extent passed through by retail utilities to end-use consumers, could affect the total costs experienced by commercial businesses. For marginally profitable businesses, increased energy costs could be enough to cause these firms to fail, reducing employment and local incomes. However, the potential for this type of impact is fairly small and would depend on the businesses' energy costs, total operating costs, opportunities to reduce electricity consumption, and market prices for their products and services.

6.6 Industrial Sector

6.6.1 Market Sector Characteristics

The industrial sector includes a diverse group of customers that primarily consists of pulp and paper, chemical, lumber and wood products, primary metals, food processing, and mining industries. In 1992, sales to industries by the region's retail utilities (excludes DSIs) were 4,323 aMW, or 25 percent of total

[26]Op. cit.

regional firm sales.[27] Of total retail industrial sales, about half (49 percent) were to customers of publicly-owned utilities, and about half were to customers of IOUs. The publicly owned utility sales were distributed among the industrial sectors as follows:

Table B-6: Pacific Northwest Industrial End Uses by Industry Type, 1990

	End Use (%)								
Industry Type	Lighting	Air Cond.	Process Heat	Air Compression	Pumping	Refrig.	Motors	Electro chem.	Total
Pulp and Paper	5	1	0	6	19	0	70	0	100
Chemicals	6	2	54	6	5	1	19	7	100
Lumber and Wood Products	4	2	0	8	18	0	68	0	100
Primary Metals	5	1	63	1	4	0	13	12	100
Food Processing	8	5	0	4	13	20	49	0	100
Petroleum Refining	6	2	35	3	11	0	42	0	100
Building Products	8	4	11	5	15	0	57	0	100
Transportation Equipment	16	5	7	6	13	0	52	0	100
AVERAGE	**7**	**3**	**20**	**5**	**13**	**2**	**47**	**3**	**100**

Industry Type	Percent Share (%)
Pulp and Paper	47
Chemicals	11
Lumber and Wood Products	9
Primary Metals	13
Food Processing	7
Other	13
TOTAL	**100**

End uses range significantly by industrial activity. Table B-6 shows the overall profile of the percentage shares of electricity use by industry type for the region as a whole in 1990 (data for publicly owned utilities alone were not available). Overall, electricity used to drive industrial motors accounts for nearly 50 percent of all electricity used by the industrial sector served by the region's utilities. Electricity used in process heat accounts for 20 percent of all electricity used by the industrial sector.

As the marginal costs of power increase through rate design changes or overall rate increases, industry will respond in a number of ways in order to reduce retail energy use. Options include switching to other energy sources such as natural gas, investing in conservation through capital efficiency improvements or programmatic conservation actions, switching to self generation or cogeneration, purchasing power from IPPs or other private power suppliers, or cutting back on production.[28] Rate design changes that lower marginal costs to end users have the opposite effect of changes that increase marginal costs.

[27]BPA, Electricity Use in the Pacific Northwest, Utility Historical Sales by Sector, 1992 and Preceding Years, September 1993.

[28]At BPA's current rate level, alternative energy sources that cost in the range of 25 to 30 mills/kWh can cause some industries to shift away from BPA.

The ability of the industrial sector to substitute other energy sources for electricity largely depends on the different end uses and production processes among different industrial customers. According to a preliminary analysis conducted by BPA, 500 to 750 MW of regional industrial load could potentially be switched to natural gas. Most of this is in the pulp and paper industry. A relatively small amount of food processing and chemical industry load could potentially be switched to natural gas.

According to an analysis conducted by BPA, BPA's non-DSI industrial load could be reduced by as much as 644 aMW if all technical conservation opportunities costing less than 63 mills/kWh (real levelized 1993 dollars) were exploited. With existing BPA rate structures, up to 300 aMW of savings could be induced through BPA programmatic actions at a cost of 15 to 20 mills/kWh.

An industry's decision to self-generate or co-generate can also be influenced by several factors other than the marginal cost of retail electricity, including the industry's experience with electric generation, aversion or reluctance to undertaking power generation, and the desire for independence (aversion to risk of rate shock). The potential for switching to cogeneration is provided by the Council in its 1991 Power Plan. According to the Council, the cogeneration potential of the region's industrial sector ranges from 300 to 600 MW. The potential for cogeneration lies mostly in the pulp and paper industry.

Assuming that retail wheeling of energy produced by IPPs or other private power suppliers is allowed by law, the potential for switching to IPPs or other private agencies for power supply lies in the ability of these entities to supply power to industry at a lower cost than a utility supplier. Thus, it follows that, all other factors being equal, industries would most likely switch to IPPs or private power suppliers for energy to the extent that marginal utility prices of electricity are greater than the marginal price of electricity from IPPs or other entities.

For industrial customers of publicly owned utilities, the LTFM estimated price elasticity of demand for price increases of 10 to 24 percent ranges from -0.11 to -0.12 in the short term, and is about -0.30 in the long term. For industrial customers of IOUs in the region, the LTFM estimated price elasticity of demand ranges from -0.10 to -0.12 in the short term, and is about -0.34 in the long term.

6.6.2 Market Response to Rate Attributes

Industrial end-use responses to rate design attributes reviewed for this study would be generally the same as described above for the commercial market sector.

6.7 Environmental Impacts

The primary impact of rate design changes passed through to the industrial sector would be associated with fuel switching, self-generation and cogeneration, industrial sector conservation programs, and socioeconomic impacts (e.g., employment and income changes).

6.7.1 Fuel Switching

Switching from electricity to natural gas or other fuels is an option in some PNW industries. The most likely fuel choice in many areas would be natural gas, although some pulp and paper industry firms might be able to use wood waste. The environmental impacts would vary according to the fuel used and the industrial process; in general, fuel switching to natural gas would have minor air quality impacts.

6.7.2 Self-Generation and Cogeneration

Some large industrial firms could develop their own generation to replace electricity purchased from a utility. This could be site generation to substitute in part for purchased electric power or on-site cogeneration facilities to produce heat and steam for industrial uses and generate electricity for plant use and/or for sale to utilities). The most likely technology would be natural gas-fired cogeneration or CTs. The typical environmental impacts of CTs and cogeneration are described in chapter 4 of the BP EIS. Cogeneration projects at many large industrial sites (particularly in the pulp and paper industry) often

replace wood waste- or diesel-fired boilers with gas-fired boilers, leading to a net improvement in air quality at the site.

6.7.3 Conservation

Industrial conservation measures vary considerably by industry, but generally include the following types of measures:

- High-efficiency motors
- Adjustable/variable speed drives
- Energy-efficient motor rewinds
- Heat recovery equipment
- Thermal storage
- Insulation
- Process heat equipment
- Compressed air systems
- Lighting efficiencies
- Energy management improvements
- Materials handling improvements
- Power factor improvements
- Cooling tower conservation
- Pump and fan efficiencies
- Distribution transformer improvements
- Dehumidifiers
- Furnace upgrades
- Water recycling processes
- Refrigeration system improvements

Most of the measures listed above do not alter existing mechanical processes in ways that lead to increases in waste streams or adverse environmental impacts; in fact, many industrial sector conservation programs simultaneously reduce electricity use and waste streams. In most industrial applications, there is sufficient environmental regulation to address any potential adverse impacts that result from process modifications to reduce energy use. In most cases, energy conservation would have positive impacts by reducing the need for new generation and increasing the efficiency of the industrial process, thereby reducing other waste streams.

6.7.4 Socioeconomic Impacts

To the extent that rate changes are passed through to the industrial customer, and to the extent that the industrial customer cannot reduce electricity costs by conservation, fuel switching, or process changes, some marginal firms could experience changes in overall production costs that could threaten their economic viability. Socioeconomic impacts are difficult to predict and would primarily affect marginally viable industries for which electricity cost is a high share of total production costs and with limited ability to shift to other fuels or reduce consumption.

6.8 Irrigation Sector

6.8.1 Market Sector Characteristics

Most of the region's irrigation takes place in the arid lands east of the Cascade Mountains in central and eastern Washington, in north-central Oregon, and in southern Idaho. Most irrigation energy sales are made during the crop-growing season from April to October, with peak sales in July or August.

Utility sales in 1992 in the PNW to the irrigation sector totaled 668 aMW. This accounted for 3.8 percent of total regional firm energy sales. Of the 8.2 million irrigated acres in the region, 56 percent are sprinkler irrigated with underground water from aquifers or with surface water from canals and rivers.

Analysis of the irrigation sector's electricity usage is difficult because of large and irregular fluctuations in usage from year to year. Table B-7 shows historical electricity sales to the irrigation sector from 1983 through 1992. As shown in table B-7, there is no easily identifiable trend in irrigation sector sales within this time period.

Besides the price of electricity, several other factors shape irrigation kWh sales from year to year and in the long term. These factors include:

- Planted sprinkled crop acreage
- Weather
- Prices of farm produce
- Energy and water conservation

An increase in sprinkled acreage, drought conditions, or farm prices results in an increase in irrigation sector energy use. Most sprinkler irrigators now practice some kind of conservation, and several measures to conserve irrigation water and electricity have become available over the last few years. An increase in water or electricity conservation measures results in a decrease in energy use by the sprinkler irrigators.

Table B-7: Irrigation Sector Firm Energy Sales, 1983 to 1992

Year	Total Sales (aMW)	Change From Previous Year (aMW)
1983	467	--
1984	475	8
1985	556	81
1986	513	-43
1987	554	41
1988	585	31
1989	582	-3
1990	615	33
1991	593	-22
1992	668	75

Source: BPA, Electricity Use in the Pacific Northwest, Utility Historical Sales by Sector, pp. 57-60.

Holding all other factors constant, changes in electricity rate design will have a predictable impact on irrigation energy use.

Some farms may also increase water conservation measures or change to crops that require less water in response to increased marginal electricity costs.

There are, however, a number of farms in the region that require pumping lifts from water sources to distant and highly elevated lands. For these farms, there are no good substitutes for use of electricity for irrigation. Higher marginal electric prices for these operations tend to simply reduce energy use through conservation, switching to crops that require less water, or elimination of uneconomical irrigation practices altogether.

For the irrigation sector customers of public utilities, the LTFM-estimated price elasticity of demand for price increases of 10 to 24 percent ranges from -0.08 to -0.10 in the short term, and is about -0.34 in the long term. For irrigation customers of IOUs in the region, the LTFM-estimated price elasticity of demand ranges from -0.09 to -0.10 in the short term, and from -0.37 to -0.44 in the long term.

6.8.2 Market Response to Rate Attributes

Following is a discussion of estimated load responses to the addition of specific alternative rate attributes at the retail level.

6.8.2.1 Tiered Rates - Inverted

As noted in the discussion of residential and commercial inverted rates, the net effect on overall use of inverted rates depends on the relative price elasticities of demand for different customer subgroups within the same class, and on the relative changes in the marginal price of electricity for these groups. Because there is little variation in end uses within the irrigation sector (most irrigators use energy only for pumping loads), there is likely to be little variation in elasticities among customers with different-sized loads. As a result, although some customers may increase consumption and some may decrease consumption in response to tiered rates, there may be little impact on overall irrigation loads.

6.8.2.2 Wright Rates

As noted in section 4, the Wright rate attribute is essentially a tiered rate that can either decrease or increase with increasing load factor blocks. In the PNW, most irrigators operate their systems at a high load factor during the summer months. The relative magnitude of the load impact resulting from this rate structure depends on the blocking structure. Generally speaking, this rate form may reduce overall energy

use in the case of increasing rates with successive load factor blocks, or increase overall energy use in the case of decreasing rates with successive load factor blocks.

6.8.2.3 Time-of-Day Rates

Most farms are extremely limited in their ability to shift irrigation loads from hour to hour or from day to day (see paragraph 6.8.2.5, Real-Time Rates, below). Therefore, assuming a revenue-neutral rate design, it is likely that negligible load impacts would occur as a result of TOD irrigation rates.

6.8.2.4 Seasonal Rates

As noted above, most irrigation energy sales in the region are made during the crop-growing season from April to October. Most utilities that supply energy to irrigators within the region are billed a seasonal energy charge and a flat demand charge. The seasonal rates currently in place increase winter energy charges and decrease summer energy charges. To the extent that utilities do not currently have seasonal rates in effect for their irrigation customers, introduction of such rates would further increase winter electricity costs and reduce summer electricity costs. As a result, it is likely that seasonal rates would result in decreased energy costs to irrigators and encourage irrigators to increase overall energy use.

6.8.2.5 Real-Time Rates

There is virtually no information available on irrigation sector load response to real-time pricing. However, based on common irrigation practices employed by most large farming operations within the region, and assuming that real-time rates are implemented on a revenue-neutral basis, it is likely that there would be no load impact as a result of irrigation sector real-time pricing.

It is unlikely that peak clipping or load shaping would occur because commercial farming operations within the region typically must operate their irrigation systems 24 hours a day for the duration of the irrigation operation while rotating irrigation systems to different sections of farmland. Furthermore, most irrigation districts within the region do not have sufficient water storage capacity to draw water during off-peak periods and store it during on-peak periods. Irrigators shifting to 12 hours per day would need to double the capacity of their water delivery systems to sustain equivalent watering of crops. As a result, during irrigation operations most farms are extremely limited in their ability to shift irrigation loads from hour to hour or from day to day.

6.8.2.6 Market-Driven Indexed Rates

In theory, rates indexed to farm commodity prices would have an impact on the irrigation sector. As noted above, farm commodity prices are one of the factors affecting energy load shape from year to year. However, the degree of crop diversification that now exists within the region would make such indexed rates complicated to implement. Application of rates indexed to the price of the main crops grown in the region would be virtually impossible from an administrative standpoint.

Rates indexed to fuel costs or utility prices are not likely to have significant impact on irrigation loads for the same reasons described above for the residential segment.

6.9 Environmental Impacts

The environmental impacts associated with rate design changes passed through to irrigation sector end-users would include impacts from irrigation sector conservation, socioeconomic impacts to the agricultural sector, and, potentially, land and water use changes from shifts in cropping patterns.

6.9.1 Conservation

The RPEIS addresses potential environmental impacts associated with irrigation sector conservation programs. The EIS notes that the environmental impacts associated with most of the energy conservation measures result in a new positive environmental impact in that reductions in both energy and water consumption are realized and equipment life is extended (RPEIS, page 3-26). The EIS explains that the few potential negative environmental impacts of irrigation conservation measures, largely due to the potential for increased soil erosion from some sprinkler irrigation methods, are mitigable.

6.9.2 Socioeconomic and Land Use Impacts

If increased electricity costs are passed through to the farmer, some marginal operations could become uneconomical. The most vulnerable operations would probably be high-head pumping operations, primarily in arid areas of the PNW with mostly sandy soils, and crops for which pumping is a larger share of total costs (e.g., wheat). For many of these vulnerable operations, grazing is probably the chief alternative use of the land.

In other cases, increased irrigation costs could cause farmers to change cropping patterns to crops that use less irrigation water in order for their operations to remain viable.

6.9.3 Impacts of Eliminating Irrigation Discount

The direct impact of eliminating the ID would be to increase the cost of electricity to qualifying irrigation end-users. The other impacts of increasing irrigation costs by eliminating the discount from the PF and NR rate schedules are briefly discussed in the context of effects on the regional irrigation sector, effects on other customer classes, effects on regional loads, and effects on the regional environment in terms of water savings and flow augmentation.

6.9.4 Effects on the Irrigation Sector

The cost of electricity for irrigating is only one component of the total cost affecting farm operations. For a high-value crop such as potatoes, the electricity cost for pumping accounts for 2 to 7 percent of the total crop cost. For an alternate (or rotation) crop on land developed primarily for high-value crops, the electricity cost for pumping accounts for 16 to 23 percent of the total crop cost. Electricity costs per acre of irrigated land vary widely depending on the irrigation method (flood versus sprinkler irrigation), and on pumping distance and elevation from the water source to the irrigated land.

The irrigation operations most vulnerable to the elimination of the ID are those that require pumping lifts from water sources to distant and highly elevated lands. These operations are referred to as high-head pumping operations. The electricity requirements per acre irrigated of these operations are two to three times greater than the average electricity requirements for normal sprinkler operations.

Generally speaking, elimination of the ID could result in irrigators adopting more energy and water conservation measures. Irrigators may also change to crops that require less water, thereby affecting overall crop diversification.

However, those operations that become uneconomical as a result of eliminating the ID would most likely be the high-head pumping operations. Most of these operations are located in arid parts of the Northwest and are comprised of mostly sandy soils. Without irrigation, grazing would be the only alternative agricultural use for much of this land.

6.9.5 Load Effects

All else being equal, elimination of the ID would result in reductions in irrigation electricity loads. The reductions could be attributed to irrigators through one or more of the following:

- Increasing energy conservation either by installing higher efficiency sprinkler systems
- Changing to crops that require less water (higher valued crops per unit of water)
- Eliminating marginal high-head pumping operations

Load decline estimates were provided in BPA's 1993 Rates EA based on demand elasticities from the LTFM. According to the EA, elimination of the ID along with the PF rate increase could reasonably result in a total irrigation load decline ranging from 5 to 8 percent.

The estimated load response to the combined effects of eliminating the ID and the PF rate increase may not reflect the situations of the vulnerable high-head pumping operations. In some cases, irrigation load

response to these high-head pumping operations would be greater than predicted by the average elasticities of the model. Larger load reductions could result if all of the following factors pertain:

- Aging equipment
- Dramatic increases in electricity costs
- Highly energy-intensive irrigation operations

6.10 Environmental Effects

It is difficult to measure any water savings directly attributable to the elimination of the ID. Elimination of the ID, all else being equal, would most likely promote energy conservation and irrigation curtailment.

Energy conservation measures in the irrigation sector are usually directed at reducing the electricity required to pump water onto fields. Most energy conservation measures are designed to optimize water use as well, thus allowing irrigation of the same amount of land using less water. Any water retained in the system due to irrigation curtailment would most likely be located downstream of major storage projects such as Grand Coulee and Dworshak and in Upper Snake River projects. The water could be stored and shaped for flow augmentation. Flow augmentation measures are used to aid the migration of juvenile anadromous fish during the spring migration period.

Attachment A

Glossary of Terms

Attachment A: Glossary of Terms

Average Cost Pricing. Pricing based on the total incurred cost of a product or service divided by the number of units sold.

Avoided Cost. A planned expenditure that would not need to be made if an available alternative resource can be used to meet the need instead.

Billing Units. Unit measurements of service to which rate components or charges are applied.

Cost Basis. The measurement of costs upon which rates are designed (e.g., embedded cost basis, marginal cost basis).

Embedded Cost Basis. The annual cost associated with capital investment already made plus average operating cost divided by the number of units.

Embedded Cost Pricing. Same as average cost pricing.

Incremental Cost Basis (also Reinforcement Cost Basis). Cost of specific facilities added to support/enable a transaction.

Incremental Cost. The cost of a specific increase in resource and transmission capability divided by the change in load being served through the increased capabilities.

Marginal Cost Basis (Near-Term and Long-Term). The change in system costs resulting from the transmission of an additional unit of power that considers the configuration of the system and forecasted pattern of demand in the short term and long term, respectively.

Marginal Cost. The change in cost associated with a unit change in output.

Market Cost Basis. The market-determined value for a transaction.

Market Response. A change in market or market segment behavior that results from a change in rate level or rate design. These responses take the form of changes in operations of existing facilities and in capital investment decisions.

Market Segment. A grouping of like customers at either the wholesale or retail level.

Opportunity Cost Basis. Net loss of revenue or net increase in generation cost caused by displacing one transaction with another when the transmission system is so constrained that both transactions cannot be handled at the same time.

Rate Attribute. The configuration of a rate component or charge.

Rate Component (or Charge). The portion of a rate design that specifies the price or prices for each unit of utility service provided.

Rate Design. A system of rate components or charges for utility services, billing units to which the charges are applied, and other requirements that relate to the charges for the service at that rate.

Rate Level. The magnitude of prices included in a rate component or charge.

Rate Schedule. A statement describing: (1) type of service to be provided, (2) the rate design for the electric service, and (3) all other terms and conditions related to the service.

Reproduction Cost Basis. The cost of reproducing an existing system under current conditions.

Sustained Peaking Capacity. The readiness to deliver a certain number of kilowatts for a certain duration (e.g., 1,000 kW for 10 hours a day, 5 days a week).

Acronyms and Abbreviations

aMW	Average Megawatt
ASC	Average System Cost
BC Hydro	British Columbia Hydro and Power Authority
BPA	Bonneville Power Administration
BP EIS	Business Plan Environmental Impact Statement
BOR	Bureau of Reclamation
BTU	British Thermal Unit
CE	Emergency Capacity Rate
COE	U.S. Army Corps of Engineers
Council	Northwest Power Planning Council
CS	Conservation Surcharge
CSP	Customer Service Policy
CT	Combustion Turbine
DOE	Department of Energy
DSI	Direct Service Industry
DSM	Demand-Side Management
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMF	Electric and Magnetic Field
EPRI	Electric Power Research Institute
ET	Energy Transmission
FBS	Federal Base System
FCRTS	Federal Columbia River Transmission System
Federal System	Federal Columbia River Power System
FERC	Federal Energy Regulatory Commission
FPT	Formula Power Transmission Rate
ID	Irrigation Discount
IOU	Investor-Owned Utility
IP	Industrial Firm Power Rate
IPP	Independent Power Producer
IR	Integration of Resources Rate
kW	Kilowatt
kWh	kilowatt-hour
LDD	Low-Density Discount
LTFM	Long-Term Forecasting Model
MT	Market Transmission
mills/kWh	mills per kilowatt-hour
NF	Nonfirm Energy Rate
Northwest Power Act	Pacific Northwest Electric Power Planning and Conservation Act
NR	New Resource Rate
ORU	Orange and Rockland Utilities
PAR	Peak-Activated Rate
Pepco	Potomac Electric Power Company
PF	Priority Firm Rate
PG&E	Pacific Gas & Electric Company
PNW	Pacific Northwest
Power Plan	Northwest Conservation and Electric Power Plan
PS	Power Shortage Rate
PSW	Pacific Southwest
PURPA	Public Utility Regulatory Policy Act
RP	Reserve Power Rate

RPEIS	Resource Programs Environmental Impact Statement
RTG	Regional Transmission Group
SI	Special Industrial Rate
SP	Surplus Firm Power Rate
SPM	Supply Pricing Model
SS	Share-the-Savings Rate
TGT	Townsend-Garrison Transmission
TOD	Time-of-Day Rate
TOU	Time-of-Use Rate
TVA	Tennessee Valley Authority
UFT	Use-of-Facilities Rate
VI	Variable Industrial Rate
WAPA	Western Area Power Administration
WNP-2	Washington Nuclear Plant No. 2
WPPSS	Washington Public Power Supply System

Attachment B

Survey of Wholesale Power and Transmission Rate Designs

Attachment B: Survey of Wholesale Power and Transmission Rate Designs

In reviewing rate forms, CH2M HILL conducted a survey of selected Federal, state, and provincial agencies in the United States and Canada that sell power at the wholesale level. Several of the agencies surveyed also provided transmission service to their wholesale customers. The results of the survey are presented in tables B-1 and B-2. Most wholesale and transmission rates included in the survey consist of a flat demand and energy charge. Common adders or adjustments to wholesale rates include billing for unauthorized overruns of power obligations, power factor adjustments, outage credits, and interim or other power cost adjustments to existing rates. A common adjustment to transmission rates includes the availability of a contract rate.

There are no transmission rate design attributes found in the survey that are notably distinct from design attributes found in existing BPA rates or described in EPRI's Survey of Innovative Rates. There are, however, three wholesale rate design attributes found in the survey that are notably distinct from those found in existing BPA rates or described in the Survey of Innovative Rates. These wholesale rate design attributes include:

- End-Use Rates
- Wright Tiered Energy Rate
- Project-Specific Rates

End-Use Rates

The end-use wholesale rate concept is currently used by the TVA. End-use wholesale rates are developed for retail groups (residential, commercial, and industrial) based on each retail group's contribution to TVA's costs. TVA then applies these rates to distributors' retail sales to compute the wholesale power bill. The distributors design retail rates to collect the wholesale power charges plus their own local distribution costs.

End-use rates were designed by TVA in response to distributors' rate concerns. The end-use rate was designed to accomplish several objectives that would both meet distributors' needs and remain revenue neutral. The end-use rate should:

- Adequately cover costs
- Give distributors more rate flexibility
- Minimize extreme temperature effects
- Encourage sales
- Be simple

Wright Tiered Energy Rate

The Wright Tiered Energy Rate is currently applied to wholesale energy sold by WAPA from the Central Valley Project and the Pick-Sloan Missouri Basin Program. Beginning May 1, 1995, firm energy from the Central Valley Project will be sold at a base rate for energy plus a tiered rate that is assessed on all kWh sold at a monthly load factor of 70 percent and higher. A tiered energy rate is currently applied to all kWh sold at a monthly load factor of 60 percent and higher from the Pick-Sloan Missouri Basin Program.

WAPA instituted the Wright Tiered Energy Rate to recover the additional cost of supplying power to customers with monthly load factors above WAPA's monthly system load factor of about 70 percent. WAPA must purchase the energy to supply the additional energy requirements of customers with load

factors of greater than 70 percent. This purchased energy is at a higher cost than energy produced through WAPA's system, and therefore, WAPA does not believe that it is fair to pass these additional costs on to all customers.

Project-Specific Rates

Project-specific wholesale rates are currently used by WAPA and the New York Power Authority. Under project-specific rates, wholesale customers are billed for power delivered from a specific project, and each project has its own power rate schedule. Rate design attributes may vary from project to project. For example, firm power sold by WAPA from the Loveland Area Projects is billed at a flat rate for demand and energy, with a provision for an interim rate adjustment in October 1994. On the other hand, power generated from the Washoe Project is sold by WAPA through an annual bidding process.

Most project-specific rates are the result of individual projects being legislated separately, either by Federal or state governments. Furthermore, many project-specific rates reflect initial power purchase contracts that were entered into by customers at the onset of project development.

Attachment C

Expected Load Response to Alternative Rate Designs

Attachment C: Expected Load Response to Alternative Rate Designs

The following discussion addresses the expected load response to inverted rates, TOD rates (both seasonal and diurnal), and real-time pricing rates. Where possible, information is provided by customer class (residential, commercial, industrial). All information presented below has been gathered from the following sources:

"Customer Response to Rate Options," Electric Power Research Institute (EPRI) Report CU-7131, January 1991.

"Rate Design: Traditional and Innovative Approaches," EPRI Report CU-6886, July 1990.

"Demand-Side Real-Time Pricing, 1992 Annual Report," Pacific Gas & Electric.

"Time-of-Use Electricity Price Effects," prepared for the U.S. Department of Energy by Allen K. Miedema, Kay K. Lee, and S. B. White, November 1981.

Inverted Rates

Typical inverted rate structures price energy differently for predefined blocks of energy consumption. The unit cost increases for energy consumed in each additional block. Inverted rate structures are typically used when a utility's marginal costs exceed its average costs. Under the conditions of higher marginal costs relative to average costs with flat or declining rates, the prices customers pay for increased use are less than the cost to provide additional electricity. To address this problem, many utilities invert their rates by setting prices for tail usage blocks (those blocks of energy that the utility must produce at the margin) at or near the cost to produce such energy. In order to maintain revenue neutrality, utilities reduce prices for initial usage blocks (those blocks that the utility can serve without having to bring on-line their marginal resource). Inverted rates attempt to send a signal to the customer to reduce overall consumption.

It should be noted that inverted rates are not exclusively marginal cost-based rates. An inverted rate raises rates to larger users within a customer class and lowers rates to smaller customers. If large-use customers impose a higher per kWh cost on the utility's system than small-use customers, this would support inversion of the rate. Conversely, if large-use customers impose a lower per kWh cost on the utility's system than small-use customers, this would support a declining block rate.

The load impacts of inverted rates are difficult to measure. For the most part, load impacts of inverted rates are estimated on the basis of price elasticity estimates. Further discussion on elasticity estimates is contained in the Attachment, and a range of elasticity values is presented below under TOD rate impacts.

The net impact of a particular inverted rate structure on customer use is the sum of the impacts at the various consumption levels. A typical inverted rate structure increases the marginal price larger-use customers pay for electricity, and decreases the marginal price to smaller-use customers. Assuming a negative price elasticity of demand for electricity, smaller customers will increase their use and large customers will decrease their use. The net effect on overall use of the inverted rate depends on which effects dominate. This in turn depends on the relative price elasticities of demand for the different customer groups, and on the relative changes in marginal price.

Evidence suggests that the price elasticity of demand increases as customer use increases. Assuming that most electricity consumption occurs within the tail block of an inverted rate structure, then the general conclusion can be made that inverted rates lead to overall load reduction.

Time-of-Day Rates

Time-of-day rate structures price either the demand or energy component (or both) differently for predefined time periods. TOD rates are designed to reflect the marginal cost of adding capacity to meet demand during daily peak periods. Usually, daily peak usage for a typical utility occurs between 7 a.m. and 10 p.m. TOD rates provide an incentive to customers to move consumption away from the daily peak period.

Residential Response to TOD Pricing

Studies suggest that residential customers are willing to change their electricity usage patterns following the implementation of TOD rates. However, the magnitude of these changes varies across utilities due to appliance stock, weather conditions, and customer demographics.

In EPRI's "Customer Response to Rate Options" report, studies by Potomac Electric Power Company (Pepco) and Pacific Gas & Electric Company (PG&E) suggest answers to two critical questions concerning implementation of residential TOD rates:

- Is there a significant difference in customer response to TOD energy charges versus TOD demand charges?
- Is there a significant difference in customer response to voluntary versus mandatory TOD rate programs?

Pepco found that there is no apparent difference in the responsiveness of residential customers to time-of-day demand and energy charges. In Pepco's experiment, one group of customers was placed on a mandatory TOD energy-only charge and another group was placed on a peak demand charge and a TOD energy charge. During the summer months, both groups reduced average on-peak demand by 3 percent and increased average off-peak demand by 1.5 percent, yielding a net reduction in energy consumption.

The results of PG&E experiments conducted in 1984 and 1987 found that customer response from voluntary TOD programs is larger than that expected for mandatory TOD customers. This is generally attributed to volunteer households having more flexibility in their use patterns than the average customer.

Results from more recent voluntary residential TOD econometric studies are also reported in EPRI's "Customer Response to Rate Options" publication. Studies by Taylor and Schwartz (1986) and PG&E (1984) report price elasticity estimates ranging from zero to -.45. Cross-elasticity estimates reported in both studies were all positive, ranging from .09 to .43. The on-peak/off-peak interaction estimates presented in these studies provide additional support to the notion that the application of voluntary TOD programs results in an increase in the substitutability of off-peak energy use for on-peak energy use.

The general conclusions gathered from the DOE's "Time-of-Use Electricity Price Effects" report tend to support those found in EPRI's report. In the mid-1970s, the DOE initiated several experiments designed to assess the impact of mandatory TOD rates. The DOE report found that during peak periods customers on mandatory TOD rate schedules consumed less on-peak energy than their counterparts in the control group on the existing rate schedule. However, the effects of TOD rates on off-peak consumption appeared to be negligible. The results of this study lend further support to the notion that customers on mandatory TOD rates tend to have less flexibility in their use patterns. Furthermore, the DOE report suggests that the effect of TOD rate structure may be stronger than the effect of TOD price variation. More precisely, changing from a declining block or flat rate to one particular TOD residential rate may have a greater effect on load shape than variations in kWh prices by time-of-use.

Commercial/Industrial Response to TOD Pricing

EPRI reports that several recent studies have analyzed the responsiveness of commercial and industrial customers to TOD rate options. While the results of these studies are mixed, the following trends emerge:

- Large commercial/industrial customers tend to be more responsive to TOD rate options than smaller commercial/industrial customers.
- Price responsiveness increases over time as businesses adjust their capital stock in response to TOD rates.

In the long-term, the introduction of production techniques, technologies, and the availability of other power sources will tend to increase the magnitude of commercial/industrial customer load-shifting response to TOD rates. Increased customer knowledge of load-shifting opportunities is another probable reason for the increasing load response experienced by some utilities.

Results from commercial/industrial TOD econometric studies by Chung and Ainger (1981), Tichler (1983), and Woo (1985) show elasticity estimates for on-peak energy ranging from -.06 to -.23, -.15 to -.27, and -.02 to -.03, respectively. Two of the three studies (Tichler and Woo) show estimates of on-peak/off-peak interaction effects. However, within the study populations, the existence of different end-uses and production processes significantly affects commercial/industrial customers' ability to shift load. As a result, on-peak/off-peak interaction estimates from these two studies cannot support any general conclusions regarding commercial/industrial load shifting from TOD rates.

Overall, the results of econometric studies suggest that statistically significant commercial and industrial load shifting does not result from the application of TOD rates. Rather, it seems that any short-term load shifting into the off-peak period is giving way to a long-term switch to alternative energy sources and changes in the level of production. For commercial and industrial customers, TOD rates act more as a peak-clipping program than a load-shifting program.

Real-Time Pricing

Real-time pricing is more or less an extension of TOD rates. Real-time pricing, sometimes known as spot or variable pricing, is based on the marginal cost of providing power at a particular instance in time. Rather than having preset on-peak and off-peak periods, real-time prices are estimated and posted closer to the time of consumption and have a much shorter duration of applicability than TOD rates.

In some cases, signals are sent to customers announcing peak times, and the price is calculated after-the-fact based on the actual marginal cost incurred. In other cases, prices are listed in advance at regular intervals. In the one case, a signal reflecting peak usage informs the customer of the expected price. In the other case, a signal reflecting varying prices of energy informs the customer of expected peak usage on the system. Both cases provide the customer with an incentive to move consumption away from peak periods, or to reduce overall consumption.

Most information available on load impacts of real-time pricing is based on utility experiments with voluntary pilot programs. Responsive metering and control technologies that allow real-time pricing customers, especially industry, greater flexibility in managing loads are relatively new. These new technologies show great promise for real-time pricing applications. However, little historical data exists on customer response to real-time pricing. Furthermore, generally speaking, the metering and control technologies available to industry have yet to reach the residential sector. As a result, residential participants in real-time pricing experiments conducted to date generally appear less responsive to price signals than would otherwise be expected.

Residential Response to Real-Time Pricing

The little information that is available on residential response to real-time pricing is summarized in EPRI's "Customer Response to Rate Options" report. The Orange and Rockland Utilities (ORU) in New York conducted two separate residential real-time pricing experiments. In the first experiment, hourly energy rates for the next day were transmitted to participants using a radio paging device. The second experiment was different from the first in that it involved a peak-activated rate (PAR) in addition to the hourly energy rates. Customers who participated in the PAR received a discount in the price of electricity used during off-peak hours, and a peak-activated surcharge on the price of electricity used during peak hours.

