United States General Accounting Office

GAO

Report to Congressional Requesters

May 2003

FEDERAL ENERGY REGULATORY COMMISSION

Charges for Hydropower Projects' Use of Federal Lands Need to Be Reassessed

GAO-03-383

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Highlights

Highlights of GAO-03-383, a report to Congressional Requesters

Why GAO Did This Study

Hydropower projects generate power valued at billions of dollars. For projects located on federal lands, FERC is required to assess "reasonable annual charges" to use these lands. FERC agrees that fair market value is the most reasonable basis for assessing these charges. This report examines FERC's annual charge system and the extent to which it reflects the federal lands' contributions to hydropower. GAO described and assessed FERC's annual charge system, estimated the fair market value for the use of federal lands, and discussed the implications of higher charges on consumers and project owners.

What GAO Recommends

FERC should reconsider its current system and develop new strategies and options for assessing annual charges that are proportionate with the economic benefits conveyed to hydropower licensees.

While FERC is developing this strategy, it should better manage its current system by verifying the amount of federal lands hydropower projects use and resolving discrepancies among its multiple billing and land databases.

In its comments, FERC disagreed with our valuation of federal lands but agreed with our recommendations to resolve discrepancies among its databases. The National Hydropower Association also disagreed with our valuation of federal lands.

www.gao.gov/cgi-bin/getrpt?GAO-03-383.

To view the full report, including the scope and methodology, click on the link above. For more information, contact Barry T. Hill at (202) 512-3841.

What GAO Found

Since 1987, FERC's charges for hydropower projects on federal lands have been based on a linear rights-of-way fee schedule that was originally used to determine the annual fees other agencies charged for the rights to locate, among other things, powerlines, pipelines, and communication lines on federal lands—uses that are generally less valuable than hydropower. FERC chose this system primarily because it was simple and predictable and would not subject the commission to appeals from the electricity industry. However, this system has no relationship to the economic benefit of the federal lands used to produce hydropower. In addition, in implementing this system, FERC does not ensure that (1) the charges it collects achieve the hydropower annual charge program objectives, (2) it has accurate information on the amount of federal lands licensees use, or (3) its billing system collects all charges due the federal government for the use of its lands.

The annual charges FERC currently collects from hydropower projects for the use of federal lands are significantly less than the annual fair market value of these lands. For this report, GAO defined this value as the value of the annual economic contribution that the use of federal lands makes to the production of hydropower. According to GAO's analysis, FERC is receiving less than 2 percent of the annual fair market value for the use of these lands. In performing its analysis, GAO examined multiple electricity market scenarios, including three that estimated the value of federal lands using actual industry data from three recent years. Under these scenarios, the fair market value for the use of federal lands by GAO's sample of hydropower projects is at least $157 million annually and, under some market conditions, hundreds of millions of dollars more. In comparison, FERC collected about $2.7 million in annual charges from these projects in 2002.

GAO reached these conclusions on the basis of its analysis of a stratified random sample of 24 projects that use federal lands. This sample was drawn from 56 projects that collectively account for about 90 percent of the hydropower produced on federal lands. Although this sample of 24 projects was not representative of all hydropower projects on federal lands, these projects produced about 60 percent of all electricity generated by FERC-licensed hydropower projects that use federal land and represent about 35 percent of all federal lands used for hydropower production.

If FERC decides to collect annual charges that more closely reflect the fair market value for the use of federal lands, the implications of such a decision for consumers and hydropower project owners would depend on (1) how much of the fair market value FERC chooses to recover and how it decides to implement these higher charges and (2) whether the affected electricity market is still fully regulated or has been restructured.

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Abbreviations

BCPS	Bath County Pumped Storage
BLM	Bureau of Land Management
CAPX	California Power Exchange
CCCT	combined-cycle combustion turbine
EIA	Energy Information Administration
FERC	Federal Energy Regulatory Commission
GAO	General Accounting Office
ID	irrigation district
IOU	investor-owned utility
IPP	independent power producer
kwh	kilowatt-hour
Muni	municipality
NBV	net book value
NHA	National Hydropower Association
O&M	operations and maintenance
PJM-WH	Pennsylvania, New Jersey, Maryland-Western Hub
PUD	Public Utility District
RCLPD	replacement cost less physical depreciation
SERC	Southeastern Electric Reliability Council
WECC	Western Electricity Coordinating Council

United States General Accounting Office
Washington, D.C. 20548

May 20, 2003

The Honorable David L. Hobson
Chairman
The Honorable Peter J. Visclosky
Ranking Minority Member
Subcommittee on Energy and Water Development
Committee on Appropriations
House of Representatives

The Honorable Charles H. Taylor
Chairman, Subcommittee on Interior
Committee on Appropriations
House of Representatives

The Federal Energy Regulatory Commission (FERC)—an independent fivemember commission appointed by the President and confirmed by the Senate—issues licenses to construct and operate many nonfederally owned hydropower projects, including 173 located on federal lands. These 173 projects generate electricity worth billions of dollars annually.[1]

The Federal Power Act requires FERC to establish and collect reasonable annual charges for the use of these federal lands. In doing so, FERC must take into account the effect of these charges on consumer rates and hydropower development. The act does not prescribe what value represents a reasonable annual charge; however, one criterion generally used for valuing land in both the public and private sectors is the land's fair market value. In implementing the annual charge requirement, FERC stated that using the fair market value of the land is the most reasonable method for compensating the government for the use of its lands. Fair market value is generally defined as the price agreed to by a willing buyer and a willing seller, where both parties have reasonable knowledge of the relevant facts. Since federal lands are not generally sold, our estimate of fair market value in this report refers to the value of the annual economic contribution federal lands make to the production of hydropower.

[1] For this report, we focused on the 173 projects that use 25 acres or more of federal land to produce hydropower. An additional 109 projects use fewer than 25 acres of federal land to produce hydropower. Also, we did not include projects that only use federal lands for the transmission of power. Finally, we did not include Indian reservations in our definition of federal lands.

The federal lands used to generate hydropower have considerable value because of the advantages hydropower has over other sources of electricity and because of the scarcity of lands that can be used to generate hydropower. Compared with other sources of electricity generation, hydropower is inexpensive to produce, its production can be increased quickly in periods of peak demand, and it produces no air pollution or radioactive wastes. There are also some disadvantages to hydropower, such as the fact that (1) the amount of power produced is limited to the amount of water available and (2) future regulatory actions established through the relicensing of hydropower projects could, among other things, limit the future quantity—or increase the cost—of hydropower produced at some projects. While hydropower has some advantages over other sources of electricity generation, lands that are suitable for producing large amounts of hydropower are scarce. These lands have unique characteristics, such as steep canyons, flowing rivers, and/or the capability of storing large volumes of water. The more hydropower the land is capable of producing, the greater the value of the land.

The U.S. electricity industry is currently undergoing substantial restructuring—from an industry that has historically been highly regulated by federal and state governments to one that operates in a more competitive environment. For example, FERC has historically approved wholesale electricity prices—the prices charged when utilities buy and sell power from other utilities within the same region of the country—and state regulators have approved retail electricity prices, such as those charged to residential and industrial consumers, principally on the basis of production costs. However, some states have recently restructured their retail electricity markets by allowing competition in the generation segment of the industry. In some cases, regulated utilities were required to sell many or all of their power plants in order to foster competition. In restructured markets, prices are determined by supply and demand. As a matter of policy, FERC encourages the movement toward greater competition in wholesale energy markets. While some states have plans to move in this direction, others do not.

As requested, this report addresses FERC's system for developing reasonable annual charges for the use of federal lands and the extent to which this system reflects the contribution these lands make to the generation of electricity. Specifically, we (1) describe the system FERC currently uses for determining reasonable annual charges for the use of federal lands by hydropower projects and assess FERC's management of that system; (2) estimate the fair market value for the use of these federal lands and compare that value with the annual charges FERC currently collects for the use of these lands; (3) discuss the implications for consumers and hydropower project owners of having FERC collect annual charges that more closely reflect the fair market value of the land; and (4) discuss the implications of FERC's not acting to collect charges that more closely reflect fair market value until after restructuring of electricity markets occurs.

To determine the fair market value of federal lands used by hydropower projects, we examined a stratified random sample of 24 FERC-licensed hydropower projects from a group of 56 projects. These 56 projects collectively account for about 90 percent of the hydropower produced on federal lands. Although our sample of 24 projects was not representative of all hydropower projects on federal lands, these projects produced about 60 percent of all the electricity generated by the FERC-licensed hydropower projects that used federal land and represent about 35 percent of all federal lands used to produce hydropower. We estimated the annual value of the federal lands in our sample of projects using a technique known as a "net benefits analysis." A net benefits analysis estimates the difference between the value of the power produced and the cost to produce it. This difference is an estimate of the land's annual fair market value. We used the net benefits approach because there is no active market for renting lands for hydropower that would provide comparable values for these lands. With the exception of federal lands and lands within Indian reservations, FERC generally requires licensees to either own the land within their project boundaries or secure the land through an easement in perpetuity.

We applied our net benefits methodology to our sample of projects under six different scenarios. First, we conducted a net benefits analysis on the basis of actual industry data for 3 recent years—1998, 1999, and 2000. In general, to conduct these three analyses, we estimated the value of the power by multiplying data on the average wholesale price of electricity by the amount of electricity actually generated. To estimate the cost of producing that power, we estimated project capital costs, including a rate of return on the investment, and added this estimate to data on actual operating costs for the same period. Second, to demonstrate how our analysis can be affected by changes in the price and quantity of power produced in any given year, we performed two sensitivity analyses on our 1999 results—one for changes in price and one for changes in quantity. Finally, because the wholesale price of electricity was extremely volatile at times during the 3-year period—1998, 1999, and 2000—we estimated what the fair market value of these lands might be in 2003 using (1) average annual generation data for 1995 through 2000 and operating cost data for 1998 through 2000, (2) estimates of capital costs for 2003, and (3) estimates of the long-term value of electricity. For comparison purposes, we adjusted all values to 2002 constant dollars. We discussed our approach and the results of our analysis with FERC, representatives of the hydropower projects we sampled, industry associations, state governments, consumer advocate groups, and several other federal agencies. Some of these representatives expressed concerns about using this method, preferring instead FERC's current method because of its simplicity and relatively low charges. We discuss additional details on our use of the net benefits analysis in appendix I.

Results in Brief

Although FERC has acknowledged that using fair market value is the most reasonable method for compensating the federal government for the use of its land, since 1987, FERC has used a "linear rights-of-way" fee schedule to determine annual charges for federal land used by hydropower projects. This system—designed by the U.S. Department of Agriculture's Forest Service and the Department of the Interior's Bureau of Land Management—was originally used to determine the annual fees the two agencies should charge for the rights to locate, among other things, power lines, pipelines, and communications lines on federal land. The agencies base their specific fees on the number of acres used. In implementing the linear rights-of-way system, FERC acknowledged that hydropower project uses are more valuable than rights-of-way. As a result, to capture these higher values, FERC doubled the per-acre fees in the rights-of-way schedule and multiplied that amount by the number of acres that were identified as being federally owned within the hydropower project's designated boundary. FERC then collected these amounts as annual charges for the use of federal lands by hydropower projects. FERC stated that the purpose of the 1987 annual charge system was to "establish a fair market rate" for the use of federal lands. However, this system has no relationship to the economic benefit of the federal lands used to produce hydropower. In addition, according to FERC's former Director of Hydropower, FERC chose this fee system primarily because it was a simple and predictable method to use and would not subject the commission to numerous court challenges from the electricity industry.

Since issuing its regulations in 1987, FERC has not performed the oversight needed to ensure that (1) the charges it is collecting meet the hydropower annual charge program objectives, (2) it has accurate information on the amount of federal lands used by licensees, or (3) its billing system collects all charges that are due the federal government for the use of its lands. Specifically, FERC has not performed any research or analysis to assess whether its fee schedule results in annual charges that are proportionate to the benefits conferred. In addition, FERC allows licensees to self-report the amount of federal acreage their projects use but does not verify any of this information. Since FERC determines its annual charges on a per-acre basis, having accurate and verified information on the amount of federal lands licensees use is critical to collecting all monies that are due the government. Finally, FERC has three separate databases it uses to determine annual charges—two for determining the amount or type of federal land used by a hydropower project and one for determining the billing amount. These databases sometimes contain conflicting information, which lead to billing errors and, in some cases, result in FERC's not collecting all the annual charges due the federal government.

The annual charges FERC currently collects for the use of federal lands are significantly less than the value of the annual economic contribution that these lands make to the production of hydropower, according to our analysis of the 24 hydropower projects. That is, FERC is receiving less than 2 percent of the fair market value for the use of these lands. In total, the estimated fair market value of the federal lands used by our sample of 24 hydropower projects is at least $157 million annually and, under some market conditions, the value of these lands is worth hundreds of millions of dollars more. In comparison, FERC collected about $2.7 million in annual charges from these projects in 2002.

If FERC decides to collect annual charges that more closely reflect the fair market value for the use of federal lands, the implications of such a decision for consumers and hydropower project owners would depend on (1) how much of the fair market value FERC chooses to recover and how it decides to implement these higher charges and (2) whether the affected electricity market is still fully regulated or has been restructured. First, FERC must balance any increases in charges with the Federal Power Act's requirement to seek to avoid unreasonable increases in consumer rates and the act's goal of encouraging the development of hydropower. FERC may therefore decide to collect only a portion of the fair market value of the land as an annual charge. No matter how much more FERC decides to charge, the impact of higher charges will depend in part on how FERC introduces them. FERC has options to mitigate the negative effects of increasing annual charges, such as phasing in higher charges over several years or tailoring the implementation to accommodate changes in the regulatory structure of the industry. Second, in a regulated market, any increases in FERC's annual charges would most likely be passed on directly to consumers through higher electricity rates. This impact would be most evident for some utilities and their customers in locations such as Idaho, Oregon, and Washington State, which rely heavily on FERC-licensed hydropower projects to generate their electricity. Consumers who buy power from these utilities have historically enjoyed some of the lowest electricity rates in the country. Consequently, any increase in annual charges to better reflect the fair market value of the federal land would most likely increase rates to a level that would be closer to the national average. In contrast, in a restructured environment, where electricity rates are based on wholesale market prices, increased annual charges are much more likely to affect the profitability of the electric utility and its shareholders rather than consumers. In this restructured, competitive environment, the utility may not be able to pass on any FERC increases in annual charges to consumers. For this reason, consumers are less likely to be affected.

If FERC decides not to collect annual charges that better reflect the fair market value for the use of federal lands until after restructuring occurs, it may (1) limit its opportunity to increase charges and (2) put taxpayers at risk of losing a potential future stream of revenue. Specifically, in restructured markets some utilities have been required to sell their generation facilities, such as hydropower plants, in order to increase competition. The price at which these plants sell includes the net benefits resulting from the use of the federal land on which the project is located. Once these plants are sold, the federal government may have limited ability to capture these benefits because the new owner paid a price that included the capitalized value of the land.[2] Any further increase in costs, such as increased annual charges, could make the cost of the project exceed the value of the power produced. For example, Maine, Montana, and New York have already restructured their wholesale electricity markets. In these states, as projects were sold, the state or the previous owner captured all of the projects' expected net benefits. In Montana, where projects that

[2] The capitalized value of the land is the present value of the expected annual net benefits over the future lifetime of the project.

included federal land were sold, the federal government did not receive any benefits from the sale even though the federal government owned some or most of the land on which these projects were built. Furthermore, if FERC continues to maintain annual charges at their current low level, this benefit to some consumers will be at the expense of many other taxpayers, who may have to make up this lost revenue through their taxes. As FERC has observed in connection with annual charges assessed for the use of government dams, an "overly low annual charge payment…ultimately places higher costs on other consumer members of the public who must make up the difference through their taxes."[3]

In light of the new information we are providing on the value of the contribution that federal lands make to the production of hydropower and FERC's policy to make all energy markets more competitive, we are recommending that FERC develop new strategies and options for assessing annual charges for the use of federal lands by hydropower projects that are proportionate with the benefits conveyed to the licensees. As FERC develops this strategy, we also recommend that it improve the management of its current annual charge system.

We provided FERC, the Department of the Interior, the Forest Service, and the National Hydropower Association (NHA)—a hydropower industry group—with a draft of this report for their review and comment. The Forest Service declined to comment. The Department of the Interior agreed with the report and provided some technical clarifications and observations. FERC generally agreed with our findings and recommendations on the conflicting information in the databases it uses to manage its annual charge system, but generally did not believe that our method of assessing the value of federal lands used by hydropower projects would be appropriate. FERC also raised concerns about using a net benefits approach as a mechanism to collect annual charges. While we recommend that FERC reassess its current annual charge system and look for ways to better account for the value of federal lands, we do not specifically recommend that FERC deploy our approach to value the land as a mechanism for collecting annual charges. NHA disagreed with our report and raised a number of concerns about increased annual charges. For example, NHA commented that increased annual charges will increase electricity rates to consumers, which could adversely affect the economy of some states that benefit from low-priced hydropower. Our report

[3] See 48 *Fed. Reg.* 15134, 15136 (1983).

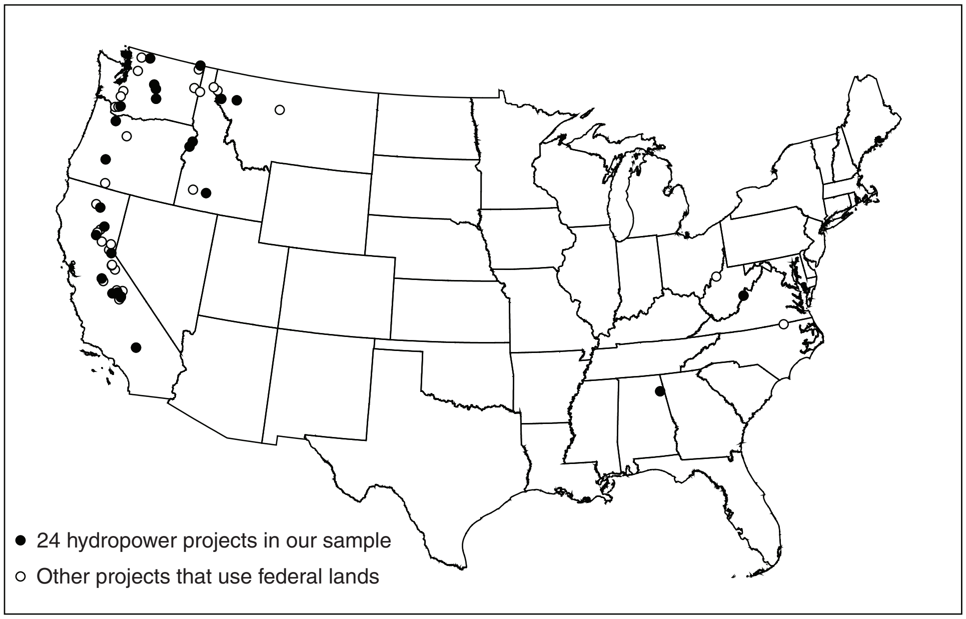
discusses this and notes that the impacts from increasing annual charges largely depend on (1) how much of the land's value FERC decides to collect and how it implements any higher charges and (2) whether the affected electricity market is still fully regulated or has been restructured.

Background

Hydropower projects include dams, reservoirs, stream diversion structures, powerhouses containing turbines driven by falling water, and transmission lines. Lands capable of producing hydropower generally have unique characteristics, such as flowing water, steep canyons, and/or the ability to store large volumes of water for later release through the turbines that generate electricity. Nationwide, hydropower projects generate about 10 percent of all electricity produced in the United States. Federally owned and operated hydropower projects produce approximately half of this electricity. Nearly all the remaining half is produced by about 1,000 nonfederal hydropower projects that are licensed by FERC, about 173 of which use at least some federal lands to produce their hydropower.[4] Of these 173 projects, 56 projects account for about 90 percent of the hydropower produced on federal lands. From these 56 projects, we selected a random sample of 24 hydropower projects which are the focus of this report. As figure 1 shows, most of the projects that use federal lands are located in the western United States due, in part, to the suitable topography found in many western states.

[4] For this report, we focused on the 173 projects that use 25 acres or more of federal land to produce hydropower.

Figure 1: Locations of the 56 Largest FERC-Licensed Projects That Use Federal Lands for Hydropower Production



Sources: FERC and GAO.

