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TOWARD ACCOUNTABILITY AND EFFICIENCY: REFORM OF THE BONNEVILLE POWER ADMINISTRATION

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EXECUTIVE SUMMARY

The U.S. electric industry's increasingly competitive structure is likely to have important ramifications for the Pacific Northwest. The gradual interconnection of local utilities, the growing significance of independent suppliers of electricity, and the increasing use of wholesale power markets have the potential to reduce the cost of power and increase service reliability. As a federal agency not directly accountable to the region's electric consumers and producers, the Bonneville Power Administration's (BPA) structure is likely to prevent the Pacific Northwest from realizing the benefits emerging from this trend.

The BPA was established by Congress in 1937 to market and transport power generated by the Bonneville Dam on the Columbia River. The agency's early objective was to promote economic development by supplying "affordable" electricity to a group of preference customers. Over time, the BPA's status as a federal government agency and its access to interest-rate subsidies has enabled it to develop an extensive transmission network and play a dominant--often counterproductive--role in the Pacific Northwest's electric industry.

The BPA's practices and policies have generated a number of adverse effects. The BPA's failure to price electricity to reflect the cost of securing additional supplies has encouraged overconsumption of electricity, discouraged conservation, and artificially stimulated the expansion of financially and environmentally costly power capacity. In addition, as a result of not paying off its federal debts, the BPA and the other federal agencies involved in the Federal Columbia River Power System owe the U.S. government an estimated \$9 billion in cumulative investment. The Bush administration's National Energy Strategy has proposed a debt repayment program for the BPA and other federal power marketing administrations in order to ensure that the full federal cost of providing power is covered.

The fundamental changes taking place in the U.S. electric industry and the Pacific Northwest's growing demand for power make it particularly important that the BPA's practices and structure be reassessed. Reforms which would make the BPA more compatible with emerging competitive trends in the U.S. electric industry and make the agency more accountable to the region's electric consumers and producers include:

- × allowing BPA preference customers to resell electricity to those who value it more highly;
- × transferring the ownership of the BPA's transmission system to the region's electric power

consumers and generators; and

× removing artificial and counterproductive incentives for conservation and instead relying on efficient market pricing of electricity for promoting wise use of energy.

These reforms would enable the Pacific Northwest to gain greater control over the agency's power marketing decisions and provide the region with greater access to economically and environmentally low-cost electricity. They should benefit not only the BPA's preference customers, but the region's electric retail customers, independent power generators, and groups interested in promoting conservation and preserving the environment as well.

I. INTRODUCTION

The BPA is the power marketing agency for the Federal Columbia River Power System (FCRPS), which also consists of the Pacific Northwest generating facilities operated by the Army Corps of Engineers and nonpower-related projects of the Bureau of Reclamation. Taken together, the accounting value of the FCRPS's total assets as of September 1990 was \$15 billion. In 1990, the Bonneville Power Administration (BPA) marketed over \$2 billion worth of electricity from thirty federally built powerplants.¹

Through its extensive transmission network (Intertie), the BPA markets power to a region encompassing the states of Washington, Oregon, Idaho, western Montana, plus portions of neighboring states. The Intertie makes up nearly 80 percent of this region's high-voltage transmission, with over 14,700 circuit miles of lines and almost 400 substations. The replacement value of the system is estimated by the BPA to be about \$10 billion.² In addition to marketing power, the BPA also promotes non-electricity-related objectives, which include conservation, irrigation, and fish and wildlife protection.

Like the four other federal power administrations,³ the BPA is authorized to give preference in the sale of power to utilities owned by public entities such as municipalities, public utility districts (PUDs), and rural electric cooperatives. In addition to also providing nonfirm power to investor-owned utilities, the BPA sells power directly to aluminum producers in the Northwest. While the BPA is required by law to charge rates that are sufficient to assure repayment of the federal investment in the FCRPS after first meeting the agency's other costs, historically it has failed to do this.

The BPA was established by Congress in 1937 to market and transport power from the Bonneville Dam on the Columbia River.⁴ Like the four other federal power marketing administrations, the BPA's original objective was to promote economic development by providing low-cost power. At the time, it was believed that investor-owned utilities were either unable, unwilling, or could not be trusted to provide power at reasonable prices.⁵ Today, as the Pacific Northwest's economic development and vitality demonstrate, this objective has generally been met. For example, when the BPA was established less than 10 percent of the farms in the United States had electricity. By 1960, over thirty years ago, over 97 percent of farms had electricity, and today this figure is over 99 percent.

Not only has the Pacific Northwest undergone dramatic changes since the late 1930s, but so has the U.S. electric utility industry. As a result of technological, economic, and regulatory changes, the industry's early monopoly structure has increasingly given way to a more open and competitive structure.⁶ The growing significance of independent suppliers of electricity in addition to the gradual interconnection of local utilities means that competition within the industry is likely to accelerate. By ensuring that prices more closely reflect the true cost of providing power, competitive power trades and other market arrangements have the potential

over the long run to reduce the cost of power, increase service reliability, and take away the need for additional environmentally and economically costly power projects.

Consistent with the electric utility industry's increasingly competitive structure is the Bush Administration's National Energy Strategy which recommends the phase-out of interest-rate subsidies to the BPA and other federal power marketing administrations. According to the administration's report, "below-cost financing has cost the U.S. Treasury more than \$4 billion to date."⁷

These fundamental changes suggest a clear need to reassess the BPA's original mandate to supply "affordable" electricity to preference consumers. But, a more powerful and obvious reason to examine the BPA's operations is found in the FCRPS's balance sheets: while assets totaled about \$15 billion, liabilities were over \$15.3 billion, calling into question the accountability of the BPA, as well as that of the U.S. Army Corps of Engineers and the Bureau of Reclamation.⁸

As the BPA is presently organized, it lacks the incentive structure to operate in a commercially sound manner or in the long-term interests of electric power consumers and producers of the Pacific Northwest. Thus, while the BPA is directed by statute to price electricity economically and repay its debts to the federal government, it has failed to do so and cannot be expected to do so without undertaking market-based reforms.

The BPA's failure to price electricity to reflect the cost of securing additional supplies has generated a number of adverse effects. BPA's long-standing practice of underpricing power encouraged overconsumption, discouraged conservation, and artificially stimulated the expansion of additional power capacity.⁹ As a consequence of having exhausted cheap hydropower by the 1960s, the BPA and other regional utilities had to turn to more financially and environmentally expensive thermal plants.

One of the more well-publicized outcomes of these actions was the \$2.25-billion default of the Washington Pacific Power Supply System (WPPSS) in 1983, the largest municipal default in history. Only two of five planned (nonfederal) nuclear power projects were salvaged, and the BPA's acquisition of a large share of the generating capability made it responsible for a large portion of each project's costs, including debt service, whether or not they were completed.¹⁰

As of September 1990, the future total BPA principal and interest payments for all "nonfederal" projects of the FCRPS came to \$13.8 billion and may be considerably higher pending the resolution of ongoing litigation over unallocated project costs. This amount is exclusive of the \$9.1-billion cumulative repayable investment the FCRPS owes the U.S. government.¹¹ The appropriated debt dates back to the agency's inception and was originally expected to be paid to the U.S. Treasury within fifty years.

Historically, the interest rates on the BPA's debt have averaged around 50 percent below commercial rates. Randomly selecting seven projects completed by the FCRPS since 1960, the U.S. Office of Management and Budget calculated that the average interest rate for the projects was less than 40 percent of the average U.S. Treasury long-term interest rate at the time the projects went into service.¹²

As a result of this highly subsidized financing, the BPA's power rates do not reflect the full costs incurred in making the power available and therefore electric power producers and consumers receive incorrect signals for making production and consumption decisions. As of 1989, the BPA had paid only 14.7 percent of its federal debt, which from 1987 to 1989 grew by \$302 million.¹³

In addition to the considerable cost to the general taxpayer, the cost of distorted price signals to consumers of power, the cost of discriminatory Intertie policies, and the cost imposed on the environment from construction of unnecessary projects, the BPA's noncommercial practices also ensure that it has an unfair competitive advantage over privately owned utilities. For example, as a federal agency, the BPA's income and properties have always been tax exempt. Thus, as it presently functions, the BPA prevents the Pacific Northwest from realizing the real benefits emerging under a competitive U.S. electric industry.