The results of the first residential real-time pricing experiment conducted by ORU indicated that, while energy reductions were evident during the real-time pricing program, the load response may not have been due to the price signal alone. Participants appeared to have reduced consumption during all peak periods regardless of price. Furthermore, there was no apparent shifting of load from on-peak hours to off-peak hours. ORU attributed these results to two factors:

- Because the experiment was voluntary, the only customers that participated were those who expected to benefit from the program without changing their normal routines.
- Participants may have noticed that higher prices consistently occurred during the peak hours, and therefore changed their habits so as to use less energy during these hours. Even though higher prices may not have actually occurred during peak periods in all cases, customers responded as though they expected prices to be higher, thus responding to real-time pricing as if it were a TOD rate.

The results of the second experiment showed a much larger on-peak reduction than with ORU's previous real-time pricing experiment. The larger peak demand impact was attributed to the strong price signal that accompanied critical peak periods. This indicated that there is a higher degree of correlation between rate and load impact associated with peak-activated real-time pricing than with ORU's other real-time pricing experiment.

Commercial/Industrial Response to Real-Time Pricing

One of the more promising real-time pricing experiments is being conducted by PG&E. The voluntary program, originally introduced in 1985, involves 16 commercial and industrial participants. In this program, PG&E transmits hourly prices daily to reflect the hourly changes in PG&E's cost of producing and delivering electricity. PG&E's "Demand-Side Real-Time Pricing 1992" annual report documents their latest findings.

In general, 12 of the 16 participants demonstrated notable price sensitivity during some part of 1992. The strongest evidence of price sensitivity was during the partial-peak and on-peak analysis periods for both summer and winter seasons.

As part of the experiment, PG&E also performed econometric analyses for the program as a whole and for each participant. Regression models were developed by hour and by time-of-use periods that correspond to PG&E's normal TOD rate. Distinct elasticity estimates were determined by season (summer and winter) and day type (weekday or weekend). Hourly elasticity estimates for the program as a whole during peak hours (8 a.m. to 7 p.m.) range from -.03 to -.05 in the summer, and from -.07 to -.86 in the winter. Over the past 3 years, results of the PG&E real-time pricing experiment have shown strong evidence of an increasing degree of peak-clipping among program participants. PG&E notes the following possible explanations for the observed increase in peak-clipping:

- Because of the length of the program, most participants have achieved a heightened level of price sensitivity due to their continued experience with the program.
- The continued economic downturn in California has forced participants to be more aware of the cost of energy as a part of their total economic costs.

Although not definitive, there is indirect evidence that real-time pricing does not necessarily result in load shifting from on-peak to off-peak periods. Different end-uses and production processes among different industrial customers significantly affect their ability to shift load. PG&E notes that three participants left the program in 1991 because of lower than expected savings resulting from real-time pricing. This fact supports the theory that, had this been a mandatory program, these industries may have replaced any short-term load shifting to off-peak periods with alternative long-term energy sources or by cutting back production.

Methods for Measuring Load Responses

Predicting customer response to alternative rate designs is difficult. Factors other than the rate structure itself play a significant role in determining how customers respond to a particular rate option. These factors include:

- Customer class characteristics
- Load shape characteristics
- Operational flexibility of the utility's system
- Rate program design and implementation approach

There are two main sources of information available on the load impacts of alternative rate designs. The first source of information is from the experience of other utilities in implementing different rate designs. The second source of information is through econometric studies that assess the relationship between electricity demand and price for different rate designs.

Although each of these sources can provide information on the expected load responses to various rate designs, there are strengths and limitations in the available results associated with each method.

Results From Other Utilities

Using data gathered from the experience of other utilities with similar rate design structures is one method to predict customer response to alternative rate designs. However, the accuracy of the load response estimate depends on the transferability of data.

Caution must be used when estimating load response based on test case results of other utilities because numerous potential differences exist between utilities and within customer classes of the same utility. Customer response could vary considerably between two utilities with identical rate structures for a variety of reasons, such as frequency, recency, and magnitude of rate changes, customer demographics, utility type, and geographic location. Generally speaking, most customer response data gathered from other utilities are not directly transferable. However, information from other utilities and pilot programs can be used to form "ballpark" estimates of customer response. The data can also be used to highlight potential problems associated with various rate design alternatives.

Econometric Studies

Econometric studies calculate load response estimates by incorporating other explanatory variables such as rate structure, customer base, and load curve information, among others. These variables are not usually specified in presenting the results of other utilities. Many econometric studies are utility-specific. However, EPRI has developed econometric models derived from the customer responses experienced by a cross-section of utilities. Theses models allow the user to input utility-specific information that is used to calculate load response estimates. However, the quality of the load response estimate depends on the quality of the utility-specific data used. Results of econometric studies can help shed some light on the expected magnitude of customer response to alternative rates. However, generally speaking, most customer response estimates from utility-specific econometric studies are not directly transferable.

Elasticity Estimates of the Elasticity of Demand for Electricity

Most econometric load response estimates are presented in terms of the price elasticity of demand. The price elasticity of demand is a measure of the percent change in consumption of a good resulting from a 1 percent change in the price of that good, with all other factors being equal. For example, if the price elasticity of electricity is -.5, this implies that a 1 percent increase in the price of electricity will result in a .5 percent decrease in its consumption.

There are three important factors to consider when interpreting price elasticities:

- Price elasticities change with large variations in price level.
- Price elasticities vary depending upon the initial price of the product.
- Price elasticities may be influenced by changes in other variables, such as the price of other goods (either substitute goods or complementary goods) and income.

Price elasticities may also interact with other related variables such as on-peak versus off-peak prices, total electricity usage, production or work schedules, appliance or large equipment stock, and weather conditions. Because price elasticities interact with a large number of variables, elasticity estimates are usually qualified under conditions of *ceritus paribus*, or all other factors being equal.

There are two other types of demand elasticities: cross-price elasticity, and elasticity of substitution. Cross-price elasticity is a measure of the responsiveness of the consumption of one good to changes in the price of another good. These goods can be either substitute goods or complementary goods. Elasticity of substitution measures the ease with which two goods can be substituted for each other as their relative prices change. Again, cross-price elasticities and elasticities of substitution are only relevant for small price changes and at the initial price level for which they were determined.

Long-Term versus Short-Term Response

It is important to note that customer responses to alternative rate designs vary over time. Therefore, it is essential to distinguish between short-term effects of a particular rate design and their corresponding long-term effects. In the context of alternative rate design, the long term is the period of time after all initial market adjustments to the alternative rate have occurred. Such market adjustments may include a change in appliances or equipment ownership, a change in work or production scheduling, or a permanent long-term change in behavior or production process. Short-term response to an alternative rate design is usually a change in discretionary scheduling or use of electricity.

Generally speaking, elasticity effects of a change in price are smaller in absolute value over the short-term than over the long-term. Unless otherwise stated, elasticity values are assumed to be long-term estimates.

Appendix C: Methodology and Assumptions for Numerical Analysis

Appendix C: Methodology and Assumptions for Numerical Analysis

Rates

The analysis of rates used the BPA Supply Pricing Model (SPM) to determine how BPA's wholesale rates and regional retail rates would change under each of the Business Plan EIS alternatives. The analysis used the medium case rates from the BPA document, Wholesale Power and Transmission Rate Projections 1993-2014 (November 1993), as the base case or "Status Quo" alternative. All other alternatives are constructed as variations from the base case, using the SPM and a small number of simplified ratemaking assumptions.

The Supply Pricing Model. The SPM is a computer model that simulates BPA's rate setting process. BPA developed the model to analyze the probable rate impacts of alternative BPA policies and actions. The SPM can produce long-term projections of annual average BPA wholesale rates and annual average regional retail rates or mid-term projections of monthly average retail rates for public utilities. The SPM projects the Priority Firm Power (PF) rate, Industrial Firm Power (IP) rate, New Resource Firm Power (NR) rate, Surplus Firm Power (SP) rate, the average cost of nonfirm energy, and BPA's average system cost. The model also projects retail rates for the residential, commercial, irrigation, and industrial sectors of both public utilities and investor-owned utilities (IOUs) for use in load forecasting.

The SPM contains capacity and cost information on both generating and conservation resources. The cost and capacity of pre-1985 Federal Base System (FBS) hydroelectric resources are included as totals; however, most other resources are treated individually. Capital and operating costs are specified for each generating resource. For conservation resources, only those costs that are to be paid through electricity rates are included.

The costs of generation and conservation are summed for the various owners (BPA, IOUs, and public generating utilities). The costs of resources used to provide power to end-use customers of BPA, public utilities, and IOUs are combined to reflect contractual agreements among utilities and provisions of the Northwest Power Act such as the residential exchange. In the SPM, all regional power markets are assumed to "clear" on an annual basis. That is, firm power resources are brought on line to serve forecasted firm regional loads, and any firm power not sold to serve firm load will be sold at nonfirm prices in the open market. If market opportunities permitted BPA to sell this power at higher than nonfirm rates, the additional revenue would reduce BPA firm power prices. The SPM also uses an economic test to displace high-variable-cost generating resources with available nonfirm power. This feature simulates a resource owner's decision to shut down resources with high fuel costs when cheaper nonfirm energy is available.

The SPM develops forecasts of BPA's costs and allocates them to rate pools (priority firm, industrial firm, new resources, and surplus power). Similarly, costs are developed for IOUs and public utilities. Retail rates are estimated using BPA's wholesale rates. The SPM calculates retail rates for public utilities and IOUs for each consuming sector. To develop rates for IOUs, the SPM calculates an average system cost using the utilities' own generation costs, transmission costs, costs of power purchases from BPA, and other appropriate costs. The IOUs' commercial and industrial rates are based on the utilities' average system cost. However, the IOU residential rate reflects benefits of the residential and small farm power exchange. Public utility retail rates are based on the melded cost of their BPA purchase power and their own generation and transmission costs. For both public utilities and IOUs, distribution costs associated with each customer group are added to derive the final retail rates.

Simplified Alternative Rate Assumptions Used in Modeling

The Status Quo alternative rates are based on a revenue requirement that has none of the efficiency savings or program reinvention savings that are reflected in the revenue requirement for the Market Driven alternative. Power costs increase since generating resource acquisitions are favored over short-term power purchases. By 2002, significant load loss tends to exacerbate the firm power rate increases. This alternative produced the highest power rates, with the average PF rate ranging from 32 to 36 mills/kWh in 2002.

The BPA Influence alternative has rates based on a revenue requirement that has some of the efficiency savings of the Market Driven alternative, but none of the program reinvention savings. This alternative assumes moderate decreases in utility sales, and somewhat larger decreases in DSI sales. This alternative assumes a tiered rate design with a tier one size of 75 percent of historical load and a tier two price equal to the marginal cost rate for each year. This alternative produced relatively higher power rates across the EIS alternatives, with the average PF rate ranging from 30 to 34 mills/kWh in 2002.

The Market Driven BPA alternative has rates based on a revenue requirement that includes savings from increased efficiency and the reinvention of BPA fish and wildlife programs and BPA conservation efforts. Decreased BPA transmission investments and replacements, along with additional market revenues from repositioned products help to keep the increase in PF rate modest through 2002. New generating resource costs are reduced by the purchase of short-term power in the open market. This alternative assumes a tiered rate design with a tier one size of 90% of historical load and a tier two price equal to the estimated BPA marginal cost for each year. The power rates produced by this alternative were at about the middle of the range for all alternatives, with the average PF rate ranging from 29 to 33 mills/kWh in 2002.

The Maximize Financial Returns alternative was not analyzed in the traditional way since it violated the cost-based-rates paradigm of the modeling tools. Rates were set at about the maximum sustainable revenue level regardless of BPA's costs to represent market-based pricing, loads were decreased from the Market Driven alternative to reflect price-induced load reductions, and the market revenues were increased from the Market Driven alternative. Then a spreadsheet calculated the excess revenues. This alternative produced power rates at about the middle of the range for all alternatives, with the average PF rate ranging from 29 to 33 mills/kWh in 2002.

The Minimal BPA alternative rates are based on a revenue requirement with all the cost reductions of the Market Driven alternative, plus additional cost cuts. These added cuts include: no new BPA transmission investment after 1996, no new BPA conservation investment after 1996, reduction in BPA administrative and general expenses. This alternative produced the lowest power rates within the range of all alternatives, with the average PF rate ranging from 28 to 32 mills/kWh in 2002.

The Short-Term Marketing alternative has rates based on the Market Driven revenue requirement. Savings from increased efficiency and program reinvention help lower the revenue requirement in this alternative. Loads are reduced slightly, but BPA is assumed to be able to continue to serve its regional firm load though short-term power contracts after the long-term power contract expires. This alternative also assumes a tiered rate design with a tier one size of 90 percent of historical load and a tier two price equal to the estimated BPA marginal cost for each year. This alternative produced rates at about the middle of the range for all alternatives, with the average PF rate ranging from 29 to 33 mills/kWh in 2002.

The assumptions used in calculating rates for the Business Plan EIS alternatives are shown in table C-1.

Table C-1: Business Plan Supplemental Draft EIS Simplified Assumptions Used in Modeling Rates

Alternative Assumption	Status Quo	BPA Influence	Market-Driven BPA	Maximize Financial Returns	Minimal BPA	Short-Term Marketing
SUMMARY	Business as usual; no adjustment to changing market	Reinvention with additional incentives for furthering NW Power Act goals	Reinvention to respond to deregulation	Aggressive marketing to increase revenues	Static BPA; federal system expansion comes to a halt	Five-year marketing horizon with stable rates for duration of sales
BPA Generation Acquisition Costs	$318M	$208M	$208M	$208M	$208M	$208M
Conservation (and Billing Credit) Expenditures	$324M	$324M	$175M	$175M	$95M	$175M
Transmission Costs (recovered in power rates)	$360M	$330M	$330M	$330M	$260M	$330M
Fish and Wildlife Costs [w/o power purchases]	$160M	$160M	$160M	$160M	$160M	$160M
BPA Administrative Costs[1]	$168M	$168M	$168M	$168M	$84M	$168M
Rate Tiers	None	Tier 1 - 75% 1996 loads; 29-33 mills Tier 2 - marginal cost of new resources - 36-40 mills	Tier 1 - 90% 1996 loads; 100% during fish flow; 27-31 mills Tier 2 - marginal cost of new resources - 36-40 mills	No tiers; firm power price just below marginal cost; 29-33 mills	None	Tier 1 - 90% 1996 loads; 100% during fish flow; 27-31 mills Tier 2 - marginal cost of new resources - 36-40 mills

[1] Amounts listed include power purchase costs which are relatively larger in the Market-Driven alternative than the Status Quo, offsetting savings from staff reduction and administrative efficiency improvements.

Table C-1 (continued): Simplified Assumptions Used in Modeling Rates

Average Firm Power Rate	32-36 mills	30-34 mills	29-33 mills	29-33 mills	28-32 mills	29-33 mills
Additional Revenues from Unbundled Products	No revenues; no unbundled products	$66M	$130M	$250M	No revenues; no unbundled products	$130M
PF Load on BPA[2]	-500 aMW	-600 aMW	0 aMW	-500 aMW	-400 aMW	-450 aMW
DSI Loads[2]	-500 aMW	-800 aMW	0 aMW	0 aMW	+700 aMW	+500 aMW

Loads

BPA Utility Loads

Changes in BPA loads under the EIS alternatives were evaluated based on the rates provided in the SPM calculations. Load effects of the predicted rates were calculated for aggregated full requirements customer loads and similarly for aggregated generating public agency loads. Estimated load effects were based on numerical price elasticity values and judgment-based adjustments to address the specific features of the EIS alternatives. Non-BPA generation was included (as explained below) as it affected utility generation and large industrial loads. Exchange loads of IOUs were also evaluated to account for the effect of changes in BPA rates on the retail rates to residential and small farm consumers benefiting from the exchange and the resulting effect on their loads.

The results of this evaluation are estimates of general load reductions in response to increases in BPA rates (as reflected in retail utility rates), and additional changes in BPA loads as customers replace expected BPA power sales with power from non-BPA suppliers.

Adjustments were made to utility loads placed upon BPA to capture the effects of the Business Plan EIS alternatives. These adjustments were composed of:

- Price effect impacts of tiered rates on end-use consumers
- Non-BPA generation estimates
- Short-term purchases
- Retail wheeling (excludes DSIs)

Description of Load Adjustments

Retail Consumer Price Effects of Tiered Rates

To adjust for load effects of rate changes and/or tiered rates on end-use consumers (retail load effects), the base utility load forecasts were analyzed to determine the effects of two influences: (1) changes in the average (melded) power rate relative to the Priority Firm power rate projected in the *Wholesale Power and Transmission Rate Projections 1993-2014* (November 1993) and, (2) for alternatives with a tiered rate structure, the Tier 2 rate relative to the estimated melded rate.

[2] These load loss assumptions are a starting point for the EIS quantitative analysis, and may vary from the load loss estimates provided elsewhere in this EIS based on price elasticity and availability of alternative power supplies.

In order to estimate retail load changes it was assumed that the non-generating public utilities would pass on 55 percent of any rate increase and that the generating utilities would pass on 51 percent of any rate increase to the end-use consumers. These pass-through percentages were based on an analysis of historical utility revenue data. Estimates of the "elasticity" of utility loads with respect to changes in electricity prices, expressed as the ratio of the percent change in loads to the percent change in utility prices, were applied to the regional utility load forecast to estimate load effects. The average elasticity was applied to total utility loads to estimate load effects from exposure to the average power rate. In alternatives with tiered rates, retail load effects were estimated by applying the marginal elasticity to the portion of utility loads that was projected to be exposed to Tier 2 rates.

The elasticity estimate reflecting the responsiveness of loads to changes in average or melded power rate was a regional elasticity estimate based on BPA's long-term (20 year) end-use forecasting models for the residential, commercial, irrigation, and industrial sectors. The implied elasticities by sector are melded into a single elasticity estimate by weighting the individual sector elasticity estimates according to their respective shares of total load. The elasticity estimates are based on projected retail consumer actions in response to electricity rate increases. Retail consumer actions are assumed to fall into three categories: (1) changes in utilization of equipment (turning off lights, turning down thermostats, etc.); (2) fuel-switching (e.g., converting from electric space heating to natural gas space heating); and (3) efficiency choice (e.g., purchase of more efficient hot water heaters, refrigerators, etc.). These elasticity estimates are assumed to be the same for both the nongenerating and generating public utility loads.

The elasticity estimate reflecting the responsiveness of loads to the difference between the higher Tier 2 power rate was assumed to be equivalent to the elasticity of the commercial sector, the most sensitive of the four sectors. The basis for this assumption was that, on the margin, when faced with significantly higher electricity prices, utility loads are more sensitive to price. These elasticity estimates are assumed to be the same for both the nongenerating and generating public utility loads.

In addition, for the alternatives with tiered rates, BPA assumed that utilities would not pass along a Tier 2 price signal immediately. A "ramp-in" effect was applied to the Tier 2 elasticity estimate to account for the lag time before utilities would pass on a marginal price signal to their end-use consumers. This ramp-in, which begins in 1996 at 30 percent, caps at 70 percent in 2002. It is assumed in 2002, roughly 70 percent of all retail load being served by a utility purchasing Tier 2 power will have a marginal price signal passed on to it in retail rates.

The ramp-in percentages are based on analytical judgment of the extent to which utilities will pass on a marginal price signal to the end-use consumer. This judgment considered the ability of utilities to incur the cost of Tier 2 power as well as the ability or desire of utilities to establish a marginal price signal to pass on to their consumers.

Non-BPA Generation Estimates

The effects of Business Plan EIS alternatives (including tiered rates) on customer load placement and non-utility generation development were analyzed using BPA's Resource Policy Screening Model (RPSM) and empirical alternative-specific short-term sales.

RPSM Projections

Projections of reduced load placement on BPA at varying PF rate levels were determined by simulating the response of non-utility generators to varying levels of posted avoided cost. In the RPSM, BPA customer utilities operate bidding programs for generation supply to cover load growth with non-utility generation, and purchase output offered at prices up to BPA's price of PF service. BPA's expected PF rate serves as the avoided cost that utilities use in their bidding programs to decide whether to purchase output from independent developers or rely on BPA.

The non-utility sector is modeled from the perspective of the non-utility generation decision makers. From data on utility avoided costs, fuel and electricity prices, and non-utility generation technology characteristics, potential non-utility generators evaluate the economic attractiveness of various generation and purchase

options. Under utility bidding programs, only the cheapest resources that are required to cover the bid amount and that meet the avoided cost threshold will be developed.

The RPSM disaggregates non-utility generation by technology, market segment, and utility service area. Market segments are meant to represent a logical grouping of technologies or application areas with similar project economics. Self generation represents a set of technologies designed to provide electricity directly to industrial and large commercial facilities that have no native steam load. Small power production covers a specific set of technologies that are defined by PURPA to include renewable generation sources, small-scale hydro, or waste-to-energy technologies. Internal cogeneration technologies and PURPA cogeneration technologies are identical in concept but different in application. Internal cogeneration technologies are sized to serve the electric load of the steam facility being served, whereas PURPA cogeneration technologies are oversized to provide sales to a utility. Technology cost and economics are therefore different for these two applications. Independent power production technologies are designed to generate wholesale electricity only with no steam host. These are similar to utility facilities in design but much different in terms of financing and effect on utility rates.

RPSM results were incorporated into an Excel spreadsheet model to further analyze the wholesale price effects of the various alternatives. To find the wholesale demand for non-BPA generation, the customers' stream of price expectations with a risk premium included and tiered rates was converted into a single net expected price of BPA power (the utility's avoided cost). The net expected price was then used to find relevant points along a demand curve for non-BPA generation, provided by RPSM.

Short Term Non-BPA Purchases

Non-utility generation provides only a partial picture of utility load placement. Marketers sell power on the short-term market by purchasing output from existing generation. To capture short-term purchases, an empirical percentage was applied to each alternative to reflect utility decision-making criteria given BPA's direction. The percentage of utility load that is served by short-term sales varies among the alternatives based on the business goals and assumptions underlying each alternative. The assumptions considered and the percentages of short-term purchases are as follows:

Alternative Assumption	Status Quo	BPA Influence	Market-Driven	Maximize Financial Returns	Minimal BPA	Short-Term Marketing
Tiered Rates	No	Tier 2 above 75% of historical load	Tier 2 above 90% of historical load	No	No	Tier 2 above 90% of historical load
Unbundled Products	No	Yes	Yes	Yes	No	Yes
Average Percent of Short-Term Purchases*	27.5	15.5	2.0	5.5	2.0	2.5

*Short-term non-BPA purchase percentages are based on empirical judgment given the various ways for BPA to conduct business with public utilities and the rates under each alternative. The reasoning behind these percentages is explained below.

Status Quo:

BPA continues in a "business as usual" mode. BPA does not acknowledge the development of a competitive market and does not make changes to become more business-like. Utilities are able and willing to shift load away from BPA service and buy power from other suppliers, for both price and process improvements.

BPA Influence:

BPA's tiered rate structure exposes a higher percentage of utility load to Tier 2 prices. The higher Tier 2 price and other conditions of BPA service reinforce utilities' willingness to purchase from other suppliers.

Market-Driven:

Cost reductions lead to lower prices, and market-orientation improves customer relations, lessening their desire to shift to obtain service from non-BPA suppliers.

Maximize Financial Returns:

Without a tiered rate structure, and with aggressive BPA marketing, utilities are more willing to purchase from BPA.

Minimal BPA:

Stable low prices make BPA power attractive relative to market alternatives.

Short-Term Marketing:

Comparable to Market-Driven, except that some customers seek longer term supplies.

Retail Wheeling

Retail wheeling estimates by utility were incorporated in the load adjustment estimate based on the *Retail Wheeling and BPA Prospectus August 1994*. Retail wheeling is the ability of electricity consumers to purchase their power supplies directly off-site from a supplier other than their local electric utility. It was assumed that only the largest industrial plants, 10 aMW or more, are likely to contract for retail wheeling.

Changes in utility loads were calculated assuming PNW states enact legislation requiring local utilities to offer final electricity users retail wheeling by 1997. Once implemented, retail wheeling sales impacts for BPA depend on four distinct factors: (1) BPA rates, (2) alternative wholesale power costs, (3) customer utility retail pricing, and (4) retail customer response. If BPA power supply rates are less than alternative wholesale power supply costs on an actual and expected basis, then retail customers are likely to continue buying power from BPA either directly or indirectly and BPA may not see any change in sales from retail wheeling. If, however, BPA power supply rates are equal or greater than alternative wholesale power costs, than BPA customer utilities, or possibly retail customers, will likely seek alternative power supplies, and BPA will lose sales. Retail customers will do so if BPA rates are passed along by customer utilities, unmelded in the case of tiered rates, and if there are enough savings to induce them to buy directly from other than their local utility.

DSI Loads

Aluminum DSIs

The total aluminum DSI load is the same under all alternatives, but BPA does not serve all of the load in any of the alternatives. Any part of the load not placed on BPA is served by other power suppliers. The amount of load served by other power suppliers varies, depending on the alternative. Except in the Status Quo alternative, it is assumed that there will be no Variable Industrial rate charged by BPA. The aluminum DSIs will pay the IP rate, which is linked to the PF rate and is about 2 mills/kWh lower than the PF rate.

The basis for the aluminum DSI load forecast for the Market Driven alternative is a metal price/smelter cost comparison for each of the plants. The long-run market equilibrium metal price (80 cents/lb.) is an important, but not sole determinant of regional smelter operations. Judgmental adjustments are made, in addition to metal price/smelter cost analysis, to incorporate other non-cost related factors. These include information on the effects from tiered rate implementation, historical regional smelter operations, and BPA's understanding of the individual characteristics and business strategies of each company. The non-Tier 1 load was assumed to be either purchased from BPA as Tier 2 power throughout each year, or else purchased from BPA as nonfirm power (at approximately 14 mills/kWh) during the water budget months (April through July), and from non-BPA suppliers (at approximately 31 mills/kWh) during the remaining months of each year. Aluminum DSIs

were analyzed individually to determine the way that each smelter would respond to its exposure to Tier 2 rates.

The tiered aluminum DSI loads for the BPA Influence and Short Term Marketing alternatives were estimated similarly to those of the Market Driven alternative. It was assumed that alternative power supplies are available for 27 mills/kWh. Further adjustments in load were made to take into account the specific characteristics of each alternative. Under the BPA Influence alternative, roughly half of the load (relative to Market Driven) is lost because of the large amount of non-firm service. These lost loads are served by non-BPA suppliers. For the Short Term Marketing alternative, the high IP rate (relative to the price of alternative power) and the 5-year contracts result in 10 percent of Tier 1 loads and all of Tier 2 loads (relative to Market Driven) shifting to other suppliers.

Rates are not tiered in the remaining three alternatives. Most of the load variations across these three alternatives are in response to IP rates. The Tier 2 load in the Market Driven was shifted to firm load for Status Quo and Maximum Financial Returns. Under Minimal BPA, firm load is lost because the DSIs are last in line for FBS allocation.

Non-Aluminum DSIs

The load forecast for the non-aluminum DSIs was prepared on a plant-by-plant basis. For each of the plants, load forecasts were prepared based upon information collected on historical operations, current operating schedules, plant technology, and expected economic and market conditions. Market projections were gathered from a variety of sources including consulting firms and commodity trade journals. The forecast was further adjusted where appropriate to reflect the effects of tiered rate structures. The non-Tier 1 load was assumed to be either purchased from BPA as Tier 2 power throughout each year, or else purchased from non-BPA suppliers. The characteristics of each alternative resulted in changes in the plant loads similar to the changes estimated in the analysis of aluminum DSIs.

Resource Development

The technical team evaluated resource development under the EIS alternatives starting with the currently planned resources as identified in the 1992 Resource Program and the load changes as estimated by forecasting tools and the RPSM. Resource development was divided between BPA and the rest of the region, which includes both IOUs and the portion of public agencies' loads not placed on BPA. The evaluation assumed that the ISAAC (Integrated System for Analysis of Acquisitions) model provided a reasonable prediction of how the rest of the region would balance loads and resources under the Status Quo alternative.

A major concern was the development of energy conservation resources. The Status Quo alternative relies on the conservation target of 660 aMW by 2003 identified in the Council's Power Plan and BPA's 1992 Resource Program. For the other alternatives, the achievable conservation potential was broken down as follows:

- 80 aMW already achieved through BPA programs since implementation of the 1992 Resource Program began
- 200 aMW committed under existing BPA conservation incentive programs
- 25 aMW from BPA market transformation activities
- 125 to 305 aMW from other BPA demand-side management actions
- 55 aMW from already-enacted codes and standards
- up to 150 aMW from utilities' own programs
- 120 to 135 aMW in response to price

This breakdown was used to estimate conservation resources under each of the EIS alternatives. Please note that the amounts overlap (for example, increases in utility-sponsored programs will reduce the potential

available from BPA-sponsored programs). The total cost-effective potential among BPA loads remains the same. The exception is price responses, because price signals change the cost at which measures become cost-effective for the power purchaser.

The last two items, utility programs and prices responses, although they contribute to achieving the potential for conservation over BPA's loads by 2003, are appropriately characterized as resource development by the rest of the region, rather than BPA.

BPA development of generating resources is dominated by resource acquisitions identified in the 1992 Resource Program, including specific acquisitions already committed, and contingency resources. Committed resources include hydro efficiency improvements, cogeneration, the Tenaska generating project, the Newberry Crater and Vale geothermal projects, and other resources BPA has committed to as demonstrations or research and development under the Resource Supply Expansion Program (RSEP). Variations among the alternatives occur in the amount of conservation achieved (as shown in the list above) and in the extent to which alternatives incorporate uncommitted amounts of purchased power or combustion turbines.

Resource Operations

The technical team estimated resource operations using the Power Work Group spreadsheet model developed to support analysis for the SOR. It was designed to quickly calculate the total system costs for alternative combinations of system operating strategies and load/resource configurations. To do this, the team made a number of simplifying assumptions, the most important of which concerned resource acquisition, resource dispatch, resource operating costs, power purchase costs, and the marketing of nonfirm and surplus firm energy. These simplifications allowed the spreadsheet model to quickly assess a wide range of inputs, thereby dealing with uncertainty and its impact on power system operation. The simplifying assumptions, however, made the model less useful for predicting absolute quantities for power system operations; it is better suited for evaluating the different alternatives relative to each other.

Model inputs comprised total (regional) generation from hydro and baseloaded thermal systems, total loads, the size of the DSI top quartile, new resource quantities and costs, prices for sales of secondary energy outside the region, prices for purchases of energy from outside the region, and southern intertie effective size. Based on the 50-year hydro regulation and the resource and load amounts for each alternative, the model operated the system month-by-month as a single regional entity, displacing regional thermal plants when possible (existing displaceable plants are displaced first, then new CTs), and selling any remaining energy outside the region. Baseload thermal plants were assumed to run all the time, excepting normal annual maintenance shutdowns, either for regional load or export. The results for each alternative are the average results from running each of the 50 water years in the hydro regulation against the load and resource figures for the 2001-02 operating year.

Firm surplus energy was assumed sold on the nonfirm market. Data representing the California market for PNW nonfirm energy and data representing the price and availability to BPA of surplus energy came from preliminary work on BPA's Marketing and Production 10-Year Plan. Total southern intertie capacity was modeled as 5,900 MW, lower than the actual figure, to approximate the characteristics of the California market (i.e., there is very little market at night; using a higher average figure for southern intertie capacity would, in effect, allow the model to sell up to 8,000 MW of nonfirm energy at night, which would be grossly unrealistic). Nonfirm energy was assumed to be sold first to displace PNW thermal generation, and then to the PSW, without regard to whether PSW prices might be more attractive than PNW prices.

Additional assumptions used for evaluation of operations:

- All PNW thermal plants were lumped into three groups for displacement purposes: new CTs, existing high-cost displaceable, and low-cost thermal plants. Baseload thermal plants - coal and nuclear - are never displaced. They are considered to run always, either for PNW loads or for export sales, due to their low variable cost. Their operation is constant across the alternatives.

- Conservation and efficiency improvement figures were shaped according to the 1995 Rate Case monthly load forecast for 2001-02, separately for Federal and non-Federal conservation. Renewables and cogeneration were considered flat in shape. Conservation, efficiency improvements, renewable resources, and cogeneration were all treated as load reductions.

Transmission Development and Operation

The analysis of effects on transmission system development began with the identification of the amount of transmission facility development that would be likely to occur under the Status Quo alternative, based on information provided to the WSCC (see the Business Plan EIS, chapter 4, paragraph 4.3.3 Status Quo, for more detail). For all of the alternatives to the Status Quo, the effects of each of the transmission issues addressed in chapter 4 of the EIS, paragraph 4.2, Market Response to Issue Alternatives, are summarized, and the likely net impact on regional transmission system development and operation is assessed in comparison to the Status Quo. Changes in regional transmission system development were identified in terms of a percent change from the Status Quo for each voltage class of new transmission. This assessment of the overall effect of each alternative on transmission involves judgment about the interaction of policy choices (the outcomes of each transmission issue addressed in section 4.2) that may individually have contradictory impacts on transmission system development. The conclusions about net impacts on regional transmission development are based on analysis of market trends, legal requirements, and BPA's own policy choices.

Consumer Behavior

To project retail consumer load effects of the various alternatives, the technical team used an Excel spreadsheet model that incorporated price elasticity equations. The base forecast was adjusted using an elasticity formula to reflect two separate influences: (1) a change in the average rate relative to the base forecast, and (2) a difference in the Tier 2 or marginal price rate relative to the average rate.

The model included two price elasticities in which the price change is assumed to be permanent: one for the average price effect and one for the marginal price effect, the latter of which accounts for the effects of a tiered rate being passed on to consumers. The average price elasticity was derived from the 1992 Long-Term End-Use models. The marginal price elasticity was assumed to be slightly larger than the average price elasticity because of the larger gap between the Tier 2 price and current rates.

All price changes were calculated from the rates used in the 1993 White Book forecast. The base loads used in the retail consumer analysis were also taken from the 1993 White Book.

A ramp-in effect was applied to the marginal price elasticity equation to account for the lag time of utilities passing on a wholesale marginal price signal in their retail rates. This ramp-in, which begins in 1996 at 30 percent, caps at 70 percent in 2003. It is assumed that, by 2003, roughly 70 percent of all retail load being served by a utility purchasing Tier 2 power will have a marginal price signal passed on to it by a utility.