Section 10(e) of the Federal Power Act requires FERC to collect "reasonable annual charges" to compensate the federal government for the use of its lands.[5] FERC must balance the amount of these annual charges with the authorizing act's requirement to seek to avoid unreasonable increases in consumer rates and the act's goal of encouraging the development of hydropower. The act does not require FERC to collect the fair market value of the federal land used by FERC-licensed hydropower projects. However, fair market value is a common criterion used by both the public and private sectors to value lands throughout the country, and, in implementing the act, FERC stated that fair market value was the most reasonable method of compensating the federal government for the use of its lands. FERC further stated, "[r]easonable annual charges are those that

[5] Our review did not focus on FERC's administration of its responsibilities under section 10(e) of the Federal Power Act to establish annual charges for hydropower projects occupying lands within Indian reservations.

are proportionate to the value of the benefit conferred. Therefore, a fair market value approach is consistent with the dictates of the act."[6] The act also prescribes how revenues from annual charges are to be distributed: 50 percent go to the Reclamation Fund—a fund that pays for reclamation projects, primarily in the western United States; 37.5 percent go back to the states where the projects are located; and 12.5 percent is deposited in the Treasury's general fund. In addition, the act fully or partially exempts hydropower projects owned by states or municipalities from paying annual charges if the power is sold to the public without profit or used for municipal purposes.

The value of any land is determined by using one of three approaches—the comparable sales approach, the income approach, or the cost approach. The comparable sales approach, which looks at transaction data for comparable lands, cannot be used for hydropower projects because (1) transaction data based on sales are not appropriate since these data are largely based on nonhydropower uses and (2) data based on renting or leasing nonfederal lands for hydropower uses are not available. FERC requires licensees, as a condition of obtaining a FERC license, to own the lands or obtain an easement in perpetuity from another landowner in order to ensure a steady supply of hydropower. Federal lands and some Native American lands are not subject to this requirement; however, licensees must pay annual charges for using these lands. When there are few or no transaction data available for comparable sales, the income approach can be used, provided that reliable and sufficient data are available. The income approach determines the value of a property or a business by considering its income-producing potential. The cost approach estimates the value of a property by adding (1) the current cost of reconstructing or replacing existing improvements, less physical depreciation and (2) the estimated value of the land. While the cost approach is generally considered less reliable than the comparable sales or income approaches, some cost approach techniques can be used to develop information needed by the other two approaches. For our analysis, we used a variant of the income approach—called a net benefits approach—to determine the value of federal lands used by a sample of hydropower projects. However, instead of using actual income from the hydropower projects—as a traditional income approach would do—our net benefits analysis relied on the market prices of the hydropower produced by these projects. We used market prices because they reflect the value of power more accurately than

[6] See 52 *Fed. Reg.* 18201, 18205 (1987).

electricity prices that are set through state regulatory processes. (For more information on this approach, see app. I.)

The methodology for conducting a net benefits analysis is consistent with standard economic theory and is based on long-established principles in economics for valuing an asset that has unique characteristics. Specifically, with a net benefits analysis, the value of the land is the benefit that remains after subtracting all nonland costs of production, including returns on the owner's investment, from the value of the power produced. This methodology for valuing land has been accepted and used by FERC and the electricity industry as a basis for annual charges in certain instances in the past. For example, FERC has approved annual charges for Native American lands occupied by hydropower projects in which the net benefits method was a basis for the annual charge. In addition, FERC used a similar methodology for a period of time to determine annual charges when private operators attached powerhouses to federal government dams to produce hydropower.

We performed our analysis on a random sample of 24 FERC-licensed hydropower projects that use federal lands. The value of each project varies considerably from year to year, depending on the prevailing price of electricity, the amount of water available, and restrictions that may be put on the project's use. In addition, each project differs from the others according to the topography of the land and the primary purpose of the project. For example, some projects are "run-of-the–river" projects, meaning that they depend on stream flow to operate, while others have large reservoirs to store water for later use. Projects with large storage reservoirs can operate to maximize revenues by generating power during periods of high demand when wholesale prices are high. Run-of-the-river projects cannot do this, since they depend on stream flow to generate power. Finally, other projects have primary purposes other than hydropower generation, such as flood control, irrigation, and municipal and industrial water supply. These other uses greatly affect the net benefits of the project over the years. We did not attempt to estimate the value of the federal lands used for purposes other than hydropower. Table 1 presents the name, location, and owner of each of the 24 projects included in our sample.

Table 1: Hydropower Projects Included in Our Sample

Project (FERC license no.)	Location	Owner
Bath County (2716)	Virginia	Dominion Virginia Power & Allegheny Power
Big Creek 1 & 2 (2175)	California	Southern California Edison
Bliss (1975)	Idaho	Idaho Power
Boundary (2144)	Washington	City of Seattle
California Aqueduct (2426)	California	California and Los Angeles Departments of Water
Coosa River (2146)	Alabama	Alabama Power
Don Pedro (2299)	California	Turlock and Modesto Irrigation Districts
Feather River (2100)	California	California Department of Water Resources
Haas-Kings River (1988)	California	Pacific Gas and Electric
Hells Canyon (1971)	Idaho/Oregon	Idaho Power
Kerckhoff 1 & 2 (96)	California	Pacific Gas and Electric
Kerr (5)	Montana	Pennsylvania Power and Light Montana
North Fork (2195)	Oregon	Portland General Electric
North Umpqua (1927)	Oregon	Pacificorp
Noxon Rapids (2075)	Idaho/Montana	Avista Corporation
Pit River (233)	California	Pacific Gas and Electric
Priest Rapids (2114)	Washington	Grant County Public Utility District
Rock Island (943)	Washington	Chelan County Public Utility District
Rocky Reach (2145)	Washington	Chelan County Public Utility District
Skagit River (553)	Washington	City of Seattle
Swift (2111)	Washington	Pacificorp
Thompson Falls (1869)	Montana	Pennsylvania Power and Light Montana
Upper American River Project (2101)	California	Sacramento Municipal Utility District
Upper North Fork Feather River (2105)	California	Pacific Gas and Electric

Sources: FERC and the Energy Information Administration.

FERC's System for Determining Annual Charges Is Based on Values for Rights-of-Way, Not Hydropower

While FERC has recognized that using the fair market value of land is a reasonable approach for determining annual fees, it currently uses a fee system designed for linear rights-of-way uses to determine annual charges for hydropower projects using federal lands. The linear rights-of-way fee system was designed by the U.S. Forest Service and the Bureau of Land Management (BLM) to collect fees for federal lands used for power lines, pipelines, and communications lines. However, this system has no relationship to the economic benefit of the federal lands used to produce hydropower. In addition, according to FERC's former Director of Hydropower, FERC chose to use this system because it was simple, predictable, and would not subject the commission to numerous court challenges from the electricity industry. This official also stated that FERC did not have the specialized staff needed to develop its own system. However, FERC has not diligently managed this fee system to ensure that (1) the charges it currently collects meet the hydropower annual charge program objectives, (2) it has accurate information on the amount of federal lands used by licensees, or (3) its billing system collects all charges that are due the federal government for the use of its lands.

FERC Currently Uses a Modified Rights-of-Way Fee Schedule for Determining Annual Charges for Hydropower Projects

The Federal Water Power Act was passed in 1920—which became the Federal Power Act in 1935—and since 1938 FERC has used a number of methods for determining annual charges for the use of federal lands by hydropower projects including appraisals and national average land values. In the 1960s, FERC calculated annual charges based on a national average land value. This method resulted in annual land use charges of $10.31 per acre in 1979. In 1981, the Department of Energy's Office of the Inspector General reported that this method resulted in "unreasonably low and inequitable" annual charges because (1) FERC based the charges on out-dated land value information and (2) FERC was using land values based on a nationwide average, which led to undervaluing many hydropower lands.[7] In response, in 1987, FERC amended its regulations under the Federal Power Act to, among other things, revise its methodology for assessing federal land use charges. Specifically, FERC implemented a modified version of the Forest Service/BLM rights-of-way fee schedule for determining reasonable annual charges for hydropower projects.

[7] See Department of Energy, *Assessment of Charges Under The Hydropower Licensing Program*, DOE/IG-0178 (Dec. 22, 1981).

The Forest Service/BLM fee schedule charges annual per-acre fees on the basis of regional land values and the number of acres used. Recognizing that federal lands used for rights-of-way are generally less valuable than those used for hydropower project purposes, FERC modified the schedule by doubling the fees and then multiplying that amount by the number of acres that were identified as being federally owned within project boundaries. The commission reasoned that fees for rights-of-way uses on federal lands should be lower than fees charged for hydropower uses because land used for rights-of-way remain available for other multiple uses—such as mining, grazing, and cutting timber—while lands used for hydropower are not available for these types of uses. However, FERC officials said that they have not conducted any detailed research or analysis to determine whether doubling the fees in the rights-of-way schedule resulted in a reasonable annual charge for the use of federal lands for hydropower production.

The Forest Service and BLM developed their fee schedule system by collecting market data on land values throughout the nation. Using these data, the agencies produced a system in 1986 that based annual fees on the number of acres used, the location of the land, and the type of right-of-way requested. However, in 1996, we reported that these values did not consider several factors critical to establishing land values that reflect fair market value. Specifically, they did not reflect what the land was being used for, the "highest and best" use of the land, or the values of any urban uses.[8] Forest Service officials acknowledged that the fees were too low and said that the data collected to generate the land values used in the fee schedule system represent the low end of the market. According to these officials, the agency's fee system may be collecting as little as 10 percent of the fair market value of the federal lands used for rights-of-way purposes. While the Forest Service agreed with the findings and recommendations of our 1996 report, to date, the agency has yet to revise its rights-of-way fee schedule system—largely because it has not placed a high priority on completing this task.

According to a former FERC director of hydropower, FERC adopted the Forest Service/BLM fee schedule system to determine annual charges for using federal lands primarily because it was simple and predictable, and would not subject the Commission to numerous appeals from industry.

[8] See U.S. General Accounting Office, *U.S. Forest Service: Fee System for Rights-of-Way Program Needs Revision* (GAO/RCED-96-84, Apr. 22, 1996).

Adopting the rights-of-way fee system accomplished these goals because it is billed on a per-acre basis, its fees are annually updated based on the Consumer Price Index, and the fees are low enough to make court challenges from the electricity industry unlikely. In addition, in 1987 when FERC was selecting a new fee system, it did not have the staff, such as appraisers and economists, needed to determine the value of the federal lands used for hydropower production and to design an original fee system. As a result, adopting the Forest Service/BLM fee schedule provided an opportunity to increase overall fees without having to develop a new schedule based on hydropower land values.

FERC Has Not Diligently Managed Its Current Fee System

Since issuing the regulations in 1987, FERC has not performed the oversight needed to ensure that (1) the charges it collects meet the hydropower annual charge program objectives, (2) it has accurate information on the amount of federal lands used by licensees, or (3) its billing system collects all charges due the federal government for the use of its lands. Federal internal control standards require agencies to measure and monitor program performance to be reasonably sure that the program is meeting its objectives.[9] However, FERC has neither measured nor monitored its current fee system to determine if the charges it currently collects meet program objectives. Specifically, in the 15 years since FERC implemented the current fee system, it has never assigned staff—such as economists and appraisers—to determine if the system is collecting reasonable annual charges. Consequently, FERC cannot demonstrate whether its current annual charges for the use of federal lands are reasonable or need adjustment. During the course of our review, FERC's executive director agreed that an assessment of the current system would be appropriate.

Federal internal control standards also require agencies to establish and implement policies and procedures to reasonably ensure that valid and reliable data are obtained on the operations of the programs they manage. However, FERC allows licensees to self-report the total federal acreage that they use to produce hydropower and makes no attempt to verify this information. As a result, FERC does not know if it is receiving valid and reliable information from the hydropower licensees.

[9] See U.S. General Accounting Office, *Standards for Internal Control in the Federal Government* (1999).

Finally, FERC is hampered in its effort to analyze the licensees' information because its databases contain differing and, at times, directly conflicting information about hydropower projects on federal lands. FERC uses at least three separate databases to determine annual charges for the use of federal lands by hydropower projects. One database contains information on the types of federal lands on which the hydropower projects are located, another contains data on the number of acres of federal land the hydropower projects use, and the third database contains information on the billing amounts. Our analysis of these databases showed that some projects were not billed when they should have been while others were sent bills when they should not have been. For example, according to FERC, project owners are not to begin receiving bills for the use of federal lands until they have begun construction of the hydropower project. However, we found several instances in which FERC's databases indicate that the agency sent bills for annual charges to applicants for hydropower project licenses, including to some applicants whose projects were never built. In addition, we found that FERC had not billed a very large project in Idaho for the use of federal lands for 2 years, resulting in a total loss in annual charges of about $30,000 for 1999 and 2000. We made numerous attempts to reconcile the inconsistent data in FERC's multiple databases. However, most of these attempts resulted in still more contradictions concerning what information was correct. Consequently, while we have identified several problems with FERC's billing system, we could not determine the extent of FERC's billing problems.

Many Federal Lands in Our Sample Are Significantly More Valuable Than FERC's Current Charges Suggest

FERC's annual charges are significantly less than the value of the annual economic contribution that federal lands make to the production of hydropower. We estimate that the annual fair market value for the use of the federal lands used by the 24 hydropower projects in our sample was at least $157 million. However, under FERC's modified linear rights-of-way fee schedule, these 24 projects paid about $2.7 million in annual charges to the federal government in 2002. Because electricity markets are volatile, we performed a net benefits analysis under six different market conditions, with each analysis yielding a similar result: FERC is currently collecting annual charges that are less than 2 percent of the annual contribution that these lands make to the production of hydropower. This result holds true even though the value of federal lands at individual projects varied considerably from year to year.

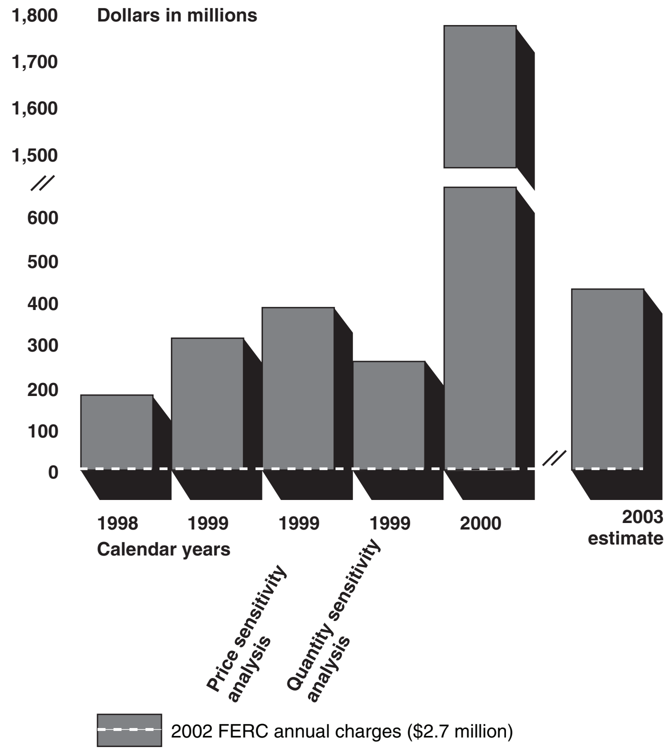
Federal Lands Used by Hydropower Projects Have Significant Value

Since wholesale electricity markets are volatile—for example, prices are very high in some years and very low in others—we estimated the fair market value of federal lands used by our sample of 24 hydropower projects using six different scenarios:

- examining historical industry data for 1998, 1999, and 2000, on the cost and value of power generated by our sample of projects;
- performing both price and quantity sensitivity analyses on the results of our 1999 analysis, the most moderate of these years; and
- developing an estimate of what the value of these federal lands might be in 2003.

Figure 2 shows the results of our analysis of the six different scenarios and compares those values with FERC's annual charges for 2002.

Figure 2: The Estimated Annual Value for the Use of Federal Lands Compared with FERC's Annual Charges



Source: GAO.

Note: All data are in 2002 dollars. Also, we did not perform this analysis for 2001 or 2002.

Fair Market Value Based on Actual Data for 1998,1999, and 2000

According to the historical industry data we examined for 1998, 1999, and 2000, the supply and demand for power varied substantially, and the wholesale price of electricity varied accordingly. These data included one year (1998) of relatively low prices and one year (2000) of extraordinarily high prices. These changes in the wholesale price of electricity resulted in widely differing values for the federal lands used to produce hydropower. Specifically, the estimated value of federal lands for our sample projects was $157 million in 1998, $280 million in 1999, and $1.7 billion in 2000.

The estimated value for the use of federal lands during these 3 years varied primarily in response to changes in the average wholesale price of electricity. For example, an abundant supply of rain in portions of the western United States in 1998 produced a supply of hydropower in those states that was well above historical averages. The elevated supply of electricity contributed to the relatively low wholesale electricity prices for that year. Prices in 1999 were still somewhat low in the West. In 2000, the wholesale price of electricity was extremely high. Causes for the high prices included fast-growing demand, slow-growing supply, and unusually dry and warm weather in the region, which led to the decreased availability of electricity in California and other western states. California state officials and others also claimed that wholesale suppliers of electricity were exercising market power[10] to raise prices above competitive levels. Table 2 shows the results of our analysis for 1998, 1999, and 2000 and compares these results with FERC's annual charges for 2002. Each of these estimates represents the value for the use of the land based on the price of electricity, including the potential exercise of market power, and other market conditions that existed during that year. In the longer term, the fair market value for the use of the land in a competitive market cannot be consistently based on electricity prices that are higher than the cost of alternative means of producing electricity. As a result, the unusually high values during 2000 could not be sustained. Such high prices would provide a strong incentive for investors to build new electricity generating plants that would drive down the price of electricity to the cost of that alternative source thereby limiting the fair market value for the use of the land.

[10] In this context, market power refers to the ability of individual sellers of electricity to charge prices above competitive levels. For more information on the electricity market in California, see U.S. General Accounting Office, *Restructured Electricity Markets: California Market Design Enabled Exercise of Market Power*, GAO-02-828, (June 21, 2002).

Table 2: The Estimated Annual Value for the Use of Federal Lands for Each of the 24 Projects in Our Sample for 1998, 1999, and 2000; and FERC Annual Charges for 2002

Dollars in thousands

Project name	1998 value of federal lands	1999 value of federal lands	2000 value of federal lands	2002 FERC annual charges
Hells Canyon	$111,336	$145,857	$602,751	$371
Boundary	26,606	67,362	297,597	34
Priest Rapids	11,665	24,129	92,322	49
Big Creek 1 & 2	4,865	6,184	96,303	154
Bliss	1,972	3,399	25,470	16
Rocky Reach	775	1,819	7,408	3
Rock Island	139	596	3,082	1
Kerr	102	339	2,563	2
Coosa River	1	($34)	($86)	7
Thompson Falls	($246)	349	5,772	4
Swift	(338)	318	3,369	19
North Fork	(408)	832	7,530	7
Noxon Rapids	(715)	410	7,872	22
Upper North Fork Feather River	(867)	(517)	6,236	85
Pit River	(1,380)	2,535	54,400	49
Kerckhoff 1 & 2	(3,371)	(4,515)	43,344	25
Don Pedro	(5,332)	(6,587)	6,905	249
Feather River	(6,119)	(6,132)	34,847	9
North Umpqua	(13,922)	(4,731)	84,937	108
Bath County	(14,682)	10,228	(1,294)	48
Haas-Kings River	(19,006)	(22,205)	69,049	202
Skagit River	(22,991)	15,290	165,137	917
California Aqueduct	(27,025)	(22,210)	1,793	17
Upper American River	(39,178)	(34,344)	68,687	286
Total of positive values	**$157,460**	**$279,648**	**$1,687,376**	**$2,685**

Source: GAO.

Note: All data are in 2002 dollars. Also, as discussed in the text below, the totals in this table do not include projects with negative values. More detailed results of our net benefits analysis for each project in our sample are included in app. II. Finally, FERC annual charges are based on the number of federal acres within the designated boundary of a hydropower project.