This paper assesses the economic and social costs generated under the BPA's present structure and shows why they can be expected to grow in the future as the U.S. electric industry moves rapidly toward competition and *de facto* deregulation of wholesale power transactions. Three proposals for reform are offered that, by introducing competitive forces and shifting BPA's resources away from the federal government and toward local control, should benefit not only the BPA's wholesale preference consumers but the wider electric consumers and producers of the Pacific Northwest.¹⁴

II. PUBLIC UTILITY REGULATION AND THE RATIONALE FOR THE BPA

A. Original Objectives of the BPA

To understand why the BPA's present structure is not capable of providing reliable electric service consistent with sound commercial and environmental practices, it is instructive to examine the unique circumstances under which the BPA was created. While these circumstances have changed, BPA practices and structure have not.

When Congress passed the Bonneville Power Act in 1937, the United States was just beginning to recover from the Great Depression, and the Pacific Northwest was generally underdeveloped compared to the rest of the country. In keeping with his 1932-campaign pledge, President Roosevelt initiated the Bonneville and Grand Coulee Dam-hydroelectric projects along the Columbia River. To resolve the issue of control and distribution of the power generated by the Bonneville Dam, which in 1940 was connected to the Grand Coulee Dam by transmission lines, Congress created the BPA.¹⁵

Central to the Act was the desire to market federal and privately produced power separately and to give publicly and cooperatively owned distribution systems the first rights to purchase. Moreover, on the grounds that the agency was intended as a marketing organization only, the 1937 Act specifically prohibited the BPA from owning generating facilities.

The rationale behind the preference policy in distributing electricity was the general belief that unlike private utilities, nonprivate organizations could be relied upon to ensure the wide distribution of low-priced power. At this time in history, private utilities were believed to have frequently exploited power consumers by charging "exorbitant" rates.¹⁶

Another important operating directive given to the BPA was that it should act in a commercial manner and hence should be self-supporting. As codified in the Flood Control Act of 1944 and later the Regional Power Act of 1980, the BPA is required to repay all the taxpayer's investment in federal dams with interest and cover annual operating and maintenance costs. Thus, to operate "under sound business principles" as required by the Act, the BPA must sell its power at rates which cover the federal government's financing costs.

Under the Department of Energy Organization Act of 1977, the BPA and the four other power marketing agencies were officially brought under the control of the Department of Energy. The Federal Energy Regulatory Commission (FERC) became responsible for reviewing the BPA's rates for all power sold within the region, and for transmission

services.¹⁷

Two years before the BPA was created, the Public Utility Holding Company Act of 1935 (PUHCA), the foundation of contemporary rate-of-return regulation of electric rates and services, was enacted.¹⁸ State commissions required that rates for public utility services to correspond to a utility's prudently incurred cost of service, including the ability to earn adequate profits for attracting capital needed to provide reliable electric service.¹⁹

Since the beginning of state regulation, in return for having their rates regulated, utilities were given monopoly franchises for distributing power within their territories. The widely perceived motivation for public utility regulation was to prevent utilities from taking advantage of their market power by charging monopoly prices.²⁰

Thus, there are two separate regulatory structures governing electricity distribution organizations in the United States: as federal facilities, the BPA's and the four other federal power-marketing administrations' rates are regulated by FERC and are required to cover operating costs and the federal governments capital costs; privately owned electric utilities are regulated by FERC as well as by state public utility commissions. In both cases, the widely perceived motivation for regulation was to ensure that consumers receive reliable, affordable electricity.

B.Objectives of the BPA Today

Since the early days of the BPA, both the electric utility industry and the regulatory framework governing it have changed dramatically. As discussed in greater detail in Section IV, important technological, legal, and competitive changes have significantly reshaped the electric industry and provided opportunities for more efficient pricing of power, the expansion of power marketing, and greater competition. At the same time, state public utility commissions have gained considerable experience regulating electric utility activities to mitigate the likelihood of monopoly abuse. Accordingly, it is instructive to reexamine the BPA's original objectives in light of the much different environment the agency finds itself in today.

The relevant policy question is whether the original reasons for establishing the BPA are valid today. The clear answer is that they are not. There is no technical or commercial reason why privately owned utilities would not be willing and able to distribute hydropower from federal dams to all customers located in their service areas. As long as federal or state regulators allow a fair rate of return to be earned on capital expenditures undertaken to serve rural customers, privately owned utilities should be just as willing to serve these customers as their other customers.

Subject to state public utility regulation, private utilities are obligated to serve anyone who wants electricity and who is located in their service area. Most privately owned electric utilities in the United States have *de facto* exclusive franchises whereby they are given the right to be the sole supplier of electricity in a designated area in return for the obligation to deliver reliable service at a "reasonable" price. Thus, existing public utility regulation is designed to prevent utilities from charging monopoly prices.

Finally, legal changes facilitating the entry of nonutility generators of power, along with the advent of transmission lines capable of carrying power over longer distances, betoken the increasing potential for competition to protect consumers from monopoly prices. Accordingly, it is no longer clear that the BPA's preference policy and pricing practices are necessary either to promote development or to protect rural electricity consumers in the Pacific Northwest.

This point becomes more apparent when viewed from the perspective of the serious problems created by the BPA's two most glaring noncommercial practices--its preference policy and its inability to set rates which recover the full cost of supplying power. Together these policies were instrumental in contributing to shortfalls in generating capacity, excessive investment of taxpayers' money, wide rate disparities, unreliable service, enactment of counterproductive energy conservation legislation, and mounting federal debt.

Predictably, underpricing of power caused demand to rise beyond the capacity of the BPA's hydropower facilities. According to economist Yvonne Levy, as a result of shortages of power capacity since the early 1970s, "BPA denied private investor-owned utilities to all but small amounts of "firm" power--assured contract supplies--to enable Bonneville to meet requirements of its preference consumers."²¹In turn, this restrictive policy lead to both significant rate disparities within the region and, by generating uncertainty, severely hampered the orderly introduction of new electric generating facilities.²²

In an effort to resolve legal disputes which arose over the BPA's preference policy, in 1980 Congress passed the Regional Power Act (Pacific Northwest Electric Power Supply and Conservation Act).²³ The class of protected ("preferred") users was expanded to include private utilities who provided power to farmers and residential customers.²⁴ This was accomplished by "Residential Exchange" contracts, which allowed privately owned utilities to exchange their qualified residential and irrigation-power loads at average cost, for the BPA's priority-firm power rates.²⁵ In 1990, these contracts cost the BPA \$160 million.²⁶

The Regional Power Act was also aimed at benefiting other consumers of BPA power. Direct-service industry customers such as aluminum producers were given assurance of long-term supply availability. To protect the original preference customers from any adverse effects of the BPA's power exchanges with privately owned utilities, a rate cap was established. Consequently, as reported in the Department of Energy's 1991 report to Congress, after adjusting for inflation, the BPA's priority firm rate declined from 1984 to 1991.²⁷ Finally, in response to concern for energy conservation, the Act broadened the BPA's responsibilities to include multisector-energy conservation programs. These programs are examined in section V.

In sum, while the BPA's noncommercial practices may have had a legitimate role in promoting regional development before either electric utility regulation or the electric utility industry was developed, this is no longer true today. Both the Pacific Northwest economy and the U.S. electric industry have been dramatically transformed since BPA was created by Congress. Indeed, the BPA's early noncommercial policies are directly contradictory to the region's and the agency's broader mandate to promote conservation and environmental protection. In addition, by stunting the growth of power industry competition and use of market arrangements in the region, continuation of BPA's noncommercial practices can be expected to harm, not promote, the region's development and electric consumers.