Even where utilities pass through a marginal cost price signal in retail rates, in the alternatives with a tiered rate structure (the BPA Influence and Market-Driven alternatives), only a portion of the retail-level load is assumed to see the marginal price or Tier 2 rate, because each utility receives an allocation of lower cost Tier 1 power. For the BPA Influence alternative, it is assumed that 25 percent of the average firm historical 1988-92 load faces the Tier 2 rate, and for the Market-Driven alternative, it is assumed that 10 percent of the average firm historical 1988-92 load faces the Tier 2 rate. All load above historical load is assumed to face a Tier 2 rate. For the alternatives with a tiered rate design, the average wholesale rate (average of Tier 1 and Tier 2) is not much different than the rates used in the 1993 White Book, so for those retail consumers that do not receive a marginal cost price signal, there is little retail price response to BPA tiered rates.

Each of the alternatives assumed specific wholesale rates derived from descriptions of the alternatives in chapter 2 of the EIS. All load changes are in relation to the 1993 White Book forecast. This analysis of the effect on retail consumers of utilities was aggregated across end-use sectors. In characterizing the relative

amounts of conservation and fuel switching within the total price-induced retail load change shown by the spreadsheet model, the technical team assumed that 80 percent of the reduction in loads due to price was attributable to fuel switching, and 20 percent was energy conservation.

Appendix D: Retail Utility Operations

Appendix D: Retail Utility Operations

Introduction

We all get electrical service for home, school, and work from retail utilities. In the PNW, most of these utilities buy some or all of their power from BPA. The decisions these utilities make about their power supplies and operations can be affected in important ways by decisions BPA makes in choosing a Business Plan. This appendix explains in general terms how utilities plan for and serve their loads, to aid the reader in understanding how utilities may be affected by BPA's business decisions.

A Retail Utility's Obligation to Serve Load

A retail electric utility plans its power supplies primarily by the load it is required to serve. As a provider of public service, the retail electric utility has a responsibility to serve all loads within its service territory. It has a monopoly franchise within its service territory, regulated by a public utility commission.

Utilities must meet their loads on an instantaneous, hourly, and seasonal basis. Electricity loads vary depending on the customers' needs being served. Loads vary in small amounts each time a consumer turns an electrical device on or off. These small changes accumulate over thousands of consumers into large amounts of power and large variations. Just as individual households use more power during the daytime and, in the PNW, during winter months, the total loads of PNW utilities tend to be much higher during the daytime and in the winter. Utilities must arrange for facilities or services to provide power to match these load fluctuations.

Forecasting Loads

An important part of arranging to meet fluctuating loads is predicting how much power will be required. Regional projections of the amount of electric power and energy to be delivered to consumers reflect assumptions about economic conditions, consumer energy use habits, weather, and population changes. These factors and others are taken into account in utility load forecasts.

Power Resource Acquisitions

To meet forecasted loads, utilities can choose from a number of distinct resource strategies. They can build their own generators and conduct their own conservation programs, or join with other utilities in developing such resources.

They can purchase resource output from independent developers or purchase power and services from a wholesale supplier, like BPA. Another way to supply their needs is to use short-term purchases on the open market. Some utilities may choose to diversify their supply of resources, and reduce the risk that any one strategy isn't fully successful by using more than one source.

Utilities may also be influenced in their choice of power supplier by the process involved in dealing with a given supplier -- the "hassle factor." If utilities have a choice of suppliers, they may determine that the hassle factor at one supplier adds unacceptably to their costs, and so choose a different supplier.

Whenever a utility builds or buys resources to supply its consumers' loads, it needs to match the output of the resource to those loads. Some resources, especially hydro generation, can vary their output to follow the changes in loads during the day. Other resources, called "baseload" resources, are most efficient when operated continuously at or near their maximum output. Some baseload thermal resources have relatively low fuel costs and high capital costs, which means that they are relatively expensive to build, but less expensive to run once they are built. For example, nuclear and coal-fired resources are generally considered baseload resources.

"Intermediate resources" are normally operated at maximum generation during heavy load hours and at minimum generation during light load hours. Examples of intermediate resources are conventional oil- or gas-fired steam units, combined cycle combustion turbines and some PNW hydro. There isn't much need for intermediate generation in the PNW, due to the flexibility of hydro generation.

Resources that are operated to provide energy above baseload during heavy load hours are known as "peak resources." Some hydroelectric resources, especially pumped storage, are normally considered peaking resources and are most effective in responding to daily load fluctuations.

Energy Conservation and Demand-Side Management

Conservation resources are different from generating resources because they reduce electrical loads rather than produce power. Many conservation measures cost less than generating resources while providing the same benefits to consumers. When conservation measures are implemented, loads are reduced, and the utility doesn't have to deliver as much electricity to consumers as it would without those measures. Depending on the specific conservation measures, loads may be reduced during peak load hours, reducing the need for peaking or load following services.

Unlike generating resources, conservation resources don't produce power that can be sold. Instead, the costs of conservation add to the utility's total costs, so retail rates may increase, even though the power costs to consumers for the same energy benefits are less. Energy-efficiency programs are desirable from a business perspective only if a utility can earn an adequate return on its investment, manage any impact on its rates, and protect its assets. Integrated resource planning will help recover the cost of lost revenues from demand-side management programs.

Strategies for redistributing, shifting or shaping electrical loads to reduce load peaks are referred to as demand-side management. These strategies influence when and how customers use electricity. The savings from conservation practices will assist in meeting electricity demands.

Utilities are making advances in strategic conservation through load control programs. Residential air-conditioning load control programs allow utilities to cycle off residential air conditioners during peak periods. Commercial lighting and use of commercial customers' stand-by generators to reduce peak demand, as well as motor trippers on load-intensive electrical appliances, are also effective load control programs.

Other methods of managing demand include peak shaving, load shifting, strategic marketing, valley filling, and off-peak load building devices.

Services to Support Power Resources

Because baseload resources cannot match fluctuating loads, they must be supplemented with other power system services to redistribute the output of the resource to match the utility's loads. These services include:

- √ **Load following:** matching small fluctuations in loads from moment to moment
- √ **Load shaping:** trading energy with other suppliers to meet higher loads in heavy load hours of the day and in the winter months
- √ **Reserves:** providing reserves in case of a generation or transmission breakdown
- √ **Nonfirm displacement:** shutting down some generators to save money during seasons when cheaper hydro energy is available
- √ **Surplus sales:** selling excess energy when generating resources can supply more energy than the utilities' near-term needs.

Reserves

System reliability requires utilities to include reserve power supplies in their generation planning. Because electricity cannot be stored easily, utilities need to arrange for generating and conservation resources to produce enough power to supply all of their customers' needs at every moment. It is essential that the system be reliable enough to continue operation without power outages even when some lines or generators are out of service. Reserves are needed for both planned and unplanned outages. Planned outages are scheduled at generating plants for routine maintenance and repair. Unplanned outages occur when power plants suffer breakdowns, or when transmission lines fail due to accidents or natural disasters. Reserves are also needed when loads can unexpectedly increase or decline.

Unscheduled or unplanned outages put additional strain on the capability of the system. The utility must be prepared to meet those additional demands through reserve generation and reserve transmission capability. A utility may also arrange for the right to interrupt or curtail some of the electric power supplied to certain consumers to provide reserve capability.

Generation reserves provide for outages in wholesale power supply. Because most consumers expect uninterrupted electrical service, the utility must also plan its transmission and retail distribution system to maintain service in the face of possible breakdowns. If not, consumers will experience the inconvenience, costs and hazards of occasional outages.

Utility Costs

To survive as a viable business operation, a utility must recover its costs. It must charge rates that will pay its costs of power, transmission, distribution, conservation programs and overhead. The costs a utility incurs determine the rates it must charge the consumers it serves. A utility's resource choices have an important effect on their costs.

To determine its least cost, a utility considers not only the cost to build and operate a resource, but also the costs of environmental impact and risk management. For example, one resource may cost more to build than another, but it may actually be the preferred "least-cost resource" because it is environmentally "cleaner," with the flexibility to operate under a broader range of possible future regulations.

Another important consideration for utilities in obtaining resources to serve their loads is location. Generating resources may be located far away from the utility's service territory, so that power must be transmitted over high-voltage lines to reach the utility's loads. The cost of transmission is a consideration for the utility in deciding how to obtain power to serve its loads.

A utility's size influences the sophistication of its operations and, to some degree, whether it owns and operates generation resources and high-voltage transmission. The level of investment a utility makes in power transfer capability is directly related to the level of reliability it chooses to maintain. Small facilities don't have the staff or resources to design systems that fully meet reliability requirements. Instead, they ensure reliability by over-engineering (i.e., by more capital investment), whereas larger facilities have large planning staffs and use statistical modeling to determine the optimal amount of investment needed to provide reliable service.

For smaller utilities, wholesale power and transmission costs can affect retail rates. However, any other costs, especially distribution and overhead, dilute the effect of the wholesale costs and ultimately increase the rate charged to

consumers. Distribution is usually a large part of a retail utility's total costs. Distribution system costs include costs of construction and land, impact mitigation, maintenance, and regulatory process compliance.

What a utility pays for power services will also influence its choice of supplier. Utilities have historically been able to obtain wholesale power that includes power services. Since some utilities do not need all the services provided, wholesalers are beginning to unbundle products and services and to provide the customer with choices as to how to serve its load.

For example, BPA power rates include transmission costs, whereas other power suppliers require a separate charge to "wheel" power over their systems. Although all wholesale power purchases must be wheeled, the cost may not be the same when buying from BPA, from an independent power producer, or from outside the region.

Conclusion

Utilities have many decisions to make about their power supplies and operations. The business decisions BPA makes can have a direct affect on utilities' choices as they arrange for facilities or services to provide power to match the loads within their service territories. The costs a utility incurs determine the rates it must charge the consumers it serves. To survive as a viable business operation, it must recover it costs and charge rates that will pay for its costs of power, transmission, distribution, conservation programs, and overhead. BPA's Business Plan will provide a new direction for BPA and utilities as it responds to changes in the electric energy market and can affect utilities choices and decisions in important ways.

Appendix E: Comments and Responses to the Draft Business Plan EIS

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Comments on the Draft EIS and Responses

BPA received comments on both the Business Plan and Business Plan EIS. This appendix summarizes comments received on the Draft Business Plan EIS. Letters were numbered consecutively in the order in which they were received by BPA. Within each letter individual comments were identified and numbered consecutively. In this summary, some numbers are missing from the letter and comment number sequence. The missing numbers represent comment letters or individual comments on the Business Plan; only Business Plan Draft EIS comments are summarized here.

Letter 83--Upper Columbia United Tribes Fisheries Research Center
Letter 92--Mason County Public Utility District
Letter 101--Washington State Energy Office
Letter 104--Central Lincoln People's Utility District
Letter 105--Benton County Public Utility District No. 1
Letter 109--Northwest Conservation Act Coalition
Letter 113--Renewable Northwest Project
Letter 120--Idaho Fish and Game
Letter 129--Seattle City Light
Letter 132--Eugene Water and Electric Board
Letter 133--Kootenai Electric Cooperative, Inc.
Letter 134--Columbia River Inter-Tribal Fish Commission
Letter 137--Public Power Council
Letter 138--Northwest Sportfishing Industry Association
Letter 142--Lloyd K. Marbet, Forelaws on Board, Utility Reform Project, and Don't Waste Oregon
Letter 143--Office of the Governor of Oregon
Letter 145--Montana Dept. of Fish, Wildlife and Parks
Letter 146--Sierra Club, Columbia Basin Field Office
Letter 149--Confederated Tribes of the Umatilla Indian Reservation
Letter 151--Columbia Basin Fish & Wildlife Authority
Letter 153--Northwest Environmental Defense Center
Letter 159--Oregon Natural Resources Council
Letter 162--Friends of the Earth
Letter 165--American Rivers
Letter 169--Canby Utility Board
Letter 173--Office of the Governor of the State of Washington
Letter 174--Northwest Conservation Act Coalition
Letter 176--National Marine Fisheries Service
Letter 178--U.S. Environmental Protection Agency
Comment 177--Portland Public Meeting, September 7, 1994; Comment of Rachel Shimshak, Renewable Northwest Project

Table E-1: Comments and Responses to the BPA Business Plan Draft EIS

Letter	Comment No.	Commenter	Topic No.	Topic Category	Comment Topic
109	3	Northwest Conservation Act Coalition	1	Scope of the EIS	Relationship between BP and SOR
109	10	Northwest Conservation Act Coalition	1	Scope of the EIS	BP EIS and SOR linked; suggest revisions
120	9	Idaho Fish and Game	1	Scope of the EIS	Redraft EIS to meet F & W needs
134	10	Columbia River Inter-Tribal Fish Commission	1	Scope of the EIS	Scope of EIS should address hydro operations
134	11	Columbia River Inter-Tribal Fish Commission	1	Scope of the EIS	F & W should be a decision supported by EIS (Ch. 1.4)
134	12	Columbia River Inter-Tribal Fish Commission	1	Scope of the EIS	Incorporating documents by reference inadequate
142	2	Lloyd Marbet/Forelaws on Board/Utility Reform Project/Don't Waste Oregon Council	1	Scope of the EIS	Need a fully scoped EIS
142	6	Lloyd Marbet/Forelaws on Board/Utility Reform Project/Don't Waste Oregon Council	1	Scope of the EIS	Acquisition of mid-Columbia hydro facilities
153	1	Northwest Environmental Defense Center	1	Scope of the EIS	BP and SOR inappropriately separated
153	7	Northwest Environmental Defense Center	1	Scope of the EIS	Effects of changes in hydropower operations
165	1	American Rivers	1	Scope of the EIS	EIS deficient under NEPA, NWPA, ESA
176	1	National Marine Fisheries Service	1	Scope of the EIS	SOR not adequate to analyze in-river impacts of BP
176	5	National Marine Fisheries Service	1	Scope of the EIS	BP lacks an explicit water policy
120	1	Idaho Fish and Game	2	Purpose and Need/Goals	Need BPA competitiveness, equitable treat., debt red.
134	1	Columbia River Inter-Tribal Fish Commission	2	Purpose and Need/Goals	Make anadromous fish protection basic objective
134	6	Columbia River Inter-Tribal Fish Commission	2	Purpose and Need/Goals	Equitable treatment and competitiveness
138	7	Northwest Sportfishing Industry Association	2	Purpose and Need/Goals	BPA not providing equitable treatment
146	3	Sierra Club, Columbia Basin Field Office	2	Purpose and Need/Goals	No evidence of need for action
146	8	Sierra Club, Columbia Basin Field Office	2	Purpose and Need/Goals	SBOs should include meeting statutory obligations
149	2	Confederated Tribes of the Umatilla Indian Reservation	2	Purpose and Need/Goals	BP fails to comport with treaty rights
174	13	Northwest Conservation Act Coalition	2	Purpose and Need	EIS should evaluate against goals of Regional Act
83	6	Upper Columbia United Tribes Fisheries Research Center	3	Procedural Issues	BP inappropriately ahead of Council's Power Plan
83	12	Upper Columbia United Tribes Fisheries Research Center	3	Procedural Issues	BP should wait for SOR operations impacts

Table E-1: Comments and Responses to the BPA Business Plan Draft EIS (continued)

92	2	Mason County Pubic Utility District	3	Procedural Issues	Need new EIS for contracts
104	3	Central Lincoln Public Utility District	3	Procedural Issues	Prepare new EIS with more info. on rates
120	10	Idaho Fish and Game	3	Procedural Issues	Defer BP until Idaho v. NMFS and SOR are settled
134	5	Columbia River Inter-Tribal Fish Commission	3	Procedural Issues	Hold EIS until after negotiations on IDFG v. NMFS
142	3	Lloyd Marbet/Forelaws on Board/Utility Reform Project/Don't Waste Oregon Council	3	Procedural Issues	NEPA analysis of power sales contracts
146	1	Sierra Club, Columbia Basin Field Office	3	Procedural Issues	Withdraw BP and DEIS
146	14	Sierra Club, Columbia Basin Field Office	3	Procedural Issues	BP and power sales contracts decisions already made
146	15	Sierra Club, Columbia Basin Field Office	3	Procedural Issues	Object to BP and SOR on separate tracks
149	3	Confederated Tribes of the Umatilla Indian Reservation	3	Procedural Issues	Government-to-government consultation with tribes
151	1	Columbia Basin Fish and Wildlife Authority	3	Procedural Issues	Redraft documents after other processes done
153	2	Northwest Environmental Defense Center	3	Procedural Issues	Need additional tiered NEPA review
153	3	Northwest Environmental Defense Center	3	Procedural Issues	Timing of rates and contracts discussions
159	11	Oregon Natural Resources Council	3	Procedural Issues	SOR and BP and contracts out of sequence
169	3	Canby Utility Board	3	Procedural Issues	Prepare new EIS with more info. on rates
174	11	Northwest Conservation Act Coalition	3	Procedural Issues	Delay negotiations, tiered rates
174	12	Northwest Conservation Act Coalition	3	Procedural Issues	One EIS not sufficient for range of issues involved
83	2	Upper Columbia United Tribes Fisheries Research Center	4	Alternatives Analyzed in EIS	SOR does not analyze all alternatives, BP inadequate
101	7	Washington State Energy Office	4	Alternatives Analyzed in EIS	Develop other alternatives with interested parties
120	4	Idaho Fish and Game	4	Alternatives Analyzed in EIS	DEIS fails to consider F & W alternative
120	5	Idaho Fish and Game	4	Alternatives Analyzed in EIS	Alternatives not quantitatively described
134	2	Columbia River Inter-Tribal Fish Commission	4	Alternatives Analyzed in EIS	F & W alternative
134	3	Columbia River Inter-Tribal Fish Commission	4	Alternatives Analyzed in EIS	Need PNCA alternative
134	8	Columbia River Inter-Tribal Fish Commission	4	Alternatives Analyzed in EIS	Need alternative based on DFOP
134	9	Columbia River Inter-Tribal Fish Commission	4	Alternatives Analyzed in EIS	Need alternative that eliminates dams
134	13	Columbia River Inter-Tribal Fish Commission	4	Alternatives Analyzed in EIS	Structure alternatives to benefit salmon

Table E-1: Comments and Responses to the BPA Business Plan Draft EIS (continued)

134	24	**Columbia River Inter-Tribal Fish Commission**	4	Alternatives Analyzed in EIS	BPA could reduce costs in programs besides F & W
134	33	**Columbia River Inter-Tribal Fish Commission**	4	Alternatives Analyzed in EIS	Propose alternative hydrosystem operation
138	2	**Northwest Sportfishing Industry Association**	4	Alternatives Analyzed in EIS	Alternative hydro operations not analyzed
142	1	**Lloyd Marbet/Forelaws on Board/Utility Reform Project/Don't Waste Oregon Council**	4	Alternatives Analyzed in EIS	Alternatives reinterpret Regional Act
142	4	**Lloyd K. Marbet, Forelaws on Board, Utility Reform Project, and Don't Waste Oregon**	4	Alternatives Analyzed in EIS	Definition of No Action alternative
142	5	**Lloyd Marbet/Forelaws on Board/Utility Reform Project/Don't Waste Oregon Council**	4	Alternatives Analyzed in EIS	Definition of No Action re: DSIs
142	7	**Lloyd Marbet/Forelaws on Board/Utility Reform Project/Don't Waste Oregon Council**	4	Alternatives Analyzed in EIS	Consistency with Regional Act, other alternatives
146	6	**Sierra Club, Columbia Basin Field Office**	4	Alternatives Analyzed in EIS	MD alternative misguided
146	7	**Sierra Club, Columbia Basin Field Office**	4	Alternatives Analyzed in EIS	BPA could save $ in other programs
149	4	**Confederated Tribes of the Umatilla Indian Reservation**	4	Alternatives Analyzed in EIS	No alternative in plan that restores F & W
149	5	**Confederated Tribes of the Umatilla Indian Reservation**	4	Alternatives Analyzed in EIS	Costs not all F&W
151	2	**Columbia Basin Fish & Wildlife Authority**	4	Alternatives Analyzed in EIS	Equitable treatment and ESA
153	9	**Northwest Environmental Defense Center**	4	Alternatives Analyzed in EIS	Need streamflow-based alternative
153	13	**Northwest Environmental Defense Center**	4	Alternatives Analyzed in EIS	Analysis of alternatives inappropriate
153	15	**Northwest Environmental Defense Center**	4	Alternatives Analyzed in EIS	Alternatives not equitable for F & W
159	1	**Oregon Natural Resources Council**	4	Alternatives Analyzed in EIS	Benefits of F & W alternative
159	12	**Oregon Natural Resources Council**	4	Alternatives Analyzed in EIS	BPA should give equitable treatment to F & W
159	14	**Oregon Natural Resources Council**	4	Alternatives Analyzed in EIS	Privatize BPA functions
159	15	**Oregon Natural Resources Council**	4	Alternatives Analyzed in EIS	Govt. corporation is the worst hybrid
165	2	**American Rivers**	4	Alternatives Analyzed in EIS	F & W not given equitable treatment

Table E-1: Comments and Responses to the BPA Business Plan Draft EIS (continued)

165	4	American Rivers	4	Alternatives Analyzed in EIS	Rates, contracts must reflect F & W obligations
165	8	American Rivers	4	Alternatives Analyzed in EIS	BPA could save $ in other programs
173	4	Office of the Governor of the State of Washington	4	Alternatives analyzed in EIS	Develop other alternatives with interested parties
174	9	Northwest Conservation Act Coalition	4	Alternatives Analyzed in EIS	Include compliance with Council Plan, etc.
176	3	National Marine Fisheries Service	4	Alternatives Analyzed in EIS	Strategies to enhance F & W and BPA competitiveness
178	2	U.S. Environmental Protection Agency	4	Alternatives Analyzed in EIS	Compatibility of conservation and competitiveness
83	5	Upper Columbia United Tribes Fisheries Research Center	5	Analytical Methods	Offended by characterization of fish and wildlife costs
101	2	Washington State Energy Office	5	Analytical Methods	Quantify risks and probabilities of options
101	4	Washington State Energy Office	5	Analytical Methods	F & W costs would increase in all alternatives
101	5	Washington State Energy Office	5	Analytical Methods	Program costs and management efficiencies in MD
101	6	Washington State Energy Office	5	Analytical Methods	"Build your own alternative"
109	1	Northwest Conservation Act Coalition	5	Analytical Methods	EIS lacks total resource cost
109	10	Northwest Conservation Act Coalition	5	Analytical Methods	Characterize costs fairly
120	2	Idaho Fish and Game	5	Analytical Methods	Consider F & W needs as hard constraints
129	28	Seattle City Light	5	Analytical Methods	Question threat to competitiveness
134	14	Columbia River Inter-Tribal Fish Commission	5	Analytical Methods	F & W costs not consistent with other flow constraints
134	16	Columbia River Inter-Tribal Fish Commission	5	Analytical Methods	Why will F & W costs will increase in BPA In. Alt.
134	17	Columbia River Inter-Tribal Fish Commission	5	Analytical Methods	Don't like BPA portrayal of salmon costs
138	8	Northwest Sportfishing Industry Association	5	Analytical Methods	BPA's bad business decisions shouldn't make fish suffer
138	10	Northwest Sportfishing Industry Association	5	Analytical Methods	Hydro operations for fish are a cost of business
145	2	Montana Dept. of Fish, Wildlife and Parks	5	Analytical Methods	BPA financial problems from drought, not F & W
146	5	Sierra Club, Columbia Basin Field Office	5	Analytical Methods	Probabilities of implementing alternatives speculative
146	10	Sierra Club, Columbia Basin Field Office	5	Analytical Methods	Assumptions show deck stacked to favor MD alt.
146	11	Sierra Club, Columbia Basin Field Office	5	Analytical Methods	BPA financial problems from WPPSS debt, etc.

Table E-1: Comments and Responses to the BPA Business Plan Draft EIS (continued)

149	5	Confederated Tribes of the Umatilla Indian Reservation	5	Analytical Methods	Costs not all F & W
151	10	Columbia Basin Fish & Wildlife Authority	5	Analytical Methods	No justif. that ratepayers won't pay for F&W
153	8	Northwest Environmental Defense Center	5	Analytical Methods	Assumptions make all but MD losers
159	2	Oregon Natural Resources Council	5	Analytical Methods	Notion BPA becoming uncompetitive unjustified
162	1	Friends of the Earth	5	Analytical Methods	F & W must be hard constraints on power
162	3	Friends of the Earth	5	Analytical Methods	Question "death spiral"
165	9	American Rivers	5	Analytical Methods	F & W obligations should be a hard constraint
173	2	Office of the Governor of the State of Washington	5	Analytical Methods	Quantify risks
174	3	Northwest Conservation Act Coalition	5	Analytical Methods	EIS should use Total Resource Cost
176	4	National Marine Fisheries Service	5	Analytical Methods	BP misconstrues F & W program costs
83	1	Upper Columbia United Tribes Fisheries Research Center	6	Impacts of Alternatives	BP bad for conservation, F & W, role of agencies/tribes
83	10	Upper Columbia United Tribes Fisheries Research Center	6	Impacts of Alternatives	BP not consistent with resident fish goals
83	11	Upper Columbia United Tribes Fisheries Research Center	6	Impacts of Alternatives	BP could lead to hydro ops with adverse fish effects
101	1	Washington State Energy Office	6	Impacts of Alternatives	Impacts of regulatory reform
120	3	Idaho Fish and Game	6	Impacts of Alternatives	Hydro ops' impacts on F & W not recognized
120	6	Idaho Fish and Game	6	Impacts of Alternatives	SOR analysis inadequate for BP
120	8	Idaho Fish and Game	6	Impacts of Alternatives	Unbundling puts pressure on fish
129	25	Seattle City Light	6	Impacts of Alternatives	Assumptions about conservation amounts/impacts
132	37	Eugene Water and Electric Board	6	Impacts of Alternatives	Ranking of alternatives wrong
133	2	Kootenai Electric Cooperative, Inc.	6	Impacts of Alternatives	Impacts of rate increases on small utilities
134	4	Columbia River Inter-Tribal Fish Commission	6	Impacts of Alternatives	Need supplemental DEIS to analyze F & W impacts
134	15	Columbia River Inter-Tribal Fish Commission	6	Impacts of Alternatives	Benefits to fish of BPA In. Alt. unclear
134	19	Columbia River Inter-Tribal Fish Commission	6	Impacts of Alternatives	M-D alt. detrimental to anadromous fish
134	20	Columbia River Inter-Tribal Fish Commission	6	Impacts of Alternatives	M-D stable funding level would not meet NWPA
134	21	Columbia River Inter-Tribal Fish Commission	6	Impacts of Alternatives	MFR alt. detrimental to anadromous fish
134	22	Columbia River Inter-Tribal Fish Commission	6	Impacts of Alternatives	Min. BPA and STM fish impacts unclear
134	23	Columbia River Inter-Tribal Fish Commission	6	Impacts of Alternatives	Table 2.4-1 is only general overview of assumptions
134	26	Columbia River Inter-Tribal Fish Commission	6	Impacts of Alternatives	Cultural resources not properly addressed
134	27	Columbia River Inter-Tribal Fish Commission	6	Impacts of Alternatives	Discuss impacts to treaty Indian fishing rights
134	28	Columbia River Inter-Tribal Fish Commission	6	Impacts of Alternatives	Unbundling could affect flows for fish

Table E-1: Comments and Responses to the BPA Business Plan Draft EIS (continued)

134	29	**Columbia River Inter-Tribal Fish Commission**	6	Impacts of Alternatives	Adding customers could adversely affect fish
134	30	**Columbia River Inter-Tribal Fish Commission**	6	Impacts of Alternatives	Effects of transmission wheeling & pricing on F & W
134	32	**Columbia River Inter-Tribal Fish Commission**	6	Impacts of Alternatives	Impacts of economic decisions on river operations
137	38	**Public Power Council**	6	Impacts of Alternatives	Analysis of effects of risk
137	40	**Public Power Council**	6	Impacts of Alternatives	Impacts on fish of business strategies?
137	41	**Public Power Council**	6	Impacts of Alternatives	Effects of purchased power in Tier 2?
138	1	**Northwest Sportfishing Industry Association**	6	Impacts of Alternatives	BPA not giving equitable treatment
138	4	**Northwest Sportfishing Industry Association**	6	Impacts of Alternatives	Hydrosystem impacts on fish not analyzed
138	6	**Columbia River Inter-Tribal Fish Commission**	6	Impacts of Alternatives	Unbundling could lead to adverse fish impacts
142	24	**Lloyd Marbet/Forelaws on Board/Utility Reform Project/Don't Waste Oregon Council**	6	Impacts of Alternatives	Impacts of gas exploration/development in Canada
143	2	**Office of the Governor of Oregon**	6	Impacts of Alternatives	Capacity impacts could affect hydro ops and F & W
143	3	**Office of the Governor of Oregon**	6	Impacts of Alternatives	BPA underestimated impacts of M-D
146	4	**Sierra Club, Columbia Basin Field Office**	6	Impacts of Alternatives	BPA Influence Alternative preferred
146	9	**Sierra Club, Columbia Basin Field Office**	6	Impacts of Alternatives	BP/MD alt. encourages customers to demand more
149	7	**Confederated Tribes of the Umatilla Indian Reservation**	6	Impacts of Alternatives	Cultural resource responsibilities
151	3	**Columbia Basin Fish & Wildlife Authority**	6	Impacts of Alternatives	Hydro operations' impacts should be included
153	5	**Northwest Environmental Defense Center**	6	Impacts of Alternatives	EIS lacks in-depth analysis and detail
153	6	**Northwest Environmental Defense Center**	6	Impacts of Alternatives	EIS lacks analysis of DSI service and irrigation rates
159	3	**Oregon Natural Resources Council**	6	Impacts of Alternatives	Correct uneven treatment of alternatives
162	2	**Friends of the Earth**	6	Impacts of Alternatives	BP fails to examine F & W impacts
165	3	**American Rivers**	6	Impacts of Alternatives	How do increased revenues affect F & W?
173	1	**Office of the Governor of the State of Washington**	6	Impacts of Alternatives	Quantify risks, need impacts of discrete elements
173	3	**Office of the Governor of the State of Washington**	6	Impacts of Alternatives	Need more inf. to build your own alternative
174	1	**Northwest Conservation Act Coalition**	6	Impacts of Alternatives	BPA did not address comments on prelim. draft
174	2	**Northwest Conservation Act Coalition**	6	Impacts of Alternatives	Level of analysis is shallow
174	10	**Northwest Conservation Act Coalition**	6	Impacts of the Alternatives	Location-sensitive pricing of transmission
174	14	**Northwest Conservation Act Coalition**	6	Impacts of the Alternatives	MD poorly characterized and evaluated
176	2	**National Marine Fisheries Service**	6	Impacts of Alternatives	SOR analysis inadequate for BP
178	1	**U.S. Environmental Protection Agency**	6	Impacts of the Alternatives	Assess preferred alternative and conservation

Table E-1: Comments and Responses to the BPA Business Plan Draft EIS (continued)

83	3	Upper Columbia United Tribes Fisheries Research Center	7	Rates	Tiered rates should be tied to fish needs
105	9	Benton County Pubic Utility District No. 1	7	Rates	Adequacy of EIS rates analysis
109	2	Northwest Conservation Act Coalition	7	Rates	Streamflow-based rates
109	10	Northwest Conservation Act Coalition	7	Rates	BP EIS and SOR; suggested revisions to EIS
137	33	Public Power Council	7	Rates	Analysis of tiered rates
137	34	Public Power Council	7	Rates	Analysis of tiered rates, DSIs,
137	39	Public Power Council	7	Rates	Rankings of alternatives
138	5	Northwest Sportfishing Industry Association	7	Rates	Need to consider seasonal and flow-based rates
138	11	Northwest Sportfishing Industry Association	7	Rates	Rates must ensure BPA viability but not kill salmon
146	13	Sierra Club, Columbia Basin Field Office	7	Rates	Incorporate drought and fish flow costs in rates
159	6	Oregon Natural Resources Council	7	Rates	Tier 1 rate does not include true costs of hydrosystem
159	7	Oregon Natural Resources Council	7	Rates	Seasonal, flow-based rate structures
159	8	Oregon Natural Resources Council	7	Rates	Tier 2 rates dilute benefit of conservation
159	9	Oregon Natural Resources Council	7	Rates	Eliminate subsidies to DSIs, irrigation
165	5	American Rivers	7	Rates	Flow-based rates
165	6	American Rivers	7	Rates	Seasonal rate structures
174	4	Northwest Conservation Act Coalition	7	Rates	NCAC tiered rates proposal
174	5	Northwest Conservation Act Coalition	7	Rates	Low density discount
174	7	Northwest Conservation Act Coalition	7	Rates	Flow-based tier one size
83	4	Upper Columbia United Tribes Fisheries Research Center	10	Conservation	Priority to conservation that reduces fall & winter use
105	9	Benton County Public Utility District No. 1	10	Conservation	Adequacy of EIS analysis
109	4	Northwest Conservation Act Coalition	10	Conservation	Conservation proposal
109	7	Northwest Conservation Act Coalition	10	Conservation	Like parts of conservation reinvention
109	8	Northwest Conservation Act Coalition	10	Conservation	Conservation proposal
109	9	Northwest Conservation Act Coalition	10	Conservation	Erosion of conservation infrastructure
134	31	Columbia River Inter-Tribal Fish Commission	10	Conservation	Conservation should be the priority resource
137	35	Public Power Council	10	Conservation	Analyze less BPA in regional conservation
137	37	Public Power Council	10	Conservation	Assumptions about conservation spending
149	8	Confederated Tribes of the Umatilla Indian Reservation	10	Conservation	Conservation should be emphasized
162	6	Friends of the Earth	10	Conservation	BPA proposal would acquire less than current program
162	7	Friends of the Earth	10	Conservation	Tiered rates can't alone spur adequate conservation
109	5	Northwest Conservation Act Coalition	11	Renewable Resources	Amounts of renewables in alternatives

Table E-1: Comments and Responses to the BPA Business Plan Draft EIS (continued)

113	1	Renewable Northwest Project	11	Renewable Resources	Mandate exists for renewables; EIS analysis inadequate
174	8	Northwest Conservation Act Coalition	11	Renewable Resources	Proposal of Renewables Northwest Project
177	2	Public Meeting, Portland, 9/7/94: Comment of Renewable Northwest Project	11	Renewable Resources	
83	7	Upper Columbia United Tribes Fisheries Research Center	12	F & W Program Reinvention	F & W funding cap
83	9	Upper Columbia United Tribes Fisheries Research Center	12	F & W Program Reinvention	Expanding IPP will reduce $ for projects
101	3	Washington State Energy Office	12	F & W Program Reinvention	Why would board manage F&W better?
120	7	Idaho Fish and Game	12	F & W Program Reinvention	Failure to achieve F & W results partly BPA's fault
129	37	Seattle City Light	12	F & W Program Reinvention	F&W management assumptions
134	18	Columbia River Inter-Tribal Fish Commission	12	F & W Program Reinvention	Transfer admin. of F & W funding to other entities
138	9	Northwest Sportfishing Industry Association	12	F & W Program Reinvention	Eliminate BPA's F & W division
145	1	Montana Dept. of Fish, Wildlife and Parks	12	F & W Program Reinvention	F & W costs are an old debt
145	3	Montana Dept. of Fish, Wildlife and Parks	12	F & W Program Reinvention	Need more inf. on F & W reinvention
146	12	Sierra Club, Columbia Basin Field Office	12	F & W Program Reinvention	Support annual lump-sum payments for F & W
149	9	Confederated Tribes of the Umatilla Indian Reservation	12	F & W Program Reinvention	Transfer BPA F & W functions to another entity
151	11	Columbia Basin Fish & Wildlife Authority	12	F & W Program Reinvention	Need more inf. on F&W reinvention
153	10	Northwest Environmental Defense Center	12	F & W Program Reinvention	F & W funding cap not equitable
159	4	Oregon Natural Resources Council	12	F & W Program Reinvention	Funding cap inadequate
159	5	Oregon Natural Resources Council	12	F & W Program Reinvention	How will focus on results make F & W budget adequate?
162	4	Friends of the Earth	12	F & W Program Reinvention	Object to F & W budget cap
162	5	Friends of the Earth	12	F & W Program Reinvention	Analyze transfer to resource agencies and tribes

Table E-1: Comments and Responses to the BPA Business Plan Draft EIS (continued)

165	10	**American Rivers**	12	F & W Program Reinvention	BP should consider F & W "contract"
165	12	**American Rivers**	12	F & W Program Reinvention	Consensus decision-making for F & W expenditures
165	13	**American Rivers**	12	F & W Program Reinvention	Thoroughly analyze transfer of F & W responsibility
104	4	**Central Lincoln People's Utility District**	13	DSI Service	Treatment of DSI loads
104	5	**Central Lincoln People's Utility District**	13	DSI Service	BPA's legal obligations to DSIs
104	8	**Central Lincoln People's Utility District**	13	DSI Service	DSI rates assumptions
105	9	**Benton County Public Utility District No. 1**	13	DSI Service	Adequacy of analysis re: Tier 1 & preference
109	10	**Northwest Conservation Act Coalition**	13	DSI Service	Alternative DSI service
137	34	**Public Power Council**	13	DSI Service	Analysis of tiered rates and preference
137	36	**Public Power Council**	13	DSI Service	Use of FBS by DSIs, preference customers
138	3	**Northwest Sportfishing Industry Association**	13	DSI Service	Plan continues DSI favoritism
159	10	**Oregon Natural Resources Council**	13	DSI Service	Alternatives to DSI contracts, irrigation subsidies
165	7	**American Rivers**	13	DSI Service	DSI rates and contract provisions
169	4	**Canby Utility Board**	13	DSI Service	Treatment of DSI loads
169	5	**Canby Utility Board**	13	DSI Service	BPA's legal obligations to DSIs
169	8	**Canby Utility Board**	13	DSI Service	DSI rates assumptions
174	6	**Northwest Conservation Act Coalition**	13	DSI Service	EIS lacks alternative treatment of DSI contacts
134	25	**Columbia River Inter-Tribal Fish Commission**		Other	Need F & W additions to Ch. 3
143	1	**Office of the Governor of Oregon**		Other	Unresolved issues in EIS
149	1	**Confederated Tribes of the Umatilla Indian Reservation**		Other	Incorporate CRITFC's comments by reference
149	6	**Confederated Tribes of the Umatilla Indian Reservation**		Other	Need F & W additions to Ch. 3
159	13	**Oregon Natural Resources Council**		Other	Change BPA's name
173	5	**Office of the Governor of the State of Washington**		Other	Use PSCs to achieve Regional Act goals
176	1	**National Marine Fisheries Service**		Other	Support CBFWA comments

Scope of the EIS

Comment 109-3
Comment Topic: Relationship between BP and SOR.
Comment Category: Scope of the EIS
Comment Summary: Currently, the SOR presumes current rate-making while the BP EIS assumes static flow measures. The BP EIS and the SOR EIS should be linked, so that the impact of flow options on BP alternatives can be analyzed. Similarly, the impacts of the different BP alternatives on fish and wildlife should be evaluated.