Some of the values in table 2 were negative, and we did not include those values in the totals. The negative values are the result of our methodology and assumptions and imply that, during the specific years with such values, the return on investment was less than the industry average of 7.22 percent that we assigned as part of each project's costs.[11] Negative values do not mean that the land is valueless or that annual charges should be negative. Rather, the fact that individual owners and investors choose to continue to operate these facilities demonstrates that the land has value. For the projects that had negative values, the return during those years was not equivalent to what would have been earned in other investment options with similar risk. With one exception, the projects with negative net benefits actually had a positive estimated return on investment that ranged from 6.8 percent to 0.1 percent.[12] That is, for all but one of the projects with negative net benefits, the value of power exceeded all the costs of producing the power and still provided some positive return on investment. If these low rates of return were to be sustained, the owners of these projects would cease operations, and the land for hydropower purposes would be worth zero in the worst case.

For most of the projects in our sample, the negative net benefits also occurred because of very low electricity prices and/or overestimated capital costs. While the cost to operate a hydropower project generally remains stable, low electricity prices can dramatically reduce revenues and thereby reduce or eliminate any net benefit for that year. For some of our sample projects, a negative net benefit estimate may also mean that the project was built for other purposes, such as irrigation. As such, the capital costs of the project include the costs associated with both irrigation and hydropower production. For these projects, other purposes are emphasized over the production of hydropower. For example, the Don Pedro Project in California is part of an irrigation project that favors storing water for later consumption over releasing water to generate power. As a result, the revenue potential from hydropower operations is not maximized and the project has a minimal or negative net benefit.

[11] For greater detail on how we determined costs for this analysis, see app. I.

[12] For our estimate of the return on investment for each project, see app. II.

Fair Market Value of Federal Lands Sensitivity Analysis Based on Our Analysis of 1999 Data

We used our analysis of 1999 industry data to perform our sensitivity analyses because that year was the most moderate of the 3 recent years of actual historical data that we reviewed. The sensitivity analyses illustrates the effect that uncertainty in two key variables—price and quantity—has on our estimates of the value of federal lands. In performing these analyses, we developed benchmarks for the (1) price and (2) quantity of power produced. Specifically, our price benchmark is based on estimates of the long-term value of power and our quantity benchmark is based on historical averages. We then calculated the change in the hydropower projects' net benefits in 1999 when (1) wholesale prices for electricity were increased to the benchmark, but everything else stayed the same and (2) the quantity of power produced by the projects was decreased to the benchmark, but everything else remained the same.

Our analysis indicated that the value of federal lands is sensitive to changes in both the price of electricity and the amount of power generated. For example, had average prices in 1999 been about 8 percent higher, equivalent to the estimated cost of electricity from the lowest cost alternative source, net benefits would have risen from $280 million to $351 million. (We used the cost of electricity from a combined-cycle combustion turbine generator as our benchmark for the estimated long-term value of power because it is generally the lowest cost alternative to most hydropower generation.)[13] On the other hand, if hydropower generation in 1999 had been about 10 percent lower, at about the average level of generation over the past two decades in California, net benefits would have been about $218 million. (We used this two-decade average as our benchmark for the quantity of electricity.) Table 3 shows the results of our sensitivity analyses in relationship to the results of our 1999 analysis.

[13] Over the long-term, a combined-cycle combustion turbine (CCCT) technology, that primarily utilizes natural gas as a fuel, is generally considered the lowest cost alternative for electric power from a hydropower project that runs most of the time. Significant changes in the relative prices of fossil fuels could make another technology more economic. For example, if gas prices are expected to rise significantly, a coal-fired power plant technology may supplant CCCT as the lowest-cost alternative. However, this would make hydropower relatively more valuable.

Table 3: Results of Our Sensitivity Analyses of Each of the 24 Projects in Our Sample—1999, 1999 with a Change in Price, and 1999 with a Change in Quantity

Dollars in thousands

Project name	1999 value of federal lands	1999 value of federal lands—price sensitivity	1999 value of federal lands—quantity sensitivity
Hells Canyon	$145,857	$176,837	$121,831
Boundary	67,362	82,356	55,733
Priest Rapids	24,129	28,554	20,697
Skagit River	15,290	26,123	6,888
Bath County	10,228	10,228	3,029
Big Creek 1 & 2	6,184	9,744	3,423
Bliss	3,399	4,764	2,341
Pit River	2,535	4,689	865
Rocky Reach	1,819	2,182	1,538
North Fork	832	1,291	477
Rock Island	596	752	476
Noxon Rapids	410	874	50
Thompson Falls	349	630	131
Kerr	339	447	254
Swift	318	586	111
Coosa River	($34)	($40)	($46)
Upper North Fork Feather River	(517)	(263)	(713)
Kerckhoff 1 & 2	(4,515)	(3,087)	(5,622)
North Umpqua	(4,731)	899	(9,098)
Feather River	(6,132)	(3,558)	(8,128)
Don Pedro	(6,587)	(5,316)	(7,573)
Haas-Kings River	(22,205)	(20,154)	(23,796)
California Aqueduct	(22,210)	(20,602)	(23,457)
Upper American River	(34,344)	(27,659)	(39,529)
Total of positive values	**$279,648**	**$350,956**	**$217,844**

Source: GAO.

Note: All data are in 2002 dollars. Details on how we conducted our sensitivity analyses of 1999 data are included in app. I. Also, as previously discussed, the totals in this table do not include projects with negative values.

Estimated Fair Market Value of Federal Lands in 2003

We developed an estimate for 2003 by (1) using our benchmark estimate of the value of power, (2) using recent averages for the quantity of power produced, (3) using recent averages for operating costs, and (4) developing an estimate of capital costs for 2003. This estimate is about $386 million, and it reflects what the value for the use of federal lands would be using more typical values for the price and quantity of the power produced. However, this estimate is subject to the uncertainties that exist in electricity markets, including weather, changes in electricity demand or supply, the costs of alternative fuels such as natural gas, and future regulatory constraints, among other factors. Table 4 shows the results of this analysis and FERC's annual charges for 2002. Overall, the table shows that FERC's annual charges for the use of federal lands are significantly below the fair market value of these lands.

Table 4: **The Estimated Annual Value for the Use of Federal Lands for Each of the 24 Projects in Our Sample for 2003, and FERC Annual Charges for 2002**

Dollars in thousands

Project name	2003 value of federal lands	2002 FERC annual charges
Hells Canyon	$194,221	$371
Boundary	85,120	34
Priest Rapids	28,206	49
Big Creek 1 & 2	20,730	154
Skagit River	20,497	917
Bath County	12,067	48
Bliss	5,733	16
Pit River	5,064	49
Kerckhoff 1 & 2	3,973	25
North Umpqua	2,305	108
Rocky Reach	2,013	3
Noxon Rapids	1,382	22
North Fork	1,269	7
Rock Island	732	1
Thompson Falls	687	4
Swift	572	19
Kerr	556	2
Feather River	229	9
Upper North Fork Feather River	207	85
Coosa River	2	7
Don Pedro	($5,635)	249
Haas-Kings River	(6,815)	202
Upper American River	(15,175)	286
California Aqueduct	(20,029)	17
Total of positive values	**$385,563**	**$2,685**

Source: GAO.

Note: All data are in 2002 dollars. Also, as previously discussed, the totals in this table do not include projects with negative values.

Most of the Lands Used by Individual Projects in Our Sample Are Worth Significantly More Than FERC Currently Charges

Our analyses for 1998, 1999, 2000, and 2003 found that the lands in our sample are worth significantly more than FERC currently charges for most years and for most projects. However, for each project, the value of the federal land can change dramatically with a significant change in supply and demand for electricity. For example, as discussed earlier, in some years when electricity prices are low, the value of power is so low that a project produces a negative net benefit.

In general, for the years we examined, we found the following differences among the projects in our sample:

- In 1998, prices were so low that the value of the power produced by 15 of the 24 projects was less than the cost to produce the power—including a 7.2 percent rate of return—resulting in a negative net benefit. The lands associated with the remaining nine projects were estimated to be worth $157 million.
- In 1999, electricity prices were somewhat higher than in 1998 but still low from a historical perspective. As a result, the lands associated with 15 of the 24 projects were estimated to be worth $280 million, while the remaining 9 projects had negative net benefits.
- In 2000, the electricity crisis in the West drove prices to extraordinarily high levels. As a result, 22 projects had lands estimated to be worth about $1.7 billion, and only two projects in our sample had a negative net benefit.
- For 2003, we estimated that the federal lands in 19 of the 24 projects would be worth about $386 million and that the federal lands within the remaining projects would be worth little, if anything, for hydropower uses above what they currently pay in annual charges.[14]

For 2003, of the 19 projects whose federal lands are worth significantly more than current annual charges suggest, five projects are on federal lands worth exceptionally more. We estimate the lands in these five projects to be worth about $349 million annually, or about 90 percent of the value of all of the lands in our sample of 24 projects. FERC currently

[14] Three of these five projects were built for purposes other than hydropower, such as irrigation, one had high capital costs, and one had less than 1 percent of its project on federal lands.

collects annual charges totaling about $1.5 million from these five projects, but our analysis estimates that the land in each project is worth from $20 million to $193 million more than what FERC currently charges. These five projects are

- Hells Canyon (Idaho Power) in Idaho,
- Boundary (City of Seattle),
- Skagit River (City of Seattle),
- Priest Rapids (Grant County Public Utility District) in Washington State, and
- Big Creek 1 & 2 (Southern California Edison) in California.

These projects are among those that (1) generated the largest volume of electricity, (2) had the lowest level of capital costs, and/or (3) used the highest percentage of federal lands. However, three of these projects are owned by municipalities (Boundary, Skagit River, and Priest Rapids). Section 10(e) of the Federal Power Act exempts licensees for state and municipal power projects from paying annual charges to the extent project power is sold to the public without profit or for state or municipal purposes. Each of these three projects received a partial exemption in the recent past that reduced their annual charges by about 9 percent for Boundary and Skagit River, and about 35 percent for Priest Rapids.

Limitations of Our Analysis

Our estimates of the fair market value of federal lands used to produce hydropower are subject to a number of uncertainties that can affect the price or quantity of hydropower produced. Changes in the weather, regulatory constraints, or the cost of fuels can dramatically affect electricity markets. Weather and rainfall patterns can affect the supply, price, and demand for electricity. For example, a hot, dry spring season will increase the demand for power and, at the same time, reduce the availability of hydropower. In addition, future regulatory actions established through the relicensing of hydropower projects could, among other things, limit the future quantity—or increase the cost—of hydropower produced at some projects. Furthermore, electricity markets are influenced by the cost of fuels, such as coal and natural gas, used to generate electricity at non-hydropower-generating plants. These uncertainties are best illustrated by the dramatic changes in the fair market value of the lands between 1998 and 2000. Finally, our analysis is also limited by the lack of available historical data on wholesale electricity prices because active markets have been in operation for only a few years. We cannot quantify the impact of these uncertainties on our overall estimates. However, it remains clear that, no matter how volatile the market, the federal lands used by our sample of projects to produce hydropower are worth significantly more than FERC's current annual charges indicate.

Effect of Higher Annual Charges on Consumers and Project Owners Will Depend on FERC's Implementation and the Regulatory Environment

If FERC decides to collect annual charges that more closely reflect the fair market value for the use of the land, the effects on consumers and project owners will depend on (1) how FERC chooses to implement these higher charges and (2) whether the electricity industry in the state where the project is located has been restructured.

Impacts Will Depend on FERC's Implementation

When considering the actions it could take to revise its annual charge system, FERC must balance any increases in charges with the Federal Power Act's requirement to seek to avoid unreasonable increases in consumer rates, and the act's goal of encouraging the development of hydropower. FERC may therefore decide to collect only a portion of the fair market value of the land as an annual charge. Clearly, if FERC decides to continue charging a small portion of the fair market value of federal lands, then the impact on hydropower project owners and consumers will be minimal. However, if FERC decides to collect a much higher percentage of the fair market value of federal lands as an annual charge, then project owners and/or consumers could be significantly affected.

If FERC increases annual charges to 100 percent of the fair market value for the use of the land, then the electricity rates of some utilities could experience significant increases. These utilities would include those that rely heavily on FERC-licensed hydropower, such as those in states like

Idaho, Oregon, and Washington. For example, one Idaho Power project in our sample—Hell's Canyon—uses federal lands that we estimated would be worth about $146 million in 1999. If 100 percent of the estimated value of these federal lands became FERC's basis for its annual charges, then the total cost to operate all of Idaho Power would increase by about 25 percent, from about $580 million to about $726 million.[15] Because Idaho Power operates under state regulation, this cost increase for the Hell's Canyon project would probably be passed on to Idaho Power's customers through higher rates. We did not include in our sample all of the hydropower projects that Idaho Power owns and that use federal lands. Therefore, Idaho Power's costs could increase even more than the increase for the Hell's Canyon project if FERC decides to increase annual charges to 100 percent of fair market value for these other projects. However, the Hell's Canyon hydropower project alone accounts for about 70 percent of all of Idaho Power's hydropower generating capacity. Consequently, the additional costs for the other projects are not likely to be as sizable.

Large increases in electricity rates can, in the short term, harm the economies of the areas the utility serves. Consumers would pay not only more for their household electricity, but they would also tend to pay more for other goods and services, as local businesses pass on increased electricity costs to consumers. In addition, according to officials from the Idaho Public Utility Commission, increases in electricity rates of 20 percent or more could reduce or eliminate the incentive for businesses to relocate to or remain in Idaho and would therefore affect the unemployment rate.

Such economic impacts are likely to be less pronounced in states where utilities do not depend as much on FERC-licensed hydropower for a significant percentage of their generation. Also, impacts will likely be less in the case of hydropower projects that use a smaller percentage of federal land. For example, the Chelan County Public Utility District (PUD) in Washington State pays FERC about $3,200 in annual charges for its use of federal lands for its Rocky Reach and Rock Island hydropower projects. These lands account for about 1 percent of the acreage in each of the projects. We estimated that these lands could be worth about $2.7 million for 2003. While this value could result in a large increase in charges, it is

[15] According to Idaho Power's annual report (SEC Form 10-K405) for the fiscal year ending Dec 31, 2001, the cost of operating Idaho Power for 1999 was about $546 million. Once adjusted to 2002 dollars—which we did for comparison purposes—the $546 million becomes $580 million.

only about 2 percent of our total annual estimated cost—about $150 million in 2003—to operate these two projects (including capital costs). Thus, this increase is not likely to significantly affect the project owner or its customers.

FERC has options to mitigate the effects on consumers of annual charges that better reflect the fair market value of the federal lands:

- FERC could collect only a portion of the fair market value of the land as annual charges.
- FERC could phase in the charges over several years to allow project operators and consumers to better prepare for and adjust to the higher rates.
- FERC could also delay implementing any higher annual charges until electricity markets become more competitive through restructuring. In restructured markets, to remain competitive, project owners may not be able to pass on higher annual charges to consumers.[16] However, FERC would need to prepare to implement higher charges while states are moving toward restructuring their electricity markets. If FERC is not prepared to act, as discussed below, its opportunities to increase annual charges at a later date would be limited.

Effect of Higher Costs Will Depend on Market Environment

The regulatory environment largely determines whether consumers or project owners pay increased charges for the fair market value of federal lands used for hydropower. Some of the states that could be affected by increases in annual charges currently have electricity industries that are highly regulated—that is, the price to consumers is based on the cost of production. For example, consumers in Idaho and Washington State—which now regulate their utilities—would see the greatest impact because some of their electric utility companies rely heavily on FERC-licensed hydropower projects for their electricity. Customers who use these utilities have enjoyed some of the lowest electricity rates in the country.

[16] In restructured markets, hydropower owners will be free to sell the electricity they generate at market prices, rather than at regulated rates. However, they will not be able to sell electricity above the market price.

In a regulated electricity market, increases in annual charges are most likely going to be passed on to consumers. However, in a restructured environment, where electricity rates are based on wholesale market prices, increased annual charges are much more likely to affect the profitability of the electric utility and its shareholders than consumers. Specifically, in a restructured environment with competition, the utility may not be able to pass on increases in annual charges and still keep its customers. For this reason, consumers would less likely be affected. Among the states most likely to be affected by any significant changes in annual charges, Montana has already made the transition to market-based pricing of electricity. As a result, in Montana, the owners of hydropower projects—rather than the customers of these projects—are likely to pay most of any increase in annual charges.

FERC's Future Ability to Increase Annual Charges Could Be Limited by Electricity Market Restructuring

If FERC decides not to act to collect annual charges that better reflect the fair market value for the use of federal lands by hydropower projects until after restructuring occurs, it may limit its opportunity to increase charges, thereby putting the taxpayers at risk of losing a potential future stream of revenue. Specifically, FERC's ability to raise annual charges may be limited after states restructure the generation segment of their electricity market because new purchasers of existing hydropower projects on federal land will likely have paid a price that included the capitalized value of the land.

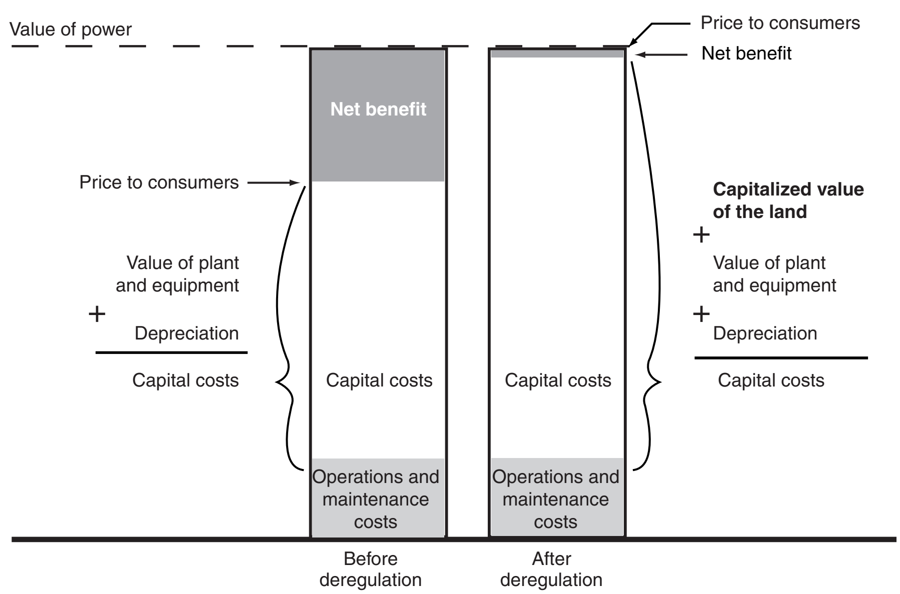
Some states have moved toward restructuring the generation segment of their electricity markets. This shift changes the way that the benefits associated with hydropower are distributed between the ratepayers and the project owners. In a regulated environment, where rates are based on the cost of service, ratepayers receive the benefits in the form of low electricity rates. These rates are associated with the low cost of hydropower production, including the low annual charges assessed to those who use federal lands to produce power. However, in restructuring this industry to create more competition, some states have allowed or required utilities to sell their power plants, including hydropower plants that are located partially or entirely on federal land. The sale price for these projects may include the net benefits that are attributable to the contribution the federal lands make to the production of power. When these projects are sold, either the state and/or the seller have captured these net benefits.[17] The state and/or the seller are able to capture these net benefits because FERC had not set annual charges at a level that better reflects the fair market value of the federal land. If FERC had done so, the project's price would have been reduced to reflect the higher operating costs associated with annual charges that more closely reflect fair market value. Once these projects are sold, the federal government may be reluctant to raise annual charges because the new owner probably paid a price that included the capitalized value of the federal land. Any further cost increases, such as higher annual charges, could make power production costs exceed the current market price of electricity. As a result, the new project operator would likely either operate at a loss or lose its customers to competition. In such situations, FERC may be reluctant to raise annual charges to better represent the fair market value of the federal land.

Some states, including Maine, Montana, and New York, have already restructured the generation segment of their electricity industries in ways that resulted in the utilities' selling off their hydropower projects. In these states, both the state and/or the seller captured the net benefits resulting from the sale of the projects. In Maine and Montana, the projects were auctioned, and the winning bids were well above the amounts that the regulators deemed sufficient to reimburse the selling utility for the value of its fixed assets, including the land owned by the utility. However, in Montana, where some of the hydropower projects' land is federally owned, the sale price was likely higher than it would have been if annual charges had more closely reflected fair market value. In fact, the new owners of these assets told us that their bid would have been lower if they had expected higher annual charges for the federal land. If FERC had implemented higher charges, more revenues would have accrued to the federal government and less to the state of Montana.