Finally, the regulatory structure governing nonfederal utilities has been shown to be capable of protecting power consumers. As a federal marketing agency, the BPA is not held to either strict commercial or state regulatory standards. Accordingly, the agency's historical tendency has been to expand its responsibilities while at the same time failing to follow its mandate of recovering its costs. The detrimental economic and environmental consequences of this tendency are described below.

III.THE ECONOMIC AND ENVIRONMENTAL COSTS OF THE BPA

A.Documented Costs of the BPA's Operations

The best measure of the magnitude of costs generated under the BPA's public ownership structure is found by examining BPA's pricing policies and the scope of the federal subsidies the agency has received. Although BPA's originating legislation states that rate schedules "shall be drawn having regard to the recovery...of cost of producing and transmitting such electric energy, including amortization of the capital investment over a reasonable number of years," an examination of its pricing and debt repayment practices indicates that the agency never took this mandate seriously.

Yvonne Levy calculated that if the BPA had to pay market-based interest rates and taxes that privately owned utilities are obligated to pay, its rates on a yearly average would have been 82 percent higher during the period of 1947 to 1979, 112 percent higher during the period of 1965 to 1979, and 134 percent higher during the period of 1971 to 1979.²⁸ San Jose State University economics professor David Shapiro calculated that normal, straight-line amortization of BPA's debt alone would have increased the cost of operation (or conversely, decreased U.S. taxpayer subsidies) by \$1.05 billion for the period of 1973 to 1986.²⁹

Subsidies to the BPA partly stem from its use of arbitrary debt repayment schedules (it does not have fixed payback periods), and its ability to extract funds from the federal government at below market interest rates. These subsidies run into hundreds of millions of dollars per year. Shapiro estimated that the total subsidy to the BPA for the period of 1973 to 1983 was about \$4 billion.³⁰ Analyst Timothy Roth estimated that, as of the end of fiscal year 1972, the BPA had repaid just 19 percent of the total federal hydropower investments.³¹ According to economist Milton Copulos, by 1986 the BPA had repaid only 8 percent of the federal investments it made from 1937 to 1986.³² Like the other federal power administrations, Bonneville was, by law, supposed to repay its investments within fifty years of start-up for projects financed with federal funds.

In 1985, then OMB Director David Stockman stated before a congressional committee that BPA would have to raise electric rates by 20 percent in 1986 with debt repayment reform.³³ Economists Andrew Kleit and Richard Stroup found that for the \$6.5 billion in loans outstanding in 1986, the average interest rate was only 3.5 percent.³⁴

B. Additional Costs of BPA's Noncommercial Operations

Although the above estimates of subsidies and required rate hikes demonstrate that the costs generated under BPA's present structure are indeed significant, they are likely to be conservative since they do not take into account the wider impacts these uneconomic practices have had on BPA's consumers, competitors, and the environment.

From the perspective of society, subsidies tend to prevent the most efficient electricity suppliers from selling in wholesale or retail markets. Privately owned utility operators have expressed concern that a move toward a more competitive environment will place them at a competitive disadvantage if publicly owned and rural electric cooperatives continue to receive large subsidies from the federal government.³⁵

Ironically, the BPA's below-cost pricing policy has led to major problems for electricity consumers in the Pacific Northwest. By artificially stimulating demand for power, underpricing forced the BPA to look for new sources of electricity supply in larger amounts and sooner than it would have otherwise. Through the 1970s, the BPA and a consortium of publicly owned utilities formed the Washington Pacific Power Supply System (WPPSS) to build five nuclear power plants. To get around the legislative prohibition against owning power plants, the BPA bought rights, through "net-billing agreements" with other utilities, to

power from three of the plants.³⁶

Because of these "net-billing agreements," the BPA acquired most of the generating capacity of the five nonfederal nuclear projects. These contracts made the BPA, and thus its customers, financially responsible for the projects' entire costs. The burden was felt particularly by aluminum smelters, whose electricity rates rose about 800 percent over the period of 1979 to 1984.³⁷

In 1983, as a result of significant cost overruns, the WPPSS defaulted on \$2.5 billion worth of bonds, and two of three plants were mothballed. According to the BPA's annual report for fiscal year 1990, "the future principal and interest payments required for nonfederal projects total \$13.8 billion, of which \$7.1 billion represents interest."³⁸ Ongoing litigation regarding two of the plants could result in the BPA assuming an additional \$1 billion in costs.³⁹

In retrospect, much of the blame for the WPPSS financial disaster can be traced to the BPA's below-cost pricing, its inaccurate electricity demand forecasts, and the fact that, as a government entity with access to taxpayer funds, it did not have to bear the burden of its decisions. Moreover, because the BPA, through its "net-billing agreements" shouldered nearly all the costs associated with the projects, the other participating utilities did not have a strong incentive to closely monitor the construction of the projects.⁴⁰

In addition, subsidized electricity prices also encouraged BPA consumers to underinvest in energy conservation. With artificially low electricity prices, consumers found it more difficult to justify making investments in energy conservation. When BPA's prices started to rise sharply in the 1980s, residents and businesses in the Pacific Northwest suffered large losses because of their high dependency on low-priced electricity. The "high dependency" reflects the low electricity rates in BPA's service area relative to the rest of the country. For example, residential electricity rates in Washington, Idaho, and Oregon are the lowest in the country; residential consumers in the three states combined pay about 55 percent of the average U.S. price for residential electricity.⁴¹

Finally, because underpricing of electricity encourages consumption, increasing the need to expand power capacity, it unnecessarily imposes costs on the environment. The BPA's extensive system of hydropower dams on the Columbia River system has significantly reduced the salmon runs by damaging the fish as they move out to the ocean and by impeding returning adult spawners.⁴² By the early 1980s the number of salmon returning to the Columbia River Basin to spawn each year had dropped from 10 to 16 million to about 2.5 million.⁴³

IV. THE EMERGENCE OF A COMPETITIVE ELECTRIC INDUSTRY

The electric industry is becoming more competitive and pressures are mounting for deregulating specific components of the industry.⁴⁴ Just a few years ago the electric industry was stridently opposed to competition and reform of traditional cost-of-service regulation. Ongoing technological, regulatory, and competitive changes, however, indicate that the industry is undergoing fundamental and irreversible restructuring.

The positions of many privately owned utilities have shifted toward acceptance of competitive forces over state regulation to determine their financial fate. For example, many electric utilities now favor purchasing generating capacity from outside parties over building their own generating facilities and being subjected to inflexible and unpredictable regulation.⁴⁵ In large measure this openness to markets is a direct response of the industry's experience with

construction delays, cost overruns, canceled projects, and prolonged rate hearings that occurred under traditional public utility regulation.

Today, five fundamental changes are occurring in the electric industry that are restructuring it along competitive lines. First, it is expected that as much as 50 percent of new generating capacity through the year 2000 will come from nonutility generators. By the end of the 1980s, almost 30,000 MW of nonutility generating capacity was in place in the United States, and 40,000 MW was being developed.⁴⁶ Several utilities have successfully conducted competitive power procurement programs for new generating capacity. Additionally, by making small generating facilities more economically attractive, technology has made the long-held presumption of economies of scale in generation invalid.⁴⁷ Consequently, less capital-intensive, small generators with shorter lead times currently are able to compete with utilities having large generating facilities in regional markets where both have equal access to potential buyers.

Second, in response to competitive pressures, the industry is becoming less vertically integrated and more focused on the primary segments of the electric generation, transmission, and distribution system. Horizontal integration through mergers and joint ventures has become more common as utilities search for ways to minimize production and transmission costs in the face of increasing competition.