Response: BPA's future business activities will be limited by the parameters established through the System Operation Review (SOR) process, and will not affect the hydro-electric system operating parameters determined through that process. When the Business Plan Draft EIS was prepared (during the spring of 1994), BPA estimated market responses and impacts based on current operation of the hydroelectric system. The SOR analysis (which largely took place from September 1992 to January, 1994) used a fairly simple view of marketing and rates vs. costs. BPA will update information about predicted revenues under the proposed BP in its evaluation of the revenue impacts of SOR alternatives. In addition, the supplemental draft BP EIS includes information based on the SOR EIS that shows the potential effects of two hydroelectric system operations strategies on the sales and revenues BPA could expect under various BP EIS alternatives. One strategy closely resembles current operations and one relies on higher flows than currently used and does not transport fish. While the characteristics of these strategies continue to evolve through the SOR process, BPA is using the latest possible information from SOR to determine the effects of the range of hydro operations on its business activities. The range of hydro operations impacts to fish and wildlife and other resources, as described in the SOR EIS, are summarized in the supplemental BP EIS.

Comment 109-10
Comment Topic: BP and SOR linked; suggest revisions.
Comment Category: Scope of the EIS (Analytical Methods; Rates; DSI Service)
Comment Summary: The Draft EIS ignores the intersection between hydro operations and business decisions. Both the SOR EIS and BP EIS each assume static inputs from each other. How operations for non-power purposes are set can be heavily influenced by rates. BPA needs to be able to react to the salmon crisis without jeopardizing its ability to be competitive. We recommend the following:

(1) Remove purchased power from Tier 1, allowing its size to fluctuate month-to-month, giving a price signal of the value of water.
(2) Investigate alternative DSI service arrangements (make service interruptible when the system is stressed by low water).
(3) Characterize costs to the system fairly; most of BPA's problems come from low gas and aluminum prices and many years of drought, not conservation or fish and wildlife expenses.

Response: The future operations of the hydroelectric system are being evaluated and will be determined through the SOR process. It is true that the SOR process's evaluation of the revenue impacts of SOR operations alternatives (documented in the Draft SOR EIS) were based on BPA's pre-Business Plan predictions of contracts and revenues. Since the Business Plan Draft EIS and the SOR Draft EIS were issued, new information about hydrosystem operations and projected BPA power marketing has been developed, and is being used to update the analysis in both documents. The supplemental draft Business Plan EIS addresses alternative strategies of future operations of the hydroelectric system, using strategies discussed in the SOR Draft EIS (see response to comment 109-3 above). In addition, BPA has provided the SOR analysts with new marketing information based on predicted operations under likely Business Plan alternatives.

The revised EIS analyzes a Tier 1 that does not include the costs of purchased power in the "Resource-Based Tier 1" policy module, and it analyzes DSI service options in DSI policy modules, including the concept of firm DSI service only during flow augmentation.

BPA recognizes that the threats to its competitive position are related to its total costs, not just to those arising from conservation or fish and wildlife programs. Fish and wildlife costs have stood out in recent years, though, due to continuing changes to respond to the crisis in salmon survival, and the concern among BPA's customers that BPA can neither predict nor control these costs.

Comment 134-10
Comment Topic: Scope of EIS should address hydro operations.
Comment Category: Scope of the EIS
Comment Summary: By refusing to address hydrosystem operational strategies in the DEIS, BPA fails to identify environmental effects in adequate detail so that alternatives can be compared as required under Part 1501.2 of NEPA. As nearly as can be determined from the BP and EIS, either electrical services and products will drive BPA actions and subsequent hydrosystem operations or hydrosystem operations as determined through the System Operations Review (SOR) will define electrical services and products that can be offered. Leaving hydrosystem operations out of the analysis and using the operational strategy from the Columbia River Salmon Flow Measures Options Analysis/EIS as indicated at 1.5.7 of the DEIS is a major omission and does not reflect the real needs for significant changes to protect and restore fish and wildlife.

Response: As stated in the Business Plan Draft EIS (page 1-6), BPA expects that the SOR process will define power operations that will apply to all BPA power transactions. As stated in the comment, the hydrosystem operations as determined through the SOR will define electrical services and products that can be offered. In an attempt to evaluate the effect on its business operations from the range of likely hydrosystem operations, BPA is examining in the supplemental DEIS two operations strategies from SOR, one which maximizes flows and drawdowns and one which more closely resembles current operations.

Comment 176-1
Comment Topic: SOR not adequate to analyze in-river impacts of BP.
Comment Category: Scope of the EIS
Comment Summary: The SOR process is incomplete and the SOR alternatives do not analyze the in-river changes that would result from the implementation of the Business Plan. The Draft EIS does not meet NEPA requirements because it does not adequately assess the potential adverse impacts and mitigation for Business Plan strategies. NMFS requires specific information about impacts and mitigation because of its mandate to protect the Endangered Species Act (ESA) listed stocks.

Response: See response to 109-3 and 134-10. Impacts of the two operations strategies from SOR used in the supplemental draft BP EIS analysis are summarized and incorporated by reference from the Draft SOR EIS. Because BPA expects the power products and services it can offer to be limited by decisions under the SOR (not that hydro operations will be driven by BPA Business Plan decisions), hydro operations impacts to fish and wildlife under the Business Plan will not differ from those identified in the SOR process.

Comment 153-1
Comment Topic: BP and SOR inappropriately separated.
Comment Category: Scope of the EIS
Comment Summary: BPA has inappropriately separated analysis and decisions about the Business Plan and the System Operations Review. BPA cannot estimate the economic impacts of alternative system operating strategies without evaluating alternative rate designs and power sales contract provisions, nor can it meaningfully evaluate business decisions unless it recognizes that those decisions play a key role in influencing the costs of alternative system operating strategies. The Business Plan EIS (at Appendix B-37) notes that "streamflow rates could help offset the economic impacts of [non power] operations," demonstrating that BPA itself recognizes this link. Until the environmental impacts from this connection are analyzed, the requirements of NEPA will not be met.

Response: Please see the response to comments 109-3, 134-10 and 176-1 in this section. BPA has included streamflow-based rates options in "modules" that may be applied to a number of the alternatives. (See sections 2.2.8 and 4.5.3.)

Comment 153-7
Comment Topic: Effects of changes in hydropower operations.
Comment Category: Scope of the EIS
Comment Summary: There is an overwhelming assumption in the Draft EIS that lack of BPA competitiveness would adversely affect fish and wildlife. There are no alternatives that explore the possibility that less pressure to produce hydropower would reduce BPA fish cost requirements, because hydro system operations are completely divorced from financial incentives. There is no discussion of the mechanics of a healthy fish/healthy BPA link.

Response: The SOR EIS, rather than the Business Plan EIS, is the appropriate forum to evaluate the appropriate balance between operations of the hydroelectric system to address fish and to generate power. Those are only two of the uses of the Columbia River hydroelectric system; others include irrigation, flood control, and navigation. The multiple uses of the system are being addressed comprehensively in the SOR process. BPA has provided updated information about its marketing plans and alternatives to the SOR analysts, and is using the most current information about SOR analysis for its Business Plan analysis. Please see also the responses to comments 109-3 and 109-10.

Using hydro operations to improve conditions for anadromous fish generally reduces the amount and flexibility of power products available from the hydro system. Because those hydro power products are a major advantage to BPA in marketing, due to their low cost, operations that produce less hydro power will increase BPA's costs and rates, reducing its ability to compete with other suppliers. Conversely, if BPA is unable to compete with other suppliers, it will be difficult for the agency to pay the costs of its programs, including Fish and Wildlife

Comment 134 -11
Comment Topic: F&W should be a decision supported by EIS (Ch. 1.4).
Comment Category: Scope of the EIS
Comment Summary: In Chapter 1.4, fish and wildlife are not considered a decision element to be supported by the EIS. How does this support the "equitable treatment" mandate of the NWPA? Unless BPA remedies these defects through issuance of a supplemental DEIS, substantive analysis of impacts to fish and wildlife from the operation of the hydrosystem will not be properly addressed.

Response: The Draft BP EIS listed the decision element "Fish and wildlife administrative strategy" in Section 1.4. The decision elements were meant to define the range of decisions to be made based on this EIS; they were not meant to be the factors to be weighed in choosing among alternatives--the "Purposes" (Section 1.2 in the DEIS) were meant to do that. In an attempt to make this intent clearer, the supplemental draft BP EIS refines the original purposes (against which the alternatives will be evaluated) to include a specific purpose of "equitable treatment." As stated in other responses, BPA expects the SOR process to define hydro operations that will then determine the hydropower products and services BPA can offer. The supplemental draft BP EIS analyzes the impacts on its business operations of two potential hydro operations scenarios from the SOR Final EIS and discusses predicted impacts to fish, wildlife and other resources.

Comment 165-1, 120-9
Comment Topic: EIS deficient under NEPA, NWPA, ESA.
Comment Category: Scope of the EIS
Comment Summary: "The Business Plan is seriously deficient with regard to BPA's fish and wildlife obligations under the Northwest Power Act (NWPA) and the Endangered Species Act (ESA), and does not satisfy procedural mandates under the National Environmental Policy Act (NEPA)." We hope BPA will revamp the BP and develop supplemental EIS analyses that give fish and wildlife equitable treatment with power generation. Failure to do so will lead to time consuming and costly litigation.

Response: Based on these and other comments, BPA has prepared a supplemental draft EIS for further public review and comment. Please see responses to comments 109-3, 134-10, and 134-11. This document still limits the discussion of fish and wildlife issues to the administration of BPA's Fish and Wildlife Program; it does not address the specific measures or strategies for enhancing fish and wildlife as mandated by the NW Power Act, which are the subject of the NW Power Planning Council's Fish and Wildlife Program.

Comment 134-12
Comment Topic: Incorporating documents by reference does not meet 1502.1.
Comment Category: Scope of the EIS
Comment Summary: Using other documents incorporated by reference as shown in Chapter 1.6 fails to demonstrate that BPA has made the necessary environmental analyses in a concise and clear manner as required in 1502.1 of the NEPA regulations.

Response: Section 1502.21 of the Council on Environmental Quality regulations implementing NEPA states:

> "Agencies shall incorporate material into an environmental impact statement by reference when the effect will be to cut down on bulk without impeding agency and public review of the action. The incorporated material shall be cited in the statement and its content briefly described."

BPA has followed these regulations in this EIS and has added material that discusses impacts to Northwest resources of alternative hydro operations, as identified in the SOR EIS. See also response to comment 109-3 in this section.

Comment 176-5
Comment Topic: BP lacks an explicit water policy.
Comment Category: Scope of the EIS
Comment Summary: The Regional Act and its resulting energy plan and fish and wildlife program give BPA and other Federal operating and regulatory agencies the responsibility to manage water resources in the Columbia Basin for fish and wildlife and other project purposes. The BP needs to identify BPA's commitment to its water management responsibilities with a clear statement of water policy.

A comprehensive Federal water policy could allocate existing and future water supplies to support spring and summer fish migration. It could also help eliminate inconsistent water resource decisions. For example, BPA provides a significant power rate discount to the irrigation utilities without incentives for water conservation. At the same time, it pursues water marketing schemes to reduce water withdrawals. The first activity subsidizes removal of water; the second subsidizes replacement. NMFS supports water marketing schemes that replace water and increase spring and summer migration flows.

Response: Water management in relation to fish migration is addressed by the SOR EIS. The supplemental draft BP EIS addresses the issue of eliminating the irrigation discount on BPA power. The general topic of Columbia Basin or Federal water policy is beyond the scope of this EIS.

Comment 142-6
Comment Topic: Acquisition of mid-Columbia hydro facilities.
Comment Category: Scope of the EIS
Comment Summary: BPA has failed to examine the least-cost source of new power supplies: acquisition of the mid-Columbia hydroelectric projects presently owned by several public utility districts but dedicated to providing power to various investor-owned utilities.

Response: BPA's current authority does not permit it to own generating plants. If BPA chose to pursue the right to market power from those facilities, the likely owner and operator would be the U.S. Army Corps of Engineers or the Bureau of Reclamation. Any such acquisition would provide operational benefits to the Federal hydro system but would require Congressional action. Current political trends suggest that it would be difficult to obtain approval for an expansion of government resource management, particularly where it would engender significant opposition from other PNW interests.

The BP EIS does not address specific resource acquisitions, and does not contemplate acquiring Mid-Columbia projects for the reasons given above.

Comment 142-2
Comment Topic: Need a fully scoped EIS.
Comment Category: Scope of the EIS
Comment Summary: BPA's reinvention of the principles and mechanism for delivery of power and fundamental changes in ratemaking principles, achieving conservation, and accomplishing environmental protection also require a fully scoped EIS.

Response: BPA believes that the EIS is appropriately scoped and that it has evaluated the reasonable alternatives to meet the agency's goals in this action. However, in response to comments on the Draft EIS and new information about the direction of the SOR process, BPA has prepared this supplemental draft EIS.

Purpose and Need/Goals

Comment 134-1
Comment Topic: Make anadromous fish protection basic objective.
Comment Category: Purpose and Need/Goals
Comment Summary: The BP and DEIS do not make anadromous fish protection, which supports the tribes' Indian treaty rights, a fundamental objective that is integrated into future management of the hydrosystem. "This DEIS only considers fish and wildlife obligations as an adjunct administrative function that impacts achieving a certain level of revenue success through the production of electricity from optimizing dam operations." This does not meet the NWPA's "equitable treatment" standard and fails NEPA planning requirements; a supplemental DEIS should be issued.

Response: BPA stated in the Draft EIS (in several places in chapter 2 and elsewhere) its intention to meet its fish and wildlife responsibilities under the Regional Act, except as noted under certain alternatives. The description of the proposed action explicitly stated in paragraph 3 (page 2-7) BPA's intention to fulfill its Council Program, ESA and other fish and wildlife responsibilities.

As stated in the response to comment 134-10 (Scope of EIS) and others, decisions made in the SOR process will determine the hydroelectric operations constraints within which BPA will develop products and services the agency proposes to provide through the Business Plan, not that Business Plan decisions will change hydro system operations.

However, BPA has attempted to clarify decisionmaking concerns by revising the "Purposes" in section 1.2 to include the purpose of providing equitable treatment for fish and wildlife and other purposes of the Federal Columbia River Power System.

Comment 174-13
Comment Topic: EIS should evaluate against goals of Regional Act.
Comment Category: Purpose and Need/Goals
Comment Summary: Our main concern with the EIS has been that BPA is failing to evaluate the proposals against the goals of the Act, and instead seems to be measuring the success of any alternatives by its new Strategic Business Objectives, which are more akin to short-term commercial purposes.

Response: BPA intends to meet the goals of the Regional Act, as well as all the other legislation governing its activities. See also response to comment 134-1 (above).

Comment 146-8
Comment Topic: SBOs should include meeting statutory obligations.
Comment Category: Purpose and Need/Goals
Comment Summary: The Market-Driven alternative is inappropriate because the Strategic Business Objectives do not include, first and foremost, a commitment to meet BPA's statutory obligations. In fact, the first objective "achieve high and continually improving customer satisfaction" is what landed BPA in its current financial crisis: the agency pushed up its fixed cost ratio (Plan, p. 7) and debt load to the U.S. Treasury (Plan, p. 21) at the insistence of its customers.

Response: As discussed in the response to comment 134-1, the Market-Driven alternative is founded on a commitment to meet BPA's statutory obligations. However, to make BPA's evaluation criteria clearer, BPA has revised the "Purposes" (see Chapter 1), against which the alternatives will be judged.

The EIS evaluates how well the alternatives enable BPA to improve customer satisfaction while meeting its statutory obligations. The concern underlying the objective of improving customer satisfaction is that loss of sales resulting from customers purchasing non-BPA power will reduce BPA's revenues and limit its ability to pay the costs associated with those statutory obligations.

Comment 134-6
Comment Topic: Equitable treatment and competitiveness.
Comment Category: Purpose and Need/Goals
Comment Summary: The DEIS does not incorporate or equitably consider the NWPA mandate to treat the Columbia Basin's fish and wildlife as an equal partner with other uses in the management and operation of the water projects when it evaluates real or perceived threats to BPA's competitiveness.

Response: See response to comment 134-1 in this section.

Comment 138-7
Comment Topic: BPA not providing equitable treatment.
Comment Category: Purpose and Need/Goals
Comment Summary: BPA's sole purpose is not to provide power. The U.S. Congress has given BPA the responsibility to protect, mitigate, and enhance fish and wildlife resources of the Columbia River.

Response: See response to comment 134-1 in this section.

Comment 120-1
Comment Topic: Need competitive BPA, equitable treatment, reduced debt.
Comment Category: Purpose and Need
Comment Summary: We appreciate BPA's concern to remain competitive, but also recognize that it is servicing substantial long-term WPPSS debt while at the same time subsidizing a marginal aluminum industry through energy purchases from primarily private utilities. BPA also has obligations under the Regional Act to provide equity between fish and wildlife and energy. One of IDF&G's major concerns is how BPA can meet fish and wildlife needs and remain competitive.

Response: WPPSS debt is a substantial contributor to BPA's costs, but BPA cannot lawfully refuse to make payments on it. BPA's payments on the WPPSS debt have been reduced $40 million annually through refinancing at lower interest rates in recent years.

BPA does not believe that it is subsidizing its aluminum-producing direct service industries, as their load characteristics make the cost of serving them low, and reserves and other benefits of their nighttime loads provide BPA with additional revenues and cost savings.

We have revised the purposes of the EIS to address specifically equitable treatment of fish and wildlife along with power production.

Comment 146-3
Comment Topic: No evidence of need for action
Comment Category: Purpose and Need/Goals
Comment Summary: The BP and EIS provide no compelling evidence that BPA is in any competitive danger that requires it to respond in a new way to the market. The DEIS states that if BPA made no changes in policy or business, the agency's rates would rise just 5 percent by the 2003 (p. 4-39), and loss of firm load would run to only 599 megawatts (MW) (p. 4-42). Even if the load loss grew to 1000 MW, BPA revenues would fall by a mere $80 million (p. 4-74). This calculation assumes the worst-case scenario that the agency would sell the 1000 MW to new buyers at 18 mills per kilowatt-hour. If new purchasers paid 27 mills, BPA would suffer no financial impact from the forecast load losses under the status quo alternative. This is not a competitive business disadvantage, much less a death spiral.

Furthermore, BPA is a public agency, not a business. BPA was established by Congress to further public goals, which have not changed, so there is no need to adopt new policies regardless of any real or alleged transformations in the electricity marketplace.

Response: Analysis of the competitive threat in the draft EIS may have understated costs and their effects on loads for several reasons. The rate increase estimated in the draft EIS did not include the effect of load losses in response to the rate. This oversight has been corrected in the illustrative numerical analysis in the supplemental draft EIS. Higher load losses are also likely as falling natural gas prices and higher efficiency in CTs reduce the cost of alternatives to BPA power. In addition, potential changes in hydro operations to improve conditions for salmon could add to BPA's costs, increasing rates and load loss (e.g., the Council estimated its Fish and Wildlife Program would increase BPA's costs by $177 million). Additional information on current competitive conditions for BPA is included in the SDEIS in sections 1.3 and 4.4.

2nd para. response: BPA is a public agency but is not tax-supported. As such, it needs to behave more like a business than many public agencies in that, in the process of furthering public goals, it needs to ensure it can sell enough of its product to cover its costs.

Comment 149-2
Comment Topic: BP fails to comport with treaty rights.
Comment Category: Purpose and Need/Goals
Comment Summary: The BP must reflect the requirements and constraints mandated by Indian treaties, the federal government's trust responsibility to Indian tribes, and the case law interpreting them. The commenters spend several pages describing the legal basis for the relationship between Federal agencies and tribes, including the concepts of the sovereign rights of the tribes as independent governments, the responsibility of the government to safeguard that which is the subject matter of Federal treaties with Indian tribes, and the superiority of tribal treaty rights to the rights other citizens enjoy--meaning they cannot be "balanced" against competing interests.

The commenters then say that, in order to fulfill these responsibilities, the BP must have the goal of "full restoration of all anadromous fish runs (including those presently extirpated and those declining but not yet listed under the ESA)" so they can provide for healthy, viable populations sufficient for sustainable Indian harvest.

Response: In keeping with the Department of Energy's Indian Policy, BPA recognizes that a trust responsibility derives from the historical relationship between the Federal government and the Tribes. BPA is developing with the commenter and other Tribes in the Basin a BPA Tribal Policy to help BPA establish government-to-government relationships with the Tribes and to fulfill its trust responsibility. (See response to comment 149-3 (Procedural Issues)). The Tribal Policy will be an additional safeguard to ensure compliance with section 10(e) of the Northwest Power Act (Act) which states that "[n]othing in this Act shall be construed to affect or modify any treaty or other right of an Indian tribe."

The comment is primarily concerned with fishery mitigation. Section 4(h)(10) of the Act, BPA's primary fish and wildlife mandate, directs BPA to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of the Federal hydroelectric projects in the Columbia River Basin. BPA fulfills this statutory obligation by funding fish and wildlife measures that are consistent with the Northwest Power Planning Council's Fish and Wildlife Program. Similarly, BPA provides equitable treatment by taking the program into account to the fullest extent practicable in its decisionmaking processes and by implementing the Program to achieve system-wide mitigation of fish and wildlife. BPA also consults with various agencies pursuant to the Endangered Species Act to avoid jeopardizing threatened or endangered species and expects to take the actions recommended or reasonable and prudent alternatives to them. These actions under the Act and ESA will benefit both listed and unlisted fish stocks. By these means, BPA fulfills its responsibilities to Native Americans and other citizens to protect resources valued by both. Nonetheless, BPA has not included in the Business Plan a goal of "full restoration of all anadromous fish runs" because this goal is not part of the Council's Program, the Northwest Power Act or its legislative history, or the Endangered Species Act, and is probably not achievable through changes in the operation of the hydrosystem only.

Procedural Issues

Comment 120-10
Comment Topic: Defer BP until Idaho v. NMFS and SOR are settled.
Comment Category: Procedural Issues
Comment Summary: BPA should defer action on the Business Plan until there is a court settlement under Idaho v. NMFS. The federal hydro operators have maintained that the SOR preferred alternative will need to be consistent with the court settlement, and since the Business Plan is predicated on the SOR, it is premature to consider a final Business Plan until SOR and the court action are complete.

Response: As this is written, NMFS is finalizing their new biological opinion, which incorporates information developed during the settlement process in Idaho v. NMFS. The process will conclude formally in February with the publication of the final biological opinion. This allows ample time for BPA to consider information in that opinion

before the final Business Plan decisions are taken. In any event, information from the settlement is being used to develop SOR alternatives, two of which are setting "endpoints" of the BP analysis of hydro operations effects on Business Plan activities (see response to comment 109-3--"Scope of the EIS").

Comment 151-1
Comment Topic: Redraft documents after other processes done.
Comment Category: Procedural Issues
Comment Summary: Current court actions and the SOR, which makes major assumptions regarding the Pacific Northwest Coordination Agreement, are incomplete. The outcome of these processes will likely alter at least one alternative in the DEIS. It seems unreasonable to proceed in the face of such unknowns.

Response: BPA acknowledges that potential changes in hydro operations could affect its assessment of the impacts of alternatives addressed in the EIS. As stated in the response to comment 109-3 (Scope of the EIS), BPA's future business operations will occur within the parameters established through the System Operation Review (SOR) process and other related processes. The supplemental draft BP EIS includes information from the SOR EIS that shows the potential effect of two SOR hydroelectric system operations strategies on the sales and revenues BPA could expect under various BP EIS alternatives. These operations alternatives encompass the range of likely outcomes and impacts of the SOR process. The BP EIS also summarizes the environmental impacts of the range of strategies from the SOR EIS.

Comment 134-5
Comment Topic: Hold EIS until after negotiations on IDFG v. NMFS.
Comment Category: Procedural Issues
Comment Summary: The BP and DEIS cannot be finalized until negotiations between the federal agencies, state agencies and Treaty tribes in Idaho Dept. of Fish and Game v. National Marine Fisheries Service are complete.

Response: See response to comment 120-6.

Comment 83-12
Comment Topic: BP should wait for SOR operations impacts
Comment Category: Procedural Issues
Comment Summary: The BP EIS is incomplete because it does not include impacts of hydrosystem operations to anadromous fish, resident fish or wildlife. A supplemental EIS should be prepared that incorporates information from SOR when it is available.

Response: As stated in response to comment 109-3 (Scope of the EIS), the supplemental draft BP EIS discusses hydro operations impacts to anadromous and resident fish, to wildlife, and to other resources. See also response to comment 151-1 (above).

Comment 146-15
Comment Topic: Object to BP and SOR on separate tracks
Comment Category: Procedural Issues
Comment Summary: Sierra Club objects to the Business Plan and System Operation Review being on separate tracks when the two analyses are integrally linked. Rates decisions in the BP directly affect analyses of costs under the SOR alternatives, and vice versa. And no alternative in either document evaluates how to optimize operation of the federal dams and electric grid for both electricity and fish. At a minimum, the agency should clearly state the precise relationship between the two processes. The DEIS offers only an inadequate schematic discussion (p. 1-6 and 1-7).

Response: As stated in response to comment 109-3 (Scope of the EIS), BPA's future business operations will occur within the parameters established through the SOR process and will not affect the hydroelectric system operating parameters determined through that process. BPA is working with the SOR analytical team to provide updated information about predicted revenues under the proposed BP to update the evaluation of the revenue impacts of SOR alternatives. And it is the SOR process in which the various uses of the river, including electricity and fish, are being balanced. See also responses to comments 134-10 (Scope of EIS) and 151-1 (Procedural Issues).

Comment 159-11
Comment Topic: SOR and BP and contracts out of sequence
Comment Category: Procedural Issues
Comment Summary: Actions under the SOR and the Business Plan are occurring out of sequence. It seems irresponsible to assert the costs of various system options (in the SOR) before the rate structure has been developed and adopted (in the Business Plan). Also, contract negotiations should not proceed until comments are weighed and a final business plan adopted. Otherwise, contracts will drive Business Plan decisions when it should be the other way around.

Response: Please see response to comment 151-1 in this section. In fact, BPA assumes that the outcome of the SOR process will determine the capability of the hydro system to supply the mix of products it offers, which will then affect its costs and rates, rather than the other way around. Also, see response to comment 153-3 below.

Note also that some commenters have expressed the opposite view, that the SOR process should be completed before the Business Plan. We recognize that both processes affect each other, and we are taking steps to apply information from the BP process in SOR and vice versa.

Comment 153-3
Comment Topic: Timing of rates and contracts discussions
Comment Category: Procedural Issues
Comment Summary: It appears that power sales contract negotiations and rate discussions will begin before the Business Plan EIS is complete. If these discussions begin before the environmental analysis is complete and the Record of Decision is published, the contract negotiations and rate discussions will drive the NEPA process by foreclosing consideration of alternatives beyond those agreed to in negotiations with customers. This is a direct violation of NEPA.

Response: Because changes in the electric utility industry are occurring rapidly, it is necessary to initiate contracts and rates discussions before the Business Plan EIS is complete. NEPA encourages Federal agencies to integrate environmental analysis with the agency decision process, so that the environmental analysis informs the decision-making. The contracts and rates negotiations develop a proposal, which is then evaluated against existing NEPA documents; further NEPA analysis is done if necessary. BPA will not make decisions on the contracts and rates until the BP EIS is final and deemed adequate to cover the proposal resulting from the negotiations.

Comment 146-14
Comment Topic: BP and power sales contracts decisions already made.
Comment Category: Procedural Issues
Comment Summary: BPA is entering into power sales contract negotiations with its customers in violation of the law. It has no final Business Plan resolving the structure for its new tiered rates, no final EIS for the Plan, and no Record of Decision. It is negotiating with no environmental assessment of alternatives, such as rates based upon fish flows, for power sales contracts. It appears that BPA has already determined the outcome for the Business Plan and the contracts.

Response: See response to comment 153-3 in this section.

Comment 142-3
Comment Topic: NEPA analysis of power sales contracts
Comment Category: Procedural Issues
Comment Summary: Even though BPA has stated since June 1994 that "policy issues" will be resolved after the Business Plan becomes final, it claims that the Business Plan EIS will "support" both the "policy direction for BPA's sale of power products," and the "contract terms BPA will offer for power sales to PNW publicly-owned utilities, IOUs and DSIs." Leaving unexamined the substantive and policy level decisions about the terms of the power sales contracts is unlawful.

Response: BPA recognizes that the development of new power sales contracts and rates are subject to NEPA, and that is why it prepared the Business Plan Draft EIS before proceeding with contracts and rates decision-making. The supplemental draft EIS contains additional analysis of the current proposals for rates and contracts. BPA will not make decisions on contracts and rates until the BP EIS is completed.

Comment 174-11
Comment Topic: Delay contract negotiations, tiered rates.
Comment Category: Procedural Issues
Comment Summary: BPA should delay the negotiation of power sales contracts and implementation of tiered rates until after the EIS is finalized.

Response: Please see the response to comment 153-3 in this section.

Comment 146-1
Comment Topic: Withdraw BP and DEIS.
Comment Category: Procedural Issues
Comment Summary: The DEIS is dangerously flawed--unresponsive to BPA's legal duties or to its business position. There is no need or purpose for this major federal action, as the BPA Influence alternative is the only legal course of action and therefore requires no new policy, plan, or environmental assessment. Instead of plunging BPA and the regional power supply system into destructive controversy and litigation, the Sierra Club urges you to withdraw the proposed Strategic Business Plan and the DEIS.

Response: The National Environmental Policy Act requires a Federal agency to prepare an EIS if it proposes a major action that may result in significant environmental impacts. NEPA also requires an agency to evaluate all reasonable alternatives that meet the need for its proposed action, even if an alternative is not allowable under the existing legal framework. However, as stated on p. 2-5 of the Draft EIS, the alternatives evaluated in the EIS assume that BPA continues to fulfill energy conservation and fish and wildlife obligations under the Northwest Power Act and to fulfill other laws, except as specifically noted. The exceptions (see p. 2-2) include the Maximum Financial Returns alternative, which assumes a change in the statutory requirements that BPA provide firm power requirements service at rates sufficient to cover total system cost, and the Minimal BPA Marketing alternative, which assumes that statutes are changed so that BPA is not required to acquire additional generation and conservation resources to serve customer loads. The revised EIS also includes "response strategies" to the outcomes of certain alternatives and two operations scenarios, some of which may require new or revised statutes to implement.