[17] As states regulate electricity markets, they also act on behalf of state ratepayers in approving the final restructuring arrangements. In some cases, the restructuring arrangements will then result in states' capturing some or all of the net benefit of projects that are sold as part of a restructuring effort.

Figure 3 graphically depicts how the sale of a hydropower project—sold as part of a state's effort to restructure its electricity market—causes the capitalized value of the land's net benefit to become a component of the project's selling price and thus the buyer's capital costs. However, this higher selling price would be at the expense of taxpayers who are at risk of losing a potential future stream of revenue. As FERC has observed in connection with annual charges assessed for the use of government dams, an "overly low annual charge payment…ultimately places higher costs on other consumer members of the public who must make up the difference through their taxes."[18]

Figure 3: Illustration of the Cost to Produce Hydropower Before and After a Sale That Occurs as Part of Restructuring



Source: GAO.

[18] 48 *Fed. Reg.* 15134, 15136 (1983).

Conclusion

Under the Federal Power Act, FERC is required to collect reasonable annual charges to compensate the federal government for the use of its lands. FERC must balance the amount of these annual charges with the authorizing act's requirement to seek to avoid unreasonable increases in consumer rates and the act's goal of encouraging the development of hydropower. However, by tying the annual charges to an out-of-date rights-of-way fee system, FERC is collecting less than 2 percent of our estimate of the fair market value for the use of federal lands by our sample of hydropower projects. FERC has not conducted any research and analysis to determine whether its current annual charges are reasonable. Thus, FERC has no assurance that its current system strikes a balance between those who benefit from the federal lands—consumers and hydropower project owners—and the taxpayers who own the lands. Even if FERC could ensure that it was assessing reasonable annual charges, administrative problems with the current system—self-reported data and conflicting information in the databases—would hamper FERC's ability to collect all moneys due.

In addition, as states restructure their electricity markets, inaction on the part of FERC to reassess what constitutes a reasonable annual charge could limit the agency's ability to increase charges in the future as states distribute the net benefits of hydropower projects that are sold during the restructuring process. In the end, if FERC does not act, taxpayers who do not benefit from low hydropower electricity rates may lose the opportunity to benefit from a potential future stream of revenue.

Recommendations for Executive Action

We recommend that FERC reassess its system of annual land use charges in light of the (1) information we are providing concerning the estimated value of the contribution that federal lands make to the production of hydropower, (2) trend toward the restructuring of the nation's electricity markets, and (3) flaws in its present system. Specifically, FERC should develop new strategies and options for assessing annual charges that are proportionate with the benefits conveyed to hydropower licensees. In conducting this reassessment, FERC should (1) determine methods for assessing or estimating the fair market value of federal lands used for hydropower purposes and (2) determine methods for assessing annual charges, taking into account the federal land's fair market value as well as the competing goals of encouraging hydropower development and avoiding unreasonable increases in electricity rates to consumers.

In the interim, while FERC is developing this strategy, we further recommend that FERC improve its internal control systems in the following ways:

- improve the management of its current system for assessing annual charges through periodically verifying self-reported data on the amount of federal lands licensed hydropower projects use, and

- resolve discrepancies among its multiple billing and land databases in order to ensure that each project is properly billed for the annual land use charges it owes the federal government.

Agency and Industry Comments

We provided FERC, the Department of the Interior, the Forest Service, and the National Hydropower Association—a hydropower industry group—with a draft of this report for their review and comment. The Forest Service declined to comment on the report. Interior agreed with the report and provided some technical clarifications and observations. (See app. V for Interior's comments and our response.)

FERC generally agreed with our findings and recommendations on the conflicting information in the databases it uses to manage its annual charge system, but it generally disagreed with our assessment of the value of federal lands used by hydropower projects. FERC questioned the validity of our analysis of the value of federal lands because our analysis resulted in values that were significantly higher than current annual charges. However, it is difficult for FERC to make meaningful comparisons on the basis of current annual charges because, as we discuss, FERC's annual charge system is based on a fee schedule that was not designed for hydropower uses and moreover does not accurately assess fair market value for its originally intended purpose. Furthermore, FERC has not performed any analysis of the value of these federal lands in over 15 years, and therefore cannot ensure that the charges it collects meet the objectives of its annual charge program. FERC also raised concerns about (1) using a net benefits approach as a mechanism to collect annual charges and (2) linking annual charges to electricity markets, which have recently been volatile. Concerning our use of the net benefits approach, our report recommends that FERC reassess its current annual charge system and look for ways to better account for the value of federal lands. We used the net benefits approach as a method to illustrate the contributions that these lands make to the production of hydropower. We do not specifically recommend that FERC deploy our approach to value the land as a mechanism for determining annual charges. Concerning the linking of annual charges to electricity markets, our report recognizes the volatility that has recently occurred in these markets. If FERC decides to reassess and revise its annual charge system, it does not have to use an annual charge system that fluctuates with electricity markets. FERC can decide to use a system based on long-term expectations, which would tend to mitigate short-term volatility. In the past, FERC has approved annual charges for tribal lands that (1) were based on a long-term analysis of the value for the use of the land and (2) were a fixed amount so that licensees could plan and budget for them. (See app III. for FERC's comments and our response.)

NHA disagreed with the report. It raised several concerns about having FERC use a net benefits approach to levy annual charges. However, we do not specifically recommend this use. Instead, we used the net benefits approach as a tool to value the federal lands used by a sample of FERC-licensed hydropower projects. In so doing, we found that FERC is collecting only a very small percentage of the federal lands' value in its current annual charge system, and recommend that FERC reassess its current annual charge system without recommending a specific approach. NHA also commented that increased annual charges will increase electricity rates to consumers, which could adversely affect the economy of some states that benefit from low-priced hydropower. We recognized this possibility. As our report discusses, the impacts from increased annual charges largely depend on (1) how much of the land's value FERC decides to collect as an annual charge and how it implements any higher charges and (2) whether the affected electricity market is still fully regulated or has been restructured.

NHA also commented that potential annual charges for the use of federal land should be reduced to recognize the public benefits provided by hydropower projects, such as recreation, flood control, irrigation, and fish and wildlife enhancement. However, FERC has twice rejected this argument, saying, in essence, that under the Federal Power Act, public benefits are provided as a condition of receiving the license and that the licensee deserves no compensation for merely complying with the law. (See app. IV for NHA's comments and our response.)

Scope and Methodology

To determine FERC's current system for assessing annual charges, we reviewed relevant laws, regulations, and FERC rulings. In addition, we interviewed officials from FERC, federal land management agencies, and industry associations concerning the history and application of the current annual charge system. We also reviewed pertinent documents from these sources, as well as past reports from GAO and the Department of Energy's Office of the Inspector General. To assess FERC's management of its current system we obtained records from multiple FERC databases for various years. These records included information on billing, the type of federal land associated with each hydropower project (e.g., Forest Service, BLM), and the number of federal acres associated with each project in our sample. We assessed the reliability of FERC's data by analyzing and crosschecking the information that was provided. In addition, we interviewed FERC officials and requested a variety of documents in an attempt to clarify discrepancies found in the data.

To estimate the values of the federal lands that utility companies use to generate hydropower, we performed a net benefits analysis using project-specific data for a sample of 24 hydropower projects that use federal lands. We developed this sample by obtaining information on the amount of hydropower generated by each FERC-licensed project that uses federal lands. We then determined that the 56 projects with the greatest generation produced about 90 percent of the power generated by FERC-licensed projects on federal lands. From these 56 projects, we selected 24 using a stratified random sampling method. The projects were grouped into four strata based on the size of the project as determined by the amount of generation produced. The first stratum included the largest projects, the second stratum had the next largest group, and so forth. We weighted the sample toward the largest generators by sampling 9 of the 10 projects in the first stratum. We grouped the remaining projects among the other three strata according to size. Five projects were randomly selected from each of the other strata. (For greater detail on our methodology see app. I.) We discussed the merits and limitations of this approach with officials from FERC, hydropower project owners, and several industry associations, including the National Hydropower Association and the Western Utilities Group.

To determine what effect an increase in annual charges might have on utilities and their customers, we met with utility representatives with projects in our sample to share the results of our analysis and discuss the implications of having FERC increase annual charges to the values that our analysis suggests. In addition, we spoke with state regulators in California, Idaho and Montana; FERC officials; hydropower project owners; and industry associations to obtain their views concerning potential impacts associated with an increase in annual charges. Finally, we met with representatives from a taxpayer advocacy group to discuss any implications of FERC's inaction on general taxpayers who do not receive any benefits associated with hydropower projects on federal lands.

To identify the potential implications of FERC's not addressing its current annual charge system in a timely manner, we relied on generally accepted economic principles of regulated and restructured markets to identify the possible consequences of FERC's inaction. In addition, we looked at available data for a recent sale of hydropower projects in Montana that included federal lands. On the basis of generally accepted economic principles and the data from that sale, we developed a probable scenario concerning the distribution of the net benefits when a hydropower project is sold as part of the restructuring of a state's electricity market.

We conducted our work from August 2000 through February 2003 in accordance with generally accepted government auditing standards.

We are sending copies of this report to the Commissioners of the Federal Energy Regulatory Commission; the Secretaries of Agriculture and of the Interior; the Director, Office of Management and Budget, and other interested parties. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site http://www.gao.gov.

If you or your staff have any questions about this report, please call me on 202-512-3841. Key contributors to this report are listed in appendix VI.

Barry T. Hill
Director, Natural Resources
and Environment

Estimating the Fair Market Value of Federal Land Used to Produce Hydropower

We were asked to estimate the fair market value of federal lands that are used by hydropower projects that the Federal Energy Regulatory Commission (FERC) licenses. This appendix describes how we estimated the fair market value of such lands. The appendix contains four sections. The first describes our rationale for choosing the net benefits methodology. The second describes the methodology. The third describes the decisions that we made in implementing the methodology, including choices on our sample of dams and the scenarios that we estimated. Finally, the fourth section describes the data required to estimate those scenarios.

GAO's Rationale for Choosing the Net Benefits Methodology to Estimate Fair Market Value

This section provides a rationale for choosing the net benefits methodology to estimate fair market value and describes our methodology in detail. Our net benefits methodology estimates the value of the land by calculating the difference between the value of the hydropower that is generated and the full nonland cost of producing it. In the absence of comparable market sales, the net benefits methodology provides an alternative for estimating fair market value that is consistent with economic principles and appraisal practices.

The Principle of the Net Benefits Approach

Our net benefits approach follows from the long-established economic principle that allocates to fixed factors of production such as land the residual value that remains after subtracting the compensation for all other factors of production at their fair market value. Economic principles and the real estate appraisal literature advocate market sales as the most reliable measure of real estate values. In some cases, there may be no market sales. One such case would be real estate with special characteristics that limit the usefulness of market sales for appraising its value. In cases like this, economists and appraisers advocate alternative approaches to valuing real property. Economists have used net benefits analysis, and appraisers have used similar analyses that are generally referred to as "income capitalization analysis."[1] In the case of land values, the real estate appraisal literature includes a particular variant of income

[1] See *The Appraisal of Real Estate*, 12th ed. (Chicago: Appraisal Institute, 2001), especially pp. 25 to 26 and ch. V. Even when market sales are available, a complete appraisal requires the use of all available information as well as market sales.

capitalization analysis that is referred to as the "land residual technique," with origins and wide support in economics.[2] The land residual technique is particularly similar to our net benefits methodology.

Our net benefits methodology, like the land residual technique, starts with the value of the goods that are produced and then subtracts the costs of all nonland factors of production. The residual net benefits are the estimated value of the land.

Land that is used for hydropower generation fits the description of real estate with special characteristics that limit the usefulness of market sales for appraising its value. Land that is a mile upstream or downstream from a suitable location may be far less valuable because of the absence of a special feature, such as a canyon. Hence, land transactions in the general vicinity of a hydropower project are not likely to shed light on the value of the project's land.

Electric utility companies have purchased land for use in hydropower generation, but their purchases were made largely under a regulatory system that does not reveal the value of the purchased land in the hydropower generation use. The Federal Power Act gives utilities the right of eminent domain which allows them to condemn private property necessary for the construction, maintenance, or operation of the project; and this ability to condemn property can have a distorting effect on the economics of utilities' land transactions. Utility representatives told us that the prices they paid for land acquisitions for hydropower projects reflected the market value of the land in the previous use, such as ranching or logging. The value of the land in such uses is likely to be very different from its value in the intended use—hydropower generation. In some states, in recent years, lands used for hydropower generation have also changed hands in cases where utilities divested their hydropower projects in competitive bidding auctions. However, in these cases, the prospective buyers typically bid on packages of electricity generation assets. We had no way of isolating the value of the land from the overall value of the package

[2] This technique goes back to David Ricardo's notion that "land rent is a residual, equal to the excess of revenues from the sale of goods produced on the land over remunerations to non-land factors used in production." Cited in Norman G. Miller, Steven T. Jones, and Stephen E. Roulac, "In Defense of the Land Residual Theory and the Absence of a Business Value Component for Retail Property," *The Journal of Real Estate Research* 10:2 (1995): 203–15. This article gives a brief review of other economists who advanced this theory into the 1990s.

of assets, especially in the absence of a large number of transactions. Even if the value of land for hydropower generation could be estimated from such transactions in some cases, it may be of little use for other cases. The value of land used for hydropower generation in one project may be quite different from the value of land in another project.

All land that is used to produce hydropower has unique features that make the land scarce and valuable, and these features provide a rationale for compensating its owners for its use. The production of hydropower requires land with certain characteristics, capital investments on that land, and a staff to manage and operate the project. The net benefits methodology recognizes that the return on capital investments is a payment to the owners of the capital, including compensation for the risk the owners incurred in their investment. Similarly, the salaries and other operating costs paid to management and employees at each hydropower facility represent the market valuation of their contribution to the production of hydropower. The remaining input required to produce hydropower is land. The fair market value of that input can be estimated by using the net benefits methodology.

In adapting this methodology, we estimated the value of the site using wholesale electricity market prices of the power that the projects in our sample produced rather than the regulated rates that utilities actually charged. The values we estimated differ from the contribution of the hydropower to the actual revenues from the sale of the hydropower in our sample. Utilities sell power to their ratepayers at regulated rates that reflect the costs of generation and delivery to customers. Our analysis is concerned with the generation segment only of the electric power industry, not the delivery segment (transmission and distribution). It is possible to estimate the portion of an electric utility's revenues that corresponds to generation only. However, given traditional utility regulation, that estimate would correspond to the portion of our equation that covers the costs of generation, which include a return on the capital investment. Because of regulation, the cost of electric power differs from its market value. Wholesale market prices are a more accurate reflection of the economic value of power.

In addition, FERC has approved settlements involving Native American lands occupied by hydropower projects in which the net benefits method figured prominently in the calculation of the annual charge. Specifically, the Confederated Tribes of Warm Springs Reservation in Oregon receives about $11 million annually for their lands in the Pelton-Round Butte project as the result of a FERC-approved settlement that was based in part on a net benefits calculation. Moreover, the Bureau of Indian Affairs has advocated, as standard practice, the use of the net benefits methodology as a starting point in negotiations between tribes and owners of hydropower projects.

Outside of the United States, economists in Canada and Norway have employed methodologies similar to our net benefits methodology in order to estimate the resource value of hydropower. Economists in these two countries that rely heavily on hydropower have estimated "hydro-electric rents" by deducting nonland costs from the value of hydropower.[3] Moreover, the government of Norway uses a net benefits model for assessing charges on hydropower. The Norwegian methodology calculates the present value of a hydropower facility's revenues net of all capital and operations and maintenance costs over the entire lifetime of the facility. This is another variant of the land residual or net benefits methodology.[4]

Industry Input in Developing Our Approach

Early in our review, we met with many representatives of electric utilities, state utility regulators, and other stakeholders to obtain their views on our methodology for estimating the value of federal land used for hydropower generation. These stakeholders included representatives of most of the private and public entities that own the projects in our sample. Representatives of the owners of projects in our sample, with few exceptions, generally expressed reservations about using net benefits as a method for estimating the value of land used for hydropower generation. Furthermore, even those who said that net benefits was conceptually a valid method for estimating land values, still had concerns about using this method as a basis for setting FERC charges. In addition, industry representative expressed reservations about estimation difficulties and

[3] See, for example, Richard C. Zuker and Glenn P. Jenkins, *Blue Gold: Hydro-Electric Rents in Canada*, a study prepared for the Economic Council of Canada (Ottawa: Canadian Government Publishing Centre, 1984), Eirik S. Amundsen, Christian Andersen, and Jan Gaute Saunnarnes, "Rent Taxes on Norwegian Hydropower Generation," *The Energy Journal* 13:1 (1992), and David Gillen and Jean-Francois Wen, *Waterpower Program Financial Review*, report submitted to Ontario Ministry of Natural Resources, Province of Ontario, (April 1997.)

[4] The implementation of the Norwegian methodology differs from ours in that it capitalizes net benefits over the entire lifetime of the project; our approach relies on annualized net benefits calculations. The capitalization approach assumes adequate knowledge of hydropower values and costs in the future. We refrained from such an approach because we wished to avoid forecasting values and costs well into the future.

uncertainties and difficulties in implementing a system of charges based on the estimates of net benefits. They also expressed serious concerns about the impacts of higher FERC charges based on our estimates of net benefits. They cited potentially serious impacts on ratepayers and, in some cases, local economies, depending on how FERC would implement a system of higher charges based on net benefits estimates. On the other hand, state regulators to whom we described our methodology generally agreed with its conceptual validity, but some of them also expressed concern about impacts on ratepayers and on local economies. Industry representatives and regulators generally agreed that higher charges would have more impacts on the shareholders of companies in case of restructuring that allows hydropower to be sold at market rates.

In contrast, from discussions with representatives of several projects in our sample, it appeared that their preference for FERC's current method of determining land charges was a result of its simplicity and relatively low charges.

One of the main substantive arguments that utilities used against our net benefits approach is that the value of land used for generating hydropower can be inferred from market transactions in lands in the general vicinity of the projects. According to this argument, the value of land in a hydropower project that is surrounded by grazing land, for example, is likely to be similar to the value of neighboring grazing plots. However, FERC has observed that the annual charge for federal lands should be proportionate to the value of the benefit conferred, and the benefit that the project owner receives from the land is the ability to operate a hydropower project, not to graze livestock.[5] Federal appeals courts have similarly concluded that annual charges must be proportional

[5] Some project owners have argued that land within a project boundary that does not contribute anything to hydropower generation should not be valued for hydropower purposes. However, the project owner could not have obtained its license without gaining access to all the land within the project boundary; thus, it is inaccurate to argue that there is no relationship between the federal land within the boundary and the hydropower project. Moreover, FERC established the project boundaries as containing those lands.

to the benefit conferred."[6] The fallacy of the argument for valuation based on adjacent lands may be illustrated by the example of grazing lands. The value of a rancher's land may not change significantly if it were moved a mile in any direction. Land that is used for hydropower generation, however, cannot easily be substituted with other land, even if it is nearby.

In some hydropower project sales in recent years, the right to the use of the land was bundled with the physical assets. Often, generation assets sold as packages that included hydropower generation projects as well as other generation plants that rely on fossil fuels such as coal. Because of the bundling of the land and physical assets, the sale does not reveal the market value for these lands. Even if the market value for hydropower project land could be gathered from such transactions, little could be said about the value of other lands used to generate hydropower because of inherent differences in the characteristics of different lands and in the value of electricity generated in different regions. As we explain later, wide differences in the topographic characteristics of project lands greatly affect the value of each project. Therefore, the value of project land is likely to differ widely from one project to another.

While we rejected the argument for using adjacent land values to estimate the value of lands used for hydropower generation, we accepted a number of specific suggestions that various stakeholders, including representatives of electric utilities, made regarding our methodology. For example, we modified our methodology to include utilities' administrative and general costs and their tax expenses.

[6] *East Columbia Basin Irrigation District v. FERC*, 946 F.2d 1550, 1560 (9th Cir. 1991). Licensees also argue that if land is to be valued on the basis of its contribution to hydropower production, each acre should be assessed differently, so that acres included in the project solely for environmental purposes, for example, are assessed at a lower rate. In response, we note that FERC's current system of land charge also assesses the same charge for each acre within the project boundary, regardless of the individual acre's contribution to hydropower production. In any event, the licensees can obtain no economic benefit from the project unless it obtains access to all the lands within the project boundary. However, FERC is authorized to approve licensee requests to alter project boundaries. Such requests could increase in the event that significant increases in annual charges, undifferentiated by acre, were to be implemented.