Third, new and existing industry participants are acquiring more access rights to transmission systems that are owned and controlled by privately owned utilities.⁴⁸ With greater interconnection of utilities, consumers have more service choices. This trend indicates that increased competition is tied to transmission access. Some utilities are offering, or are proposing to offer, competitors easier access to their transmission system in return for more flexibility in the pricing of wholesale power.⁴⁹

Fourth, pricing in the industry will be determined more by market conditions and less by traditional cost-of-service regulation.⁵⁰ Electric services will increasingly become unbundled, with consumers being offered a greater mix of prices and services. In a competitive environment, prices will more closely reflect the cost of generating and delivering additional power.

Lastly, further *de facto* deregulation of wholesale power markets and other workably competitive markets is likely to take place over the next several years. As the number of buyers and sellers increases and the benefits from trading increase, the regulatory system will come under considerable pressure to change and accommodate the growing interests who will gain under a more open and competitive environment. Support for a more competitive electric industry also comes from the Bush Administration, which is recommending expanding access to electricity transmission for wholesale participants and amending the Public Utility Holding Company Act of 1935.⁵¹

Increasingly, FERC has allowed transactors more freedom to sign contracts rather than being subjected to traditional rate-setting regulation.⁵² As reflected in some of its major rulemakings issued in 1988, the FERC position has shifted to favoring competition over regulation in determining the price of electricity.⁵³ FERC's liberalization of pricing rules for wholesale services and its policy shift toward lifting regulatory restrictions on suppliers of different wholesale services reflect its recognition of the important role competition has to play.

Even state regulators, by endorsing competitive bidding of new generating capacity and market-based rates for consumers who threaten to bypass the local utility, have been receptive

to the increasingly competitive conditions in the electric industry. Since 1986, several state regulators have allowed electric utilities to offer special rates to customers who threaten to install cogeneration facilities.⁵⁴ In addition, as of March 1990, competitive power procurement programs operated in 26 states.⁵⁵

The electric industry's increasingly competitive and demand-responsive character could offer significant benefits in the form of greater access to lower-cost electric power to the Pacific Northwest. Unfortunately, the BPA's structure and its federal agency status make it incompatible with encouraging this beneficial trend.

As a federal agency with wide discretionary powers which is not directly accountable to its customers, the BPA can not be expected to make, for example, pricing and transmission access decisions consistent with the emerging decentralized competitive power markets. BPA's preference customers and large direct service industrial customers stand to lose the benefits of more competitive and responsive markets unless the BPA's structure is changed to give them greater control over decisionmaking.

Finally, given its dominant position in the Pacific Northwest, its subsidized pricing practices, and its ability to influence capacity-expansion decisions, the BPA's present structure is likely to adversely disrupt the development of competitive power markets outside its region.

V. PROPOSALS FOR REFORM

The fundamental changes taking place in the U.S. electric industry and BPA's growing demand for additional power make it particularly important that the BPA begin changing its structure and practices. Short of transferring all of BPA's assets and responsibilities to the private sector, there are a number of other reforms, which by introducing the discipline of competitive markets, could significantly improve the BPA's performance in providing reliable, efficiently priced power.

To be politically viable, any reform proposal must not only increase the efficiency of the overall system, but compensate those who currently benefit from the status-quo arrangement. Essentially, this requires that preference customers suffer no economic losses. The proposals presented below attempt to achieve this outcome.

A. Reselling Preference Electricity

Allowing the reselling of electricity by preference customers would represent a seemingly simple but important reform that could eliminate one major source of inefficiency of the BPA system. Currently, the BPA prohibits private persons or agencies, with the exception of privately owned utilities, from reselling electricity to privately owned utilities. The economic benefit of reselling reflects the difference between the market value of "preference" electricity and the value placed on it by preference customers themselves, who are the original recipients of the electricity.⁵⁶ Reselling would therefore achieve roughly the same efficiency gains as would auctioning off all the available hydropower, assuming a scenario where all preference rights are eliminated.⁵⁷

Under one proposal that preserves existing preference rights, the original preference recipient would have the option of either consuming the low-priced electricity it is allocated by the BPA or reselling any portion of it in the marketplace. A good analogy is the current trend in water reallocation in the West, where farmers with preferential rights to cheap water are being given the rights to resell the water they conserve at a market-based price up to their traditional allocations.⁵⁸ Preference customers would have an incentive to resell whenever the value they

place on electricity lies below the value placed by market bidders. The cost of energy conservation illustrates one possible value that preference customers, at the margin, may place on the electricity they consume. A privately owned utility may assign a higher value to a preference customer's electricity if the alternative is to build an expensive new power plant.

Reselling would also promote energy conservation and, at the same time, protect the environment from unnecessary damage. By reselling in a competitive market, the preference customer would more efficiently consume electricity since the effective cost of electricity consumption to the customer would reflect the true market value of electricity rather than the subsidized, below-market price the customer currently pays the BPA. By facing the real market price for electricity that would more accurately reflect the value of the resource, preference consumers would have better information and incentives with which to make efficient consumption decisions. Moreover, by encouraging conservation and trading of power, reselling would diminish the reliance on financially and environmentally costly generating capacity.

As a major outcome, reselling electricity would benefit the original recipients, namely preference customers and their retail customers.⁵⁹ If the original recipients decide to resell the electricity, they would be better off economically than if they lacked the right to resell. But just as importantly, by facilitating exchange, another party would also benefit; namely, a buyer who is able to purchase a source of valuable electricity whether because it is lower-priced, more conveniently available, or more attractive in some other way than alternate sources of supply.

One method of facilitating the exchange of preference power would involve the federal government soliciting bids from all interested purchasers specifying their willingness to pay for different quantities of power. The auction would include all of the hydropower available to both preference and nonpreference customers. Taking into account individual bids, the buyer's willingness to pay for available power can be measured. The market price would be determined by the interaction of bidders' willingness to pay with the total available power offered by the federal government. Bidders without preference rights would pay the market price. Preference customers also would pay the market price for the electricity they wish to consume, but would receive a credit equal to the market price times their original rights to power.

To illustrate, assume that a preference customer is willing to buy 500,000 kilowatthours (KWHs) of electricity at the market (bid) price of 5-cents per KWH; assume also that the customer has an original preference right to 1 million KWHs. Consequently, the customer would pay \$25,000 (5 cents times 500,000 KWHs) for electricity it wishes to consume and, concurrently, would receive a credit of \$50,000 (5 cents times 1-million KWHs) for its original rights. The preference customer, on net, receives \$25,000 for allocating a portion (500,000 KWHs) of its original rights to the market; in other words, the preference customer receives the market value for electricity that it makes available to others.

Customers would gain from reselling whenever they could be compensated for the unused electricity, for example, by "buying" energy conservation at a cost of less than 5-cent per KWH. Under the current regime, the preference customer would tend to only conserve when the cost of conservation is less than the subsidized power prices charged by the BPA. If the preference price equals 3-cents per KWH, for example, and the cost of conservation equals 4-cents per KWH, the customer would rather consume than conserve, since conserving is more expensive than buying electricity.

If instead the market price was 5-cents per KWH the preference customer would be better off by reselling electricity and purchasing conservation, since the price received for selling electricity is greater than the cost of offsetting the sale by conservation. Under this

arrangement, preference customers would tend to have an incentive to resell anytime the value they placed on electricity was lower than the market price. Preference customers would reduce their consumption of electricity up to the point where the cost of conservation is equal to the market value of their allocated electricity. Reselling, then, would give preference customers a stronger incentive to conserve electricity. Currently, because of the prohibition on reselling, preference customers overconsume electricity at artificially low prices, and nonpreferential consumers underconsume at artificially high prices.