Withdrawing the EIS would prevent BPA from taking actions to adapt to the changes occurring in the electric utility industry and would lead to the business and environmental consequences of the Status Quo alternative.

Comment 174-12
Comment Topic: One EIS not sufficient for range of issues involved.
Comment Category: Procedural Issues
Comment Summary: We believe that one blanket EIS cannot be sufficient for NEPA compliance for future rate designs, power sales contracts, significant changes in resource acquisition, and fish and wildlife programs.

Response: NEPA regulations permit Federal agencies to review the potential environmental consequences of related actions in a single NEPA document, and they discourage inappropriate segmentation of linked decisions. Because BPA is considering rate designs, power sales contracts, and fish and wildlife program administration in its Business Plan decisions, it is appropriate that these decisions be analyzed in a single EIS. Please see also the response to comment 153-2 in this section.

Please note that the BP EIS does not address specific resource acquisition decisions or specific actions to implement the Council's Fish and Wildlife Program. Both of these types of decisions would be the subject of additional NEPA documentation.

Comment 153-2
Comment Topic: Need additional tiered NEPA review.
Comment Category: Procedural Issues
Comment Summary: The Business Plan is a programmatic EIS, and when BPA makes specific decisions on power sales contracts and rates, it must develop and tier additional NEPA documents to this EIS. NEDC is concerned that specific decisions (including alternative DSI rates and alternative rate designs, including irrigation rates and streamflow-based rates) will be made by BPA without the necessary NEPA analysis of their impacts.

Response: BPA agrees that the Business Plan EIS is a programmatic EIS; however, because it is a programmatic document does not necessarily mean that subsequent decisions on rates and contracts will require separate NEPA analysis. BPA initiated the Business Plan EIS with the goal of preparing environmental analysis that would support subsequent contract negotiations and rate cases. BPA will evaluate rate and contract proposals against existing NEPA documentation to determine whether it is adequate or whether additional NEPA analysis is required.

The supplemental draft EIS includes additional information on DSI rates and other rate design issues which was not included in the initial draft.

Comment 92-2
Comment Topic: Need new EIS for contracts.
Comment Category: Procedural Issues
Comment Summary: BPA should not rely on the existing Draft EIS to cover the range of issues addressed by new comments; instead, BPA should begin preparation of an EIS on new contract terms as part of the contract renegotiation process. The draft document should be published when the draft of the new power sales contracts is ready for review by customers.

Response: BPA believes that the information in the final Business Plan EIS will be sufficient to document the impacts of new power sales contracts, but we will not know for sure until the terms of the proposed contracts are settled. Once a proposal has been made, BPA will be able to assess whether additional NEPA documentation is appropriate.

The supplemental DEIS contains new information and analysis on several issues, including power sales contracts issues, particularly in relation to DSI service and tiered rates.

Comment 104-3, 169-3
Comment Topic: Prepare new EIS with more info. on rates.
Comment Category: Procedural Issues
Comment Summary: BPA should publish a revised draft Business Plan and EIS, with more information about rates and impacts on preference customers, before proceeding with a final version.

Response: BPA has prepared a supplemental draft EIS on the Business Plan, which provides more detailed analysis of rate and contract issues. It includes additional rates and DSI options (in the modules). The EIS analysis of the effects of alternatives on BPA's utility loads inherently addresses effects on preference customers, because all of BPA's firm energy sales to PNW utilities are to preference customers. See sections 2.2.8 and 4.5.

Comment 149-3
Comment Topic: Government-to government consultation with Tribes.
Comment Category: Procedural Issues
Comment Summary: President Clinton, Attorney General Janet Reno, and the Department of Energy have affirmed the responsibility of Federal agencies to consult with Tribes on decisions that affect them on a government-to-government basis.

Response: BPA agrees that the Administration and the Department have directed Federal agencies, including BPA, to consult with Tribes on decisions that affect them on a government-to-government basis. For over a year now, BPA has been working with the Region's Tribes to develop a Tribal Policy which outlines how BPA will establish and maintain its side of a government-to-government relationship with each of the Tribes. To lead this and other relationship-building efforts with the Tribes, during its reorganization BPA created and filled a Tribal Account Executive position, a new full-time permanent position. In addition, BPA continues to consult with Tribes when necessary to fulfill its duties under Federal laws such as the National Environmental Policy Act and the National Historic Preservation Act (see Chapter 5).

Comment 83-6
Comment Topic: BP inappropriately ahead of Council's Power Plan.
Comment Category: Procedural Issues
Comment Summary: BPA's Business Plan appears to be way out in front of the Council's Power Plan, currently in process. Since the projected rate increase is only 5 percent without BPA reinvention, why is BPA rushing ahead without a proper analysis?

Response: The Council's next Power Plan, which is expected to be released in draft in spring, 1995, addresses regional electrical generation and conservation supply issues, not the broad BPA business direction alternatives BPA is addressing in the Business Plan and this EIS. BPA's conservation and resource acquisition decisions are addressed in its resource acquisition programs, which were evaluated in the Resource Programs Final EIS issued in February 1993. BP EIS assumptions about resource acquisitions are consistent with the Council's Plan except for modules that project acquiring higher-cost renewables and the expected new emphasis on purchased power to replace generation foregone for fish mitigation. The Council, too, is revising its approach to take into account the changes in the electric utility industry.

The June 1994 draft BP EIS understated the magnitude of the rate increase under the Status Quo alternative. Re-analysis of rate and load impacts of Business Plan EIS alternatives for this supplemental draft EIS shows a greater difference in rates among alternatives. However, in today's competitive energy markets, a difference of only a few mills in power costs is enough to affect where retail utilities and industrial users choose to turn for their power supplies.

Alternatives Analyzed in EIS

Comment 134-2
Comment Topic: F&W alternative.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: BPA did not include a NWPA fish and wildlife plan alternative as we suggested in our scoping letter of September 13, 1993. As stated in the 1993 letter, "[t]he federal hydrosystem would be coordinated with the private hydrosystem to meet fish and wildlife needs as recommended by the tribes and fishery agencies. Examples of needs include provisions for increased flows, modification of reservoir elevations and increased habitat. This would be first priority. Second priority would be marketing power to preference customers. Third priority would be marketing power to the Direct Service Industries and others as power is available."

Response: As stated in responses to other comments (for example, in comment category "Scope of the EIS"), BPA expects that the outcome of the SOR process will determine the hydro operations within which BPA must market its products. In addition, BPA has stated that the alternatives considered in the EIS will comply with the Council's Fish and Wildlife Program and other legal mandates, except where specifically noted. The proposed action does not include such exceptions.

The supplemental draft BP EIS includes analysis of two hydro operations strategies derived from the System Operation Review process, which show the effect a range of potential operations may have on BPA's products and services, rates and revenues. One would provide the highest flows for fish and would likely provide the priority suggested by the comment; the other more closely resembles current operations. The supplemental draft BP EIS also includes alternative contract provisions for DSIs and rate designs which commenters have suggested might provide benefits to salmon.

A multitude of possible variations to hydro operations exist, many of which have been proposed by various commenters in a variety of forums. BPA is not legally required, nor can it realistically be expected, to present and evaluate all possible alternatives in the EIS. It must consider the full range of reasonable alternatives. As the SOR is the appropriate forum to consider alternative hydro operations, we have taken two operations strategies from that process that represent the range of likely outcomes, and have shown how they will impact Business Plan decisions. However, the process in which interested parties should present variations to those operations is the SOR, not the Business Plan.

Comment 120-4
Comment Topic: DEIS fails to consider F&W alternative.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The DEIS fails to consider a fish and wildlife alternative proposed during the scoping process.

Response: See response to comment 134-2 above.

Comment 134-3
Comment Topic: Need PNCA alternative.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: BPA did not include a Pacific Northwest Coordination Act alternative as we suggested in our scoping letter of September 13, 1993. As stated in the 1993 letter, "BPA would act in accordance with the Pacific Northwest Electric Power Planning and Conservation Act of 1980, without any deviations from the Act. All agency actions would be measured against the language and clear intent of the Act."

If fishery concerns and appropriate operational constraints were included in the PNCA, in-river migration conditions for anadromous fish could be improved, but the EIS does not address this.

Response: The PNCA and alternatives to it are within the scope of the SOR process. BPA believes it has been acting in accordance with the 1980 Regional Act. Please see also response to comment 134-2 above.

Comment 134-8
Comment Topic: Need alternative based on DFOP.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The DEIS does not consider an alternative that includes the needs for fish and wildlife that are incorporated in the fishery managers' Detailed Fishery Operating Plan with 1994 Operating Criteria.

Response: Please see response to comment 134-2 in this section. The SOR 7a strategy from the SOR process, used as one of the potential strategies to bracket the BP EIS analysis, closely resembles DFOP.

Comment 134-9
Comment Topic: Need alternative that eliminates dams.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: "Another alternative to be considered would be the elimination of projects that can be shown to be detrimental to anadromous fish. This would include dam breaching for Lower Granite, Little Goose, [and] Lower Monumental along with a substantial reduction in size of John Day and McNary pool or dam breaching."

Response: This alternative is not encompassed in the scope of this EIS. Because it addresses the operation of the hydro system, it is more appropriate to the SOR process.

Comment 134-13
Comment Topic: Structure alternatives to benefit salmon.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: None of the six alternatives, including Status Quo, include marketing actions designed to provide improved hydrosystem operational benefits to fish and wildlife, anadromous fish in particular. The current operational agreements or the base conditions described in this DEIS, as determined from the Salmon Flow Measures Options Analysis EIS or through the Endangered Species Act (ESA) consultations with NMFS are inadequate to restore salmon stocks to productive levels. The NMFS 1993 Biological Opinion was successfully challenged in federal court for not providing suitable recovery of listed salmon stocks. These shortcomings must be taken into account in developing and evaluating a broad range of hydrosystem operational alternatives.

BPA must recognize the impact of marketing actions on salmon and then structure market actions to benefit salmon.

Response: Please see response to comment 134-2 in this section.

Comment 134-33
Comment Topic: Propose alternative hydrosystem operation.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: We suggest an alternative hydrosystem operation be included in a supplemental DEIS. [The commenters propose over 2 pages of criteria for instream flows in the mainstem Snake and Columbia rivers, plus additional flow-related measures.] [Oregon Department of Fish and Wildlife submitted similar but more detailed operations suggestions on the BP.]

Response: These detailed operations proposals are more appropriate to the SOR process. They resemble operations as described in the SOS 7a strategy from the SOR process, one of the operations strategies included in the supplemental draft BP EIS to show how it affects Business Plan decisions.

Comment 138-2
Comment Topic: Alternative hydro operations not analyzed.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The BP and EIS do not adequately analyze alternative hydrosystem operations for anadromous fish, nor do alternatives integrate fish and power.

Response: Please see response to comment 134-2 in this section.

Comment 83-2
Comment Topic: SOR does not analyze all alternatives; BP inadequate.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The Plan relies on the incomplete SOR process for NEPA compliance. The agencies and Tribes have questioned assumptions and analysis in the SOR and are concerned that, as a result, the Business Plan does not consider all alternatives. Loss of some BPA load could give BPA the opportunity to operate the hydrosystem to be more beneficial for anadromous and resident fish. It might reduce BPA's revenue to the benefit of another utility but would implement BPA's fish and wildlife mandate.

Response: The supplemental draft BP EIS incorporates information on impacts of hydro operations to reduce reliance on the SOR EIS. Although loss of load might permit hydro operations that could benefit fish populations, the effects of lost revenue could weaken BPA's viability as a power marketer, undermining its ability to fund mandated fish and wildlife enhancement activities. (See section 2.5, Comparison of Alternatives.)

Comment 159-1
Comment Topic: Benefits of F&W alternative.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: BPA's statements such as "...our business success supports the achievement of our legislative mandates," etc. fails to recognize the connection between how BPA earns its revenues and its fish and wildlife mandate. "The need to finance fish and wildlife programs stems directly from the damage done by operations of the federal hydrosystem. [Thus], the attempt to meet BPA's mandates by focusing on maximizing revenues is likely a losing strategy for fish and wildlife."

BPA should seriously consider alternatives which, while producing fewer revenues, also require fewer expenditures to mitigate fish and wildlife losses. Analysis likely will show that, if modifications were made in the structure and operation of the hydrosystem to make it more compatible with fish and wildlife (admittedly a substantial initial investment), future reduced costs would more than offset related revenue losses and offer the stability and certainty needed to attract customers.

Response: The supplemental draft BP EIS addresses the effects of alternative hydro operations strategies on BPA's revenue requirements. Only one of the BP EIS alternatives is oriented toward maximizing revenues; the others test different business directions BPA could take while continuing to meet its statutory obligations. See also responses to comments 134-2 and 83-2 in this section.

Comment 149-4
Comment Topic: No alternative in Plan that restores F&W.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: A full range of alternatives must include at least one that provides for restoration of fish and wildlife to productive populations that can support the economic and cultural needs of the Indian people, the economic needs of non-Indian fishers, and the international obligations of the Pacific Salmon Treaty. An alternative that maximizes fish and wildlife protection and restoration should be included and fairly addressed. BPA's failure to do so,

and its inclusion of a "Maximize BPA's Financial Returns" alternative emphasizes its bias against placing fish and wildlife on an equal footing with power generation, as required by the Northwest Power Act.

Response: The BP EIS evaluates how well different business approaches balance the many requirements BPA is subject to, including obligations to enhance fish and wildlife in the Columbia Basin and to provide an adequate, efficient, economical and reliable power supply as mandated by the Northwest Power Act. Specific actions to restore fish and wildlife populations are outside the scope of this EIS. The fish and wildlife decisions addressed in the EIS are limited to the administrative approach BPA adopts to support the restoration efforts proposed in other processes.

Comment 165-2
Comment Topic: F&W not given equitable treatment.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: Despite the NWPA's requirement that fish and wildlife receive equitable treatment with power generation, the BP fails to adequately address BPA's fish and wildlife obligations. It discusses only BPA's internal administration, and in a superficial and conclusory way.

Response: BPA believes that it is recognizing its fish and wildlife obligations appropriately, within the scope of this EIS. The BP EIS is not the forum to evaluate alternative hydro operations, which most people believe to be BPA's chief impact on fish and wildlife, or other specific measures to enhance PNW fish and wildlife populations. Hydro operations are being determined through the SOR process, and BPA will accept the outcome of that process as determining the hydro operations constraints within which BPA can develop products and services. Specific measures to enhance fish and wildlife are developed in the Council's Fish and Wildlife Program.

The revised EIS has added two operations scenarios from the SOR in an attempt to show how a range of operations would affect its business decisions. The appropriate fish and wildlife-related decision for this Business Plan decision process is how to administer the responsibilities that are, in large part, determined through other processes. BPA has also revised the purposes in this EIS (section 1.2), to sharpen the analysis of how well alternatives meet the need identified for this decision process.

Comment 153-15
Comment Topic: Alternatives not equitable for F&W.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The Northwest Power Act is the framework that must be followed by the Business Plan EIS. The Act requires equitable treatment for fish and wildlife. It is not equitable to assume that a financially healthy BPA is the only scenario that is beneficial to fish and wildlife; it is not equitable to not consider streamflow-based rate designs; it is not equitable to constrain fish and wildlife responsibilities in business terms; it is not equitable to place an arbitrary cap on fish and wildlife spending.

Response: The supplemental draft EIS includes streamflow-based rates among policy modules which may be applied to EIS alternatives. (See section 2.2.8) Given that the NW Power Act requires BPA to support fish and wildlife enhancement, BPA's financial health has an important influence on the region's ability to carry out enhancement programs. BP EIS alternatives analyze BPA's ability to give equitable treatment to fish and wildlife while assuring the region of an adequate, efficient, economical and reliable power supply. If BPA is not financially healthy, it may not be able to achieve either of these goals.

Comment 151-2
Comment Topic: Equitable treatment and ESA.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The DEIS does not have an alternative that provides for equity between fish and wildlife and power or that shows how BPA will "not further jeopardize" under ESA, nor does it describe the impacts if equity is met.

Response: Equitable treatment of fish and wildlife along with power is one of the EIS purposes against which all alternatives are evaluated; it should not be a separate goal for one specific alternative. (See section 2.5.) In the supplemental draft BP EIS, BPA has included alternative hydro operations strategies from the SOR process (see response to comment 134-2 and others), one of which significantly increases flows for fish migration and one of which more closely resembles current operations, to show the effect on the power products BPA can offer. However, SOR is the process that will determine hydro operations, which BPA's business plan decisions will not alter. The revised BP EIS also summarizes the impacts of alternative hydro operations on fish and wildlife.

Comment 159-12
Comment Topic: BPA should give equitable treatment to F&W.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: BPA should consider an alternative that gives equitable treatment to fish and wildlife. The agency hasn't really tried.

Response: See response to comment 151-2.

Comment 153-13
Comment Topic: Analysis of alternatives inappropriate.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: Alternatives evaluated in the Draft EIS do not cover the broad range of alternatives required by NEPA; missing are alternatives designed specifically for fish and wildlife and streamflow-based and seasonal rate structures. Seasonal rate structures that consider and utilize the hydro system in a more natural river-flow configuration could benefit both fish and wildlife and power customers. The alternatives discussed in the EIS are based on assumptions that give an unfair weighting to the Market-Driven alternative.

Response: BPA has added to the supplemental draft BP EIS alternative operations strategies being considered in the SOR EIS (see response to comment 134-2 and others). It has also added rates options, in the form of "modules," that deal with streamflow-based and seasonal rate structures. Some of the assumptions and characteristics of the alternatives have been changed to include actions that could be taken under any alternative. (See comment category "Analytical Assumptions.")

Comment 165-4
Comment Topic: Rates, contracts must reflect F&W obligations.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: We recommend preparing a supplemental EIS that includes alternative rate structures and power sales contract provisions that better reflect BPA's fish and wildlife obligations. The current EIS is not adequate to support final action on these issues.

Response: BPA has revised the EIS to provide new information and analysis on several issues, including rate structures and power sales contract provisions.

Comment 176-3
Comment Topic: Strategies to enhance F&W and BPA competitiveness.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: NMFS offers the following strategies as examples of actions that could enhance fish and wildlife resources and BPA's competitiveness:

- For the short term, develop a drought management plan to guarantee emergency funding for power purchases when safe passage for ESA-listed fish is needed.

• Consider federal cooperative agreements, effective in low-water years, which would allow agencies to alter operating constraints to meet requirements of listed fish.

• For the long term, identify additional future water supplies for power and reliable instream flows. Such planning could occur in the Plan's proposed Water Resources Management Program.

• When effective fish bypass measures are in place, explore long-term, spring and summer firm power contracts that could rely on required instream flows for fish passage. In summer, for example, BPA could develop additional inter-regional or extra-regional firm contracts.

• Identify long-term strategies that encourage all non-Federal entities that benefit from Columbia Basin water resources to provide fish protection facilities and operations, and to contribute to fish and wildlife enhancement costs.

Response: The first three strategies suggested in this comment are within the scope of the SOR EIS, not the Business Plan EIS. The last strategy listed is the responsibility of the Northwest Power Council. Strategies dealing with power sales contracts are addressed in the BP EIS.

Comment 134-24
Comment Topic: BPA could reduce costs in programs besides F&W.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: Funding limitations are placed on the F&W Program, yet BPA could reduce costs in other programs and save up to $150.5 million annually. (See BPA at a Crossroads, Majority Staff Report, U.S. House of Representatives, Committee on Natural Resources 35, May 1994).

Response: BPA has reviewed all of its costs and has identified cost savings in all of its programs, some of which already have been implemented. BPA is pursuing some of the savings identified in the House report, while others require legislation. Estimated cost savings have been incorporated into the rate analysis for the supplemental draft BP EIS.

Comment 146-7
Comment Topic: BPA could save $ in other programs.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The Market-Driven alternative is unnecessary because the BPA Task Force of the U.S. House Committee on Natural Resources chaired by Rep. Peter DeFazio identified ways for BPA to save $150 million annually through basic efficiencies while still implementing the NWPA.

Response: Please see response to comment 134-24. All BP EIS alternatives are intended to implement the Northwest Power Act.

Comment 165-8
Comment Topic: BPA could save $ in other programs.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The BP does not discuss eliminating waste, such as measures suggested by a Congressional Task Force, which concluded that BPA could save over $150 million by adjusting the DSI rate reductions, eliminating irrigation subsidies, and reducing costs of operating the one function Washington Public Power Supply System nuclear reactor and of maintaining the two mothballed WPPSS reactors.

Response: Please see response to comment 134-24.

Comment 146-6
Comment Topic: MD alternative misguided.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The Market Driven alternative is misguided "because BPA plans to retain load and maintain low near-term rates instead of securing lower long-term rates by shedding load through cost-effective conservation, discontinuation of market subsidies, and/or voluntary departures."

Response: The merits of the Market-Driven alternative can be evaluated based on the results shown in the supplemental draft EIS. The load effects noted in the comment occur in varying degrees among EIS alternatives.

Comment 174-9
Comment Topic: Include compliance with Council Plan, etc.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: NCAC has repeatedly suggested requiring that all those who benefit from any part of the BPA system have certain obligations to the system, such as adherence to the Council's Plan, renewable and conservation targets, full accounting for environmental externalities, etc. This idea is mentioned in the EIS but not given much credence. The effect of such a requirement could be expected to vastly increase the amount of renewable resources and conservation. It would also level the playing field between IOUs, which are required by PUCs to do least cost planning, and the public utilities.

Response: The BPA Influence alternative was intended to represent the approach described in the comment. Policy modules added to the supplemental draft EIS also may be consistent with this view.

Comment 178-2
Comment Topic: Compatibility of conservation and competitiveness.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: BPA should explore the potential for enhancing both conservation and competitiveness together, not as opposing objectives, and formulate an environmentally preferred proposed action that addresses both favorably.

Response: The BP EIS does not assume that conservation and competitiveness are antagonistic. The conservation reinvention approach in the BPA Influence, Market-Driven, and Short-Term Marketing alternatives is intended to achieve conservation goals and provide opportunities for competitive marketing.

Comment 159-14
Comment Topic: Privatize BPA functions.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: One alternative would be to privatize BPA's functions. Then it would be accountable first to stockholders (who wouldn't subsidize a dying aluminum industry), then to Wall Street (who never would have financed five unneeded nuclear power plants), and to government regulators (it may be necessary to grant additional powers to regulators such as the Federal Energy Regulatory Commission, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Power Planning Council).

Response: The alternative which most closely resembles this approach is the Maximize Financial Returns alternative. It incorporates pricing concepts that would generate excess revenues and marketing activities comparable to those of an investor-owned utility. Because WPPSS debt was incurred in the past, all of the BP EIS alternatives assume that BPA's contractual obligations for WPPSS debt continue. No alternative in the EIS proposes privatizing BPA functions

because BPA's financial and program obligations make it unlikely that a private buyer would be willing to take over BPA's functions.

Comment 159-15
Comment Topic: Govt. corporation is the worst hybrid.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: Although not addressed directly in the BP, the government corporation proposal reflects the worst characteristics of its parents. It is not accountable either to any elected government body and ultimately the people or to stockholders and government regulators. As such it is not in the public interest.

Response: Thank you for your comment.

Comment 101-7, 173-4
Comment Topic: Work with interested parties to develop other alternatives.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The intention behind Section 4.3.10 ("design your own alternative") was good, but the execution needs improvement. It may not be possible to construct a simple set of instructions to enable someone to construct every interesting alternative. Because of our inability to construct our own alternative based on the documentation provided in the DEIS, Washington State Energy Office asks that BPA work with parties who are interested in constructing other alternatives and that the agency publish the results in the Final EIS or in a Supplementary Draft EIS.

Response: In the SDEIS, the modules are intended to allow readers to test other policy directions for the alternatives.

Comment 120-5
Comment Topic: Alternatives not quantitatively described.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The DEIS does not contain an adequate quantitative description of the alternatives.

Response: The Business Plan EIS is a programmatic document that proposes business policies rather than specific implementing actions. While specific rate levels, for example, are not proposed, assumptions about rates, loads, amounts of various resources acquired, and many other aspects of the analysis are quantified, as are environmental impacts where such numbers are appropriate and meaningful.

Comment 142-1
Comment Topic: Alternatives reinterpret Regional Act.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: Whatever the value of the private enterprise business metaphor, the Business Plan and Business Plan Draft EIS are not acceptable substitutes for a fully scoped process on the proposed changes in fundamental ratemaking principles, including Tiered Rates, and contract power sales to nonpreference customers. BPA's proposed actions (and even the "no action" alternative) are, at best, a significant reinterpretation of the Regional Act and BPA's role in implementing the Act. We believe that all of the various proposals and alternatives discussed in the BPA documents would fundamentally violate the provisions of the Regional Act.

Response: The National Environmental Policy Act requires an agency to evaluate all reasonable alternatives that meet the need for its proposed action, even if an alternative is not allowable under the existing legal framework. However, as stated on page 2-5 of the Draft EIS, the alternatives evaluated in the EIS assume that BPA continues to fulfill energy conservation and fish and wildlife obligations under the Northwest Power Act and to fulfill other laws, except as specifically noted. The exceptions (see page 2-2) include the Maximum Financial Returns alternative, which assumes a change in the statutory requirements that BPA provide firm power requirements service at rates sufficient to cover total

system cost, and the Minimal BPA Marketing alternative, which assumes that statutes are changed so that BPA is not required to acquire additional generation and conservation resources to serve customer loads.

Comment 142-7
Comment Topic: Consistency with Regional Act, other alternatives.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The only "alternative strategic direction" that is consistent with the Regional Act is the "BPA Influences Customers to Support Regional Goals" option. All others are inconsistent with the Regional Act and should be discarded. Moreover other directions and principles advocated by commentators and other public interest groups are absent or misleadingly conflated, reflecting flaws in the process and resulting in a defective EIS.

Response: See response to comment 142-1 in this section. A multitude of possible alternatives exist, many of which have been proposed by various commenters in a variety of forums. BPA is not legally required, nor can it realistically be expected, to present and evaluate all possible alternatives in an EIS. Rather, it must consider the full range of reasonable alternatives. BPA has worked with numerous commenters in an attempt to identify and analyze a range of alternatives and has modified the revised EIS substantially based on those comments.

Comment 142-4
Comment Topic: Definition of No Action alternative.
Comment Category: Alternatives Analyzed in EIS
Comment Summary: The draft EIS fails to consider a true "No Action" alternative (proceeding without new contracts, new ratemaking principles, or other changes) in either the EIS or the Business Plan. What BPA chooses to call "No Action" is in fact a continuation of the present contracts, which expire in 2001, followed by a renewal of all contracts to an unspecified future date (or indefinitely). The Regional Act authorized BPA to sign long-term power sales contracts with non preference customers only once. The Regional Act specifically limits power sales contracts with the DSIs to "an initial long term contract" and does not authorize BPA to enter into a series of such contracts.

Response: The Northwest Power Act requires BPA to offer initial power sales contracts to the DSIs. BPA has interpreted that language to mean that the initial power sales contracts under the Act were mandatory, and that follow-on contracts are optional. An accepted definition of "No Action" under NEPA is continuation of current conditions. Current conditions include contracts with non-preference customers. Therefore, BPA believes it has properly defined the No Action alternative. However, in response to comments on the Draft EIS, the supplemental DEIS includes analysis of the impacts on BPA, its ratepayers, the DSIs, and the environment of renewing and not renewing DSI power sales contracts--but not as part of the Status Quo alternative.

Comment 142-5
Comment Topic: Definition of No Action re: DSIs.
Comment Category: Alternatives Analyzed in the EIS (DSI Service)
Comment Summary: The "no action" alternative should address a course of signing post-2001 firm power sales contracts with utility customers but not with DSIs. Instead, all of the BPA-proposed alternatives envision post-2001 firm power sales contracts for the DSIs. BPA's failure to address an authentic "no action" alternative renders the EIS invalid.

Response: See response to comment 142-4 above.

Analytical Methods

Comment 176-4
Comment Topic: BP misconstrues F&W Program costs.
Comment Category: Analytical Methods
Comment Summary: The BP portrays fish and wildlife investments growing exponentially from 1981 to 1994. However, the increase becomes linear when power purchases are removed from fish and wildlife costs. Power purchases increased because of the region's extended drought. The period 1986-1994 was the lowest nine-year streamflow sequence on record, and two critical period flow sequences occurred during that nine-year period. Even without the instream flow requirements for fish passage, additional power purchases were required to meet potential firm electrical deficits.

The U.S. House of Representatives Majority staff report (BPA at a Crossroads, Committee on Natural Resources 35, May 1994) and NPPC testimony before the House in August 1994 lend support to NMFS's view. BPA's exaggerated portrayal of the fish and wildlife budget would not be possible if the BP detailed other water resource use costs as well. If costs were treated equally, fish and wildlife expenses would be relatively small.

Response: BPA recognizes that drought made achieving fish flow requirements more expensive. However, the costs we quote are estimated to be those attributable solely to the fish obligation. A number of influences on the hydro system affect BPA's power purchase requirements.

Comment 145-2
Comment Topic: BPA financial problems from drought, not F&W
Comment Category: Analytical Methods
Comment Summary: We question the implication that fish and wildlife program costs, "a pittance when compared to the rest of the BPA budget," are out of control when the drought has had more effect on BPA's financial condition.

Response: See response to comment 176-4 above. BPA's fish and wildlife costs, including power purchases, are today about 15 percent of BPA's total costs. Fish and wildlife costs are growing at a much faster rate than other costs and the rate of growth is to a large degree directed by agencies other than BPA, which makes it difficult for BPA and its customers to predict their effect on rates and thus plan future business activities.

Comment 149-5
Comment Topic: Costs not all F&W
Comment Category: Analytical Methods
Comment Summary: BPA suggests that increased fish and wildlife costs are responsible for its rate increases and waning competitiveness, when in fact, many costs are due to recent drought conditions and low water years. They are costs incurred when the hydrosystem was constructed, and which the tribes continue to bear in the form of losses of fish and wildlife. Improvements to fish and wildlife are benefits, not costs.

This treatment is not consistent with BPA's budget treatment of other constraints on flows, such as irrigation withdrawals. They reduce water flows that could produce $150-$300 million worth of annual power production but are not treated as an annual expense.

Response: Please see response to comment 176-4 above. While BPA recognizes the benefits of enhancing fish and wildlife populations, the means to do that still require large expenditures of money or foregone revenues, just as achieving the benefit of a reliable electricity supply for growing regional demand also requires substantial expenditures.

BPA does not control irrigation withdrawals, although it affects them indirectly through such things as the irrigation discount. The supplemental DEIS examines effects of the irrigation rate discount.

Comment 134-14
Comment Topic: F&W costs not consistent with other flow constraints
Comment Category: Analytical Methods
Comment Summary: "BPA's treatment of F&W Program funding is ...inconsistent with its treatment of other constraints on flows. For example, irrigation withdrawals reduce water flows that could produce $150-300 million worth of annual power production, yet irrigation withdrawals are not treated as an annual expense. BPA does not 'own' the water in the Federal Columbia River Power System (FCRPS). This water is subject to appropriation, interstate allocation, and Indian reserved water rights. We strongly urge BPA to refrain from such 'salmon cost' portrayals in the future."

Response: See response to comment 149-5. BPA does not claim to own the water. BPA shares responsibility for some water uses, such as flows for fish, but others it does not (e.g., irrigation). BPA and the project operators have legal rights to operate hydro facilities using available water. Irrigation is a major purpose of some Federal projects, including Grand Coulee. BPA does not have control over decisions on irrigation withdrawals, and must manage available flows given existing commitments to irrigation.

Comment 134-17
Comment Topic: Don't like BPA portrayal of salmon costs.
Comment Category: Analytical Methods
Comment Summary: {2.2.2} A large portion of costs BPA attributes to fish and wildlife are related to power purchases in poor water years or for flow and spill provisions that cannot be used under existing electrical power market strategies. This portrayal of salmon costs does not recognize BPA's legal obligation to protect and restore depleted anadromous fishery resources or the huge economic losses that the hydro system's impacts on salmon have brought to the tribes.

Response: Please see response to comments 176-4 and 149-5. BPA recognizes its responsibility to protect and enhance fish and wildlife resources in the region, but must also recognize the costs of doing so, which are real. BPA also knows that the region has been severely affected by the reduction in fish and wildlife populations. Those losses have been documented and provide the basis for the Council's Fish and Wildlife program and other recovery programs, the programs BPA is trying to find the resources to fund through the Business Plan process.

Comment 109-10
Comment Topic: Characterize costs fairly.
Comment Category: Analytical Methods
Comment Summary: The Draft EIS ignores the intersection between hydro operations and business decisions. Both the SOR EIS and BP EIS each assume static inputs from each other. How operations for non-power purposes are set can be heavily influenced by rates. BPA needs to be able to react to the salmon crisis without jeopardizing its ability to be competitive. We recommend characterizing costs to the system fairly; most of BPA's problems come from low gas and aluminum prices and many years of drought, not conservation or fish and wildlife expenses.

Response: BPA believes it has characterized its costs fairly. The detailed response to this comment appears under the comment category "Scope of the EIS."

Comment 83-5
Comment Topic: Offended by characterization of fish and wildlife costs.
Comment Category: Analytical Methods
Comment Summary: The way BPA treats fish and wildlife obligations as a cost of the program, especially wording such as "Fish and Wildlife Cost Exposure" [in the Business Plan] is "insensitive at best and offensive at worst. I find it disconcerting that, at a time when the region needs to coalesce and develop sensible, integrative solutions to thorny,

complex fish and energy problems, these abysmal documents are the best that a large federal agency could come up with. They lack imagination and foresight."

Response: As evidenced by other comments in this section, several reviewers objected to how fish and wildlife costs were characterized. Please see responses to those comments.

Comment 151-10
Comment Topic: No justification that ratepayers won't pay for F&W.
Comment Category: Analytical Methods
Comment Summary: The agencies and tribes do not accept the premise in the DEIS that provided the rationale for amalgamating fish and wildlife costs, that ratepayers will not accept further such costs. The Corps of Engineers 1990 study also refutes this. BPA should provide evidence to justify the premise or not use the argument.

Response: The revised analysis in the supplemental DEIS addresses the issue of maximum sustainable revenue. The premise is that there is a rate at which customers will begin to find other suppliers. If BPA's costs, including its fish and wildlife costs, drive its rates above that point, BPA will not be able to charge enough to its remaining customers to cover its costs. Please see section 4.4.