A Description of Our Methodology

We used a net benefits methodology to estimate the fair market value of federal lands used to generate electricity at a sample of 24 FERC-licensed hydropower projects. For this report, "fair market value" refers to annual estimates of net benefits rather than a one-time sale of the permanent right to use the federal land.[7] Our estimate of the net benefits for a given project during a given year is the difference between the estimates of the market value of power that the project generates and the full cost of all nonland factors used for hydropower generation for that year. We defined the full cost of nonland factors as the sum of the year's (1) annualized capital cost; (2) operations and maintenance costs; including a share of corporate overhead; and (3) a share of the owner's direct tax expenses allocated to the project. All factors of production contribute to the value of power that a hydropower project generates, and full costs, as we define them, cover the compensation that all factors—except land—earn on their contributions. Our net benefit methodology allocates to project lands the difference between the value of hydropower production at the project and the full production costs as we defined them. The federal government's share of net benefits is based on the federal share of the total land area within the FERC boundaries of a given project.

Our net benefits methodology follows four basic steps:

- To estimate the value of hydropower that a project generates, we multiplied the quantity of hydropower generated by the wholesale price for power in its market area. As discussed earlier, our estimates of the value of power generally differ from the revenues that the project owners earn from the sale of the hydropower that they generate, because utilities' revenues are still predominantly based on costs rather than on market prices.

- For each project, we summed its annualized capital cost; operations and maintenance costs, including a share of corporate overhead costs; and a share of the owner's tax expenses allocated to the project.

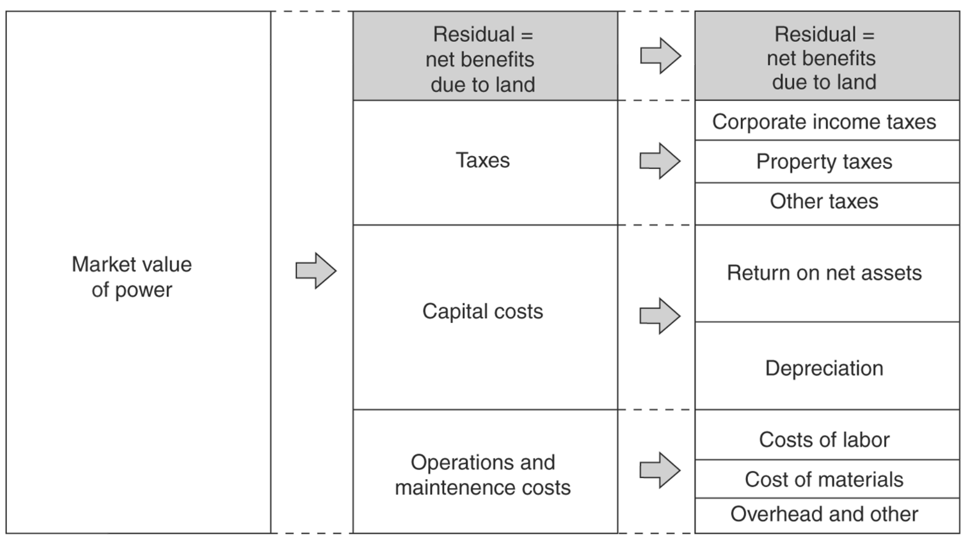
[7] To create a value that is comparable to current annual FERC charges, we focused on the annual value of the lands in a hydropower project. This is different from the capitalized value of the project's land. The capitalized value is the present value of annual net benefits over the future lifetime of the project. An appraiser would consider the capitalized value of the land in connection with an outright sale of the land, for example, as opposed to annual charges for the use of the land.

- We subtracted the sum of costs from the value of hydropower. The resulting differential represents an estimate of the annualized fair market value of project lands.

- We multiplied the estimated annualized fair market value of project lands by the federal government's share of total project lands to obtain the federal government's share of this estimate.

Figure 4 illustrates how the net benefits methodology estimates the value of the land by deducting from the value of hydroelectric power three major cost components: capital costs, operations and maintenance costs, and taxes.

Figure 4: The Net Benefits Methodology



Source: GAO.

Technical Details of Our Methodology

While the previous overview of the methodology provides a summary of the steps taken, we represent the methodology by several equations that allow it to be implemented, using data on a sample of dams. The methodology estimates the fair market value of the federal land for a given project during a given year. The model can be summarized as follows in equations 1 and 2:

$$\mathrm{FNB}(i,t) = \mathrm{s}(i) \times \mathrm{NB}(i,t) \tag{1}$$

$$\mathrm{NB}(i,t) = \mathrm{p}(i,t) \times \mathrm{Q}(i,t) - \mathrm{C}(i,t) \tag{2}$$

where

$\mathrm{FNB}(i,t)$ = Federal net benefits for project i, in year t;

$\mathrm{s}(i)$ = percentage of land that is federal land for project i;

$\mathrm{NB}(i,t)$ = net benefits for project i, in year t;

$\mathrm{p}(i,t)$ = price we used to value the hydropower generated for project i, in year t;

$\mathrm{Q}(i,t)$ = amount of electric power generated and sold by project i, in year t; and

$\mathrm{C}(i,t)$ = cost of all nonland inputs for project i, in year t.

Project land is all the land within the project boundary, excluding lands used for transmission rights of way.

On the cost side, we included operations and maintenance costs, a share of the owner's tax expenses assigned to the project, and annualized capital cost in equation 3:

$$\mathrm{C}(i,t) = \mathrm{O\&M}(i,t) + \mathrm{T}(i,t) + \mathrm{K}(i,t) \tag{3}$$

where

$\mathrm{O\&M}(i,t)$ = project's direct operations and maintenance costs, plus an adjustment intended to assign a portion of the owner's overhead costs to the project;

$\mathrm{T}(i,t)$ = share of taxes the project owner paid, which we assigned to the project; and

$\mathrm{K}(i,t)$ = annualized capital costs of the project.

In addition, annualized capital costs are defined by equation 4:

$$\mathrm{K}(i,t) = \mathrm{D}(i) + r \times \mathrm{RCLPD}(i,t) \tag{4}$$

where

$\mathrm{D}(i)$	=	annual depreciation factor for project i;
r	=	real discount rate to convert a capital cost to annual payments; and
$\mathrm{RCLPD}(i,t)$	=	replacement cost less physical depreciation. We used this estimate as a proxy for the value of the project's capital investment net of accumulated depreciation. RCLPD for project i, declines by an amount equal to $\mathrm{D}(i)$ each year.

In other words,

$$\mathrm{RCLPD}(i,t) = \mathrm{RCLPD}(i,t-1) - \mathrm{D}(i) \tag{5}$$

We assumed that the depreciation factor, $\mathrm{D}(i)$, stays constant for the period of analysis, 1998 through 2003. Capital additions, replacement of major equipment, or major maintenance over a longer period would result in the annual depreciation factor's changing over time. We chose this method of annualizing capital costs because it is widely used in utility industries. A utility is allowed to set electricity rates that will recover its full estimated costs, including depreciation and a return on the net value of its capital investment—the value remaining after accumulated depreciation has been subtracted.[8]

[8] A standard definition of revenue requirements is
$R = C + D + (r \times B)$,
where
R = total quantity of revenues to be provided,
C = total operating costs of the firm,
D = depreciation allowance,
r = allowed rate of return on the firm's undepreciated assets, and
B = net value of the firm's undepreciated assets, or the rate base.

See Giles Burgess Jr., *The Economics of Regulation and Antitrust* (New York: HarperCollins College Publishers, 1995), p. 66.

Table 5 illustrates our methodology further with a numeric example for a hypothetical Project X.

- We start by calculating the value of power—the project's generation amount multiplied by the wholesale electric power price. In our example, we multiply 5 billion kilowatt-hours that the plant produces in 2003 by a price of \$0.04/kwh (or \$40/megawatt-hour). The result is \$200 million.

  - Next we calculate nonland costs of \$130 million by adding capital costs, operations and maintenance costs, and corporate taxes.

  - Capital costs consist of (1) an annual depreciation allowance of \$25 million, and return on investment of \$75 million (replacement cost less physical depreciation of \$1 billion multiplied by the after-tax, regulated real rate of return of 7.5 percent; we chose 7.5 percent instead of 7.22 percent for simplicity for this example);

  - taxes are a prorated share of corporate taxes and equal \$10 million; and

  - operations and maintenance costs, including a share of the project owner's overhead costs, are \$20 million.

The sum of costs is \$130 million. The net benefit is therefore \$200 million minus \$130 million, which is \$70 million. For this hypothetical example, this \$70 million is our estimate of the annualized value of project lands for 2003. To obtain the federal government's share, we multiply this amount by the federal government's share of project lands, 10 percent in this hypothetical example, to obtain \$7 million as our estimate of the fair market value of the federal land for 2003.

Table 5: Numeric Example of Summary Net Benefits Calculations

Project X	**Year 2003**
Generation (kwh)	5,000,000,000
Price in $/kwh	0.04
Value of power	**$200,000,000**
Replacement cost less physical depreciation	$1,000,000,000
Rate of return on investment	7.5%
Subtotal (return on investment)	**$75,000,000**
1 year's depreciation	$25,000,000
Taxes—a prorated share of corporate taxes	$10,000,000
O&M, including a share of corporate overhead	$20,000,000
Total costs	**$130,000,000**
Net benefit	$70,000,000
Federal lands' share of project lands	10%
Net benefit of federal lands	**$7,000,000**

Source: GAO.

Notes: Hypothetical example.

kwh = kilowatt-hour

Implementing the Net Benefits Methodology

This section of the appendix describes the decisions that we made to implement the net benefits methodology for estimating fair market value. It includes information on our sample of 24 dams, the six scenarios that we estimated, and the different types of data that are required to determine fair market value.

Information on Our Sample of 24 Hydropower Dams

We selected for analysis a random sample of 24 of the 56 largest FERC-licensed projects that occupy federal land. Twenty-two of the 24 projects in our sample were in western states, while the 2 others were in Alabama and Virginia. The 24 projects ranged from about 75 megawatts to 2,100 megawatts of generating capacity and accounted for about 60 percent of the generation for all FERC-licensed hydropower projects on federal land.[9] In addition, our sample accounted for about 35 percent of the federal lands used by FERC-licensed projects to generate hydropower.[10] Figure 1 in the report illustrates the geographic distribution of the projects in our sample.

Some of the projects in our sample are owned by private entities while others are owned by states, municipal utility districts, or other public entities. Two of the projects in our sample were built primarily for transporting water from northern California to various locations, and one was built with irrigation, flood protection, and hydropower generation as primary purposes.

The sample of dams includes the wide variety of characteristics that determine the value and costs of any particular dam. The value of hydropower generated at each dam and its production costs depend on many factors, including physical characteristics and how the dam is used for power generation and other purposes. For example, some dams, known as "run-of-the-river dams," run almost continuously, while others store water in impoundments and, as a result, use that water at a later time to produce more electricity during peak demand periods, when the electricity is more highly valued. Since the value is determined by the market price at the time the electricity is produced, the two types of dams have different values, even if they generate the same amount of hydropower.[11] Our sample also includes dams with widely varying construction costs that depend on the shape of the land around the dam and other topographic conditions. Table 6 provides profiles of the dams in our sample.

[9] The electricity generation capacity of a power plant is measured in kilowatts, or megawatts. One kilowatt is 1,000 watts, and a megawatt is 1 million watts. A watt is an electrical unit of power, or rate of energy transfer.

[10] These figures exclude land used for transmitting electric power.

[11] Wholesale electric power prices vary from one hour of the day to the next.

Table 6: Profiles of Our Sample of 24 Hydropower Projects

Dollars in millions

FERC project number	Project name	State	Ownership type[a]	Capacity in megawatts
5	Kerr	Montana	IPP	196
96	Kerckhoff 1& 2	California	IOU	178
233	Pit River	California	IOU	368
553	Skagit River	Washington	Muni	688
943	Rock Island	Washington	PUD	627
1869	Thompson Falls	Montana	IPP	90
1927	North Umpqua	Oregon	IOU	186
1971	Hells Canyon	Idaho–Oregon	IOU	1,167
1975	Bliss	Idaho	IOU	75
1988	Haas-Kings River	California	IOU	189
2075	Noxon Rapids	Idaho–Montana	IOU	466
2100	Feather River	California	State	762
2101	Upper American River	California	Muni	740
2105	Upper North Fork Feather River	California	IOU	348
2111	Swift 1	Washington	IOU	240
2114	Priest Rapids	Washington	PUD	1,856
2144	Boundary	Washington	Muni	1,060
2145	Rocky Reach	Washington	PUD	1,280
2146	Coosa River	Alabama	IOU	688
2175	Big Creek 1&2	California	IOU	152
2195	North Fork River	Oregon	IOU	92
2299	Don Pedro	California	ID	167
2426	California Aqueduct	California	State	1,679
2716	Bath County	Virginia	IOU	2,100

Source: GAO's analysis of data from the Energy Information Administration (EIA), FERC, and Scientech.

[a]ID = irrigation district; IOU = investor-owned utility; IPP = independent power producer; muni = municipality; PUD = a public utility district.

We Estimated the Fair Market Value of Federal Land for Six Scenarios

We produced estimates of fair market value for each of 3 recent years, 1998 through 2000, and the current year, 2003. We also conducted sensitivity analysis for 1999 estimates by constructing hypothetical examples to test the impact of a higher price in one case and lower hydropower generation by each project in the second case. We chose to estimate land values for 4 years because factors that determine net benefits can vary considerably from year to year, depending on wholesale electricity prices, water availability, and restrictions on water use, among other things.

In order to estimate the net benefits for 2003, we assumed that the hydropower produced by our sample of plants would be at the average quantity generated over 5 recent years, 1995 through 2000, and that the price of wholesale electricity would be equal to the average cost of production from a newly built, least-cost alternative generation plant. Currently, the least-cost alternative is a combined-cycle, dual-fuel, combustion turbine power plant operating primarily on natural gas. Some industry analysts consider this average cost a good current indicator of the average tendency of wholesale prices in the long term. While the data on prices and production for 1998-2000 provide an estimate of the value of the federal lands during these years, these estimates depended on the market conditions that prevailed at the time. In the longer term, the fair market value for the use of the lands would be limited by the cost of the least-cost alternative source of electricity, as in the 2003 calculation, rather than sustained higher prices that may occur during a given year, such as 2000. Such higher prices would induce investors to build new generating capacity and thereby drive the long-run price of electricity to the cost of that alternative.

In order to determine the influence of quantity and price variations independently of each other, we also conducted a sensitivity analysis for 1999 by constructing a “lower quantity” case and a “higher price” case.[12] The lower quantity sensitivity case for 1999 included 10 percent less generation than the actual figure for each project in our sample. We chose this 10 percent reduction to reflect the fact that annual hydropower generation in California from 1983 through 2001 averaged about 10 percent less than its level in 1999. We also constructed a higher price scenario for 1999 in which we assumed that the price was equal to $40 per megawatt-

[12] Sensitivity analysis refers to artificially changing the value of a given variable in a model to gauge the effect of change on model results.

hour, which is about 8 percent higher than the price that we originally used for 1999. We selected $40 because it represents the long-run marginal cost per megawatt-hour from a newly built, least-cost alternative source of power generation. (This assumption is similar to our price assumption for 2003.)

Data to Implement the Net Benefits Methodology

To estimate the fair market value of federal land, we needed data on several key variables. This section describes the price and quantity data we used to estimate the value of the hydropower produced at each of the 24 facilities. In addition, this section describes the three key elements of cost data that we used, including (1) annualized capital costs, (2) operations and maintenance costs, and (3) taxes.[13] Finally, it describes the data we used for determining the federal share of project lands.

Price and Quantity Data

We used prices of electric power in wholesale markets to value the hydropower that our sample of 24 projects generated. Wholesale electric power markets have developed in response to the restructuring of the electricity industry across the United States. These market prices differ in two ways from the regulated rates that electric power consumers have traditionally paid. First, regulated rates are set through an administrative process, are intended to reflect the utility's average cost of production, and include returns on the net value of capital investments, subject to approval by state regulators. Wholesale market prices largely reflect market forces on both the supply and demand sides of the market. Second, regulated rates reflect the costs of a bundle of services, including generation, transmission, and distribution. Wholesale electricity prices do not reflect the value of the delivery service, which is provided separately and is still subject to traditional cost-based regulation.

We used prices from the California Power Exchange (CAPX) for all projects in the Western Electricity Coordinating Council (WECC) during 1998 through 2000. These include all projects in our sample except the Coosa River in Alabama and the Bath County in Virginia. Specifically, we used an average of the hourly wholesale market prices for all hydropower projects that sold into CAPX, weighted by each individual unit's hourly

[13] We adjusted all dollar values in our analysis to 2002 constant dollars, using the gross domestic product (GDP) implicit price deflator.

generation. We obtained the confidential hourly generation data from FERC. We used the resulting annual weighted average price for the projects in Idaho, Montana, Oregon, and Washington State, as well as California, because of the integrated nature of WECC. Large quantities of electric power are traded across the WECC region during the course of the year, despite occasional transmission constraints within the region at different times. While transmission constraints prevent trades across subregions at times, resulting in different prices for different locations, annual averages tend to converge because of trading activity when transmission capacity is sufficient. We consulted with a number of experts on this matter and they agreed that it is reasonable to use the annual average of hourly prices in California as a proxy for the annual average price for the entire WECC region.

The operations of CAPX were relevant to our analysis because CAPX hourly prices were publicly available prices for directly valuing much of the hydropower generated by the projects in our sample over the period of our analysis. CAPX was also important to our analysis because California is a large and important part of the WECC region, which has been a fairly well integrated market region for electric power. WECC comprises 14 western states, the Canadian provinces of Alberta and British Columbia, and portions of northern Mexico. Twenty-two of the hydropower projects in our sample are in WECC.

For the Coosa River project in Alabama, we used the simple average of Southeastern Electric Reliability Council (SERC) hourly prices for 1998-2000.[14] We used the simple average because hourly generation data were not available.

The Bath County Pumped Storage (BCPS) project is a special case because it is a pumped-storage project.[15] It is co-owned by Dominion Virginia Power and Allegheny Power, and is located within PJM's–Western Hub (PJM-WH). PJM is the centralized wholesale electricity market for an area that encompasses Maryland, New Jersey, Pennsylvania, and portions of Virginia and West Virginia; PJM-WH is one of the zones within PJM. Dominion Virginia Power, which is co-owner of BCPS with Allegheny Power, uses

[14] These are prices for SERC, excluding Florida. We obtained them from the Tennessee Valley Authority, but they originate from *Power Markets Weekly*.

[15] The California Aqueduct project also includes a pumped-storage facility, but we did not treat the project as a whole as a pumped storage facility.

PJM-WH prices to value the power that it sells from BCPS for internal accounting purposes, and the Allegheny Power System is an active participant in PJM-WH.

Dominion Virginia Power provided us with hourly data on the hydroelectric power that it sold from its share of BCPS hydropower generation for 1998 and 1999. We used these hourly generation data and hourly PJM-WH prices to value all BCPS power sold from BCPS in 1998 and 1999. Specifically, for each of these 2 years, we calculated a price on the basis of average of all hourly prices from PJM-WH, weighted by Dominion Virginia Power's sales from this project. These weighted average values can be thought of as average hourly revenue per megawatt-hour for the respective years, had all Dominion Virginia Power's share been sold at PJM-WH prices. Dominion Virginia Power did not provide hourly generation data for 2000, but we used the 1998 and 1999 hourly generation and price data and the hourly PJM-WH price data for 2000 to extrapolate a weighted average price for BCPS for 2000.[16]

For 2003, we assumed that prices for all projects except BCPS would be equal to the cost per megawatt-hour from the least cost, newly-built alternative source of power generation. In the electricity industry, this average is also known as the "levelized" cost of the least-cost, long-run alternative. It includes all cost components, including capital costs and a return on investment. The reasoning behind this assumption is that investors will not invest in new power generation capacity if they cannot reasonably expect future prices that will allow recovery of all costs, including a risk-adjusted return on their invested capital. We assumed that

[16] A pumped water project pumps water from a lower reservoir to an upper reservoir at times when demand for electricity is low. During periods of high demand, the water is released back to generate electricity. For 1998 and 1999, we calculated a weighted average value per megawatt-hour for Dominion Virginia Power sales from BCPS at $34.03 and $51.98, respectively. These values are 1.57 and 1.86 times higher than the simple averages of hourly PJM-WH prices for these years. We used the lower of these two ratios, 1.57, as an escalation factor for the 2000 simple average of hourly PJM-WH prices to value BCPS generation for that year.

hydropower, on average, should be valued at least as highly as base load power, so we used levelized cost estimates for base load plants.[17] Specifically, we used Global Insight (formerly DRI-WEFA Inc.) levelized cost estimates for power that is generated by a combined-cycle, dual-fuel combustion turbine. Global Insight's estimates are for different regions of the United States, so we used the estimates for the western and southeastern states—$42 per megawatt-hour.[18] For the special case of BCPS for 2003, we used the levelized cost estimate of about $41 per megawatt-hour (in 2002 dollars) but extrapolated a price based on the 1998 and 1999 data.