In sum, the auctioning of excess preference rights has two major benefits. First, preference rights would be transferable to the highest-valued uses. In the above example, if the preference customer values its allocated electricity at less than 5-cents per KWH--the market price--it would have an incentive to sell to a buyer who values electricity more. To put it differently, an auction would allow preference customers to sell their rights to others if the market is willing to pay more for the rights than what the rights are worth to preference customers. Second, by allowing any party to bid on electricity that preference customers are willing to offer at the market price, auctioning of "excess" preference rights would stimulate competitive conditions, and the price of electricity should therefore more closely reflect the cost of providing additional power.⁶⁰

B. Sale of BPA's Transmission System

Sale of the BPA's transmission line to interested buyers is a prerequisite both for promoting competition in the Pacific Northwest electric industry and for increasing the efficiency gains from reselling. The recent debate over competition in the U.S. electric industry has focused on the rights of independent power producers and customers to gain fair access to transmission networks.⁶¹

Competitive conditions require that privately owned utilities, independent power producers, publicly owned distributors, rural electric cooperatives, and other participants in the electric industry have access to the transmission network. A 1989 study by the Office of Technology Assessment concluded that, in a competitive wholesale market, technical conditions should not hamper the increased demands that would be placed on transmission systems.⁶²

In the absence of nondiscriminatory access, some interested entrants may face difficulties acquiring financial capital or selling their electric services in a spot market, or under long-term contracts, to nonlocal buyers.⁶³ In addition, distributors and other purchasers would be deprived of the lowest-cost, available electricity in a regional market.⁶⁴

The major policy issue revolves around the question of what is the most efficient institutional arrangement for giving "nonBPA" groups access to the transmission network: How much, and at what level of control, of the current and future BPA transmission network do the various suppliers and consumers located in the Pacific Northwest need to foster competitive conditions?

The argument for joint ownership of BPA's transmission network centers on the need to establish well-defined rights that would give users incentives both to utilize the network efficiently and to invest in new capacity when warranted by market conditions. By possessing the rights of access, exclusion, and transferability, users would realize maximum benefits from investing funds in the network as a response to new demands brought on by changing market conditions.

The benefit to society of joint ownership stems from the likelihood that the transmission assets currently owned by the federal government will have a higher value in the marketplace than

what they have now. This is because joint ownership would create new incentives stimulating economical investments in new capacity and efficient use of existing capacity. Individual owners would have the right to lease or sell their right to transmission capacity to outside parties or other existing owners of the network.

One proposal would involve the BPA auctioning off transmission capacity that is not needed to serve preference customers and other customers with which the BPA has existing service obligations. The funds from the sale could be used to repay BPA's outstanding debts to the U.S. Treasury. Alternatively, the BPA would offer to sell parts of existing capacity to preference customers at a discounted price. In either case, the current BPA transmission network would evolve into a joint privately owned/publicly owned network.

The newly formed regional transmission company would devise rules giving managers wide discretion to operate the system in a way necessary for maintaining technical integrity. Rules also would require that new users be allowed to purchase and to receive the same rights as current users. Such rules would prevent existing owners from foreclosing the entry of new generators into the regional power market. The new users would have to abide by the operational rules established by the transmission company and meet their financial obligations for funding new capacity and maintaining current capacity.⁶⁵ Without these requirements the value of current and future assets would likely fall, thereby discouraging current owners from making additional investments.

The owners collectively would form pricing rules falling under the scrutiny of antitrust laws. It is expected that, under newly developed competitive conditions, owner-users would refrain from price-fixing practices since it would not be in their interests to establish artificially high prices that would lower the value of each owner's market share.

Joint ownership by regional users of the BPA transmission network has distinct advantages over other proposals such as contract-common carriage and "better" pricing of transmission services.⁶⁶ Joint ownership would:

- × avoid the costs of monopoly power currently being exhibited by the BPA, reflected in the priority given to power generated and sold by the federal government;
- × transfer ownership-control rights among parties on the basis of economic value, as access would be available to those who value it the most as reflected in the prices they are willing to pay for transmission service or for ownership rights in the regional transmission company;
- × eliminate transaction costs that would be created in negotiating complex contracts with the BPA;
- × eliminate the need for complex access and pricing rules that would induce costly legal and judicial interference (antitrust enforcement and FERC oversight could ensure that the regional transmission company does not artificially restrict the entry of new owners); and
- × eliminate the ambiguity of ownership rights and governance under the present arrangement, and thus reduce legal and political costs in addition to encouraging efficient use of the transmission network.

The BPA currently controls about 80 percent of the Pacific Intertie extending from the Northwest to California.⁶⁷ The BPA faces little oversight by FERC and is exempt from antitrust laws and therefore can discriminate against privately owned utilities and other groups to favor its preference consumers. BPA's Intertie pricing and access policies have met with bitter opposition by regional and nonregional electricity producers and consumers. California

utilities and regulators for years had protested against BPA's Intertie access policy as both anticompetitive and discriminatory. Specifically, they have charged that the BPA sells power to the California market at discriminatory prices, reflecting a BPA policy of minimizing revenues that the BPA needs to collect from its preference customers.⁶⁸

As the demand for energy in the Northwest increases, many of the BPA's preference consumers can be expected to want to develop nonBPA generating power. A critical step in ensuring that this diversification strategy is successful will be the availability of capacity rights to the BPA's transmission lines. As is increasingly true across the rest of the country, electric power consumers of the Pacific Northwest will find it more attractive to shop around for low-priced electricity as more supply sources become available. Given a transmission system with tradeable capacity rights, trading among utilities and between independent producers and utilities will grow as a substitute for expensive large-scale capacity expansion. For the country as a whole, utility-built capacity is expected to account for as little as half of the new electric generating resources for the 1990s.⁶⁹

The major economic constraint under the current single ownership regime is that new competition in alternative transmission lines is impractical because individual generators are severely restricted from constructing their own transmission lines over different rights of way. In contrast, under a jointly owned transmission system, competition would be directed to vying for ownership and control rights in existing transmission lines. Thus, even in the presence of scale economies, competitive conditions would still prevail by allowing groups to sell or lease rights in transmission capacity to others.⁷⁰

Finally, the joint owners would perform the same functions as the BPA currently does, including planning for and financing new transmission capacity, operating with sufficient capacity and system interconnections, and coordinating electricity flowing from different generators to their purchasers.⁷¹ Participants in the electric power market would gain essential rights that they currently do not have, namely rights for market-based access and prices. In contrast to the BPA's present anticompetitive Intertie policy, joint ownership would promote competition in ownership control and provide strong incentives to coordinate power efficiently and make economically sound capacity expansion decisions.

C. An End to Counterproductive Government Energy Planning

The Pacific Northwest Electric Power and Conservation Act of 1980 contains a provision that may have the effect of severely diminishing the efficiency of the region's electric power industry. The provision requires the Northwest Power Planning Council (which was established, in part, to develop on a periodic basis a twenty-year electric power plan for the region) to give priority to energy conservation as a new resource to meet the future demand for electricity.

The Act applies a 10 percent premium to energy conservation by discounting its cost for environmental advantages when placed side-by-side with traditional resource alternatives. The Act also gives priority to renewable resources and generating resources applying waste heat or high fuel conversion efficiency over other resources (for example, gas-fired facilities).⁷²

In accordance with the Act, the BPA is required to take planning actions that are consistent with the approved plan of the Northwest Power Planning Council. The Council is composed of representatives from Oregon, Washington, Idaho, and Montana, and its primary job is to develop a twenty-year power plan for the Pacific Northwest. In every approved plan, the emphasis has been on promoting "cost-effective" energy conservation. The Council defines "cost effective" as a condition under which the cost of energy conservation is less than the

cost of new supply resources.⁷³

A basic premise of the Council's planning is its perception that energy conservation should be subsidized at the cost of new supply resources (for example, gas-fired plants); the Council believes that energy conservation subsidized up to the cost of new resources can be considered "cost effective." To the contrary, subsidies based on the cost of new supply resources provide consumers with excess incentive to conserve electricity: the effective cost of electricity consumption to an individual would equal the price of electricity plus the cost of new supply resources (that is, the subsidy offered to the consumer for investing in conservation), thereby inducing conservation beyond the amount that is warranted given current resource availability.⁷⁴

To illustrate, if the price of electricity equals 3-cents per KWH and the cost of new supply resources equals 5-cents per KWH, a consumer would face a cost of 8-cents per KWH when using an additional KWH of electricity. The consumer therefore faces an effective price of 8 cents for using electricity, while the real cost is only 5 cents. As a consequence, the consumer would have an incentive to underconsume electricity since the effective price of electricity consumption exceeds the cost of new supply resources. In other words, the cost of electricity from the consumer's perspective would be above the real cost of electricity.