Comment 138-8
Comment Topic: BPA's bad business decisions shouldn't make fish suffer.
Comment Category: Analytical Methods
Comment Summary: BPA's serious burden is WPPSS, debt load, and subsidies of DSIs. Any NSIA member businesses that had a 65-percent long-term debt service while giving tremendous subsidies to "preferred customers" would no longer be in business. The burden of correcting BPA's previous poor business decisions should not be borne by fish or weaken federal responsibility to protect, enhance, and restore Columbia Basin salmon.

Response: We agree that WPPSS and repayment of the cost of constructing the hydroelectric system are part of our financial burden. The DSI variable rate has led to higher revenues and lower revenues, depending on the period of time involved. Overall, however, BPA believes that lower DSI rates have been justified by their load characteristics, as discussed in section 2.5 in the supplemental DEIS .

Comment 146-11
Comment Topic: BPA's financial woes from WPPSS debt, etc.
Comment Category: Analytical Methods
Comment Summary: BPA alternately blames competition, drought, low aluminum prices, and salmon for its financial woes when the root causes are WPPSS debt and failure to implement the NWPA.

Response: BPA believes that a number of costs and other issues are threatening its competitiveness. The supplemental DEIS attempts to clarify those assumptions. See chapter 3 and section 4.4.

Comment 159-2, 162-3
Comment Topic: Notion BPA becoming uncompetitive unjustified.
Comment Category: Analytical Methods
Comment Summary: The notion that BPA is in imminent danger of becoming hopelessly uncompetitive is not warranted. The agency's own analysis indicates that continued BPA operations under a status quo alternative over the next 10 years would still allow for rates lower than any other available generating resource (p. 4-39). This is despite

the fact that the deck is stacked by the lack of administrative savings in all but the preferred alternative, although such savings could be realized under any alternative. Comments from the Northwest Power Planning Council and Northwest Conservation Act Coalition provide more detail.
Response: The analysis in the supplemental DEIS has been changed significantly. It shows a greater difference between Status Quo and other alternatives. The greater success of the proposed alternative is not so much in administrative savings as in other program changes that lead to significant cost reductions and products that match the market.

Comment 129-28
Comment Topic: Question threat to competitiveness.
Comment Category: Analytical Methods
Comment Summary: We question the magnitude of the threat of competition to BPA. We are concerned that BPA is overstating the case when it says that it is close to the point where fish and wildlife costs may cause BPA to lose customers and revenue. BPA's characterization of increasing [fish and wildlife] cost without commensurate results fails to acknowledge that we do not know how much worse populations would have fared without the steps that were implemented and that results from operational actions for downstream migration over the last three years have yet to be seen. BPA appears to indicate that the rate impact of the fully funded conservation program variant of the Market Driven alternative would raise BPA firm power rates by one mill, which we do not believe would tip the balance from a competitive to a non-competitive BPA.

Response: It is true that we do not know how much worse the anadromous fish populations would have fared without the measures already taken. The concern with results is that those measures have been expensive and the problems continue, as do the costs. The analysis in the supplemental DEIS shows significantly different rate impacts among the alternatives and discusses the effects of smaller and larger increases on BPA's competitiveness. (See chapter 4.)

Comment 134-16
Comment Topic: Why will F&W costs increase in BPA In. Alt?
Comment Category: Analytical Methods
Comment Summary: {2.2.2} "There is no specific evidence presented that indicates F&W Program expenditures will continue to increase under [the BPA Influence alternative]." The most concrete information is presented in Figure 2.5-2, which relates various alternatives to average megawatt values. How these values are derived is not explained."

Response: BPA has revised its analysis of fish and wildlife administrative structures to show that the agency could apply any of several administrative mechanisms regardless of the alternative. (See Fish and Wildlife Modules, section 2.2.8.) The analyses in section 2.5 and in chapter 4 discuss why BPA believes it can have more influence on cost predictability and stability under some modules than others.

Comment 101-4
Comment Topic: F&W costs will increase in all alternatives.
Comment Category: Analytical Methods
Comment Summary: The Draft EIS states that under Status Quo and the BPA Influence alternatives, BPA's fish and wildlife program costs would be susceptible to increases due to additional funding for new measures and potential reductions in Federal hydro capability. These statements are equally true of other alternatives, where no such statement is made.

Response: The commenter is correct. The supplemental DEIS has been corrected to acknowledge that BPA does not have sole control over fish and wildlife cost increases. (See sections 2.2.8 and 2.5.)

Comment 146-10, 153-8, 101-5
Comment Topic: Program costs and management efficiencies in M-D.
Comment Category: Analytical Methods
Comment Summary: The Draft EIS (Table C-1 in Appendix C) states that only under the Market-Driven alternative would BPA take cost-cutting measures to reduce revenue requirements. What does this mean? If programs are being cut, what programs? If this means improved management efficiency, that should apply to all alternatives. What would be the quantified revenue impact and the related environmental effect?

Response: The SDEIS applies administrative cost savings to all alternatives. See section 2.2.

Comment 109-1
Comment Topic: EIS lacks Total Resource Cost.
Comment Category: Analytical Methods
Comment Summary: The EIS lacks an extremely important dimension of analysis: Total Resource Cost (TRC). BPA's examination of the six alternatives correctly includes rates, load and environmental impacts. However, it is left to the reader to combine these three factors in order to properly compare the effects. Most PUCs require investor-owned utilities to us TRC for least cost plans, which incorporate three types of costs--utility, environmental, and consumer; BPA would have to add wholesale supplier costs. BPA could begin with the Oregon PUC's recommended adders for air quality, and add the upstream costs of fossil-fuel production and distribution.

Response: BPA agrees that its analysis of Business Plan alternatives should reflect a long-term perspective that considers total societal costs, including environmental impacts. BPA's analysis of resource acquisitions in the Business Plan Draft EIS did incorporate monetized environmental externalities estimates for sulfur dioxide, oxides of nitrogen, and particulate matter, as well as land and water impacts. These environmental externalities were added to the costs of generation resources before the resources were ranked in the "resource stack" used by the Integrated System for Analysis of Acquisitions (ISAAC) model. The ISAAC model was used as the base for assessing resource development in each alternative (for further information, see the *Resource Programs Final EIS*, BPA, February, 1993).

Monetized externalities are a very rough and incomplete method of incorporating environmental considerations into decision-making; some types of environmental impacts (e.g., land use impacts of CTs or wind farms) are highly site-specific and not easily monetized on a generic level. In addition, even if all environmental costs can be monetized and summed up, doing so can hide useful information about the nature of the different environmental impacts. For example, an analysis that states that one alternative has environmental externality costs of $X million while another has costs of $Y million does not explain whether one alternative's environmental impacts are primarily in the area of NOx while the other's are more related to land use.

For these reasons, the Business Plan Draft EIS (e.g., Table 4.5-1) uses matrices that quantify and separately display key environmental impacts. However, in addition, monetized environmental externalities estimates (based on the externalities estimates BPA uses in its resource planning) have been calculated and presented in the supplemental draft EIS in sections 2.5 and 4.4.

Comment 174-3
Comment Topic: EIS should use Total Resource Cost.
Comment Category: Analytical Methods
Comment Summary: The Draft EIS is flawed because it fails to monetize environmental costs and compare alternatives on the basis of total societal costs. Northwest IOUs are required to compare resource alternatives on the basis of Total Resource Cost, including utility and consumer costs, using a range of air emission adders to reflect air quality costs. BPA should also rank alternatives on the basis of total cost, including environmental externalities, in order to preserve a long-term societal perspective.

Response: Please see the response to comment 109-1 in this section.

Comment 120-2, 138-10, 162-1, 165-9
Comment Topic: F&W obligations should be a hard constraint.
Comment Category: Analytical Methods
Comment Summary: A principal reason for the lack of certainty in BPA's relationships with its power customers has been its failure to make its fish and wildlife obligations under the NW Power Act and ESA a hard constraint in power planning and management, an alternative the region's fish and wildlife agencies have proposed for over a decade. The obligations should be considered a cost of doing business, like environmental constraints put on other businesses in the U.S., and not be treated as discretionary programs.

Response: BPA expects that the hydro system operations defined in the SOR process will revise existing "hard" constraint and operations goals, affecting power planning and management and defining the limits of the products and services BPA can offer. BPA also considers its fish and wildlife obligations under the Regional Act and ESA as hard constraints on its power planning. The debate between BPA and many of its critics stems not from the fact that BPA considers these responsibilities discretionary, but that BPA and other groups disagree about the specific measures to take to implement those responsibilities and their cost.

Comment 101-2, 173-2
Comment Topic: Quantify risks and probabilities of options.
Comment Category: Analytical Methods
Comment Summary: BPA's choice between options seems to rely on the assessment of probabilities of successful implementation. For example, the BPA Influence has the lowest environmental impacts, but BPA proposes to adopt the Market-Driven alternative, apparently because BPA believes Market-Driven is more likely to be implemented. Section 4.9 discusses only in general terms the likelihood that each option could be successfully implemented. This is not an adequate basis for a decision of this magnitude. BPA needs to quantify the risks of each option and, to the extent possible, quantify their probabilities.

For example, the DEIS states that the higher rates and increased conditions of service in the BPA Influence alternative could cause some customers to switch to other suppliers, thus reducing BPA revenues and its ability to meet conservation and fish and wildlife goals. However, the DEIS does not indicate the size or the probability of the potential load loss, the revenue impact on BPA, or how that impact would affect conservation, fish and wildlife programs, or other customers. If the potential impacts were small and had a low probability, this would be the most attractive option. If the potential impacts were large and had a high probability, that would be a strong argument against this option.

In another example, BPA would transfer some of its conservation responsibilities to its customers in the Market-Driven alternative, but would reassume them if the customers failed to acquire the conservation, which could become a delayed version of the BPA Influence alternative. The reassumption would increase BPA's revenue requirement and thus rates. The likelihood customers would meet their conservation targets depends on the incentives to acquire and the consequences of not doing so. The EIS needs to discuss the ways BPA could induce its customers to acquire conservation and the likelihood each would succeed, and to quantify the effects of customers failing to acquire conservation.

Response: The Draft EIS recognizes the multiple uncertainties associated with predicting markets and market responses. Section 4.3.9, for example, describes and quantifies a set of uncertainties related to load growth, borrowing limits, repayment reform, debt refinancing, loss of firm hydro capability, extended drought, aluminum prices, carbon taxes, and increases in natural gas prices. Quantifying the multiple permutations of risk factors would provide information of dubious validity and usefulness because each element of risk has a degree of "fuzziness," and multiplying risk factors multiplies the degree of uncertainty. Instead, BPA selected a set of predicted assumptions and outcomes for most of its analysis, which are described in Appendix C (Table C-1, Figure C-1 and text). In Sections 2.5

and 2.6, BPA qualitatively describes how some of the risk factors might interact, and ranks alternatives based on this qualitative assessment.

Comment 146-5
Comment Topic: Probabilities of implementing alternatives speculative.
Comment Category: Analytical Methods
Comment Summary: The DEIS offers only speculation about the probabilities of implementing the various alternatives, though the abstract asserts that the Market-Driven alternative has a higher probability than BPA Influence.

Response: See response to comment 101-2/173-2 above.

Comment 101-6
Comment Topic: "Build your own alternative."
Comment Category: Analytical Methods
Comment Summary: Section 4.3.10 invites readers to design their own alternative. This is a good idea; however, WSEO staff tried to do so and found that there was not sufficient information provided in the Draft EIS to do so and/or found inconsistent results. To the degree we could calculate revenue to BPA from certain examples--for example, the revenue to BPA from the DSIs and sales of surplus power in the BPA Influence and Market Driven alternatives--differences appeared to be quite minimal. This seriously undermines support for the Market Driven alternative.

Response: The "build your own alternative" feature of the Draft EIS was an attempt to provide some simple tools that would allow readers to examine in a general manner the potential impacts of other combinations of policy choices besides those explicitly addressed in the EIS. In hindsight, it is clear that the simplifications required did not allow readers to develop results with ease and accuracy. The supplemental draft EIS incorporates new analyses and "modules" (see section 2.2.8) that address the comments BPA received on the Draft EIS. The modules may allow readers to more easily "mix and match" some elements of alternatives that represented frequently raised concerns by commenters, although we recognize that precise quantification of effects will not be possible. BPA also contacted several of the commenters for clarification of ideas and alternatives suggested in their letters.

Impacts of Alternatives

Comment 174-1
Comment Topic: BPA did not address comments on prelim. draft.
Comment Category: Impacts of the Alternatives
Comment Summary: Our April 27, 1994 comments on the Preliminary Draft EIS were offered constructively and with ample time for BPA staff to respond in this draft. Comments addressed the criteria and methodology used to evaluate alternatives, the mischaracterization of some of the alternatives (especially the Market Influence alternative) and the poor and illogical consequences and impacts ascribed to various alternatives. We will not repeat these here nor submit another page-by-page critique; however, we must express our disappointment that those issues are not significantly addressed in the Draft EIS.

Response: BPA believes it did respond reasonably well to these comments and addressed most of them.

Comment 174-2
Comment Topic: Level of analysis is shallow.
Comment Category: Impacts of Alternatives
Comment Summary: The level of analysis is extremely shallow and inconsistent, and is mostly just unsubstantiated and over-general statements of someone's "expert opinion" of what the impact of a particular activity may be. The

Draft EIS is fatally deficient for purposes of satisfying NEPA requirements for most of the actions, including the implementation of tiered rates and the negotiation of power sales contracts.

Response: BPA disagrees. As much of the analysis as is reasonable for a program-level document is quantified. We have added material to the supplemental DEIS that discusses rate and power sales contracts options in more detail.

Comment 153-5
Comment Topic: EIS lacks in-depth analysis and detail.
Comment Category: Impacts of Alternatives
Comment Summary: There is a disappointing lack of analysis concerning impacts on the environment of all the alternatives addressed in the Draft EIS. The goal of an EIS is to provide informed decision-making by evaluating the consequences of proposed alternatives. The Draft EIS does not provide in-depth analysis.

Response: The revised EIS includes more detail on the effects of numerous issues.

Comment 120-6
Comment Topic: SOR analysis inadequate for BP.
Comment Category: Impacts of Alternatives
Comment Summary: Increasing the efficiency of the hydrosystem for energy production will change river flows that directly affect fish and wildlife. SOR alternatives do not analyze the in-river changes that will result from implementing Business Plan actions. The SOR analysis also relies heavily on CRISP modeling to assess fish impacts from hydrosystem operations; this salmon passage model certainly does not cover the range of other regional analysis expected under NEPA.

Response: As stated in responses to other comments (e.g., comment 109-3 in "Scope of the EIS"), BPA will not take actions under the Business Plan EIS that change decisions on hydrosystem operations made in the SOR process. SOR decisions will limit the products and services BPA offers; BPA business decisions will not change those agreed-upon operations. Analysts for both the BP and SOR EISs are exchanging information to assist in clarifying issues in the two processes that are related. The supplemental BP DEIS discusses impacts on a number of resources of two hydro operations strategies from the SOR EIS.

Comment 176-2
Comment Topic: SOR analysis inadequate for BP.
Comment Category: Impacts of Alternatives
Comment Summary: NEPA analysis for the Business Plan is inadequate because it relies on the incomplete SOR process, which does not analyze the in-river changes that would result from implementation of the Business Plan. Thus, the DEIS does not adequately assess the potential adverse impacts and mitigation for BP strategies. NMFS requires specific information about impacts and mitigation because of its mandate to protect ESA-listed stocks.

Response: See response to comment 120-6 above. The supplemental draft BP EIS includes analysis of two hydro operations strategies from the SOR EIS and their impacts on BPA's business decisions and on the environment, including fish and wildlife.

Comment 83-11
Comment Topic: BP could lead to hydro ops with adverse fish effects.
Comment Category: Impacts of Alternatives
Comment Summary: Because the BP and EIS do not describe hydro operations that will result from the business plan, many aspects of BPA's proposal lead us to believe that the BP could be in direct conflict with the objective of providing adequate conditions for fish: Fish and wildlife are not considered to have the same status as customers but are seen as a

cost which must be controlled; BPA plans to unbundle its services to be responsive to its customers, to make DSI loads un-interruptable, and to provide shaping and capacity services while not losing any base load; most new resources are gas combustion turbines, so the hydrosystem will be used to maximize shaping, peaking and capacity needs.

Response: Please see responses to comments 120-6 and 176-2 above and to comments under "Scope of the EIS."

Comment 151-3
Comment Topic: Hydro operations impacts should be included.
Comment Category: Impacts of Alternatives
Comment Summary: BPA's dependence on the ultimate hydrosystem operation definition in the SOR is misplaced, and we have no way of determining in the DEIS the impacts of hydrosystem operation.

Response: The supplemental draft BP EIS includes analysis of two hydro operations scenarios from the SOR EIS and their impacts on BPA's business decisions and on the environment, including fish and wildlife. See also responses to comments under "Scope of the EIS."

Comment 162-2, 120-3, 138-4
Comment Topic: BP fails to examine F&W impacts.
Comment Category: Impacts of Alternatives
Comment Summary: The Business Plan [EIS] fails to examine how the proposed changes would impact fish and wildlife, although changes in system operations, power contracts, and reinvention activities, etc. could have significant adverse impacts on them. BPA simply assumes that increasing its revenues will help fish by ensuring funding (p. 4-102).

Response: See response to comments 176-2 and 151-3.

Comment 134-4
Comment Topic: Need supplemental DEIS to analyze F&W impacts.
Comment Category: Impacts of Alternatives
Comment Summary: BPA should issue a supplemental DEIS to include a valid analysis of the impact of various alternatives for the marketing of electricity on fish and wildlife. "The limited focus on salmon is only on some undefined level of recovery for anadromous fish (at 4.2.5). This will not provide for the restoration of these species to productive population levels that can support the economic and cultural needs of the Indian people, the economic needs of the non-Indian fishermen, or meet international obligations to the Pacific Salmon Treaty."

Response: The scope of this EIS does not include specific proposals for fish and wildlife restoration. Those decisions are made in other forums, including under the Council's Fish and Wildlife Program. Hydro operations, the major BPA impact on fish and wildlife, will be decided under the SOR process. In the supplemental DEIS, BPA examines whether different ways of administering its fish and wildlife responsibilities (the specifics of which are defined in other forums) lead to predictable differences in fish and wildlife impacts. We conclude that there is no objective evidence to support a conclusion that different impacts will result from different administrative policies. (See section 4.5.1.)

Comment 83-10
Comment Topic: BP not consistent with resident fish goals.
Comment Category: Impacts of Alternatives
Comment Summary: The BP proposes only to identify resident fish losses to define the limit of BPA's obligation. It is clear that the creation and operation of reservoirs has brought the native ecosystem close to collapse, such as in the Idaho portion of the Kootenai River. The Business Plan is not consistent with the resident fish goals of the UCUT Tribes.

Response: See response to comment 134-4.

Comment 134-15
Comment Topic: Benefits to fish of BPA In. Alt. unclear.
Comment Category: Impacts of Alternatives
Comment Summary: {2.2.2} The benefits to fish from the BPA Influence alternative are not clear. If the objective were to provide for the fishery in PNCA planning and use "basin-wide . . . hydrologic and biological analysis to determine . . . flow regimes for the mainstem and estuary, migration conditions for anadromous fish could be improved." This is the type of integrated hydro system operation required to benefit anadromous fish and must be addressed in the supplemental DEIS.

Response: See responses to comments 151-3, 134-4 and responses under "Scope of the EIS."

Comment 146-4
Comment Topic: BPA Influence Alternative preferred.
Comment Category: Impacts of Alternatives
Comment Summary: The BPA Influence Alternative carries the fewest environmental impacts, but in its headlong rush to become an end in itself rather than a means to work the public will, BPA rejects the very alternative for which it was established.

Response: BPA was established in the 1930s to market and transmit power from the Federal Columbia River hydro system. Subsequent legislation has added to, not replaced, that original purpose. BPA is attempting in this EIS to analyze how best to run its business operations so it can fulfill all its mandates.

Comment 174-14
Comment Topic: M-D poorly characterized and evaluated.
Comment Category: Impacts of the Alternatives
Comment Summary: NCAC also criticized, in our April 27 comments, the poor characterization and subsequent evaluation of the Market Influence alternative.

Response: BPA has changed some assumptions and re-analyzed impacts of all the alternatives. See sections 2.2.3 and 4.4.4 for changes to the Market Influence alternative.

Comment 132-37
Comment Topic: Ranking of alternatives wrong.
Comment Category: Impacts of Alternatives
Comment Summary: The conclusion reached in the EIS regarding the preferred/practicable alternative is in error. The Modified Market Driven alternative is clearly environmentally preferable to the Market Driven Alternative, so therefore the Market Driven alternative is the third best alternative from an environmental perspective, not second best. Based on the apparent rankings used in the charts on page 2-39, it is clear that the Modified Market-Driven alternative would be the overall preferred/practicable alternative because it would consistently be ranked between the BPA Influence alternative and Market-Driven BPA alternative in terms of environmental impacts. It also addresses a number of the issues identified by BPA as factors weighing against the success of the Market Driven Alternative, namely, a lack of environmental constituent support causing program cost pressure on BPA, which causes higher rates.

Response: The Draft EIS acknowledges (pages S-11 and 2-37) that the Modified Market Driven alternative's environmental impacts fall between those of the BPA Influence alternative and Market-Driven BPA alternative. BPA disagrees that the Modified Market Driven alternative would be more practicable than the BPA Influence or Market-Driven alternative, because in the Modified Market alternative, conservation program costs would be greater than in the

Market-Driven alternative, leading to higher rates and greater potential for BPA to lose customers to other, lower-cost energy sources.

In the supplemental DEIS, BPA modified its treatment of conservation issues. It addresses them in several policy modules that can be applied to the alternatives independently. See section 2.2.8 and 4.5.

Comment 129-25
Comment Topic: Effects of less conservation, etc. underestimated.
Comment Category: Impacts of Alternatives
Comment Summary: The EIS underestimates the environmental effects of less conservation and renewables and more gas generation--a plausible outcome of the Market-Driven alternative. BPA has made overly optimistic assumptions about the conservation levels to be achieved under the Market-Driven alternative, and assumes that more CT development and operation occur under the Status Quo and more secondary sales occur under the Market-Driven alternative. The basis for these assumptions is not documented.

BPA believes that it has appropriately predicted the environmental effect of each alternative. The Supplementary Draft EIS includes revised predictions of the amounts of each generation type that would be developed under each alternative. The Status Quo alternative shows more CT development than the Market-Driven BPA alternative, because in Status Quo, BPA would implement the resource acquisitions initiated in the 1992 Resource Program, whereas in the Market-Driven BPA alternative, BPA would recognize the reality of current energy supply markets and customer choices and reduce its resource acquisitions. The amounts of conservation acquired under each alternative are based on the market analysis and conservation experience of BPA conservation program staff. The amounts of secondary sales shown in each alternative result from the amount of surplus power in the alternative, the amount of DSI top quartile available to serve, and the amount of high cost thermal resources that can be displaced (any remaining surplus is sold out-of-region as secondary sales). Although the relative levels of each of these factors varies among alternatives, the analysis in the Supplementary Draft EIS now suggests that they would result in similar amounts of secondary sales among alternatives.

Comment 143-3
Comment Topic: BPA underestimated impacts of M-D.
Comment Category: Impacts of Alternatives
Comment Summary: We agree that the main environmental impact of all the strategies is the effect on energy resource development. In its evaluation of the preferred alternative, BPA assumes that utilities will achieve substantial conservation. We believe that they may acquire far less conservation and far more generation. Therefore, the environmental and financial impacts have been underestimated.

Response: BPA believes that the pace of regional conservation acquisition will remain consistent with levels prescribed in the NW Power Planning Council's Regional Plan. BPA and its customers have developed a conservation accountability framework that will, as part of power sales contracts, require:

1) Customers to prepare either an Integrated Resource Plan (IRP) or Local Conservation Plan (LCP);
2) Implement their IRP or LCP;
3) Report their conservation accomplishments to BPA on a regular basis.

If the sum of customers' conservation efforts falls short of the regional conservation goal, as per the Regional Plan, BPA will take steps to acquire any energy necessary to make up such a shortfall.

Comment 178-1
Comment Topic: Assess preferred alternative and conservation.
Comment Category: Impacts of Alternatives
Comment Summary: We recommend that BPA revisit the decision to select the market-driven alternative as the proposed action and further assess and disclose the relative compatibility of that alternative with conservation and protection goals and policies.

Response: Please see responses to comments 132-7 and 143-3 in this section.

Comment 134-19
Comment Topic: M-D alt. detrimental to anadromous fish.
Comment Category: Impacts of Alternatives
Comment Summary: {2.2.3} The Market-Driven alternative would be detrimental to anadromous fish. It would optimize river management for electric power and shift water from spring and summer to generate more electricity at higher prices in the fall and winter, which is not consistent with a biologically sound ecosystem approach.

Response: Actions BPA takes under the Business Plan will not change hydro operations parameters defined through the SOR process. The outcome of the SOR process will define the power products and services BPA can provide.

Comment 159-3
Comment Topic: Correct uneven treatment of alternatives.
Comment Category: Impacts of Alternatives
Comment Summary: The final plan must "correct the uneven treatment of the alternatives, which is slanted toward a predetermined conclusion in favor of its preferred alternative."

Response: BPA has made several changes in the analyses in the supplemental DEIS. For example, it shows that certain administrative savings could be achieved under all alternatives. See particularly chapters 2 and 4.

Comment 134-20
Comment Topic: M-D stable funding level would not meet NWPA.
Comment Category: Impacts of Alternatives
Comment Summary: {2.2.3} The Market-Driven alternative's proposed stable funding level, which is not defined, would not meet the NWPA's requirement to effectively protect fish and wildlife. Fish and wildlife measures must be implemented when it is biologically and ecologically necessary as based on resource conditions, not when convenient. Money cannot substitute for water when it comes to the ecology of salmon resources.

Response: BPA is attempting to evaluate how to control its costs and sustain enough revenues to meet its many regional mandates, including assuring an adequate, efficient, economical and reliable power supply and protecting and restoring fish and wildlife. That effort includes attempting, in the SOR process, to balance the water needs for fish and wildlife, power, and other uses. BPA is not proposing a specific fixed level of funding in the BPEIS. See section 2.2.8 for new policy modules describing fish and wildlife administrative alternatives.

Comment 146-9
Comment Topic: BP/MD alt. encourages customers to demand more.
Comment Category: Impacts of Alternatives
Comment Summary The BP and Market-Driven alternative are irresponsible because, if the agency were indeed losing its competitive edge, the single most damaging step it could take is to announce that customers might take their business elsewhere and BPA will do what it can to prevent their departures. Now, "[l]ike so many trained seals...the

customers clap their front fins together barking 'We will leave! We will leave!' so that BPA will toss them some more fish. But what does BPA intend to do when it runs out of herring?"

Response: NEPA does not permit BPA to ignore alternatives because they raise upsetting possibilities. Whether the alternatives were included in the EIS or not, customers have become increasingly aware that they have the option of buying power from other suppliers.

Comment 134-21
Comment Topic: MFR alt. detrimental to anadromous fish.
Comment Category: Impacts of Alternatives
Comment Summary: {2.2.4} The Maximize BPA's Financial Returns alternative would be detrimental to anadromous fish. Minimal funding levels to carry out mandated fish and wildlife responsibilities would not meet the express purpose of the NWPA and cannot substitute for the basic ecosystem requirements of salmon.

Response: Minimizing costs does not mean that BPA would fund its fish and wildlife responsibilities inadequately. The EIS states in the first sentence of section 2.2.4, that this alternative will continue "to fulfill the . . . fish and wildlife requirements of the Northwest Power Act." In addition, the mechanism of meeting its obligations, such as "fund transfers or trust with regional fishery managers" mentioned in the last paragraph of that section, is specifically supported by CRITFC in an earlier part of this letter (see comment 134-18). BPA concludes in section 4.5.1 of the supplemental draft EIS that no objective evidence can be found to show that one administrative mechanism will be more or less detrimental to fish and wildlife.

Comment 134-22
Comment Topic: Min. BPA and STM fish impacts unclear.
Comment Category: Impacts of Alternatives
Comment Summary: {2.2.5 and 2.2.6} The impacts to anadromous fish from the Minimal BPA and Short-Term Marketing alternatives are not clear. "As with all alternatives, if fishery considerations are not incorporated into PNCA planning and status quo hydrosystem operations are maintained, then migration conditions will continue to deteriorate. The flows resulting from these alternatives must be evaluated for their impacts on fish and wildlife in the supplemental DEIS." Short notice changes to hydrosystem operations can substantially impact anadromous fish migrations.
Response: As stated in other responses, the SOR process will define flows for fish, not Business Plan alternatives. Please see responses in "Scope of the EIS" and elsewhere.

Comment 134-23
Comment Topic: Table 2.4-1 is only general overview of assumptions.
Comment Category: Impacts of Alternatives
Comment Summary: "Table 2.4-1 provides only a general overview of the assumptions upon which BPA based its alternative analysis. The descriptions provided in the table are qualitative and insufficient to begin to describe the potential impacts to river operations that could result under each issue for each alternative."

Response: The table was intended to provide only a general overview of how each alternative would deal with each business issue. These issues are described fully in Section 2.3 of the DEIS and the supplemental DEIS. The table also was not intended to describe the impacts of the alternatives. River operations will be defined in the SOR process and Business Plan alternatives will not affect them. See response to comment 134-10 and others ("Scope of the EIS").

Comment 134-26, 149-7
Comment Topic: Cultural resources not properly addressed.
Comment Category: Impacts of Alternatives
Comment Summary: The supplemental DEIS must properly address Indian rights and interests in the area of assessment, including protection and preservation of cultural resources. BPA's responsibilities are defined in several acts. Mitigation of impacts to cultural resources must be addressed by specific plans and procedures with appropriate funding and in consultation with the tribes.

Response: The DEIS identifies BPA's consultation and cultural resource protection and mitigation responsibilities in Section 5.4. BPA does not believe that proposals or alternatives in this EIS will result in impacts to cultural resources beyond those being identified and mitigated in other decision processes. Future site-specific proposals that result in impacts to specific cultural resources will require additional site-specific NEPA analysis and consultation under the Acts and Agreements cited in Section 5.4.

Comment 134-27
Comment Topic: Discuss impacts to treaty Indian fishing rights.
Comment Category: Impacts of Alternatives
Comment Summary: The supplemental DEIS must discuss how the various market alternatives could impact treaty Indian fishing rights through the loss of anadromous fishery resources due to hydrosystem operations. Treaty rights, as supported in several court cases, include geographical rights and the guarantee of a proper quota of fish.

Response: Hydrosystem operations and their impacts are discussed in the SOR EIS. Effects on treaty Indian fishing rights will depend on the outcome of the SOR process and will not be changed by Business Plan actions.

Comment 120-8, 138-6
Comment Topic: Unbundling puts pressure on fish.
Comment Category: Impacts of Alternatives
Comment Summary: Unbundling, which will allow larger customers to switch to non-BPA resources for base load, will put additional revenue pressure on BPA and its smaller, full-service customers. Smaller utilities' rates could be raised and, to produce more revenue from the hydrosystem, spring and summer flows could decrease in favor of fall and winter periods and nighttime flows could decrease in favor of daily peaking. Such operations ignore the needs of fish and wildlife, especially anadromous fish.

Response: As stated elsewhere, hydro operations as defined in the SOR process will limit the power products and services BPA can provide under its Business Plan, not vice versa. Thus, impacts to fish and wildlife will depend on the outcome of SOR decisions.

Comment 134-28
Comment Topic: Unbundling could affect flows for fish.
Comment Category: Impacts of Alternatives
Comment Summary: The full impacts of unbundled power products on fish and wildlife are not thoroughly discussed in the DEIS. Unbundling could allow utilities to purchase greater peaking and seasonal load shaping capacity from BPA, thus changing hydrosystem operations in a manner detrimental to anadromous fish and federal court decrees. For example, increased fall and winter generation may result in lower spring and summer flows so that migration conditions would be worse, although BPA made no fish and wildlife changes.

Response: See response to comment 120-8/138-6 above.

Comment 134-29
Comment Topic: Adding customers could adversely affect fish.
Comment Category: Impacts of Alternatives
Comment Summary: The Northwest is in load/resource balance. Adding customers will require new resources. Adding CTs, which are more economically attractive in spring and summer, could change hydro operations to emphasize fall and winter peaking. Meeting morning and evening peak demands will decrease nighttime flow, subjecting juvenile migrants to delay and greater exposure to predators. Such operations could also drastically impact flow and spill options to improve migration conditions for juveniles and adults.

Response: See response to comment 120-8/138-6 in this section.

Comment 134-30
Comment Topic: Effects of transmission wheeling & pricing on F&W.
Comment Category: Impacts of Alternatives
Comment Summary: The DEIS needs to analyze possible changes in FCRPS operations from pricing of transmission and wheeling and their effects on fish and wildlife. For example, allowing BC Hydro transmission access to the Southwest could change operation of Canadian reservoirs and flows.

Response: The hydroelectric operations of the Columbia River system are being evaluated through the System Operation Review process. The hydroelectric operations restrictions or parameters that are implemented in that process will establish the parameters within which BPA will make all operational decisions that could affect hydroelectric operations of the FCRPS, including any decisions regarding transmission and wheeling of power. Decisions made about BPA Business Plan alternatives, including rate and contract options, will not have additional impacts on fish and wildlife resulting from the operation of the FCRPS outside those addressed in the SOR process.

The operation of reservoirs in Canada is controlled by BC Hydro, is subject to the environmental regulations and reviews of the Canadian government, and is outside the scope of this EIS.

Comment 174-10
Comment Topic: Location-sensitive pricing of transmission.
Comment Category: Impacts of Alternatives
Comment Summary: Impacts of location-sensitive pricing of transmission have not been adequately evaluated.

Response: Location-sensitive pricing is addressed broadly in the Draft EIS, in a level of detail commensurate with the policy-level decisions addressed in the EIS. The EIS identifies that location-sensitive pricing can affect the location and cost of new generating resource development and the cost of service to existing loads. Providing more detail than that is not feasible given the uncertainties about the range of costs and supply options that are likely to develop around the region with or without location-sensitive pricing.

Comment 134-32
Comment Topic: Impacts of economic decisions on river operations.
Comment Category: Impacts of Alternatives
Comment Summary: The DEIS does not fully recognize the impacts of economic decisions on in-river operations, making assertions that most issues will cause "little or not change" on resource operations inaccurate.

Response: As stated elsewhere, BPA considers decisions coming from the SOR process to be hard constraints on river operations, which Business Plan decisions will not alter.