For all the projects in our sample, we escalated wholesale prices by 7 or 12 percent to reflect the value of ancillary services. Ancillary services include services related to the provision of electricity other than simple generation, transmission, or distribution.[19] The provision of "balancing energy supply" is an example of an ancillary service. This is energy that is not scheduled in advance but is required to meet energy imbalances in real time to maintain the reliability of the electric system. Because markets for electricity ancillary services in the United States are generally not well developed, we tried to account for their value by escalating the wholesale market price by a fixed percent. Hydropower projects are recognized as very important sources of ancillary services. We used a 7 percent price escalation factor for all our sample projects except for the Bath County project pumped storage project in Virginia (BCPS.) We chose 7 percent as a conservative number after consulting with a number of experts and reviewing how other studies accounted for the value of ancillary services. For BCPS, we used a 12 percent price escalation factor that the project owner agreed was a reasonable number. Table 7 provides some detail on the wholesale market prices we used in our analysis.

[17] Base load generating plants are designed for nearly continuous operation at or near full capacity to provide all or part of the base load. Base load is the minimum level of demand for electric power in a given system over a period of time.

[18] Global Insight World Energy Service, *U.S. Outlook*, released January 2002.

[19] Ancillary services are required to maintain system reliability and meet the electric system's operating criteria. They include spinning, nonspinning, replacement reserves, regulation, voltage control, and instantaneous start capability.

Table 7: Prices Used to Value Hydropower for Our Sample of 24 Projects

	Project by location					
	California and the Northwest[a]		Coosa River, Alabama		Bath County Pumped Storage[b]	
Year	Price[c]	Basis	Price[c]	Basis	Price[c]	Basis
1998	$27.40	Hydro-specific average of hourly prices from CAPX, weighted by hourly generation[d]	$40.01	Simple average of hourly prices for the Southeast Reliability Council region, excluding Florida	$36.86	Average of hourly real-time prices for PJM–Western Hub, weighted by project hourly generation
1999	35.43	Hydro-specific average of hourly prices from CAPX, weighted by hourly generation[d]	42.14	Simple average of hourly prices for the Southeast Reliability Council region, excluding Florida	55.16	Average of hourly real-time prices for PJM–Western Hub, weighted by project hourly generation
2000	124.54	Hydro-specific average of hourly prices from CAPX, weighted by hourly generation[d]	34.60	Simple average of hourly prices for Southeast Reliability Council region, excluding Florida	44.34	Extrapolated from simple average of hourly PJM–Western Hub prices, adjusted to reflect peak values
2003	41.21	Levelized cost of electricity from a combined-cycle dual fuel plant for the Western region	41.21	Levelized cost of electricity from a combined-cycle dual fuel plant for Southeast Reliability Council	64.68	Extrapolated from levelized cost of electricity from a combined-cycle dual fuel plant for the Southeast Reliability Council
1999 higher price sensitivity	40.00	Approximate levelized costs from least-cost base-load plant	40.00	Approximate levelized costs from least-cost base-load plant	55.16	Average of hourly real-time prices for PJM–Western Hub, weighted by project hourly generation
1999 lower hydropower generation sensitivity	35.43	Hydro-specific average of hourly prices from CAPX, weighted by hourly generation[d]	42.14	Simple average of hourly prices for the Southeast Reliability Council region, excluding Florida	55.16	Average of hourly real-time prices for PJM–Western Hub, weighted by project hourly generation

Sources: California Power Exchange and California Independent System Operator, Dominion Generation, the Federal Energy Regulatory Commission, Global Insight, and PJM Interconnection.

Note: For the Coosa River project, we used data from the Tennessee Valley Authority, based on *Power Markets Weekly*.

[a]Projects in the Northwest include Idaho, Montana, Oregon, and Washington State.

[b]Pumped-storage facilities have high pumping costs that we accounted for separately.

[c]Prices per megawatt-hour, in 2002 constant dollars. One megawatt-hour is equal to 1,000 kilowatt-hours. Prices exclude the value of ancillary services.

[d]CAPX = California Power Exchange.

As we mentioned above, we constructed two sensitivity cases for 1999, one assuming lower hydropower generation and the other assuming a higher price. For the lower-generation case, we used the same price as our 1999 “base case.” For the 1999 higher-price case, we assumed a price of $40 per megawatt-hour for all projects except BCPS. As with the 2003 prices assumption, we selected this price because it is approximately equal to the cost of power from the least-cost, new alternative generation source.

The hydropower generation data for 1998 through 2000 came from several sources. For the investor-owned utilities, we used data from the project owners’ annual FERC form 1. For publicly owned projects—those owned by state agencies, municipalities, public utility districts, or irrigation districts—we used Energy Information Administration (EIA) form 412, which the utilities are required to submit to EIA. For 2003, we used for each project the average net generation for 1995–2000. To compute these averages, we obtained the 1995-2000 data from RDI databases, a service of Platts Global Energy. Our 5-year average included a mix of relatively high and low hydropower generation years in the western U.S.

Capital Cost Data

We hired Scientech, an expert power plant engineering and consulting firm, to provide us with capital cost estimates because FERC’S and EIA’s data on capital costs do not account for the effect of inflation over long periods of time. FERC’s and EIA’s data forms contain capital cost figures that consist of original investment costs plus the cost of additions and less the cost of retirements in current dollar values. For example, if a turbine is replaced because of its age, the retired turbine’s original cost is subtracted and the cost of the new one is added. The forms show only the cumulative capital cost figures; they do not detail retirements and additions and their dates. For example, 1990 capital expenditures may be added to 1940 capital cost expenditures, with no adjustment for inflation, rendering the figure unusable for our purposes. Representatives of hydropower project owners told us that they could not provide us with detailed, project-by-project data on major retirements and additions and their dates, especially for projects that date back many decades. The California Public Utility Commission regulators also said that searching their records for such data would be extremely difficult, even if complete data existed.

Given these data constraints, we decided to assign to each project annual capital costs based on the standard formula of compensating utilities for their costs, and on a current estimate of the project owners' net capital investments (net of accumulated depreciation). The standard formula for compensating utilities for their capital costs is based an annual depreciation factor and the "net book value of their investments in equation 5:"[20]

$$ACC = D + (r \times B) \tag{6}$$

where

ACC	=	annualized capital component of a utility's revenue requirement,
D	=	annual capital depreciation allowance,
r	=	regulated rate of return on the firm's net assets, and
B	=	net book value of the firm's assets, also known as the "rate base." (See footnote 8.)

Data on the net book value of the projects are not available. Hence, we decided to rely instead on an expert consultant's estimates of replacement cost less physical depreciation (RCLPD). RCLPD is an estimate of the value, in today's dollars, of the owner's net investment. Because of inflation, RCLPD is likely to be systematically higher than net book value (B in the above formula,) and it is therefore higher than the amount that would adequately compensate project owners for such costs. Since capital costs are a major component of total costs in our analysis, our reliance on RCLPD effectively means that our estimates of capital cost are systematically high, and our estimates of net benefits are conservative.

A team of Scientech engineers and analysts used extensive data sources and their hydropower engineering expertise to estimate RCLPD for each of the individual projects in our sample. Scientech started with estimates of replacement costs, which are the total capital investment that would be needed today to reproduce a given project on the unimproved site. Scientech estimated separately for each project in our sample the costs of

[20] Net book value is defined as original cost less accumulated depreciation—all in the dollar values of the years in which the original costs were incurred.

(1) reservoirs, dams, and waterways, (2) power plant structures, (3) power plant equipment, and (4) roads and bridges. Next, Scientech made assumptions about the useful life span of these components of hydropower projects in order to estimate physical depreciation factors for them. Given knowledge of development dates, and Scientech's own estimates of replacement costs and depreciation factors, Scientech estimated RCLPD for each project. It also added, for each project, an estimate of the cost of licensing that these projects had incurred in the past.

Scientech estimated RCLPD in 2002 dollar values by first estimating replacement costs (new) for each category and then making assumptions regarding their useful life span and their age to estimate their physical depreciation. It also added, for each project, an estimate of the cost of licensing that these projects had incurred in the past. Finally, Scientech estimated an annual depreciation factor, $D(i)$, for each project as a composite of the depreciation factors in each category.

Moreover, we assumed that all the capital costs of a project are allocated to the hydropower function. This is certainly not the case for at least three projects in our sample. The California Aqueduct and the Feather River projects in California were built primarily to convey water over hundreds of miles from northern California to various locations, making their development costs far higher per megawatt of electric generation capacity than most other projects in our sample. The Don Pedro project was built with irrigation and flood protection as major purposes, in addition to electricity. Since we had no reliable way of allocating the capital costs of these projects among their major purposes, we allocated all the capital cost to hydropower generation. However, this potential overstatement of capital costs could lead to an understatement of the value of these projects.

In order to provide an annual estimate of the return on the value of capital, we used a real discount rate of 7.22 percent—a weighted average cost of capital for investor-owned electric utilities, averaged over the 5 years 1998 through 2002—from Global Insight. We used the investor-owned utilities' rate for all projects, although public utilities' cost of borrowing is lower. We used a real, after-tax discount rate, based on Global Insight's financial data for investor-owned electric utilities. This rate is consistent with guidance from the Office of Management and Budget.[21] We used a real rate because our analyses relies on costs (including capital costs) and benefits in constant dollar values.

Operations and Maintenance Costs

For the operations and maintenance data, we relied on data provided by project owners on their FERC form 1 and EIA form 412. We used project-specific costs and added an amount that reflected the owners' general and administrative costs, or overhead costs. To accomplish this, we used data from FERC form 1 for each of the investor-owned projects in our sample. We obtained from these forms the overall corporate (1) electric operations and maintenance expenses and (2) administrative and general costs. We then calculated what percentage the corporate wide administrative and general costs were of the total corporate operations and maintenance costs. We multiplied this percentage by the project-specific operations and maintenance costs. The resulting amounts were added to the operations and maintenance costs for the investor-owned projects. Because we did not have adequate information on the publicly owned projects in our sample, we used an annual average percentage, on the basis of data for the investor-owned utilities, and applied it to the publicly owned projects in the sample.

BCPS' operations and maintenance costs posed a special challenge. As we mentioned above, pumped-storage projects pump water up into a reservoir during off-peak hours, when the electricity prices are relatively low, and then generate electricity with the stored water during peak-demand hours.

[21] According to OMB Circular A-94, "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs," the real (constant dollar) rate of 7 percent "approximates the marginal *pretax* rate of return on an average investment in the private sector in recent years." Investor-owned electric utilities, however, belong to the *corporate* segment of the private sector. According to the Office of Management and Budget, the private, real pretax rate of return on an average investment in the corporate private sector over the period 1991 through 2001 has been about 10 percent, making an *after-tax* rate of about 7 percent a reasonable estimate for the corporate sector. The level of financial risk in the regulated electric utility industry has generally been lower, so historical rates of return were probably also lower than the average for the corporate sector. However, unregulated energy companies that operate in today's restructured electricity markets face higher risk levels than their regulated counterparts did in the past.

FERC form 1 did not include the costs of pumping water that a pumped-storage facility incurs as part of its normal operations. However, Dominion Energy provided us with hourly data on its use of electric power for pumping, as well as power generation, for 1998 and 1999. We used the hourly pumping data and PJM-WH prices to estimate BCPS' pumping costs for those 2 years. We multiplied the hourly amounts of power it used for pumping by the PJM-WH hourly prices and summed the products. We also relied on its 1998 and 1999 data to extrapolate this project's pumping costs for 2000 and 2003.[22]

Taxes

Taxes are paid at the corporate level—not by individual hydropower projects. However, to fully account for the total costs for each project, we assigned a portion of the project owners' taxes to their projects in our sample. To accomplish this, we obtained the total corporate taxes and total generation in kilowatt-hours from the FERC form 1. We then divided the taxes by the total generation to obtain a "tax per kilowatt-hour." We then multiplied this rate by the amount of generation at a given project for each year to produce each project's share of the total taxes. This amount was then added to the total costs for that project. Publicly owned generators of electric power are exempt from federal income taxes, but many of them pay significant amounts of taxes and "tax equivalents." We used a similar method, using data from EIA form 412s, to assign a portion of the tax burden of the public entity that owned a project in our sample to the individual project itself. For example, if Utility A paid $10 million in taxes in 1998 and its Project Y generated 10 percent of A's total generation, we used 10 percent of $10 million, that is, $1 million, as our tax estimate.

Our estimate for the projects' year 2003 taxes is an average of their 1998 and 1999 taxes, adjusted for inflation. We excluded 2000 from our tax calculations because it was a very unusual year for utilities' finances in the western United States, where most of our sample projects were located.

[22] The manager of BCPS told us that the relationship between the amount of electricity used for pumping water and the amount of hydropower it generates is stable over time: 1.25 kilowatt-hours of pumping are needed for each kilowatt-hour of power generated, on average. We also calculated the average cost of pumping per kilowatt-hour for 1998 and 1999, using hourly amounts of electricity used for pumping and hourly PJM-WH prices. For those 2 years, we calculated a ratio of this weighted average cost of pumping to the simple annual average of hourly PJM-WH prices. We used these relationships and BCPS' 2000 and 2003 hydropower generation figures to extrapolate the project's 2000 and 2003 pumping costs.

Data on the Federal Share of Project Lands

To determine the percentage of a project's lands that are federal, we obtained the amount of federal acreage associated with each project from FERC documents. Because FERC did not have data on the total acreage of each project (including federal and nonfederal lands), we generally obtained the total project acreage from the each of the owners of projects in our sample. (Two project owners chose not to share this information with us, so we used estimates the Forest Service provided—one of the agencies that manages the federal lands on which these projects are located.) From this information, we determined the percentage of federal land associated with each project by dividing the number of federal acres by the number of total project acres. We did not include transmission line acreage in our analysis because we were interested only in the primary project acres.

Net Benefits Analysis for Each of the 24 Projects in Our Sample

This appendix provides details on our estimates of the net benefit of federal lands for each project. These details include the value of the power produced and the costs to produce it. Sources for the data used in this analysis are discussed in appendix I. For some years, our analysis estimates that the net benefit for several projects are negative values. As discussed in our report, a negative net benefit estimate does not mean that the value of the land is negative or, in most cases, that the project is losing money. Instead, a negative net benefit estimate indicates that, for that year, the project operated below the industry average rate of return on investment (7.22 percent) that we assigned as part of each project's costs. To show how the rate of return on investment can vary from year to year, the tables below provide our estimates of the rate of return on investment for each of the projects in our sample. (In the following tables, some totals do not add because of rounding).

Table 8: Bath County, FERC License No. 2716

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	3,750,777,000	4,161,461,000	4,519,820,000	4,144,019,333
Price	$0.0413	$0.0618	$0.0497	$0.0724
Value of power	**$154,855,911**	**$257,083,891**	**$224,478,155**	**$300,181,342**
RCLPD	$1,174,300,000	$1,159,900,000	$1,145,500,000	$1,102,300,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$84,784,460**	**$83,744,780**	**$82,705,100**	**$79,586,060**
1-year's depreciation	$14,400,000	$14,400,000	$14,400,000	$14,400,000
Total capital costs	**$99,184,460**	**$98,144,780**	**$97,105,100**	**$93,986,060**
Taxes	$22,996,196	$25,514,120	$31,061,285	$24,255,158
Operations and maintenance	$85,111,699	$96,897,363	$100,931,663	$138,844,651
Total costs	**$207,292,355**	**$220,556,262**	**$229,098,047**	**$257,085,868**
Net benefit	($52,436,444)	$36,527,629	($4,619,893)	$43,095,474
Percentage of project on federal lands	28%	28%	28%	28%
Net benefit of federal lands	**($14,682,204)**	**$10,227,736**	**($1,293,570)**	**$12,066,733**
Estimated return on investment	2.75%	10.37%	6.82%	11.13%

Sources: Various agencies (data), GAO (analysis).

Notes: Owners: Virginia Dominion Power & Allegheny Power.

FERC annual charges (2002): $48,061.

Table 9: Big Creek 1&2, FERC License No. 2175

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	1,016,587,421	728,211,389	770,657,000	943,396,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$29,800,271**	**$27,607,706**	**$102,698,124**	**$41,596,288**
RCLPD	$61,600,000	$54,850,000	$48,100,000	$27,850,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$4,447,520**	**$3,960,170**	**$3,472,820**	**$2,010,770**
1-year's depreciation	$6,750,000	$6,750,000	$6,750,000	$6,750,000
Total capital costs	**$11,197,520**	**$10,710,170**	**$10,222,820**	**$8,760,770**
Taxes	$8,422,837	$5,990,369	($8,346,210)	$7,206,603
Operations and maintenance	$5,315,070	$4,722,987	$4,518,040	$4,898,434
Total costs	**$24,935,427**	**$21,423,526**	**$6,394,649**	**$20,865,807**
Net benefit	$4,864,844	$6,184,180	$96,303,474	$20,730,481
Percentage of project on federal lands	100%	100%	100%	100%
Net benefit of federal lands	**$4,864,844**	**$6,184,180**	**$96,303,474**	**$20,730,481**
Estimated return on investment	15.12%	18.49%	207.44%	81.66%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Southern California Edison.

FERC annual charges (2002): $153,780.

Table 10: Bliss, FERC License No. 1975

Dollars in 2002 dollars

	1998	1999	2000	2003
Generation (kwh)	491,650,000	465,406,000	405,601,000	463,943,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$14,412,242**	**$17,644,316**	**$54,050,585**	**$20,456,210**
RCLPD	$93,720,000	$91,540,000	$89,360,000	$82,820,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$6,766,584**	**$6,609,188**	**$6,451,792**	**$5,979,604**
1-year's depreciation	$2,180,000	$2,180,000	$2,180,000	$2,180,000
Total capital costs	**$8,946,584**	**$8,789,188**	**$8,631,792**	**$8,159,604**
Taxes	$984,341	$1,591,870	$1,406,085	$1,288,105
Operations and maintenance	$1,194,352	$1,597,704	$1,562,505	$1,454,008
Total costs	**$11,125,278**	**$11,978,762**	**$11,600,382**	**$10,901,717**
Net benefit	$3,286,964	$5,665,555	$42,450,203	$9,554,493
Percentage of project on federal lands	60%	60%	60%	60%
Net benefit of federal lands	**$1,972,178**	**$3,399,333**	**$25,470,122**	**$5,732,696**
Estimated return on investment	10.73%	13.41%	54.72%	18.76%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Idaho Power.

FERC annual charges (2002): $16,327.

Table 11: Boundary, FERC License No. 2144

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	3,827,283,720	4,445,309,880	3,786,081,000	4,353,333,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$112,193,100**	**$168,529,100**	**$504,534,981**	**$191,947,487**
RCLPD	$438,460,000	$427,670,000	$416,880,000	$384,510,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$31,656,812**	**$30,877,774**	**$30,098,736**	**$27,761,622**
1-year's depreciation	$10,790,000	$10,790,000	$10,790,000	$10,790,000
Total capital costs	**$42,446,812**	**$41,667,774**	**$40,888,736**	**$38,551,622**
Taxes	$23,023,259	$21,573,230	$25,252,386	$22,298,245
Operations and maintenance	$8,164,029	$7,662,020	$7,093,877	$7,735,371
Total costs	**$73,634,100**	**$70,903,024**	**$73,235,000**	**$68,585,237**
Net benefit	$38,559,000	$97,626,076	$431,299,981	$123,362,250
Percentage of project on federal lands	69%	69%	69%	69%
Net benefit of federal lands	**$26,605,710**	**$67,361,992**	**$297,596,987**	**$85,119,952**
Estimated return on investment	16.01%	30.05%	110.68%	39.30%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: City of Seattle.