In addition, such subsidies would harm nonrecipient consumers, since BPA distributors receive less revenues and make subsidy payments equal to the cost of new supply resources. To make nonrecipient consumers no worse off, the maximum subsidy should not exceed the difference between the cost of new resources and the current price of electricity.⁷⁵ Instead, the BPA subsidies require nonrecipient consumers to help pay for conservation investments that would generally benefit only a small minority of preference customer's retail buyers.

The Northwest Power Planning Council apparently believes that the pricing system is deficient at achieving the economically efficient amount of conservation because electricity consumers are either irrational or ill-informed, or both, when making decisions on how much energy conservation to purchase. But, evidence of market imperfections serious enough to justify subsidies for energy conservation has not emerged. Studies that allege the presence of market imperfections fail to account for factors such as consumers expecting to earn higher returns from other types of investments, the high uncertainty of actual electricity savings, and the transaction costs associated with purchasing conservation measures.⁷⁶

Ironically, by failing to price electricity at its real cost, the BPA not only undermines the most effective mechanism for fostering conservation but, by seriously underpricing power, it actually encourages consumers to overconsume electricity and underinvest in conservation. In addition, the subsidies offered by the BPA for conservation exacerbate the problem of overconsuming electricity by artificially making electricity more attractive in relation to natural gas and other energy substitutes in specific uses such as water heating. Thus, the most effective approach the BPA can take to promote energy conservation in the Pacific Northwest involves setting the price of electricity to reflect its market value--the real cost of securing additional supplies. The right to resell preference power, the first reform offered in this section, would achieve the same objective by informing preference users of the (market) value of the power they consume.

The Northwest Power Planning Council's experience indicates why government attempts at energy planning are often likely to be misguided and counterproductive. By suppressing the crucial role prices play in guiding consumption and investment decisions, subsidies, whether for below-cost power or for energy conservation, impede the ability of consumers to make cost-minimizing energy decisions. At the same time, by distorting market prices, subsidies impede efficiency-enhancing competition in the supply of electricity. By making power

artificially cheap, subsidies in the Pacific Northwest have likely discouraged the development of independent power production, which may in fact be the most cost-effective source of new supply.

D. Beneficiaries of Reform

Taken together, the three reforms advanced would go a long way to benefit the nation, the Pacific Northwest, and various groups affected by the BPA's current practices. The group with the most to gain would be the group most affected by BPA's policies and practices--BPA's preference customers. By gaining greater control over the agency's power marketing decisions, preference customers would be in a position to enhance the organization's accountability and efficiency.

For public power districts, rural electric cooperatives, and municipal utilities in the Pacific Northwest, the proposals offer the choice of whether to continue consuming the power they are currently allocated or to resell a portion to interested buyers at a profit. A jointly owned transmission system which allowed electric power consumers and producers to buy and sell transmission capacity rights would facilitate these mutually beneficial transactions. As a result, preference customers would be better positioned to take advantage of the emerging competitive electric industry.

Groups interested in preserving the environment would also benefit from the proposed reforms. By encouraging power marketing, market-based pricing, and cost-efficient alternative energy production, the proposals would curb the expansion of economically and environmentally costly new generating capacity and reduce the region's reliance on hydropower.

To conservationists the proposals promise to offer electricity consumers in the Pacific Northwest and adjacent regions more opportunities to make efficient conservation investments. For privately owned utilities the proposals open new markets for both the electricity they sell and the electricity they buy.

U.S. taxpayers would benefit by allowing BPA to reduce its debt with the U.S. Treasury from the sale of transmission assets and by seeing that BPA's operations are put on a sounder financial basis. Independent power entrepreneurs would gain by having more opportunities to compete fairly with power marketed by the BPA.

Most importantly, the reforms would benefit the nation as a whole by stimulating competition in the electric industry and by promoting efficient pricing and trading. Competition almost assuredly would benefit the long-term interests of both the region's electricity consumers and the nation.

VI. CONCLUSION AND POLICY IMPLICATIONS

The future of the Bonneville Power Authority should be assessed in light of (1) the Authority's historically costly operating performance, (2) the Pacific Northwest's need to secure, environmentally and economically low-cost energy, and (3) the competitive and efficient market-like arrangements which are increasingly emerging in the U.S. electric industry. Together, these three factors strongly suggest that the BPA's present operating structure be reassessed.

The three proposed reforms include: (1) allowing the BPA's preference customers to resell electricity to those who value it more highly; (2) transferring ownership of the BPA's transmission system to the region's electric power consumers and generators; and (3) removing artificial (uneconomic) incentives for conservation and instead relying on efficient

market pricing of electricity for promoting wise use of energy.

The three fundamental reforms offered here would make the agency's practices more compatible with market incentives. This, in turn, would make the BPA more accountable to the region's consumers, as well as allow both electricity consumers and producers to take greater advantage of the emerging competitive electric industry. By offering greater availability of reliable, low-cost electric power, these reforms would put the Pacific Northwest on a more stable and economically sound foundation.

By placing greater reliance on market arrangements and less on federal control, these reforms have the merit of both increasing efficiency and accountability, whereby those groups most affected by BPA's policies and practices will be in a better position to influence its direction. Finally, by making the BPA both more economically and locally responsive, the electricity industry in the Pacific Northwest would rely less on economic and environmentally costly power sources.

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ENDNOTES

1.U.S. Department of Energy, Bonneville Power Administration, *Bonneville Power Administration: 1990 Financial Summary* (Portland, Oregon: Bonneville Power Administration, January 1991).

2.Ibid., 10.

3.The four are the Alaska Power Administration, the Southeastern Power Administration, the Southwestern Power Administration, and the Western Area Power Administration.

4.An excellent history of the BPA is presented in David L. Shapiro, *Generating Failure: Public Power Policy in the Northwest*, Cato Institute Book (Lanham, Maryland: University Press of America, Inc., 1989).

5.By 1932, for example, the eight largest electric holding companies controlled 73 percent of the privately owned electric business. In 1935 Congress enacted the Public Utility Holding Company Act, which provided the foundation for present-day public utility regulation in the United States.

6.See, for example, Paul L. Joskow, "Regulatory Failure, Regulatory Reform, and Structural Change in the Electrical Power Industry," Martin Neil Baily and Clifford Winston, eds., *Brookings Papers on Economic Activity: Microeconomics 1989* (Washington, D.C.: The Brookings Institution, 1989), 125-208; Margaret E. Kriz, "Power Struggle," *National Journal* (April 6, 1991): 789-93; Larry E. Ruff, "Electricity Restructuring in Two Nations: Different Paths to a Competitive Future," *Public Utilities Fortnightly* (June 22, 1989): 13-19; and John

C. Sawhill, "Planning to Win in the New Utility Environment," *Public Utilities Fortnightly* (October 12, 1989): 19-33.

7.U.S. Department of Energy, *National Energy Strategy: Powerful Ideas for America*, First Edition 1991/1992 (Washington, D.C.: U.S. Department of Energy, February 1991), 37-38.

8.U.S. Department of Energy, Bonneville Power Administration, *Bonneville Power Administration: 1990 Financial Summary*.

9.The Bush Administration's *National Energy Strategy* similarly argues that the current pricing practices of federal power marketing administrations "discourage energy conservation and efficiency by underpricing electricity. This, in turn, increases demand for electricity and for more federal hydroelectric dams" (p. 38).