Comment Topic: Impacts on fish of business strategies?
Comment Category: Impacts of Alternatives
Comment Summary: Has BPA produced any analysis of the impacts on fish of various business strategies?

Response: Impacts to fish would come primarily from operation of the hydrosystem. These impacts are analyzed in depth in the SOR EIS and summarized in section 4.3 of the supplemental Draft BP EIS.

Comment 137-41
Comment Topic: Effects of purchased power on Tier 2?
Comment Category: Impacts of Alternatives
Comment Summary: Have the effects of including purchased power as a Tier 2 resource been analyzed?

Response: Alternative ways to formulate Tier 2 are addressed in the supplemental draft EIS in section 2.2.8; the effects are discussed in section 4.5.3.

Comment 133-2
Comment Topic: Impacts of rate increases on small utilities.
Comment Category: Impacts of Alternatives
Comment Summary: There seems to be an underlying assumption that BPA's wholesale customers are institutional monopolies that will remain in business regardless of the rates they charge their retail customers, and that utility retail customers will have economic choices when they probably don't. Some businesses may discontinue business in the area due to higher power costs, and residential customers may be faced with a reduced quality of life. The analysis of this impact presented in the EIS is entirely inadequate. BPA has not even mentioned the potential impact to small utilities whose rates get pushed higher than surrounding IOUs' rates and the resulting potential for acquisition and loss of BPA load.

Response: The EIS addresses the limitations on the choices of small utilities in section 4.4.4.2, and represents some of their choices in the accompanying figure.

Comment 138-1
Comment Topic: BPA not giving equitable treatment.
Comment Category: Impacts of Alternatives
Comment Summary: BPA is not providing equitable treatment and the fish and many Northwest sportfishing businesses are suffering as a result.

Response: The supplemental DEIS has refined the purposes (section 1.3) to make clear BPA's intent to provide equitable treatment of fish and wildlife and power.

Comment 143-2
Comment Topic: Capacity impacts could affect hydro ops and F&W.
Comment Category: Impacts of Alternatives
Comment Summary: Because the EIS is based on average energy planning, it inadequately address impacts of BPA proposals. "To the extent that average energy planning results in new base load resources, the hydro system is largely called on to meet seasonal and daily peaks. The DEIS fails to recognize any capacity impacts from BPA's strategy proposals." We believe that capacity effects could have significant impact on hydro operations and thus on fish and wildlife.

Response: As stated elsewhere, the SOR process will define hydro operations and their effects, including the effects on BPA's power products and services. The supplemental DEIS includes analysis of two alternative hydro operations strategies to show the range of effects on power products, including capacity effects.

Comment 165-3
Comment Topic: How do increased revenues affect F&W?
Comment Category: Impacts of Alternatives
Comment Summary: The assumption that BPA's fish and wildlife obligations will be adequately met by increasing BPA revenues and providing greater certainty to its customers is unfounded. The BP needs to discuss how proposed changes in BPA's customer relationships, power sales contracts, and rates would affect fish and wildlife. For example, the BP proposes regulating flows to more closely meet customer power needs but does not address the negative impact such fluctuations would have on mainstem fish passage. The EIS only asserts that fish and wildlife would benefit if BPA were financially stronger and could provide stable funding for its F&W Program (p.4-102), which does not meet the analytical requirements of NEPA. Moreover, some changes that might increase revenues, for example, adjusting flows to mirror customer power needs, might wreak havoc on salmon populations, costing more to fix the damage than was gained from the higher level of customer satisfaction.

Response: The primary effect of BPA's business activities on fish and wildlife is from operation of the hydro system. These effects are analyzed in depth in the SOR EIS and summarized in section 4.3 of the supplemental draft BP EIS. BPA's Business Plan decisions will not change hydro operations and thus will not change the effects evaluated in the SOR EIS.

Comment 153-6
Comment Topic: EIS lacks analysis of DSI service and irrigation rates.
Comment Category: Impacts of Alternatives
Comment Summary: The Draft EIS lacks analysis concerning DSI service and impacts of different rates for irrigation, both areas with great environmental impacts on fish and wildlife.

Response: The supplemental DEIS includes modules that analyze DSI service options and that eliminate the irrigation discount. See section 2.2.8.

Comment 142-24
Comment Topic: Impacts of gas exploration/development in Canada.
Comment Category: Impacts of the Alternatives
Comment Summary: The Draft EIS does not include adequate analysis of the impacts of acquiring combustion turbines in Canada. [The comment letter goes on to provide several pages of material about the environmental impacts of gas exploration and development.]

Response: Material from the comment letter has been summarized and incorporated in section 4.3.1 of the supplemental DEIS.

Comment 83-1
Comment Topic: BP bad for conservation, F&W, role of agencies/tribes.
Comment Category: Impacts of Alternatives
Comment Summary: Elements of the Business Plan will prevent BPA from meeting its conservation and fish and wildlife obligations. The role of the fishery agencies and Tribes in development of the Fish and Wildlife Program is diminished.

Response: BPA stated in several places throughout the DEIS its intention to meet its fish and wildlife and conservation obligations. Nothing in the EIS diminishes the role of the fish and wildlife agencies and tribes in development of the Fish and Wildlife Program. The supplemental DEIS reinforces the fact that BPA recognizes their role. See section 2.2.8 (Fish and Wildlife Policy Modules).

Comment 173-1
Comment Topic: Quantify risks, need impacts of discrete elements
Comment Category: Impacts of Alternatives
Comment Summary: The DEIS appears to do a reasonable job of presenting the environmental impacts of the proposed action and a range of alternatives, where each alternative is defined by a set of actions by BPA and a set of reactions by others. However, other information that will have a crucial impact on BPA's chosen direction is not adequately presented. Two areas where additional information is needed include a quantification of the risks of each option and the lack of adequate information on impacts when the elements of the options are combined differently.

Response: Location-sensitive pricing is addressed broadly in the Draft EIS, in a level of detail commensurate with the policy-level decisions addressed in the EIS. The EIS identifies that location-sensitive pricing can affect the location and cost of new generating resource development and the cost of service to existing loads. Providing more detail than that is not feasible given the uncertainties about the range of costs and supply options that are likely to develop around the region with or without location-sensitive pricing.

Comment 137-38
Comment Topic: Analysis of effects of risk
Comment Category: Impacts of Alternatives
Comment Summary: How is BPA's risk affected by various rate design and unbundled products options? Are all alternatives less risky than Status Quo? Does transfer of load growth risk to local utilities have financial, institutional, or environmental consequences?

Response:

BPA's risk: The primary risk-related concern associated with the rate design and unbundled products options is in revenue forecasting, and ultimately revenue stability. The primary causes of BPA's current revenue stability problems are streamflows, weather, aluminum prices and gas prices. Shifting from selling essentially three "bundled" products (power, energy, and wheeling) to a number of unbundled products creates special challenges in estimating BPA revenues because most of the unbundled products BPA is proposing to sell are not products typically sold by utilities on a product-by-product basis. Therefore, projecting the quantity (or billing determinants) sold within BPA's two-year rate period will be challenging, and could increase the risk of a revenue under- or over-collection. As BPA staff gain more experience selling unbundled projects, the risk associated with development of a revenue forecast will be reduced. This will lead to greater revenue stability as the pricing of BPA's products more closely matches the needs of the competitive marketplace. In addition, the combination of unbundled products and tiered rates will reduce the loss of customers to other suppliers as compared to other alternatives

Relative riskiness of alternatives: The Market-Driven alternative is less risky than the Status Quo because it addresses BPA's need to adapt to the new competitive marketplace. As tables 4.4.1 and 4.3-3 show, the market-driven approach shows lower Priority Firm rates and less loss of firm load than most of the other alternatives. The reduced rates and retention of customers otherwise lost to non-BPA generation implies that BPA's revenues will be higher and more stable under the Market-Driven alternative.

Consequences of transfer of load growth risk: Transferring responsibility to meet load growth from BPA to the utilities should have minimal financial consequences. Most of BPA's customers are public agencies, and as such, have access to tax-free bonds at interest rates close to rates BPA pays to the Federal government. It is likely that utilities will

band together to acquire resources (as is happening now with Pacific Northwest Generating Co-op and Power Resource Management.) As discussed in section 4.2.2.3 of the Draft BP EIS, utilities acquiring resources independently could over-build to some degree if their predictions of load growth are incorrect and if they are unable to sell surplus power. If this occurs, rates could be higher for those utilities that have power surpluses.

Institutional consequences should be comparable because the state siting and licensing requirements for generating resources are identical, whether a resource is acquired by BPA or built by a public agency. One level of administrative review could be eliminated because Section 6(c) of the Regional Act applies only to resources acquired by BPA. Without the NPPC review process, utilities constructing their own resources could save some legal and consulting costs and time between the planning and operation stages.

Environmental consequences of transferring the load growth risk to utilities are evaluated by predicting how other utilities will respond to BPA's generation acquisition policies under various alternatives (Section 4.2.3) and in the overall evaluation of market responses under each alternative (Sections 4.4.4) and by identifying typical impacts of various types of generation facilities in Section 4.3.1.

Comment: 101-1
Comment Topic: Impacts of regulatory reform.
Comment Category: Impacts of Alternatives
Comment Summary: BPA has assumed a competitive energy market; however, the Northwest has not yet reached a point where full and equitable competition exists in the wholesale power market or the retail service market. Regulatory bodies will respond to changes in the market with regulatory reforms that could affect those markets. For example, they could require that, to site energy facilities, applicants must demonstrate consistency with regional resource plans. This might lead to construction of fewer combustion turbines than assumed in the Draft EIS. In the Final EIS, BPA should show the possible results of siting regulations that consider the need for power and consistency with regional resource plans.

Response: It is difficult to predict the specific direction that regulatory reform will head, although it is clear that energy markets are becoming more competitive and open. The Draft EIS includes analysis of the general effect of changes in environmental laws and regulations, including a carbon tax, curtailment of natural gas supply, EMF regulations, and stricter regulations on emissions, as well as increases in the price of natural gas (see page 4-78 and 4-79 of the Draft EIS). The BPA Influence alternative, in which BPA takes actions to influence its customer utilities to comply with the Council's Power Plan and Fish and Wildlife Program, and in which fewer combustion turbines are acquired than in most alternatives, may correspond to a case in which agencies impose regulations that limit the amount of new combustion turbine generation acquired in the region.

Comment 173-3
Comment Topic: Need more inf. to build your own alternative
Comment Category: Impacts of Alternatives
Comment Summary: The final business plan is unlikely to be identical to any of the options examined in the DEIS. While the "Build Your Own Alternative" was a good idea, we could not find adequate documentation to construct one ourselves. We wanted to examine the interaction of BPA funding for conservation, DSI rates, and BPA revenues, but could find no documentation of BPA revenues in the different options. We were unable to find a unified explanation of the DSI loads and allocations of Tier 1 power assumed in the alternatives. From the partial explanations found at various places in the DEIS and the White Book, we were able to make several estimates of DSI allocations, loads, and revenues, but could not make them consistent.

Response: The "build your own alternative" feature of the Draft EIS was an attempt to provide some simple tools that would allow readers to examine in a general manner the potential impacts of other combinations of policy choices besides those explicitly addressed in the EIS. In hindsight, it is clear that the simplifications required did not allow readers to develop results with ease and accuracy. The supplemental draft EIS incorporates new analyses and

"modules" (see Section 2.2.8) that address the comments BPA received on the Draft EIS. The modules may allow readers to more easily "mix and match" some elements of alternatives that represented frequently raised concerns by commenters.

Rates

Comment 138-11
Comment Topic: Rates must ensure BPA viability but not kill salmon
Comment Category: Rates
Comment Summary: "A recent Elway poll done in the state of Washington revealed that the rate-payers were willing to pay additional sums in order to operate the power system for salmon recovery. By providing power at half the national average, we have systematically destroyed the capacity of what was once the largest salmon producing river in the world Our future power rates and BPA business plans must be based on rates and pricing structures that keep BPA viable without requiring it to kill salmon."

Response: The chief challenge facing BPA is developing its Business Plans to establish a viable business while fulfilling its obligation to restore fish and wildlife in the Columbia Basin.

Comment 146-13
Comment Topic: Incorporate drought and fish flow costs in rates
Comment Category: Rates
Comment Summary: As we and others have proposed before, BPA might negotiate new power sales contracts with its customers, incorporating costs of drought and fish flow releases into the rate structure.

Response: By law, BPA's rates must recover its costs. Existing rate structures incorporate all of BPA's costs, including drought and flow augmentation costs. Customers pay these costs now, and would pay them under new contracts. The challenge to BPA is to set rates that recover costs without driving loads away to other power suppliers.

Comment 159-9
Comment Topic: Eliminate subsidies to DSIs, irrigation.
Comment Category: Rates
Comment Summary: Northwest citizens enjoy artificially low electricity rates, and aluminum smelters and irrigators are subsidized. If BPA "were serious about protecting fish and wildlife and increasing its financial stability, it would make operations and rate decisions based on the true costs of power production. Although charging market rates might drive marginal industries out of business, thus reducing BPA's revenues, it might also be one of the most effective and inexpensive means of providing needed water to fish, thus reducing expenses. In addition, a portion of the 'extra' power could be sold at higher rates to other customers."

Response:

Low electric rates: Northwest citizens no more enjoy artificially low electricity rates than citizens of the Maine coast enjoy artificially low lobster prices. The Pacific Northwest contains a fast-moving river system that moves a large volume of water a long distance with a significant change in elevation. These characteristics allowed the development of a number of dams, linked by an extensive transmission network. Most of the dams and all of BPA's transmission system were funded by long-term bonds from the Federal government. BPA's rates for electricity from these dams cover the original cost of construction plus ongoing operations and maintenance costs. This pricing method is the same

one used by public utilities throughout the United States. The dams on the Columbia were built between the late 1930s through the 1960s, when construction costs and interest rates were much lower. The citizens of the Northwest continue to receive the benefits of this investment. The Federal government undertook development of the dams because the cost and risk were too large for private utilities to finance. The dams also provide flood control, navigation, recreation and other benefits which properly place them in the category of "public goods," projects which the government should construct. Electricity rates are lower in the Northwest than elsewhere because the region has a comparative advantage in hydroelectric production and proximity to the source.

Response: Rates for DSIs are set according to section 7(c)(2) of the Northwest Power Act. DSI rates under section 7(c)(2) are set to be equivalent to the rate to preference utilities, consistent with the DSIs' load factor, plus an adjustment comparable to the markup utilities would make to set their retail rates, and credit for the value of reserves that DSIs provide to the federal system. Although DSI rates are lower than rates to utility customers, DSIs are not subsidized, because the costs to serve their loads are much lower, due to their high load factors.

The Variable Industrial rate was adopted in 1986 in an effort to promote stability in DSI loads. Unpredictable fluctuations in aluminum prices were leading to shutdowns among DSIs that would reduce BPA's revenues variability. The VI rate provided a mechanism to stabilize aluminum loads and to reduce BPA's revenue volatility, although the variability of the rate still means that BPA's revenues are subject to significant variation due to changes in the price of aluminum. In practice, the VI produced high revenues during the first five years it was in effect, because aluminum prices unexpectedly rose to over a dollar per pound. In recent years, the price of aluminum has been low as a result of aluminum sales from plants in the former Soviet Union. These variations roughly cancel each other out, so that the revenues BPA has recovered under the VI rate are about the same as BPA would have received under the pre-VI industrial power (IP) rate, except that BPA might have lost some revenues under the IP rate if smelters had shut down during the periods of lower aluminum prices.

Before BPA implemented the VI Rate, only one smelter in the entire world was served with an electricity rate based on aluminum prices. Since BPA adopted the Variable Rate in 1986, over 30 percent of the world's aluminum production is served with a tariff based on aluminum prices.

Irrigation discount: BPA's initial proposal for the 1995 rate case recommended eliminating the irrigation discount; the supplemental draft BP EIS contains a module analyzing the effects of doing so.

Market-based rates: BPA currently uses a form of market-based rates for the sale of nonfirm energy. When the supply of nonfirm is high during spring runoff, the price is generally very low. During other times of the year, the price is set by the interaction of supply and demand on the West Coast power grid. BPA is prohibited by Federal statute from selling firm power at market-based rates to its preference and DSI customers. BPA's rates must be set in accordance with Section 7 of the Regional Act, and such rates must recover all of BPA's costs of providing electricity to its customers. BPA cannot simply raise the rates to the DSIs high enough to have them all shut down and hope that it can raise rates to other customers to make up the difference. The DSIs account for about 25 to 30 percent of BPA's revenues. By shifting costs to preference and other customers, BPA would lose significant load and the ability to operate without direct payments from Congress.

Comment 105-9
Comment Topic: Adequacy of EIS analysis.
Comment Category: Rates (DSI Service; Conservation)
Comment Summary: The Draft EIS does not adequately address the impacts of:
(a) tiered rates based on a Tier 1 assigned the costs of existing FBS resources only;
(b) allowing versus precluding FBS resource additions;
(c) including short-term power purchases in Tier 2;

(d) Tier 1 accommodation of new preference customers;
(e) reductions in DSI Tier 1 power to serve future preference customer loads;
(f) accommodating nonpreference customers with FBS service at the expense of preference customers; and
(g) a substantially reduced BPA role in regional conservation in favor of local control and responsibility.

Response: The supplemental DEIS analyzes several rates "policy modules." (See sections 2.2.8 and 4.5.) The preferred alternative (Market-Driven BPA) incorporates a tiered rate proposal that has the Tier 1 DSI service percentage declining over time.

BPA believes its conservation reinvention proposal represents a substantially reduced BPA role in conservation in favor of local control and responsibility.

Comment 137-34
Comment Topic: Analysis of tiered rates, DSIs.
Comment Category: Rates, DSI Service
Comment Summary: The Draft EIS failed to consider:

- an initial allocation of Federal Base System resources to Tier 1 recognizing preference;
- reallocation of unused DSI Tier 1 power to preference customers;
- access to Tier 1 Federal Base System resources by new preference customers; and
- recall of DSI service due to shrinkage of Federal Base System capability for use by preference customers.

Response: The supplemental draft EIS includes analysis of DSI service options comparable to reallocation of DSI Tier 1 power and recall of DSI Tier 1 service, among other DSI service options. (See sections 2.2.8 and 4.5).

Comment 137-39
Comment Topic: Rankings of alternatives.
Comment Category: Rates
Comment Summary: Why does Table 4.3-1 differ from Figure C-1 as to the ranking of rates among alternatives?

Response: The supplemental draft EIS incorporates revised rates analysis, which addresses this comment, among others. See chapters 2, 4, and Appendix C.

Comment 174-5
Comment Topic: Low density discount
Comment Category: Rates
Comment Summary: Our [NCAC] recommendation regarding the low density discount in the 1993 rate case would result in significant energy savings.

Response: Low density discounts are among the rate designs addressed in Appendix B. Generally, rate designs to encourage energy conservation must take into account market prices, which limit the effect of price incentives. Conditions on the low density discount based on energy could influence the level of conservation achieved, but such conditions could also add to customers' inclinations to buy power from non-BPA suppliers.

Tiered

Comment 83-3
Comment Topic: Tiered rates should be tied to fish needs.
Comment Category: Rates
Comment Summary: BPA ignored fish and wildlife in establishing rate tiers. However, BPA could price electrical generation from fall and winter drafts of storage reservoirs higher than electricity generated at the time of historical peak flows in the spring and early summer. This would conserve water in storage reservoirs during winter. It would benefit anadromous fish by conserving water until flows are needed in spring; it would benefit resident fish because the drafts of storage reservoirs in spring would not be as deep as they are now.

Response: The SDEIS addresses variations in rate design which provide for seasonal and streamflow-based rates, as well as tiered rates that vary with Federal system capability (see section 4.5.3). However, because the operation of the hydro system is controlled by the operators and the requirements of NMFS recovery plan and other direction, rate designs will not alter operations, but only affect how well BPA's marketing matches those operations.

Comment 174-4
Comment Topic: NCAC tiered rates proposal
Comment Category: Rates
Comment Summary: Our [NCAC] proposal in the 1993 rate case regarding tiered rates is still a viable option with many advantages to those offered by other parties. Its unique aspects, including a rate pool approach and a "growth adjustment" option, would lead to impacts that are significantly different from those evaluated in the Draft EIS.

Response: The supplemental draft EIS includes analysis of a loads-based Tier 1 and a resource-based Tier 1. See section 2.2.8 and 4.5.3.

Comment 137-33
Comment Topic: Analysis of tiered rates.
Comment Category: Rates
Comment Summary: The Draft EIS failed to analyze the effect of tiered rates based on clear division between old and new resource costs; Tier 1 rates should not include Federal Base System replacements. BPA's analysis included some Federal Base System resources in Tier 2.

Response: The supplemental draft EIS includes analysis of a resource-based Tier 1 and a loads-based Tier 1. See section 2.2.8 and 4.5.3.

Comment 109-10
Comment Topic: Remove purchased power from Tier 1.
Comment Category: Rates
Comment Summary: The Draft EIS ignores the intersection between hydro operations and business decisions. Both the SOR EIS and BP EIS each assume static inputs from each other. How operations for non-power purposes are set can be heavily influenced by rates. BPA needs to be able to react to the salmon crisis without jeopardizing its ability to be competitive. We recommend removing purchased power from Tier 1, allowing it to fluctuate month-to-month, giving a price signal of the value of water.

Response: The revised EIS analyzes a Tier 1 that does not include the costs of purchased power in the "Resource-Based Tier 1" policy module.

Comment 159-6
Comment Topic: Tier 1 rate does not include true costs of hydrosystem.
Comment Category: Rates
Comment Summary: We support the concept of tiered rates to reflect the costs of production. However, "the arbitrary annual cap on fish and wildlife expenditures and the goal of avoiding any tier 1 rate increase until the year 2000 will only continue to insulate tier 1 customers from the actual costs of the federal hydrosystem. References to the 'inexpensive federal hydrosystem' are sprinkled throughout the plan, signaling that the huge ongoing costs to fish and wildlife as a result of existence and operation of the hydrosystem continue to be excluded from the equation."

Response: BPA's Tier 1 customers will always pay the "true costs" of the hydro system. Fish and wildlife costs are an integral part of BPA's budget and wholesale rates. BPA has spent in excess of $2 billion on fish and wildlife costs since 1981. The current annual costs are almost $350 million annually. The new measures recently adopted by the Northwest Power Planning Council or National Marine Fisheries Service could add an additional $150 to $200 million annually. These fish and wildlife costs are being paid for by the citizens and industry of the Pacific Northwest through electric rates.

Comment 174-7
Comment Topic: Flow-based Tier 1 size.
Comment Category: Rates
Comment Summary: The Draft EIS fails to investigate flow-based sizing of tier one, a proposal accepted by all the customer groups.

Response: The rate design appendix (Appendix B) in the Draft EIS reviewed a wide range of rate designs that could at least hypothetically apply in the Pacific Northwest. As explained in the Draft EIS (page 1-6), the System Operation Review (SOR) process will establish the hydro operations parameters within which BPA will operate in the future. Once the SOR establishes those parameters, a streamflow-based rate would primarily affect revenues, i.e., how many sales BPA could make within that hydro operation framework. The supplemental draft EIS explores how streamflow-based rates could provide a useful marketing tool to make the best of the hydro operations established by the SOR.

Comment 159-8
Comment Topic: Tier 2 rates dilute benefit of conservation
Comment Category: Rates
Comment Summary: If the costs of each new and more expensive resource are simply averaged with existing tier 2 resources, the price signals expected to drive conservation will be diluted. Also, tiered rates will eliminate the 10-percent advantage for conservation specified in the Northwest Power Act. The BPA Task Force chaired by Rep. DeFazio found that tiered rates alone will not provide adequate incentives for substantial investments in conservation and energy efficiency; the Council has expressed similar concerns and offered alternatives. BPA should investigate alternatives and adopt a plan that provides more assurance of continued conservation success and addresses renewables as mandated in the Power Act.

Response: BPA does not intend to rely upon price signals alone. BPA will acquire regional conservation through market transformation efforts and by offering energy services products to its customers. Also, see response to comment 143-3.

Streamflow-Based/Seasonal

Comment 109-2
Comment Topic: Streamflow-based rates.
Comment Category: Rates
Comment Summary: The rate designs appendix, page B-37, states that implementation of a streamflow-based alternative could support increased survival of anadromous fish. The extent of this support should be quantified and credited to alternatives that have this type of rate.

Response: The rate design appendix (Appendix B) in the Draft EIS reviewed a wide range of rate designs that could at least hypothetically apply in the Pacific Northwest. As explained in the Draft EIS (page 1-6), the System Operation Review (SOR) process will establish the hydro operations parameters within which BPA will operate in the future. Once the SOR establishes those parameters, a stream-flow based rate would primarily affect revenues, i.e., how many sales BPA could make within that hydro operation framework. The Supplemental Ddraft EIS explores how streamflow-based rates could provide a useful marketing tool to make the best of the hydro operations established by the SOR.

Comment 165-5
Comment Topic: Flow-based rates
Comment Category: Rates
Comment Summary: The BP is silent on flow-based rates and contract provisions that would help reduce BPA's revenue volatility during low-water conditions, which some BPA customers have adopted.

Response: See response to comment 109-2 above.

Comment 159-7
Comment Topic: Seasonal, flow-based rate structures.
Comment Category: Rates
Comment Summary: Because BPA divorced fish and wildlife obligations and costs from power production goals, it has not adequately considered seasonal rate structures or other incentives to encourage conservation and to make the hydrosystem more compatible with fish and wildlife needs, thus reducing mitigation costs and complying with the purposes of the treaties and federal and state laws on management of Columbia River resources. Flow-based rates and/or flow-based tier 1 sizing have also been suggested.

Response: See response to comment 109-2 in this section.

Comment 138-5
Comment Topic: Need to consider seasonal and flow-based rates.
Comment Category: Rates
Comment Summary: The cost structure has the potential to be beneficial as a conservation incentive, but no attempt is made to use rates to guarantee that in drought years sufficient water will be available for fish migration (i.e., seasonal rates and flow-based rates).

Response: See response to comment 109-2 in this section.

Comment 165-6
Comment Topic: Seasonal rate structures
Comment Category: Rates
Comment Summary: The BP fails to look at seasonal rate structures such as lower rates in spring and summer when water is needed for fish flows.

Response: See response to comment 109-2 in this section.

Conservation

Comment 109-4
Comment Topic: Conservation proposal.
Comment Category: Conservation
Comment Summary: A number of alternatives have BPA as the regional funder and acquirer, while others leave most of the conservation effort to the customers. Both these types of options are expected, in the EIS, to achieve the same amount of conservation--the 660 aMW target--by 2003. Regional conservation targets have been surpassed in recent years, and we would expect year-by-year targets set by the Council would be met if the "full-funding" approach continued. This would result in a minimum of 122 additional aMW acquired by 2003. The NCAC recommends that the attached detailed option for conservation be evaluated (see below, comment 109-8). Its rate impact would be below the current "fully-funded" approach and it would lead to significantly greater conservation resource acquisition.

Response: Please see response to comment 109-8 in this section.

Comment 134-31
Comment Topic: Conservation should be the priority resource.
Comment Category: Conservation
Comment Summary: Conservation should be the priority resource. BPA should discontinue the Super Good Cents program as being counter to BPA's mandate. Conservation that reduces use of the FCRPS during fall and winter could improve spring and summer migration conditions if BPA does not sell the conserved energy under its unbundled services. Failure to conserve could adversely impact migration for anadromous fish if CTs are acquired and flows are seasonally reduced.

Response: See response to comment 143-3 ("Impacts of Alternatives" section).

Comment 83-4
Comment Topic: Priority to conservation that reduces fall & winter use.
Comment Category: Conservation
Comment Summary: "Priority should be given to conservation projects that reduce fall and winter electricity consumption."

Response: See response to comment 143-3 (see "Impacts of Alternatives"). To BPA, conservation is important year-round, so it looks for opportunities wherever they exist.

Comment 149-8
Comment Topic: Conservation should be emphasized.
Comment Category: Conservation
Comment Summary: Conservation should be the priority resource.

Response: Conservation is the priority resource in BPA's resource acquisition program.

Comment 162-6
Comment Topic: BPA proposal would acquire less than current program
Comment Category: Conservation
Comment Summary: The Business Plan's conservation proposal would be a radical shift from a program which has finally begun to surpass annual targets. By abandoning the year-to-year conservation targets in the Council's plan and focusing solely on the overall goal of 663 aMW, BPA effectively reduces the amount of conservation it would acquire because of the earlier successes of a program now being discarded.

Response: See response to comment 143-3 (see "Impacts of Alternatives").

Comment 162-7
Comment Topic: Tiered rates can't alone spur adequate conservation.
Comment Category: Conservation
Comment Summary: While FoE supports the concept of tiered rates, a quick review of various utility's rates and level of conservation shows that "price signals" do not by themselves spur significant energy conservation. A successful program must include education and incentives such as BPA has funded in recent years. The BP proposal represents poor business judgment and a retreat from Northwest Power Act mandates.

Response: BPA does not intend to rely upon price signals alone. BPA will acquire regional conservation through market transformation efforts and by offering energy services products to its customers. Also, see response to comment 143-3 (under "Impacts of Alternatives").

Comment 105-9
Comment Topic: Adequacy of EIS analysis.
Comment Category: Conservation (Rates; DSI Service)
Comment Summary: The Draft EIS does not adequately address the impacts of a substantially reduced BPA role in regional conservation in favor of local control and responsibility.

Response: See response to Comment 143-3 ("Impacts of Alternatives"). BPA believes its proposal represents a substantially reduced BPA role in favor of local control.

Comment 137-35
Comment Topic: Analyze less BPA in regional conservation.
Comment Category: Conservation
Comment Summary: The Draft EIS failed to consider a full ramp-down of conservation funding from BPA and transfer of conservation development responsibilities to utilities. Analysis (including effects on retail and wholesale rates) of a successful regional conservation program with much less involvement of BPA should be included.

Response: In the existing centrally funded paradigm of acquiring conservation, all BPA customers currently contribute (through wholesale rates) to the costs of a regional system. These costs are determined by the amount of power purchased from BPA, not the level of conservation potential available within a given utility's service territory. This system of re-allocation has created significant inequities as these funds are redistributed.

BPA staff have analyzed the potential retail rate effects of moving from a centralized, regionally-funded conservation acquisition model to one of local control and funding. The generating public utilities are expected to incur a rate "increase" as a result of conservation reinvention. However, by reducing incentive levels and increasing end-consumer contribution levels, these rate effects can be mitigated. The non-generating public utilities are generally expected to see their costs (i.e., conservation and purchased power) decline from current levels.

Comment 137-37
Comment Topic: Assumptions about conservation spending.
Comment Category: Conservation
Comment Summary: What assumptions regarding exceedance of conservation borrowing caps underlie the Status Quo rates projections? How do these assumptions affect conservation acquisition targets? If BPA is relying on third-party financing assumptions, are the costs reflected in wholesale and retail rate projections?

Response: At the current rate of conservation acquisition (under the existing model) BPA's conservation borrowing authority will be depleted in Fiscal Year 1998. Assumptions used in the Status Quo alternative do not reflect this limitation.

Comment 109-7
Comment Topic: Like parts of conservation reinvention
Comment Category: Conservation
Comment Summary: We applaud some of the key insights of BPA conservation reinvention:

- Long-term conservation success requires local initiative
- Real and perceived inequities in the distribution of conservation expenditures need to be addressed
- BPA and its customers can and should reduce conservation overhead
- We should focus on performance and reward it.

Response: Thank you for your support. See also response to comment 143-3 (see "Impacts of Alternatives").

Comment 109-8
Comment Topic: Conservation proposal
Comment Category: Conservation
Comment Summary: We suggest some features of an improved regional approach to conservation:

1. Adjust conservation cost-sharing to more closely reflect utilities' resource needs and reliance on BPA.
2. Increase retail utilities' proportion of overall conservation investment relative to BPA's to reflect the increased local value of conservation in a tiered rates environment. Do not diminish aggregate conservation investment as cost-effective conservation opportunities remain.
3. Reduce the total cost of energy efficiency programs by capitalizing on the customers' access to favorable tax-exempt financing.
4. Reduce the unit cost of saved energy and ensure that conservation targets do not become caps by preserving the budget flexibility to take advantage of unanticipated opportunities between rate cases.
5. Continue the trend toward providing increased local flexibility in program implementation.
6. Forge a clear contractual link between efficiency performance and allocation of FBS benefit to wholesale customers.
7. Develop and implement an ambitious market transformation program that uses BPA's formidable market leverage to institutionalize efficiency in technology development, construction practices, building operations, and industrial processes.
8. Identify and remove barriers that constrain BPA's ability to reap the full market value of its efficiency investments on behalf of the region's customers.

Response: BPA is currently negotiating with its customers the parameters of an "accountability framework." BPA's implementation plan is as follows:

1). BPA remains committed to acquisition of regionally cost-effective conservation as established in the Northwest Power Planning Council's regional Plan. We will ensure that this goal is met either through the actions of our customers and others, or by BPA itself.

2). BPA will provide, in consultation with the Council, sufficient funding to implement its share of regionally cost-effective market transformation efforts.

3). BPA's power sales contracts will require utility customers and direct service industries to prepare and implement integrated resource plans or local conservation plans designed to capture their share of regionally cost-effective conservation.

4). Conservation performance will be tracked independently.

5). The accountability mechanism will include a combination of wholesale tiered rates, remedies for poor conservation performance, and rewards for good performance. It is intended to make regionally cost-effective conservation the best business choice for customers.

6). BPA is prepared to provide additional support for conservation acquisition if necessary to ensure that the region meets or exceeds the Council's conservation targets.

While BPA is transferring some conservation funding responsibilities to our customers, these actions do not imply any reduction in our determination to secure cost-effective electricity savings.

Comment 109-9
Comment Topic: Erosion of conservation infrastructure.
Comment Category: Conservation
Comment Summary: We are concerned about the rapid erosion of a conservation infrastructure that took a decade to build and delivered admirable results last year. Because of widespread perception that BPA's "reinvention" will mean significant and rapid reductions in energy efficiency investment, private sector energy service leaders have reduced their workforces or left the region.

Response: BPA is not the only source of conservation in the region; many utilities have independent conservation programs, and more public utility commissions are requiring conservation. BPA's conservation reinvention does not diminish the regional conservation effort, so people should be available to accomplish the work. The market for conservation has adjusted in the past and will continue to do so if conservation is a worthwhile effort, which BPA believes is the case.

Renewable Resources

Comment 109-5
Comment Topic: Amounts of renewables in alternatives.
Comment Category: Renewables
Comment Summary: The amount of renewable resources foreseen from each alternative in the EIS was inadequately analyzed. All alternatives except one result in the same amount of renewables acquired. Given that the Market Influence alternative called for penalties for failure to include externalities in resource decisions and incentives for development of renewables, it is inconceivable that not one more MW of green resources would be acquired.