FERC annual charges (2002): $33,538.

Table 12: California Aqueduct, FERC License No. 2426

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	1,665,149,000	2,055,889,000	1,745,986,000	1,953,370,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$48,812,223**	**$77,942,175**	**$232,670,937**	**$86,128,137**
RCLPD	$2,392,100,000	$2,365,500,000	$2,338,900,000	$2,259,100,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$172,709,620**	**$170,789,100**	**$168,868,580**	**$163,107,020**
1-year's depreciation	$26,600,000	$26,600,000	$26,600,000	$26,600,000
Total capital costs	**$199,309,620**	**$197,389,100**	**$195,468,580**	**$189,707,020**
Taxes	$0	$0	$0	$0
Operations and maintenance	$18,410,988	$19,362,864	$25,995,071	$21,599,815
Total costs	**$217,720,608**	**$216,751,964**	**$221,463,651**	**$211,306,835**
Net benefit	($168,908,385)	($138,809,788)	$11,207,286	($125,178,698)
Percentage of project on federal lands	16%	16%	16%	16%
Net benefit of federal lands	**($27,025,342)**	**($22,209,566)**	**$1,793,166**	**($20,028,592)**
Estimated return on investment	0.16%	1.35%	7.70%	1.68%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: California Department of Water Resources.

FERC annual charges (2002): $17,463.

Table 13: Coosa River, FERC License No. 2146

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	2,350,723,000	1,631,966,000	1,028,390,000	2,037,752,000
Price	$0.0428	$0.0451	$0.0370	$0.0441
Value of power	**$100,631,464**	**$73,579,712**	**$38,074,641**	**$89,848,715**
RCLPD	$705,520,000	$680,040,000	$654,560,000	$578,120,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$50,938,544**	**$49,098,888**	**$47,259,232**	**$41,740,264**
1-year's depreciation	$25,480,000	$25,480,000	$25,480,000	$25,480,000
Total capital costs	**$76,418,544**	**$74,578,888**	**$72,739,232**	**$67,220,264**
Taxes	$14,869,270	$10,322,842	$7,054,801	$12,596,056
Operations and maintenance	$9,016,934	$8,538,031	$9,007,943	$8,903,706
Total costs	**$100,304,748**	**$93,439,762**	**$88,801,975**	**$88,720,026**
Net benefit	$326,716	($19,860,049)	($50,727,334)	$1,128,688
Percentage of project on federal lands	0.2%	0.2%	0.2%	0.2%
Net benefit of federal lands	**$555**	**($33,762)**	**($86,236)**	**$1,919**
Estimated return on investment	7.27%	4.30%	-0.53%	7.42%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Alabama Power.

FERC annual charges (2002): $6,933.

Table 14: Don Pedro, FERC License No. 2299

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	1,053,287,020	702,548,000	477,697,000	636,108,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$30,876,085**	**$26,634,765**	**$63,658,133**	**$28,047,322**
RCLPD	$505,640,000	$499,830,000	$494,020,000	$476,590,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$36,507,208**	**$36,087,726**	**$35,668,244**	**$34,409,798**
1-year's depreciation	$5,810,000	$5,810,000	$5,810,000	$5,810,000
Total capital costs	**$42,317,208**	**$41,897,726**	**$41,478,244**	**$40,219,798**
Taxes	$0	$0	$0	$0
Operations and maintenance	$2,968,359	$2,539,956	$3,516,604	$3,055,939
Total costs	**$45,285,567**	**$44,437,682**	**$44,994,848**	**$43,275,737**
Net benefit	($14,409,482)	($17,802,918)	$18,663,284	($15,228,415)
Percentage of project on federal lands	37%	37%	37%	37%
Net benefit of federal lands	**($5,331,508)**	**($6,587,080)**	**$6,905,415**	**($5,634,514)**
Estimated return on investment	4.37%	3.66%	11.00%	4.02%

Sources: Various agencies (data), GAO (analysis).

Notes: Owners: Turlock and Modesto Irrigation Districts.

FERC annual charges (2002): $249,313.

Table 15: Feather River, FERC License No. 2100

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	3,847,301,000	2,925,184,000	2,524,105,000	3,189,787,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$112,779,887**	**$110,898,596**	**$336,363,450**	**$140,644,329**
RCLPD	$1,586,540,000	$1,567,080,000	$1,547,620,000	$1,489,240,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$114,548,188**	**$113,143,176**	**$111,738,164**	**$107,523,128**
1-year's depreciation	$19,460,000	$19,460,000	$19,460,000	$19,460,000
Total capital costs	**$134,008,188**	**$132,603,176**	**$131,198,164**	**$126,983,128**
Taxes	$0	$0	$0	$0
Operations and maintenance	$12,768,334	$12,360,892	$11,570,904	$12,388,113
Total costs	**$146,776,522**	**$144,964,068**	**$142,769,068**	**$139,371,241**
Net benefit	($33,996,635)	($34,065,471)	$193,594,382	$1,273,088
Percentage of project on federal lands	18%	18%	18%	18%
Net benefit of federal lands	**($6,119,394)**	**($6,131,785)**	**$34,846,989**	**$229,156**
Estimated return on investment	5.08%	5.05%	19.73%	7.31%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: California Department of Water Resources.

FERC annual charges (2002): $9,158.

Table 16: Haas-Kings River, FERC License No. 1988

Dollars in 2002 dollars

	1998	1999	2000	2003
Generation (kwh)	1,000,289,000	493,756,000	743,326,000	860,409,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$29,322,499**	**$18,719,112**	**$99,055,981**	**$37,937,219**
RCLPD	$407,080,000	$400,260,000	$393,440,000	$372,980,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$29,391,176**	**$28,898,772**	**$28,406,368**	**$26,929,156**
1-year's depreciation	$6,820,000	$6,820,000	$6,820,000	$6,820,000
Total capital costs	**$36,211,176**	**$35,718,772**	**$35,226,368**	**$33,749,156**
Taxes	$12,264,819	$5,391,264	($20,449,656)	$8,828,041
Operations and maintenance	$3,207,088	$3,732,820	$3,044,591	$3,377,873
Total costs	**$51,683,083**	**$44,842,856**	**$17,821,303**	**$45,955,071**
Net benefit	($22,360,584)	($26,123,744)	$81,234,679	($8,017,852)
Percentage of project on federal lands	85%	85%	85%	85%
Net benefit of federal lands	**($19,006,496)**	**($22,205,182)**	**$69,049,477**	**($6,815,174)**
Estimated return on investment	1.73%	0.69%	27.87%	5.07%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Pacific Gas and Electric.

FERC annual charges (2002): $202,378.

Table 17: Hells Canyon, FERC License No. 1971

Dollars in 2002 dollars				
	1998	**1999**	**2000**	**2003**
Generation (kwh)	7,482,604,000	7,041,547,000	5,768,411,000	6,998,260,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$219,345,258**	**$266,956,772**	**$768,701,233**	**$308,567,808**
RCLPD	$703,460,000	$679,470,000	$655,480,000	$583,510,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$50,789,812**	**$49,057,734**	**$47,325,656**	**$42,129,422**
1-year's depreciation	$23,990,000	$23,990,000	$23,990,000	$23,990,000
Total capital costs	**$74,779,812**	**$73,047,734**	**$71,315,656**	**$66,119,422**
Taxes	$14,981,058	$24,084,830	$19,997,178	$19,532,944
Operations and maintenance	$5,877,905	$7,760,440	$7,664,822	$7,114,735
Total costs	**$95,638,775**	**$104,893,003**	**$98,977,656**	**$92,767,101**
Net benefit	$123,706,483	$162,063,769	$669,723,577	$215,800,707
Percentage of project on federal lands	90%	90%	90%	90%
Net benefit of federal lands	**$111,335,835**	**$145,857,392**	**$602,751,219**	**$194,220,636**
Estimated return on investment	24.81%	31.07%	109.39%	44.20%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Idaho Power.

FERC annual charges (2002): $371,075.

Table 18: Kerckhoff 1&2, FERC License No. 96

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	811,487,000	442,526,000	519,900,000	685,309,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$23,787,952**	**$16,776,898**	**$69,282,125**	**$30,216,696**
RCLPD	$132,900,000	$126,700,000	$120,500,000	$101,900,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$9,595,380**	**$9,147,740**	**$8,700,100**	**$7,357,180**
1-year's depreciation	$6,200,000	$6,200,000	$6,200,000	$6,200,000
Total capital costs	**$15,795,380**	**$15,347,740**	**$14,900,100**	**$13,557,180**
Taxes	$9,949,865	$4,831,890	($14,302,979)	$7,390,878
Operations and maintenance	$3,150,251	$3,437,569	$3,012,817	$3,249,366
Total costs	**$28,895,497**	**$23,617,198**	**$3,609,938**	**$24,197,424**
Net benefit	($5,107,544)	($6,840,301)	$65,672,187	$6,019,272
Percentage of project on federal lands	66%	66%	66%	66%
Net benefit of federal lands	**($3,370,979)**	**($4,514,599)**	**$43,343,643**	**$3,972,720**
Estimated return on investment	3.38%	1.82%	61.72%	13.13%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Pacific Gas and Electric.

FERC annual charges (2002): $25,476.

Table 19: Kerr, FERC License No. 5

Dollars in 2002 dollars

	1998	1999	2000	2003
Generation (kwh)	1,013,017,230	1,112,198,118	1,124,722,000	1,164,570,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$29,695,615**	**$42,165,283**	**$149,880,996**	**$51,348,308**
RCLPD	$162,760,000	$158,745,000	$154,730,000	$142,685,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$11,751,272**	**$11,461,389**	**$11,171,506**	**$10,301,857**
1-year's depreciation	$4,015,000	$4,015,000	$4,015,000	$4,015,000
Total capital costs	**$15,766,272**	**$15,476,389**	**$15,186,506**	**$14,316,857**
Taxes	$7,033,669	$7,740,389	$4,968,029	$7,387,029
Operations and maintenance	$1,806,949	$2,021,255	$1,592,134	$1,824,738
Total costs	**$24,606,889**	**$25,238,033**	**$21,746,669**	**$23,528,624**
Net benefit	$5,088,725	$16,927,250	$128,134,327	$27,819,685
Percentage of project on federal lands	2%	2%	2%	2%
Net benefit of federal lands	**$101,775**	**$338,545**	**$2,562,687**	**$556,394**
Estimated return on investment	10.35%	17.88%	90.03%	26.72%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: PP&L Montana.

FERC annual charges (2002): $1,823.

For this project, operations and maintenance costs were adjusted to exclude payments made for the use of Native American lands.

Table 20: North Fork, FERC License No. 2195

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	507,690,000	586,514,000	466,426,000	535,966,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$14,882,439**	**$22,235,722**	**$62,156,154**	**$23,631,853**
RCLPD	$100,280,000	$96,460,000	$92,640,000	$81,180,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$7,240,216**	**$6,964,412**	**$6,688,608**	**$5,861,196**
1-year's depreciation	$3,820,000	$3,820,000	$3,820,000	$3,820,000
Total capital costs	**$11,060,216**	**$10,784,412**	**$10,508,608**	**$9,681,196**
Taxes	$2,561,569	$2,728,153	$1,940,147	$2,644,861
Operations and maintenance	$3,813,505	$3,521,370	$2,643,929	$3,374,338
Total costs	**$17,435,290**	**$17,033,935**	**$15,092,684**	**$15,700,395**
Net benefit	($2,552,852)	$5,201,787	$47,063,470	$7,931,459
Percentage of project on federal lands	16%	16%	16%	16%
Net benefit of federal lands	**($408,456)**	**$832,286**	**$7,530,155**	**$1,269,033**
Estimated return on investment	4.67%	12.61%	58.02%	16.99%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Portland General Electric.

FERC annual charges (2002): $7,087.

Table 21: North Umpqua, FERC License No. 1927

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	1,068,238,000	1,151,767,000	992,251,000	1,067,051,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$31,314,358**	**$43,665,405**	**$132,227,847**	**$47,048,493**
RCLPD	$449,780,000	$441,260,000	$432,740,000	$407,180,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$32,474,116**	**$31,858,972**	**$31,243,828**	**$29,398,396**
1-year's depreciation	$8,520,000	$8,520,000	$8,520,000	$8,520,000
Total capital costs	**$40,994,116**	**$40,378,972**	**$39,763,828**	**$37,918,396**
Taxes	$2,665,609	$3,531,653	$2,919,663	$3,098,631
Operations and maintenance	$1,577,117	$4,486,202	$4,607,187	$3,726,428
Total costs	**$45,236,841**	**$48,396,827**	**$47,290,678**	**$44,743,455**
Net benefit	($13,922,483)	($4,731,423)	$84,937,169	$2,305,039
Percentage of project on federal lands	100%	100%	100%	100%
Net benefit of federal lands	**($13,922,483)**	**($4,731,423)**	**$84,937,169**	**$2,305,039**
Estimated return on investment	4.12%	6.15%	26.85%	7.79%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Pacificorp.

FERC annual charges (2002): $107,525.

Table 22: Noxon Rapids, FERC License No. 2075

Dollars in 2002 dollars

	1998	1999	2000	2003
Generation (kwh)	1,688,285,000	1,896,663,000	1,635,238,000	1,996,970,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$49,490,433**	**$71,905,653**	**$217,912,605**	**$88,050,552**
RCLPD	$624,740,000	$613,080,000	$601,420,000	$566,440,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$45,106,228**	**$44,264,376**	**$43,422,524**	**$40,896,968**
1-year's depreciation	$11,660,000	$11,660,000	$11,660,000	$11,660,000
Total capital costs	**$56,766,228**	**$55,924,376**	**$55,082,524**	**$52,556,968**
Taxes	$4,451,279	$4,625,208	$1,345,019	$4,538,243
Operations and maintenance	$2,582,016	$3,156,814	$4,040,562	$3,309,051
Total costs	**$63,799,523**	**$63,706,397**	**$60,468,104**	**$60,404,263**
Net benefit	($14,309,090)	$8,199,255	$157,444,500	$27,646,289
Percentage of project on federal lands	5%	5%	5%	5%
Net benefit of federal lands	**($715,454)**	**$409,963**	**$7,872,225**	**$1,382,314**
Estimated return on investment	4.93%	8.56%	33.40%	12.10%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Avista.

FERC annual charges (2002): $21,880.

Table 23: Pit River, FERC License No. 233

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	2,421,714,000	2,203,044,000	1,973,926,000	2,170,564,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$70,990,190**	**$83,521,066**	**$263,046,331**	**$95,704,672**
RCLPD	$420,400,000	$408,800,000	$397,200,000	$362,400,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$30,352,880**	**$29,515,360**	**$28,677,840**	**$26,165,280**
1-year's depreciation	$11,600,000	$11,600,000	$11,600,000	$11,600,000
Total capital costs	**$41,952,880**	**$41,115,360**	**$40,277,840**	**$37,765,280**
Taxes	$29,693,302	$24,054,781	($54,304,717)	$26,874,041
Operations and maintenance	$6,244,151	$5,675,887	$5,072,667	$5,746,843
Total costs	**$77,890,332**	**$70,846,028**	**($8,954,211)**	**$70,386,164**
Net benefit	($6,900,142)	$12,675,038	$272,000,542	$25,318,508
Percentage of project on federal lands	20%	20%	20%	20%
Net benefit of federal lands	**($1,380,028)**	**$2,535,008**	**$54,400,108**	**$5,063,702**
Estimated return on investment	5.58%	10.32%	75.70%	14.21%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Pacific Gas and Electric.

FERC annual charges (2002): $49,448.

Table 24: Priest Rapids, FERC License No. 2114

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	9,432,280,000	11,314,265,000	9,621,814,000	10,671,292,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$276,498,114**	**$428,942,626**	**$1,282,207,576**	**$470,519,412**
RCLPD	$857,620,000	$819,840,000	$782,060,000	$668,720,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$61,920,164**	**$59,192,448**	**$56,464,732**	**$48,281,584**
1-year's depreciation	$37,780,000	$37,780,000	$37,780,000	$37,780,000
Total capital costs	**$99,700,164**	**$96,972,448**	**$94,244,732**	**$86,061,584**
Taxes	$7,637,605	$8,356,892	$8,652,931	$7,997,248
Operations and maintenance	$23,349,213	$22,000,357	$25,281,673	$23,882,666
Total costs	**$130,686,981**	**$127,329,696**	**$128,179,336**	**$117,941,498**
Net benefit	$145,811,132	$301,612,930	$1,154,028,240	$352,577,914
Percentage of project on federal lands	8%	8%	8%	8%
Net benefit of federal lands	**$11,664,891**	**$24,129,034**	**$92,322,259**	**$28,206,233**
Estimated return on investment	24.22%	44.01%	154.78%	59.94%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Grant County Public Utility District.

FERC annual charges (2002): $49,262.

Table 25: Rock Island, FERC License No. 943

Dollars in 2002 dollars

	1998	1999	2000	2003
Generation (kwh)	2,567,863,600	3,184,966,500	2,747,085,000	2,938,037,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$75,274,424**	**$120,747,384**	**$366,077,873**	**$129,544,149**
RCLPD	$397,600,000	$383,400,000	$369,200,000	$326,600,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$28,706,720**	**$27,681,480**	**$26,656,240**	**$23,580,520**
1-year's depreciation	$14,200,000	$14,200,000	$14,200,000	$14,200,000
Total capital costs	**$42,906,720**	**$41,881,480**	**$40,856,240**	**$37,780,520**
Taxes	$2,167,707	$1,870,624	$1,588,846	$2,019,166
Operations and maintenance	$16,274,989	$17,364,417	$15,436,263	$16,561,592
Total costs	**$61,349,416**	**$61,116,521**	**$57,881,350**	**$56,361,278**
Net benefit	$13,925,008	$59,630,862	$308,196,523	$73,182,871
Percentage of project on federal lands	1%	1%	1%	1%
Net benefit of federal lands	**$139,250**	**$596,309**	**$3,081,965**	**$731,829**
Estimated return on investment	10.72%	22.77%	90.70%	29.63%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Chelan County Public Utility District.

FERC annual charges (2002): $628.

Table 26: Rocky Reach, FERC License No. 2145

Dollars in 2002 dollars	1998	1999	2000	2003
Generation (kwh)	5,963,472,049	7,425,230,613	6,288,474,000	6,694,102,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$174,813,383**	**$281,502,857**	**$838,005,079**	**$295,156,851**
RCLPD	$737,600,000	$720,800,000	$704,000,000	$653,600,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$53,254,720**	**$52,041,760**	**$50,828,800**	**$47,189,920**
1-year's depreciation	$16,800,000	$16,800,000	$16,800,000	$16,800,000
Total capital costs	**$70,054,720**	**$68,841,760**	**$67,628,800**	**$63,989,920**
Taxes	$5,034,170	$4,361,056	$3,637,099	$4,697,613
Operations and maintenance	$22,186,765	$26,363,109	$25,907,624	$25,154,953
Total costs	**$97,275,655**	**$99,565,925**	**$97,173,523**	**$93,842,486**
Net benefit	$77,537,728	$181,936,931	$740,831,556	$201,314,365
Percentage of project on federal lands	1%	1%	1%	1%
Net benefit of federal lands	**$775,377**	**$1,819,369**	**$7,408,316**	**$2,013,144**
Estimated return on investment	17.73%	32.46%	112.45%	38.02%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Chelan County Public Utility District.

FERC annual charges (2002): $2,580.

Table 27: Skagit River, FERC License No. 553

Dollars in 2002 dollars

	1998	1999	2000	2003
Generation (kwh)	2,182,773,373	3,165,975,767	2,510,464,000	2,766,407,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$63,985,878**	**$120,027,413**	**$334,545,644**	**$121,976,626**
RCLPD	$783,520,000	$767,890,000	$752,260,000	$705,370,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$56,570,144**	**$55,441,658**	**$54,313,172**	**$50,927,714**
1-year's depreciation	$15,630,000	$15,630,000	$15,630,000	$15,630,000
Total capital costs	**$72,200,144**	**$71,071,658**	**$69,943,172**	**$66,557,714**
Taxes	$13,130,607	$15,364,581	$16,744,282	$14,247,594
Operations and maintenance	$11,499,148	$11,748,608	$11,948,450	$11,890,426
Total costs	**$96,829,899**	**$98,184,846**	**$98,635,904**	**$92,695,734**
Net benefit	($32,844,021)	$21,842,567	$235,909,740	$29,280,892
Percentage of project on federal lands	70%	70%	70%	70%
Net benefit of federal lands	**($22,990,815)**	**$15,289,797**	**$165,136,818**	**$20,496,624**
Estimated return on investment	3.03%	10.06%	38.58%	11.37%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: City of Seattle.