10.See Peter D. Cooper, "The Bonneville Power Administration: The Worst Mess by a Dam Site," *Cato Policy Analysis* (Washington, D.C.: Cato Institute, February 6, 1986); and Shapiro, *Generating Failure*.

11.U.S. Department of Energy, Bonneville Power Administration, *Bonneville Power Administration: 1990 Financial Summary*.

12.U.S. Office of Management and Budget, "Fact Sheet on Reform of the Federal Power Marketing Administration's Debt Repayment Practices" (April 1991), 3. The mean interest rate for the seven BPA projects was 2.8 percent, while the mean U.S. Treasury long-term interest rate was 7.5 percent. OMB calculated that the "top" 228 federal power marketing administrations' projects will cost the U.S. Treasury \$300 million annually or \$13 billion in interest subsidies over the duration of the outstanding loans (p. 4).

13.U.S. Department of Energy, Bonneville Power Administration, *Bonneville Power Administration: 1990 Financial Summary*.

14.Recent proposals to deal with the BPA problem focus on repaying BPA's debts to the federal government. Senator Mark Hatfield proposes, for consideration, the use of private financing to repay BPA's current debts with the U.S. Treasury. Similarly, Philip O'Connor and Wayne Olson propose local ownership of the BPA's electric power system as a political solution to the debate over repayment reform and privatization. (Philip R. O'Connor and Wayne P. Olson, "Localizing Federal Power Assets: A Path for the Pacific Northwest," *Public Utilities Fortnightly* (February 1, 1990): 7-13.)

15.See Shapiro, *Generating Failure*.

16.In addition to the BPA, other federal power marketing agencies, the Tennessee Valley Authority, and rural electric cooperatives were formed largely because of the prevailing perception that privately owned utilities could not be trusted to provide affordable electricity to customers who were located in remote areas.

17.It is questionable how much authority FERC has in setting rates. A 1987 ruling by FERC argued that the rates charged by the BPA to California utilities are based, *de facto*, on the policies and regulations of the U.S. Department of Energy. Consequently, FERC reasoned that it has no authority to review the rates BPA charged to California utilities. ("Proposed BPA Intertie Policy Drawing Criticism," *Public Utilities Fortnightly* (June 25, 1987), 37.)

18.Prior to passage of the Public Utility Holding Company Act of 1935, many observers of the electric industry felt that state public utility commissions lacked the adequate authority, the expertise, and in some cases, the will to monitor effectively the activities of electric utilities.

The Act facilitated the ability of state commissions to sort out intercorporate transactions. Although state commissions were authorized to regulate electric operating companies, no governmental entity had authority to control the activities of electric utility holding companies.

19. "Cost of service" equals the sum of the utility's operating costs plus the product of its rate base and a fair rate of return. Regulators generally allow utilities the opportunity to collect sufficient revenues to recover these costs. Operating costs include depreciation expense, labor costs, and fuel costs. The rate base typically is based on the book cost (original cost minus depreciation) of capital committed to utility service. The fair return usually reflects a utility's cost of capital.

20. This social contract has had its costs. These costs stem from three major sources. First, consumers suffer most of the risks of utility operating and planning decisions through higher rates. Second, utility management receives weak incentives to control operating costs and to carry out innovative, least-cost investments. Third, retail customers are deprived of the opportunity to purchase lower-priced electricity from outside utilities and other suppliers.

Some evidence points to the pro-utility posture of early state regulation, illustrated by the fact that electricity rates and profits were higher in states with regulation (See, Gregg A. Jarrell, "The Demand for State Regulation of the Electric Utility Industry," *Journal of Law and Economics* 21 (October 1978): 269-98).

21. Yvonne Levy, "Pricing Federal Power in the Pacific Northwest: An Efficiency Approach," *Federal Reserve Bank of San Francisco Economic Review* (Winter 1980), 43.

22. See David L. Shapiro, "Bonneville Agency Pricing and Electric Power Utility," *Quarterly Review of Economics and Business* 16 (Winter 1976): 19-34.

23. The Act was a response to growing threats, starting in the 1970s, of rising energy prices and anticipated power shortages in the Pacific Northwest. These threats jeopardized the future availability of low-priced power to privately owned utilities and direct service industries in the Pacific Northwest.

24. Politically, the Act tried to appease all electricity consumer groups by expanding the BPA's role.

25. See, for example, Andrew N. Kleit and Richard L. Stroup, "Blackout at Bonneville Power," *Regulation*, No. 2 (1987): 30-36.

26. U.S. Department of Energy, *Bonneville Power Administration: 1990 Financial Summary*, 14.

27. U.S. Department of Energy, *1991 Annual Report to Congress* (Washington, D.C.: U.S. Department of Energy, Energy Information Administration, April 1991), 224. The rate, in current dollars, increased by only 6 percent.

28. Levy, "Pricing Federal Power in the Pacific Northwest," 40-63. Levy also estimated that, for 1980, the BPA sold power at an average price that was only 13 percent of its marginal cost.

29. Shapiro, *Generating Power*.

30. *Ibid.*

31. Timothy P. Roth, "Power Marketing Administrations: The Case for Privatization"

(Washington, D.C.: Citizens for a Sound Economy, January 31, 1986).

32. Milton R. Copulos, "Cutting the Deficit by Selling Federal Power Marketing Administrations" (Washington, D.C.: The Heritage Foundation, February 13, 1986).

33. U.S. Office of Management and Budget, *Testimony of the Honorable David A. Stockman, Director, Office of Management and Budget, before the Committee on Interior and Insular Affairs. Subcommittee on General Oversight Northwest Power and Forest Management, U.S. House of Representatives*, Washington, D.C., 1985.

34. Kleit and Stroup, "Blackout at Bonneville Power."

35. The privately owned utilities have long opposed subsidies to public power groups and rural electric cooperatives. They perceive these subsidies as being anticompetitive by giving unfair advantages to their competitors.

36. Net billing allowed the BPA to own the long-term contracts for all of the power from nuclear units 1 and 2, and 70 percent of all power from nuclear unit 3. The BPA applied a credit to the prices charged WPPSS utilities to help pay the interest and the principal on bonds the utilities issued to fund the nuclear power plants. Funding for the credit came from other BPA customers in the form of higher power rates.

37. Paul Spies, "Variable Electricity Prices for Aluminum Smelting in the Northwestern USA," *Energy Policy*, 18 No. 2 (March 1990): 162-69.

38. U.S. Department of Energy, Bonneville Power Administration, *Bonneville Power Administration: 1990 Financial Summary*, 30.

39. *Ibid.*, 31.

40. For example, the net-billing agreement forced BPA customers as well as U.S. taxpayers to bear the risks of cost overruns, noncompletion, and other problems encountered by the Washington Pacific Power Supply System (WPPSS) in constructing the nuclear power plants. The BPA's obligations to the WPPSS were on a "take or pay" basis, where credit to WPPSS utilities would accrue regardless of whether their nuclear plants ever generated power. The BPA even lacked the authority to manage the construction of the WPPSS plants.

41. U.S. Department of Energy, Energy Information Administration, *Form EIA-213*, 1989.

42. Walter Butcher and Philip Wandschneider, and Norman Whittlesey, "Competition Between Irrigation and Hydropower in the Pacific Northwest," in *Scarce Water and Institutional Change*, Washington, D.C.: Resources for the Future, K. Frederick ed., 1986.

43. "Protection for Fish to Cut Bonneville Power Output, May Boost Use of IPPs," *Electric Power Alert*, January 22, 1992.