Response: The Supplemental Draft EIS revised the analysis of renewable resources, and incorporates several "modules" that address: renewable resource incentives, maximization of renewable resource acquisition, and a "Green" Tier 2 rate that would allow interested utilities to acquire additional renewable resources. The BPA Influence alternative (which incorporates the renewables incentives and "Green" Tier 2 modules) and the Market-Driven BPA alternative (which incorporates the "Green" Tier 2 module) show a total of 380 aMW of renewable resource acquisitions by 2002--210 aMW more than in the Status Quo alternative. (See sections 2.2, 4.4 and 4.5.)

Comment 174-8
Comment Topic: RNP proposal.
Comment Category: Renewable Resources
Comment Summary: The detailed proposal of the Renewable Northwest Project must be given serious consideration and evaluation in the Final EIS.

Response: Please see the response to comment 113-4 below.

Comment 177-2
Comment Topic:
Comment Category: Renewables
Comment Summary: Commenter summarized the comment letter that the Renewable Northwest Project had submitted to BPA (see Letter 113 comments).

Response: Please see the response to comments 113-1 through 113-4 below.

Comment 113-1
Comment Topic: Mandate exists for renewables; EIS analysis inadequate
Comment Category: Renewables
Comment Summary: Numerous polls show significant public support for the environment and renewable energy. BPA deserves credit for the wind and geothermal projects it has underway. But despite this record, despite the Regional Act's guidance that renewables will receive priority as a resource after conservation, and despite BPA's huge presence in the current Northwest market, renewables receive no real analysis in BPA's Business Plan and EIS.

Response: As noted above in the response to comment 109-5, the Supplemental Draft EIS incorporates substantially greater analysis of renewable resource acquisition alternatives.

Comment 113-2
Comment Topic: Errors in renewables analysis.
Comment Category: Renewables
Comment Summary: The following are errors or oversights in the Business Plan and EIS:

- BPA lists acquiring only 10 aMW of its wind projects, though BPA project summaries state the total should be 16 aMW.
- BPA indicates there are no other renewables that other utilities will acquire between now and 2003, although geothermal and wind projects in development or active negotiation total 95 aMW, and others are first options or could be expanded.
- EIS inadequately analyzes the impact of the Business Plan on renewables development.
- EIS is remiss in treatment of price risks for CTS from fuel costs, further tightening of clean air requirements, and possible carbon taxes.

Response: The Supplemental Draft EIS incorporates revised assumptions about renewable resource acquisitions, and shows a minimum of 170 aMW of regional renewable resource acquisitions in all alternatives (and up to 380 aMW in two alternatives). The Supplemental Draft EIS also includes revised analysis of renewable resources, and incorporates several "modules" that address: renewable resource incentives, maximization of renewable resource acquisition, and a "Green" Tier 2 rate that would allow interested utilities to acquire additional renewable resources. Although this EIS addresses possible contract and rate provisions to encourage the development of renewable resources, the Business Plan and its EIS are not the decision vehicle for decisions about broad choices of the types of conservation and generation resources BPA may acquire (e.g., price risks for CTs, further tightening of Clean Air Act requirements, and possible

carbon taxes). Such choices were addressed in BPA's Resource Programs Final EIS, and will be considered in future BPA resource programs processes.

Comment 113-3
Comment Topic: Vision and goals for renewables.
Comment Category: Renewables
Comment Summary: As the BP lacks goals for renewables, we suggest the following vision and goals for renewables in the region:

- Ultimate vision: all resources used for electricity in the Northwest should be either renewable or energy efficiency. A mid-term goal would be that from the year 2000 forward, all new resources acquired would be renewables or energy efficiency.
- BPA should focus on market-making and market-confirming activities.
- BPA should establish a Critical Success Factor for renewables, reinforced in the roles for Customer Account Executives, similar to their role for DSM.
- BPA or its customers should acquire a minimum of 450-600 aMW of renewables by the 2000.
- BPA should identify how its system, especially its transmission assets, can be used to achieve the renewables goal.

Response: Thank you for your input on a suggested vision and goals for BPA's renewable resource acquisitions.

Comment 113-4
Comment Topic: Action plan for renewables.
Comment Category: Renewables
Comment Summary: We propose the following action plan for renewables:

- Provide a 10-percent incentive in BPA's rate structure for utilities using BPA services to integrate non-BPA renewable resources into their systems.
- Invest in renewables for future generation acquisitions and develop products and services to be offered as a green alternative to meet load growth.
- Make available an integration package that incorporates the unique needs of renewable resources.
- Offer DSM and renewables competitively for utilities to meet tier 2 load growth.
- Establish separate tariffs and credits to utilities that amount to a 10-percent reduction in *project* costs for renewables.
- In BPA's acquisition program, evaluate renewables solicitations at an estimated incremental cost 10 percent below actual project costs, but acquire them at project costs.
- Make at least 35 percent of BPA's future resource acquisitions renewable.
- Work with the Administration under its Climate Change Action Plan to minimize greenhouse gases and encourage PNW utilities to join the Climate Challenge Program.

Response: The Supplemental Draft EIS includes revised analysis of renewable resources, and incorporates a modules that largely addresses the action plan identified by this comment. The "Renewable Incentives" module (section 4.5.4.2) assumes that BPA would develop an incentive package of rates and contracts provisions that would provide a 10-percent reduction in the effective cost of renewable resources and that would encourage acquisition of renewables by both BPA and BPA customer utilities. It should be noted that in the proposed alternative (Market-Driven BPA), 38 percent of BPA's resource acquisitions by 2002 are renewable resources, and 85 percent are renewables or conservation.

Fish and Wildlife Program Reinvention

Comment 145-1
Comment Topic: F&W costs are an old debt
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: We are concerned about BPA's commitment to funding fish and wildlife costs--an old debt, not a new cost.

Response: BPA is committed to mitigating the damage to fish and wildlife resources caused by the development and operation of the Federal Columbia River Power System. Whether viewed as an old debt or a new cost, this mitigation responsibility is clearly laid out in the Northwest Power Act and the Endangered Species Act.

Comment 145-3
Comment Topic: Need more inf. on F&W reinvention
Category: Fish and Wildlife Program Reinvention
Comment Summary: The Business Plan and EIS are quite vague on the Ten Year Planning Process, the new Implementation Planning Process (IPP) and the Plan's relationship to the Council's Fish and Wildlife Program. We agree that the IPP needs to be improved, submitted projects need to be part of a coordinated whole and all should be evaluated and prioritized in light of the Council's program. However, the Business Plan does not provide much information on the new process. The wording implies that "BPA may be interested in creating a new, larger, unworkable bureaucracy that will make it impossible to reach an agreement on funding any project. . .

BPA must describe the proposed IPP process, the Ten Year Plans and the connection between the CSIs and the Council's Fish and Wildlife Plan in sufficient detail for the public to understand the implications of the plan and to comment from an informed position. Without this information the Draft EIS is deficient."

Response: It is not possible to provide precise information on the process BPA will use to coordinate its fish and wildlife business as the process has yet to be developed. The Implementation Planning Process (IPP) has not been sufficiently satisfactory to BPA and to many fish and wildlife entities. There are certain principles about a public coordination process, however, that BPA believes must be integrated into the new. The process:

1) must be open and public;
2) must allow improved working relations with fish and wildlife agencies and improved government-to-government relations with Tribes;
3) will schedule implementation of BPA fish and wildlife actions arising from the Columbia River Basin Fish and Wildlife Program and the ESA Recovery Plans, and review the outcomes of the implemented actions;
4) will encourage implementation of projects arising from integrated watershed plans;
5) will strive to ensure that efforts are not duplicative of others;
6) will encourage adoption of biological objectives and specific fish and wildlife results on a project-by-project basis.

The commenter questions the relationship of any BPA Fish and Wildlife Program Reinvention to the Northwest Planning Council's Fish and Wildlife Program. An overriding purpose of F&W Reinvention is to implement those measures assigned to BPA in the Program in an efficient and effective manner. Any final Reinvention would therefore be directly tied to the Program and would be a mechanism for its realizations. Similarly, the Critical Success Indicators that will be developed through the Reinvention will focus BPA implementation activities on the priorities outlined in the Council's Program and any ESA Recovery Plans.

BPA has decided to alter its proposal of a Ten-Year Fish and Wildlife Implementation Plan. BPA still intends to account for the costs, biological objectives, and results of those projects it funds for implementation. This accounting will occur as specific projects are developed and implemented to accomplish measures in the Fish and Wildlife Program and Recovery Plans. This accounting system will allow BPA and the region to track actual costs and progress on specific biological objectives in a publicly accessible information system.

Comment 151-11
Comment Topic: Need more inf. on F&W reinvention.
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: The preferred alternative in the DEIS is not consistent with the Business Plan. It does not describe the Ten Year Planning Process, the new IPP, development of the CSIs, or combining of reimbursable funding for natural resource management. BPA must describe these proposed activities in sufficient detail that we may determine how they relate to BPA's responsibilities under ESA and the Power Act, and to BPA's treaty and trust responsibilities to the tribes.

Response: See response to comment 145-3.

Comment 83-9
Comment Topic: Expanding IPP will reduce $ for projects.
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: Expanding the IPP process, already Portland-based and consuming too many dollars for process, will further reduce the dollars available for on-the-ground projects.

Response: BPA does not intend to create an expensive and cumbersome coordination process to replace the IPP. BPA's interests are to direct as much of its funding as possible into activities that produce fish and wildlife results. A process will be created that allows the pursuit of results to occur in a coordinated, collaborative, and cost-effective manner. BPA is attempting to reduce its coordination expenses.

Comment 129-37
Comment Topic: F&W management assumptions
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: BPA's preferred alternative includes several key features (pursuing additional measures that are cost-effective, biologically sound, and results-oriented, and increased BPA coordination of regional implementation) that could be applied to other alternatives. In addition, BPA's ability to take on the regional coordination role, as proposed in the EIS's Market-Driven alternative, is not clearly demonstrated in the Business Plan itself.

Response: BPA agrees that different ways of administering its fish and wildlife program could apply to any alternative, and has revised the EIS to include fish and wildlife administrative options as "modules" that can be "mixed and matched" with the six comprehensive alternatives. See sections 2.2.8 and 4.5.

BPA does not intend to assume the role of a regional coordinator for implementation of fish and wildlife mitigation. BPA intends to implement those projects assigned to it in the Council's Fish and Wildlife Program and ESA Recovery Plans. BPA wants to ensure that its implementation does not duplicate or reduce the effectiveness of activities being implemented by others in the region. BPA wants to work with others in the region who fund fish and wildlife mitigation and enhancement, to ensure an integrated regional effort.

Comment 101-3
Comment Topic: Why would Board manage F&W better?
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: Certain assumptions have been made for which no rationale has been given. For example, BPA provides no evidence to support the statement that a board or trust might not do a better job managing fish and wildlife programs than BPA, nor does it show the degree of influence this has on environmental impacts.

Response: The concept of an Ecosystem Trust is not to focus on whether a Trust, managed by a Board, would manage fish and wildlife mitigation projects better or worse than BPA. The Trust concept is viewed as a beneficial one because it would encourage many regional parties, public and private, to combine available funds for similar fish and wildlife objectives and accomplish progress toward those objectives in a more efficient and coordinated manner.

BPA has revised its analysis of fish and wildlife administrative options to more clearly discuss the tradeoffs (section 4.5). However, we conclude that there is no objective evidence to support the conclusion that a particular administrative approach will increase or decrease fish survival.

Comment 162-5
Comment Topic: Analyze transfer to resource agencies and tribes.
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: The Business Plan should analyze transfer of implementation of fish and wildlife program activities to the resource agencies and tribes, to the Columbia Basin Fish and Wildlife Authority or to some comparable agency/tribal entity.

Response: The Draft EIS did consider the alternative of transferring responsibility to another entity. However, the revised EIS includes the option as a module that can be applied to any of the alternatives, although it is not currently the proposed option.

Comment 134-18
Comment Topic: Transfer admin. of F&W funding to other entities.
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: We strongly urge BPA to transfer administration of F&W Program funding to an entity created by the Columbia Basin's federal and state fish and wildlife agencies and Indian tribes or to the U.S. Fish and Wildlife Service. This would be conditioned on a thorough monitoring and evaluation program tied to specific rebuilding targets and a commitment to the Council's F&W Program. A lump-sum transfer would allow BPA to reduce its fish and wildlife staff, freeing additional funds for F&W measures. It could also "alleviate the time-consuming conflicts between BPA staff and agency and tribal staff and unilateral decisions by BPA staff that have slowed program progress and locked out fishery agency and tribal input."

Response: BPA expanded its analysis of this option in the revised EIS. As discussed in section 4.5, annual BPA fish and wildlife staff costs of about $5 million would not contribute a significant amount to on-the-ground projects, as they represent only 7 percent of BPA's 1994 Fish and Wildlife Program direct costs of $83 million

"Time-consuming conflicts" often result from a lack of clarity and regional agreement on the objectives fish and wildlife mitigation measures are designed to correct. This lack of clarity on objectives comes to a head when regional agreement is attempted at the time of funding. BPA's proposal and one alternative attempt to clarify BPA's role in defining project objectives.

Comment 149-9
Comment Topic: Transfer BPA F&W functions to another entity.
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: We support transferring administration of F&W Program funding to an entity created by the Columbia River Basin Federal, state and tribal fish and wildlife agencies or, in the absence of such an entity, to the U.S. Fish and Wildlife Service. A lump-sum transfer would allow BPA to substantially reduce its fish and wildlife staff, free additional funds for F&W Program measures, and alleviate time-consuming conflicts between BPA staff and agency and tribal staff that have slowed the program's progress.

Response: See response to comment 134-18.

Comment 165-13
Comment Topic: Thoroughly analyze transfer of F&W responsibility.
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: The BP should thoroughly analyze the transfer of responsibility for implementing the F&W Program to other fish and wildlife agencies and Indian tribes. The efforts of BPA's substantial full-time F&W staff have too often duplicated or been inconsistent with the measures implemented by other agencies and Indian tribes.

Response: See responses to comments 162-5 and 134-18.

Comment 146-12
Comment Topic: Support annual lump-sum payments for F&W
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: BPA might pay for F&W actions in annual lump-sums with oversight and audit by an independent body (e.g., NWPPC), eliminating need for BPA's large and expensive F&W staff. We and others have made these proposals before.

Response: See responses to 162-5 and 134-18.

Comment 120-7
Comment Topic: Failure to achieve F&W results partly BPA's fault
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: The BP asserts that BPA expenditures on the Fish and Wildlife Program have yielded few results. "BPA's insistence on micro managing the fish and wildlife portion of the Power Act has been partially at fault for its failure. BPA has made unilateral decisions on expenditures of research dollars and has considered off limits the operation of the projects as part of the basic fish and wildlife program. Providing spill is a prime example of the 'hands off operations' approach BPA has taken in the past. Had fish and wildlife program funds been directed more toward project operations, the status of anadromous fish stocks [might] be somewhat better today."

Response: The region is considerably frustrated by the general lack of fish and wildlife results, despite considerable mitigation expenditures and foregone revenues from operations of the hydrosystem. This frustration is primarily focused on anadromous fish. BPA shares in this frustration. We do recognize, however, that this lack of results is due only in part to the efficacy of the projects and operations BPA has funded or implemented. It is clear that natural environmental conditions, poor ocean conditions and continuous drought are the primary causes for the lack of response of anadromous fish runs to mitigation measures.

It is clear to BPA and many others that monitoring and evaluation activities for Columbia River Basin mitigation could be better organized and coordinated to achieve greater understanding of cause-and-effect relationships. Without better information, the region cannot follow the path of adaptive management to increase the fish and wildlife produced from our mitigation activities.

There is not agreement in the region about the benefit of spill for fish, or how the system could be best operated to meet fish and wildlife, power, and other needs. Much of the confusion over which operations to implement will be clarified in the future through the directives of NMFS in its Biological Opinions and Recovery Plans prepared pursuant to ESA, and as part of the SOR process; Business Plan decisions will be guided by the operational constraints imposed in those processes.

Comment 138-9
Comment Topic: Eliminate BPA's F&W division.
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: The reason BPA expenditures for fish and wildlife have not resulted in salmon recovery is because a large portion of the funding decisions were made without the input or consensus of regional fish managers. BPA should eliminate its fish and wildlife division as duplicative of the resource agencies and tribes.

Response: See response to comments 134-18 and 120-7.

Comment 165-12
Comment Topic: Consensus decision-making for F&W expenditures.
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: BPA acknowledges in the EIS that "funding by itself is no assurance of effective mitigation or enhancement [of fish and wildlife]." (p. 4-102). However, the Business Plan's F&W budget cap proposal seems to assume that the F&W Program has been properly administered but failed to achieve the desired results.

A substantial obstacle to cost-effective implementation of a comprehensive fish and wildlife program has been BPA's failure to follow the advice of agencies and tribes responsible for management in the Columbia River Basin. BPA "has unilaterally implemented measures that were not generally supported by these experts and failed to implement other potentially effective measures that were widely supported."

BPA should adopt consensus decision-making for all its fish and wildlife expenditures. Both the mid-Columbia and the Skagit provide models of processes where fish and wildlife agencies, tribes and utilities have worked cooperatively on fishery solutions.

Response: As indicated in response to comment 145-3, BPA is still investigating how to develop a coordination and implementation process that best accomplishes BPA's fish and wildlife responsibilities in a collaborative manner. BPA has met, and will continue to meet, with many regional environmental leaders in its Fish and Wildlife Sounding Board to pursue the formation of this process. The "Mid-Columbia and Skagit" mitigation processes are being considered in this forum as possible formats for BPA.

BPA has largely followed the advice of regional fishery entities through implementation of the Council's Program and through several forums where hydrosystem operations are coordinated. With respect to operations, much of the confusion over which operations to implement will be clarified in the future through the directives of NMFS in its Biological Opinions and Recovery Plans prepared pursuant to ESA, and through the SOR process.

Comment 165-10
Comment Topic: BP should consider F&W "contract"
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: "The BP should consider the alternative of a 10-year fish and wildlife 'contract,' one that parallels power sales contracts, that clearly identifies those measures to effectively implement the Council's Strategy for Salmon and other essential fish and wildlife programs." The "contract" could also identify areas of uncertainty, such as the potential implementation of a federal salmon recovery plan that might affect future funding requirements.

Response: As discussed in section 2.2.8 of the supplemental draft EIS, BPA is currently considering the possibility of a multi-year agreement for a BPA fish and wildlife budget. Agreement is being sought with fish and wildlife agencies on a stable funding level that would satisfy full implementation of the Council's Program. If such an agreement can be achieved, then all regional fish and wildlife and ratepaying interests would gain certainty in funding levels.

BPA also has proposed a gain-sharing concept that would add a percentage of any annual BPA net revenues to its fish and wildlife mitigation efforts. An Ecosystem Trust is being considered as a possible repository for these gain-sharing funds.

BPA is assuming that the Council's Program and the Recovery Plan for Snake River salmon will be consistent, thereby allowing the possibility for a budget agreement.

Comment 83-7
Comment Topic: F&W funding cap
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: We fear that BPA's proposal to lump the Fish and Wildlife Program, ESA (foregone revenues) and cost reimbursement funding into one package and allow them to compete within a cap (which will then be shrunk or held constant) will be bad for the F&W Program. (We have been told that BPA takes its ESA responsibilities more seriously than responsibilities to the F&W Program.) It appears that BPA plans to lower its expenditures for the Program because it is absorbing the cost of spill for ESA species. This contradicts the language of the Regional Act, which states that BPA's F&W Program expenditures must be "in addition to" rather than "in lieu of" other BPA obligations, an example of which would be the agency's obligations under ESA.

The UCUT Tribes believe that Program expenditures need to be $110 to $120 million per year to fully implement the Council's program. Under the current lower level of funding, a substantial number of projects in the Program are not being funded, risking that we will have numerous ESA species to contend with. However, the trade-off between ESA and Program activities seems to be a major objective of the Business Plan.

Response: BPA has responsibilities under both the ESA and the Northwest Power Act. In implementing measures, BPA will be guided by the Council's Program, ESA Recovery Plans, and ESA Biological Opinions. BPA views the requirements of ESA as a subset of its responsibilities under the Power Act, although with a very high priority. These two mandates are not inconsistent.

With respect to funding, as indicated in the response to comment 165-10, BPA is working with the region to define the cost for full implementation of the Council's Program, from which a multi-year budget might be developed.

Comment 159-4
Comment Topic: Funding cap inadequate.
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: The fixed annual budget for fish and wildlife expenditures violates its fish and wildlife mandates by setting an arbitrary limit, which the Power Council says does not reflect the costs of existing programs, let alone likely future obligations. See the Council's comments for more detail.

Response: See response to comment 165-10.

Comment 162-4
Comment Topic: Object to F&W budget cap
Comment Category: Fish and Wildlife Program Reinvention

Comment Summary: The budget cap on fish and wildlife expenditures violates the equitable treatment provision of the Northwest Power Act. The Council, not BPA, is responsible for establishing necessary and appropriate fish and wildlife measures; BPA may not limit its spending at its own discretion.

Response: BPA is not proposing to set a "cap" on its responsibilities to provide "equitable treatment" in operations of the hydrosystem. BPA has proposed a budget that combines its direct expenditures for fish and wildlife and its budget for repaying the annual fish and wildlife costs to the U.S. Treasury of other Federal agencies. As stated in the response to comment 165-10, efforts are underway to determine what this full cost could be.

Whatever is decided for this budget, it will not include the costs of hydrosystem operations for fish and wildlife. It is largely through these operations that BPA and other operating agencies achieve their equitable treatment responsibilities.

Comment 153-10
Comment Topic: F&W funding cap not equitable.
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: The Draft EIS proposes that fish and wildlife programs can be accomplished while placing an arbitrary cap on funds for these programs. This is inconsistent with the equitable treatment for fish and wildlife required by the Northwest Power Act.

Response: See response to comment 162-4.

Comment 159-5
Comment Topic: How will focus on results make F&W budget adequate?
Comment Category: Fish and Wildlife Program Reinvention
Comment Summary: While it is surprising that BPA calmly admits that it was not concerned with fish and wildlife results these last ten years while fish species have plummeted toward extinction, there is no evidence that its proposed change in attitude will make BPA's proposed budget adequate to the task of protection and recovery.

Response: The protection and recovery of fish and wildlife populations can only be measured in terms of actual fish and wildlife results--increases in their population levels. BPA budget levels will therefore not determine the adequacy of these efforts; only results will count.

DSI Service

Comment 165-7
Comment Topic: DSI rates and contract provisions
Comment Category: DSI Service
Comment Summary: The BP fails to look at DSI rates and contract provisions. Should BPA continue to serve the DSIs? Should DSIs pay the same rates as other customers? What would the rate effects be in the long run? How could DSI rates and contracts be used to improve fish flows in the spring and summer? How can BPA use DSI and other customer rates and contract provisions to maintain maximum flexibility for fish operations and reduce power purchases for fish?

Response: In the supplemental Draft BP EIS, BPA has incorporated several modules that examine the consequences of various contract and power supply options for serving the DSIs, as well as other modules that address stream-flow based rates.

Comment 104-8, 169-8
Comment Topic: DSI rates assumptions
Comment Category: DSI Service
Comment Summary: The Plan and EIS do not discuss DSI rates, but assume they will be about 4 or 5 percent less than preference customer rates. This assumption needs to be revisited. BPA needs to look at other price forecasts and discuss those in the Plan and EIS.

Response: The DSI rate is set according to the language contained in section 7(c)(2) or the Regional Act, which states that the DSI rate is to be "...based upon the Administrator's applicable wholesale rates to such public body and cooperative customers and the typical margins included by such public body and cooperative customers in their retail industrial rates ..." taking into account the size, character and other items included retail industrial rates. Determination of the DSI rate under Section 7(c)(2) is made by calculating the 7(b) or preference rate at the DSI load factor, adding the "typical margin" paid by retail industrial customers of preference customers, and subtracting the credit for value of reserves. (Load factor is the ratio of the average usage to maximum (or peak) usage for a particular customer or customer class.)

The numbers shown for DSIs and Preference customers in the Draft BP EIS are not rates, but are the average cost of electricity to DSI and Preference customers for one year. The actual PF rate and IP (or DSI) rate consist of two charges, a demand charge for the maximum amount of power purchased in a month, and an energy charge for the electricity used during a month. The primary reason the average cost for DSIs is less than the average cost for PF customers is because of the difference in load factors for the PF and DSI customer classes. The preference customers as a class have about a 67-percent load factor, while the DSI's load factor is about 97 percent. Because of the difference in the intensity of energy usage, two customers can purchase electricity under the same rate schedule, and have very different average costs of power. The load factor explains over 75 percent of the difference between the average costs of electricity for PF and DSI customer.

According to data from BPA's 1993 Annual Report (p. 48), the City of Canby purchased electricity from BPA at a 60-percent load factor and the average cost of power for the year was 25.62 mills/kWh. Tacoma City Light purchased power at a 96-percent load factor and their average cost of power for the year was 21.74 mills/kWh. Pacific Northwest Generating Company purchased power at a 35-percent load factor and had an average cost of power 29.65 mills/kWh. Just as there are large differences in the average cost of power for three PF customers purchasing power at the same rate, the DSI average cost of power is less than the average cost of power for PF customers because of the DSIs' high load factor, even though they purchase power under a similar rate.

The supplemental draft EIS addresses alternative DSI rates and contract options. (See sections 2.2.8 and 4.5.)

Comment 137-34
Comment Topic: Analysis of tiered rates and preference
Comment Category: Rates, DSI Service
Comment Summary: Draft EIS failed to consider:

- an initial allocation of Federal Base System resources to Tier 1 recognizing preference;
- reallocation of unused DSI Tier 1 power to preference customers;
- access to Tier 1 Federal Base System resources by new preference customers; and
- recall of DSI service due to shrinkage of Federal Base System capability for use by preference customers.

Response: The supplemental draft EIS includes analysis of reallocation of DSI Tier 1 power and recall of DSI Tier 1 service, among other DSI service options. (See sections 2.2.8 and 4.5.)

Comment 137-36
Comment Topic: Use of FBS by DSIs, preference customers
Comment Category: DSI Service
Comment Summary: The preferred alternative, Table 4.3-3 and 4.3-10, showed increased use of Federal Base System by DSIs and IOUs and decreased use by preference customers relative to status quo. This indicates that the proposed policy changes do not recognize or adequately address public preference.

Response: The Draft BPA Status Quo alternative indicated that BPA would suffer a 231 aMW loss of public agency load and a 348 aMW loss of DSI load relative to the 1993 "White Book" estimates of BPA loads in 2003. By adopting the preferred alternative (Market-Driven BPA), the loss of preference customer load would increase to 369 aMW and the DSI load would increase by 74 aMW. The loss of load is caused by preference customers' belief that they can find power from other suppliers at more attractive rates, and from price-induced conservation resulting from the Tier 2 price signal. The total DSI load, even with the 74 aMW increase, is still far below the contract demand set in the DSI power sales contracts. The load changes in the BP EIS do not have any relationship to public preference nor does it imply a change in BPA's adherence to public preference.

Comment 174-6
Comment Topic: EIS lacks alternative treatment of DSI contracts
Comment Category: DSI Service
Comment Summary: The Draft EIS does not address different legal interpretations of BPA's obligations to serve DSI loads, service options presented by the Aluminum Information Project, recall rights proposed by the PPC, or the restrictions preference rights would make on service to the DSIs under BPA's preferred option.

Response: BPA has included several modules in the supplemental Draft BP EIS that examine the consequences of various contract and power supply options for DSI service.

Comment 104-5, 169-5
Comment Topic: BPA's legal obligations to DSIs.
Comment Category: DSI Service
Comment Summary: What are BPA's legal obligations to DSIs? Although the EIS states that BPA has no statutory obligation to provide power to the DSIs beyond the term of their current contracts, does BPA believe it must serve DSI loads anyway? Do the contracts compel it to offer succeeding agreements? This needs to be clarified and supported in the Plan and EIS, which should evaluate the costs and benefits of continued DSI service.

Response: The Northwest Power Act requires BPA to offer initial power sales contracts to the DSIs. BPA has interpreted that language to mean that the initial power sales contracts under the Act were mandatory, and that follow-on contracts are optional. The supplemental draft EIS includes analysis of the impacts on BPA, its ratepayers, the DSIs, and the environment of renewing and not renewing DSI power sales contracts.

Comment 159-10
Comment Topic: Alternatives to DSI contracts, irrigation subsidies.
Comment Category: DSI Service
Comment Summary: "Although the Business Plan admits that, '...BPA has no statutory obligation to provide power to the DSIs beyond the term of their existing contracts,' the plan does not evaluate the benefits and costs associated with these contracts or consider any real alternatives to the status quo. In fact, the proposed plan...confers preference status on these industries by giving them more tier 1 power than preference utilities and by shifting costs to preference customers." Even with subsidies, some DSIs may not survive. BPA should do a "benefit-cost analysis of the environmental and economic impact of DSI contracts to the region, with a full discussion of possible alternatives, such as non-renewal of the contracts, charging market rates, and/or increasing interruptibility. Irrigation subsidies should receive similar scrutiny."

Response: BPA has incorporated several modules in the supplemental Draft BP EIS that examine the consequences of various contract and power supply options for DSI service.

In addition, the preferred alternative (Market-Driven BPA) incorporates the tiered rate proposal included in BPA's initial proposal for the 1995 rate case, which has the Tier 1 DSI service percentage declining over time.

Comment 104-4, 169-4
Comment Topic: Treatment of DSI loads
Comment Category: DSI Service
Comment Summary: The Plan and EIS contain little analysis of different options for serving DSI load, such as greater interruptibility, seasonal power sales, shorter term contracts, and other alternatives. The documents seem to suggest that keeping DSI load is more important than retaining public agency load. The next version of the Plan and EIS need to explore the treatment of DSI loads in more detail. Under what circumstances is it to BPA's advantage to reduce DSI loads?

Response: The supplemental draft EIS does address options for DSI contracts and loads. (See sections 2.2.8 and 4.5.)

Comment 109-10
Comment Topic: Alternative DSI service
Comment Category: DSI Service
Comment Summary: The Draft EIS ignores the intersection between hydro operations and business decisions. Both the SOR EIS and BP EIS each assume static inputs from each other. How operations for non-power purposes are set can be heavily influenced by rates. BPA needs to be able to react to the salmon crisis without jeopardizing its ability to be competitive. We recommend investigating alternative DSI service arrangements (make service interruptible when the system is stressed by low water).
Response: The current DSI contract contains interruptibility provisions that allow BPA to interrupt the DSIs' top quartile for a wide range of reasons, including low water. The DSIs have seen substantial reductions in their load over the last few years due to low water and extreme temperatures. In 1989, when the Pacific Northwest suffered a prolonged Arctic cold spell, the DSIs' top quartile was curtailed and many companies paid up to 100 mills/kWh for replacement power for the top quartile. Recently, BPA has curtailed the DSIs' top quartile for up to 3 months due to the prolonged drought.

In the supplemental Draft BP EIS, BPA has incorporated several modules that examine the consequences of various contract and power supply options for serving the DSIs.

Comment 138-3
Comment Topic: Plan continues DSI favoritism
Comment Category: DSI Service
Comment Summary: While the plan attempts to improve pricing structures, it does not resolve issues that have and continue to be detrimental to anadromous fish, such as BPA's continuing favoritism towards the DSIs.

Response: BPA does not favor one customer or customer class over another. BPA is required by its organic statutes to observe public and regional preference for BPA power.

Comment 105-9
Comment Topic: Adequacy of analysis re: Tier 1 and preference
Comment Category: DSI Service (Rates; Conservation)
Comment Summary: The Draft EIS does not adequately address the impacts of ... reductions in DSI Tier 1 power to serve future preference customer loads or accommodating nonpreference customers with FBS service at the expense of preference customers.

Response: The preferred alternative (Market-Driven BPA) incorporates a tiered rate proposalthat has the Tier 1 DSI service percentage declining over time.

Other

Comment 134-25, 149-6
Comment Topic: Need F&W additions to Ch. 3
Comment Category: Other
Comment Summary: {3.6.1, Pacific Northwest} This section needs to discuss fish and wildlife and the economies dependent on them, including a description of the declines in anadromous fish populations and the fisheries dependent on them; and impacts on resident fish and wildlife species.

Changes in the Columbia River annual hydrograph with the incremental development of the hydrosystem should also be presented and described in detail.

Response: The EIS already includes a brief description of the economies dependent on fish and wildlife resources. According to NEPA regulations, the description of the affected environment should be no longer than is necessary to understand the effects of the alternatives. BPA does not believe that a history of the decline of the fishery or the changes in the river's flow is relevant to decisions supported by this document. The current status of existing resources determines the effects of alternative actions. BPA believes the section is adequate.

Impacts are more appropriately discussed in Chapter 4, not in the Chapter 3 description of the existing environment.

Comment 143-1
Comment Topic: Unresolved issues in EIS
Comment Category: Other
Comment Summary: There are many unresolved issues surrounding major elements of the draft business plan, especially conservation and fish and wildlife programs, tiered rates, and unbundled products and services. As a result, the EIS is not a complete assessment for the purposes of NEPA.

Response: The supplemental draft EIS includes new information and additional modules dealing with these issues. (See especially chapters 2 and 4.)

Comment 173-5
Comment Topic: Use PSCs to achieve goals of Regional Act
Comment Category: Other
Comment Summary: The new power sales contracts with BPA customer utilities and DSIs must provide BPA sufficient tools to meet public policy goals. Contracts should provide for penalties and rewards for resource actions based on consistency with the Regional Act and Power Plans.

Response: Parts of BPA's proposal and some alternatives include penalties and rewards for meeting Regional Act goals and plans. Please see chapter 2.

Comment 149-1
Comment Topic: Incorporate CRITFC's comments by reference.
Comment Category: Other
Comment Summary: CTUIR incorporates comments submitted by the Columbia River Inter-Tribal Fish Commission by reference.

Comment 176-1
Comment Topic: Support CBFWA comments
Comment Category: Other
Comment Summary: NMFS agrees with and supports the comments provided to BPA by the Columbia Basin Fish and Wildlife Authority.

Comment 159-13
Comment Topic: Change BPA's name
Comment Category: Other
Comment Summary: BPA should change its name to something like the Bonneville Fish, Wildlife, Conservation and Power Administration, conveniently shortened to the Bonneville Conservation Administration, to refer to conservation of fish, wildlife and energy.