44. See, for example, Federal Energy Regulatory Commission, *Electricity Transmission: Realities, Theory, and Policy Alternatives* (Washington, D.C.: The Transmission Task Force's Report to the Commission, October 1989); Douglas A. Houston, "Privatization of the Tennessee Valley Authority," *Issue Paper* (Santa Monica, CA: The Reason Foundation, October 7, 1988); Joskow, "Regulatory Failure," Congress of the United States, Office of Technology Assessment, *Electric Power Wheeling and Dealing* (Washington, D.C.: Office of Technology Assessment, May 1989); Ruff, "Electricity Restructuring in Two Nations; Sawhill, "Planning to Win in the New Utility Environment;" and Vernon L. Smith, "Currents of Competition in Electricity Markets," *Regulation*, 11 No. 2 (1987): 23-29.

45. See, for example, Joskow, "Regulatory Failure."

46. See Congress of the United States, Office of Technology Assessment, *Electric Power Wheeling and Dealing*.

47. Until recently, technological changes favored large generating units. The trend in the industry toward smaller-scale and less capital-intensive generating facilities (for example, modular and staged combustion turbine, combined cycle) reflects a rational response to prevailing economic and political realities.

48. See Douglas A. Houston, "Toward Resolving the Access Issue: User-Ownership of Electric Transmission Grids," *Policy Insight No. 129* (Santa Monica, CA: The Reason Foundation, August 1991); and Kenneth W. Costello, "The Struggle over Electricity Transmission Access," *Cato Journal*, 8 (Spring/Summer 1988): 107-24.

49. For example, Public Service of Indiana received approval from the FERC to price 450 megawatts of wholesale electricity at market prices in return for granting both utility and independent suppliers greater access to its transmission system (FERC Docket No. ER89-692).

50. In a competitive environment, utilities and other suppliers would be pressured to apply market pricing to both existing and potential new customers. For a utility threatened with uneconomical "bypass," market pricing becomes necessary in preventing customers from switching to higher cost suppliers or technologies. Market pricing increases aggregate benefits and a utility's earnings, as well as reduces the need to raise rates to so-called "captive" customers.

51. See, for example, U.S. Department of Energy, *National Energy Strategy: Powerful Ideas for America*.

52. Jan Paul Acton and Stanley M. Besen, *Regulation, Efficiency, and Competition in the Exchange of Electricity: First Year Results from the FERC Bulk Power Market Experiment* (Santa Monica, CA: Rand Corporation, October 1985); and Joskow, "Regulatory Failure."

53. FERC issued three Notices of Proposed Rulemakings (NOPRs) on March 16, 1988 (Docket Nos. RM-88-000-4, 5, and 6), addressing independent power producers (IPPs), avoided cost rates for purchased power, and all-source bidding for purchased power, respectively.

54. Kenneth W. Costello, "Incentive Rates or Market Rates: A Rose by Any Other Name?" *The Electricity Journal*, 2 (August/September 1989): 42-51.

55. See, for example, Kenneth Rose et al., *Implementing a Competitive Bidding Program for Electric Power Supply* (Columbus, OH: The National Regulatory Research Institute, 1991).

56. This does not strictly hold if purchasers sell power at a price that deviates from marginal cost (see Michael A. Einhorn, "Hydroelectric Relicensing: An Optimal Approach," *Resources and Energy*, 9 (1987): 45-53; and Paul L. Joskow and Richard Schmalensee, "Adversary Hydro Relicensing Applications: Using Economic Criteria," *Public Utilities Fortnightly* (December 20, 1984): 22-28).

57. The major difference in outcome between the two arrangements lies with the distribution of gains. Unlike reselling, auctioning off of hydropower at market prices would directly benefit U.S. taxpayers.

58. Terry L. Anderson, *Water Crisis: Ending the Policy Drought* (Baltimore, MD: The Johns Hopkins University Press, 1983).

59. Preference customers typically are power distributors owned by the retail customers they serve. The average customer would therefore stand to benefit from the economic gains of resale.

60. The economic benefits and political palatability of reselling preference power in the Pacific Northwest also are discussed in Kleit and Stroup, "Blackout at Bonneville Power."

61. See Houston, "Toward Resolving the Access Issue;" Costello, "The Struggle over Electricity Transmission Access;" and Smith, "Currents of Competition in Electricity Markets."

62. U.S. Congress, Office of Technology Assessment, *Electric Power Wheeling and Dealing*.

63. Under many circumstances, the spot market can shift risks efficiently. Generally, in a spot market the risks of planning and operation fall on investors rather than consumers. A spot market can also promote efficiency by rapidly setting prices that reflect future market conditions.

64. "Shopping around" induced by access to transmission lines should improve both allocative and productive efficiency. Sellers would be pressured by competitive forces to offer prices corresponding to their marginal costs, or else lose customers to other suppliers. In addition, it is more likely that electricity consumers would be served by the lowest-cost suppliers, since consumers would not be constrained to purchase their electricity from local suppliers.

65. Separation of ownership rights and operation rights currently exists for the National Grid Company, which is the newly formed British common-carrier, electric transmission utility. The company is owned by twelve regional electric distribution companies.

66. For problems associated with contract-common carriage, see Houston, "Toward Resolving the Access Issue;" and Joe D. Pace and Rodney Frame, "Approaching the Transmission Access Debate Rationally," *Transmission Research Group (TRG) Working Paper No. 1* (Washington, D.C.: National Economic Research Associates, November 1987).

"Better pricing" may not be a reality given continued ownership and control of the transmission network by the BPA. Political considerations and abuse of BPA's market power make it unrealistic to believe that prices would be set at efficient levels.

67. The combined capacity of the Pacific Intertie equals 5,156 megawatts of which 4,056 megawatts fall under the BPA's control.

68. See "Proposed BPA Intertie Policy Drawing Criticism," 36-37; and Arlon R. Tussing, "Electricity and Gas: The U.S. West," *Energy Journal*, 9 No. 4 (October 1988): 111-19.

69. "EEI Sees No Shortages, Increasing Reliance on DSM Programs and NUGs," *Electric Utility Week* (December 9, 1991), 7.

70. Arguments for joint ownership of electric transmission lines are presented in Houston, "Toward Resolving the Access Issue;" Costello, "The Struggle over Electricity Transmission Access;" and Smith, "Currents of Competition in Electricity Markets."

Joint ownership of natural gas pipelines recently has been proposed to promote competition in the natural gas markets. See Dan Alger and Michael Toman, "Market-Based Regulation of

Natural Gas Pipelines," *Journal of Regulatory Economics*, 2 (September 1990): 263-80. Joint ownership, according to the authors, would allow pipelines to "reap scale economies by competitive offering of transportation services by multiple shareholders to limit the exercise of market power (p. 276)."

71. Joint ownership must reckon with three major technical conditions required for a smoothly functioning electric power system. First, the electricity flowing from individual generators to purchasers and from different generators, all using the same transmission network, would have to be coordinated. Second, the regional transmission company would need to take into account the interdependency between the three primary components (generation, transmission, distribution) of an electric power system. The workings of the three components are intertwined in a way that allows an electric power system to operate as a coordinated whole. Third, the flow of electricity on outside electric power systems should be held to a tolerable level or, if not possible, compensation should be paid to utilities located outside the intended transmission path.

72. See Northwest Power Planning Council, *Supplement to the 1986 Northwest Conservation and Electric Power Plan, Volume 1* (Portland, OR: Northwest Power Planning Council, 1989):

The Act requires the Council to give first priority to conservation, second to renewable resources, third to generating resources of high fuel-conversion-using efficiency, and last to all other resources. Finally, the Act provides a 10 percent advantage in calculating the estimated incremental system costs for conservation measures (p. 4).

73. *Ibid.*, 4.

74. See, for example, Paul L. Joskow, *Testimony before the Subcommittee on Energy and Power, House Committee on Energy and Commerce* (Washington, D.C.: March 31, 1988), 19.

75. *Ibid.*, 10.

76. See, for example, T. Scott Newlong and David Weitzel, "Do Market Imperfections Justify Utility Conservation Programs? A Review of the Evidence," *The Electricity Journal*, 4 No. 4 (May 1991): 40-53.



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