FERC annual charges (2002): $917,001.

Table 28: Swift, FERC License No. 2111

Dollars in 2002 dollars

	1998	1999	2000	2003
Generation (kwh)	738,349,000	912,943,000	629,872,000	824,169,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$21,643,983**	**$34,611,189**	**$83,937,047**	**$36,339,322**
RCLPD	$252,800,000	$247,350,000	$241,900,000	$225,550,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$18,252,160**	**$17,858,670**	**$17,465,180**	**$16,284,710**
1-year's depreciation	$5,450,000	$5,450,000	$5,450,000	$5,450,000
Total capital costs	**$23,702,160**	**$23,308,670**	**$22,915,180**	**$21,734,710**
Taxes	$1,842,426	$2,799,349	$1,853,376	$2,320,888
Operations and maintenance	$1,729,340	$3,196,729	$3,016,732	$2,755,581
Total costs	**$27,273,926**	**$29,304,748**	**$27,785,288**	**$26,811,179**
Net benefit	($5,629,944)	$5,306,441	$56,151,759	$9,528,143
Percentage of project on federal lands	6%	6%	6%	6%
Net benefit of federal lands	**($337,797)**	**$318,386**	**$3,369,106**	**$571,689**
Estimated return on investment	4.99%	9.37%	30.43%	11.44%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Pacificorp.

FERC annual charges (2002): $18,651.

Table 29: Thompson Falls, FERC License No. 1869

Dollars in 2002 dollars

	1998	1999	2000	2003
Generation (kwh)	505,681,000	523,358,957	506,722,000	497,759,000
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$14,823,547**	**$19,841,410**	**$67,526,018**	**$21,947,227**
RCLPD	$121,940,000	$118,430,000	$114,920,000	$104,390,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$8,804,068**	**$8,550,646**	**$8,297,224**	**$7,536,958**
1-year's depreciation	$3,510,000	$3,510,000	$3,510,000	$3,510,000
Total capital costs	**$12,314,068**	**$12,060,646**	**$11,807,224**	**$11,046,958**
Taxes	$3,511,088	$3,642,339	$2,238,251	$3,576,713
Operations and maintenance	$1,234,231	$966,774	$1,006,853	$1,082,540
Total costs	**$17,059,387**	**$16,669,759**	**$15,052,328**	**$15,706,211**
Net benefit	($2,235,840)	$3,171,651	$52,473,690	$6,241,016
Percentage of project on federal lands	11%	11%	11%	11%
Net benefit of federal lands	**($245,942)**	**$348,882**	**$5,772,106**	**$686,512**
Estimated return on investment	5.39%	9.90%	52.88%	13.20%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: PP&L Montana.

FERC annual charges (2002): $4,043.

Table 30: Upper American River Project, FERC License No. 2101

Dollars in 2002 dollars

	1998	1999	2000	2003
Generation (kwh)	2,818,100,622	2,317,979,622	1,944,354,622	2,476,064,622
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$82,609,879**	**$87,878,467**	**$259,105,635**	**$109,174,828**
RCLPD	$1,377,020,000	$1,338,290,000	$1,299,560,000	$1,183,370,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$99,420,844**	**$96,624,538**	**$93,828,232**	**$85,439,314**
1-year's depreciation	$38,730,000	$38,730,000	$38,730,000	$38,730,000
Total capital costs	**$138,150,844**	**$135,354,538**	**$132,558,232**	**$124,169,314**
Taxes	$103,413	$93,043	$49,249	$98,228
Operations and maintenance	$10,759,147	$10,641,772	$10,080,115	$10,627,978
Total costs	**$149,013,405**	**$146,089,352**	**$142,687,596**	**$134,895,520**
Net benefit	($66,403,526)	($58,210,885)	$116,418,039	($25,720,692)
Percentage of project on federal lands	59%	59%	59%	59%
Net benefit of federal lands	**($39,178,080)**	**($34,344,422)**	**$68,686,643**	**($15,175,208)**
Estimated return on investment	2.40%	2.87%	16.18%	5.05%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Sacramento Municipal Utility District.

FERC annual charges (2002): $285,804.

Table 31: Upper North Fork Feather River, FERC License No. 2105

Dollars in 2002 dollars

	1998	1999	2000	2003
Generation (kwh)	1,524,166,457	1,297,626,219	1,251,223,000	1,482,681,522
Price	$0.0293	$0.0379	$0.1333	$0.0441
Value of power	**$44,679,457**	**$49,195,171**	**$166,738,581**	**$65,374,506**
RCLPD	$417,360,000	$406,070,000	$394,780,000	$360,910,000
Rate of return on investment	7.22%	7.22%	7.22%	7.22%
Subtotal (return on investment)	**$30,133,392**	**$29,318,254**	**$28,503,116**	**$26,057,702**
1-year's depreciation	$11,290,000	$11,290,000	$11,290,000	$11,290,000
Total capital costs	**$41,423,392**	**$40,608,254**	**$39,793,116**	**$37,347,702**
Taxes	$18,688,224	$14,168,630	($34,422,421)	$16,428,427
Operations and maintenance	$6,233,997	$7,331,316	$5,462,547	$6,431,826
Total costs	**$66,345,614**	**$62,108,200**	**$10,833,243**	**$60,207,955**
Net benefit	($21,666,156)	($12,913,029)	$155,905,338	$5,166,551
Percentage of project on federal lands	4%	4%	4%	4%
Net benefit of federal lands	**($866,646)**	**($516,521)**	**$6,236,214**	**$206,662**
Estimated return on investment	2.03%	4.04%	46.71%	8.65%

Sources: Various agencies (data), GAO (analysis).

Notes: Owner: Pacific Gas and Electric.

FERC annual charges (2002): $85,389.

Comments from the Federal Energy Regulatory Commission

Note: GAO's comments appear at the end of this appendix.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426

OFFICE OF THE CHAIRMAN

April 2, 2003

Mr. Barry T. Hill
Director
Natural Resources and Environment
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Re: FERC's Comments on GAO Draft Report, GAO-03-383

Dear Mr. Hill:

Thank you for giving us the opportunity to respond to your draft report entitled "Charges for Hydropower Projects' Use of Federal Lands Need to Be Reassessed." We feel that this report highlighted many of the issues surrounding land valuations and was a laudable effort in analyzing such a difficult subject.

Section 10(e)(1) of the Federal Power Act requires the Commission to collect from its hydropower licensees reasonable annual charges to recompense the United States for a project's use, occupancy, and enjoyment of federal lands, but to seek to avoid increasing the price to the consumers of the project power. The Commission has used an assessment system based on a schedule of right-of-way values developed by the U.S. Forest Service and Bureau of Land Management. These values are based on local surveys of market values for the various types of land that has been allowed to be occupied by linear rights-of-way and the fees are calculated on a per-acre basis by state and county.

See comment 1.

The draft report identifies an alternative method to recover compensation for a project licensee's use of federal lands. The method employed a "net benefits" analysis. Using a sample of licensed projects, its analysis produced values in orders of magnitude far exceeding those calculated under the right-of-way system. The GAO method also showed extreme variations in year-to-year charges. Both of these results are reasons for GAO to reconsider the validity of its method.

The draft report provides sound recommendations on how the Commission's databases containing information on federal lands should be managed. These databases were established independently for different purposes.

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We are reviewing the specifics of these recommendations and will implement the improvements as soon as possible.

I have enclosed an appendix with staff comments on the report. If you have any questions concerning our comments, please contact John R. Paquin at (202) 502-6003.

Best regards,

Pat Wood, III
Chairman

Enclosure

FEDERAL ENERGY REGULATORY COMMISSION
STAFF COMMENTS ON DRAFT REPORT ENTITLED
"Charges for Hydropower Projects' Use of Federal Lands Need to Be Reassessed"

General Comments:

See comment 2.

1. The net benefits methodology employed in calculating the fair market value of the lands occupied by the sample set of 24 licensed projects yielded values that in many cases far exceeded the values calculated under the current right-of-way methodology. One striking example is the Hells Canyon Project in Idaho. Ninety percent of lands within the project boundary are federal. In FY 2002, we collected annual charges of $371,000 while between 1998 and 2000, under the net benefits approach, the annual value for the use of federal lands was estimated to range from $111,336,000 to $602,751,000. We question how charges based on such extreme valuations could be considered "reasonable."

See comment 3.

2. Utilizing the net benefits analysis technique would require the Commission to begin collecting additional data that is currently collected only from some licensees, or is not currently required to be filed. Data on project operating costs and expenses, overhead expenses, and replacement costs generally are not available and may be reported differently using different assumptions and accounting practices. Under the net benefits methodology, the Commission staff would have to recalculate much of the data each year. Moreover, additional burden would be placed on licensees to supply some of this information. Additional staff and resources would be required to perform these analyses and to recalculate the amounts each year.

See comment 4.

3. The draft report states that the Commission does not verify the federal acreage within the project boundary reported by licensees in their applications. Federal land management agencies are active participants, and sometimes cooperating agencies in our licensing/relicensing and NEPA processes. Public notices are issued giving the agencies the opportunity to review the reported acreage figures and location of these lands. Any disagreements are worked out by the agency and applicant before the Commission establishes the charges.

See comment 5.

4. GAO conducted its net benefits analysis using a stratified sample of 24 projects that accounted for about 60 percent of the power generated by projects that occupy federal lands. Moreover, the sample set of 24 was drawn from a set of 56 projects that represent about 90 percent of the power generated at projects

occupying federal lands. These 56 projects represent 5.5 percent of the total licensed projects under the Commission's jurisdiction. That leaves 117 projects on federal lands that generate the remaining 10 percent of the power. We must also consider the time and resources required to conduct economic analyses that involve such a small number of projects. The same detailed analysis would have to be applied to the 117 projects that only contribute 10 percent of the power.

See comment 6.

5. The draft report acknowledges that the value of the federal land can change dramatically with a significant change in supply and demand for electricity. The wholesale price of electricity, one of the key factors in the net benefit methodology, is governed by supply and demand factors. In addition, the draft report lists other uncertainties like changes in weather, regulatory constraints, and cost of fuels that can affect electricity markets. Licensees would be placed in the very difficult position of having to plan and budget their resources to respond to wide variations in annual charge bills, which would place an increased burden on all licensees.

Specific Comments:

Note: Page numbers in the draft report may differ from those in this report.

See comment 7.

Page 14, 3rd paragraph – The statement that FERC databases with information on federal lands contain "conflicting information" is misleading. These databases were set up independently for different purposes and the perceived inconsistencies reflect this fact. For example, the Commission does not issue bills or collect charges from most of the approximately 10 licensed projects that occupy Indian tribal reservations, because it approved settlement agreements that provided for lump-sum payments or payments that the licensee makes directly to the tribes. Also, the Commission does not assess federal land use charges for the federal lands underlying a federal dam used by a licensed project; instead, the licensee pays a federal dam use charge.

Nevertheless, we agree that integrating portions of these systems would increase accuracy and efficiency for all users. Presently, the Commission is developing requirements for a Commission-wide tracking and management system that includes, as one of its primary goals, the functional integration of associated and duplicative systems.

See comment 5.

Page 28, 3 bullets – The suggestions on how to mitigate the effects on consumers of assessing rates close to or equal to fair market values ignore the difficulty in setting different rates for each of the 173 projects that would be considered to be reasonable, in light of the number of variables GAO has identified as affecting the calculation of fair market value. This would be an extremely complex undertaking that would almost guarantee a significant number of disputed bills and administrative hearings to resolve them.

See comment 5.

Page 48, 3rd full paragraph – GAO acknowledges the "wide variety of characteristics that determine the value and costs of any particular dam." We accept the fact that any change to our methodology of calculating land use charges would open the door to challenge. But to impose a system based on complex economic analyses based on so many assumptions would almost certainly result in costly challenges and appeals. One example is the actual contribution the government lands make to the project. How do you factor that into the equation and fairly access each licensee?

See comment 8.

Page 62 – Under the GAO net benefits methodology, the percentage of a project's total acreage that is federal is a key consideration in its calculations. What matters is not the percentage that is federal, but the value of what such lands contribute to the project's economic benefits.

The following are GAO's comments on the Federal Energy Regulatory Commission's letter dated April 2, 2003.

GAO's Comments

1. We disagree. As we discuss, the value of federal land varied because the wholesale price of electricity varied during the 3 years we reviewed—-not because our analysis was flawed. Furthermore, even the lowest of our estimates of the value of federal lands used for hydropower demonstrates that FERC's current annual charge system is getting less than 2 percent of the land's hydropower value. We shared these results in detail with high-level FERC officials—-including FERC's Executive Director—in September 2002 and February 2003. In contrast to their written comments, FERC officials at those meetings indicated that they had no analytical disagreement with our analysis, and as we indicate in our report, the Executive Director agreed that a reassessment of FERC's current annual charge system would be appropriate.

2. We do not specifically recommend that FERC use a net benefits approach as a mechanism for levying annual charges. However, we do recommend that FERC consider the hydropower value of the land—as well as the Federal Power Act's other competing goals of encouraging the development of hydropower and avoiding unreasonable rate increases to consumers—to develop a reasonable annual charge. As we reported, FERC's annual charge system is based on a fee schedule that was not designed for hydropower uses, and that does not accurately assess fair market value for the fee schedule's original intended purpose. FERC did not address these shortcomings in its comments. Moreover, because FERC officials have not analyzed the value of federal lands used to produce hydropower for more than 15 years, it is difficult for FERC to address such questions as (1) what is the fair market value of these lands, (2) how much does FERC need to discount from fair market value to adequately encourage the development of hydropower, and (3) at what point would annual charges based on the fair market value result in unreasonable rate increases to consumers. After completing such an analysis FERC will be in a better position to determine what annual charges are reasonable.

3. As mentioned in comment 2, we do not specifically recommend that FERC adopt a net benefits approach. We recognize that in reassessing its current annual charge system, by whatever method it uses, FERC may have to consider the administrative burden it may pose for itself

and licensees. In the end, FERC has to consider the costs and benefits of revising its current system. Since our estimates indicate that the federal lands are worth hundreds of millions of dollars annually, it is likely worthwhile for FERC to expend more resources than it does under its existing system. Regarding licensees, FERC currently requires many licensees to report an enormous amount of data in its annual FERC Form 1 submissions. For several licensees in our sample, the completed form was more than an inch thick. In our view, FERC has not demonstrated that requiring licensees to provide additional data would significantly increase the existing burden on licensees. (See also comment 5.)

4. We disagree with FERC's apparent assertion that the federal land management agencies—not FERC—are responsible for determining the amount of federal acreage to levy an annual charge, and that through the process of issuing a public notice, federal land management agencies and the license applicant will resolve any questions about the number of federal acres involved. We have two concerns about this assertion. First, under the Federal Power Act, developing and executing an annual charge system is FERC's responsibility—not that of the federal land management agencies'. Accordingly, FERC should ensure that it has accurate and verified information on the amount of federal acres that licensees should be charged for using. Second, if FERC wants the federal land management agencies to verify federal acreage, then FERC needs to formally communicate this task to the agencies, develop mutually agreed to protocols, and confirm that the work was completed. According to officials from the Forest Service and the Department of the Interior, none of these actions have occurred.

5. See comment 2. In addition, we do not recommend that FERC perform a net benefit analysis every year on all projects that use federal lands. Finally, if FERC reassesses its current annual charge system, it needs to decide which valuation tools to use, how to balance the competing goals of the Federal Power Act, and what revisions to make.

6. If FERC decides to reassess and revise its annual charge system, it does not have to use an annual charge system that fluctuates with electricity markets. FERC can make decisions on the basis of long-term expectations that would tend to mitigate short-term volatility. In the past, FERC has approved annual charges for tribal lands that (1) were based on a long-term analysis of the value for the use of the land and

(2) were a fixed amount so that licensees could plan and budget for them.

7. We disagree that our presentation of issues regarding the databases supporting FERC's annual charge program is "misleading." Even though these databases were established for varying reasons, FERC still has to correct conflicting information. However, as discussed in the report, the databases for several cases we reviewed contained conflicting billing or federal acreage information that we could not resolve. More importantly, FERC staff had difficulty resolving this conflicting information, and in some cases never did.

8. FERC appears to agree with our essential point that, in valuing federal lands, what matters is how much these lands contribute to the project's economic benefit. The value of the economic contribution of federal lands to hydropower production forms the basis for the approach we took in this report. We recognize that for many of the projects in our sample, a portion of the acreage is owned by the federal government and the remainder is owned by other parties. For our analysis, we multiplied the value to hydropower production of all lands in each project by the percentage of the project owned by the federal government. However, if FERC can differentiate between project lands that are more or less important in producing economic value, then FERC would be justified in setting annual charges accordingly.

Comments from the National Hydropower Association

Note: GAO's comments appear at the end of this appendix.

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March 31, 2003

Mr. Barry T. Hill
Director
Natural Resources and Environment
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Re: Comments of the National Hydropower Association (NHA) and Western Public Power Entities on the General Accounting Office's (GAO) Draft Report on Federal Land Use Fees

Dear Mr. Hill:

Please find enclosed the comments of NHA and the Western Public Power Entities on GAO's Draft Report entitled, "Charges for Hydropower Projects' Use of Federal Lands Need to be Reassessed, March 2003, (GAO-03-383)." NHA and the Western Public Power Entities appreciate the opportunity to respond to this important report.

Sincerely,

Linda Church Ciocci

On behalf of:

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March 31, 2003

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Director
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441 G Street, N.W.
Washington, D.C. 20548

Re: Comments of the National Hydropower Association (NHA) on the General Accounting Office's (GAO) Report on Federal Land Use Fees

Dear Mr. Hill:

The National Hydropower Association thanks you and your staff for the opportunity to review and comment on the GAO's Draft Report entitled, "Charges for Hydropower Projects' Use of Federal Lands Need to be Reassessed, March 2003, (GAO-03-383)." NHA appreciates the opportunity to comment on this important report affecting the hydropower industry.

As you know, NHA is the national trade association committed exclusively to representing the interests of the hydroelectric power industry. Our members represent 61 percent of domestic, non-federal hydroelectric capacity and nearly 80,000 megawatts overall in North America. NHA's membership consists of more than 140 organizations including; public utilities, investor owned utilities, independent power producers, equipment manufacturers, environmental and engineering consultants and attorneys.

Sincerely,

Linda Church Ciocci

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**COMMENTS
OF THE
NATIONAL HYDROPOWER ASSOCIATION
ON THE
GAO REPORT TO CONGRESS ON FEDERAL LAND USE FEES
FOR
HYDROPOWER PROJECTS**

MARCH 31, 2003

INTRODUCTION

The National Hydropower Association (NHA) submits the following comments to the United States General Accounting Office (GAO) on its draft report to Congress entitled, "Charges for Hydropower Projects' Use of Federal Lands Need to be Reassessed (GAO-03-383)." NHA appreciates the opportunity to comment on the draft report for inclusion in the final report that is forwarded to Congress by GAO.[1]

MAJOR CONCERNS AND CONCLUSIONS

See comment 1.

- GAO's methodology, if adopted, could easily increase retail rates to consumers, particularly in the West, by hundreds of millions of dollars per year. These are consumers who are still reeling from the energy crisis that affected the entire western region of the United States in 2001.

See comment 2.

- GAO's methodology could produce highly volatile land use charges and could generate significant uncertainty in its application. Should the Federal Energy Regulatory Commission (FERC) follow GAO's example and implement this methodology, FERC would require new staff resources and lengthy dispute resolution procedures. The new system would also impose a significant administrative burden on the industry to develop the paperwork necessary for FERC to set the new fees.
- GAO's methodology is technically flawed. It produces negative "net benefits", yet does not propose that FERC pay licensees under such circumstances. It could produce annual land use charges that could vary by many orders of magnitude from one year to the next. It relies on market price indices recently judged to have been manipulated by market participants. It assumes that all economic rents should be allocated only for land, and not for other fixed inputs such as the investments made by project licensees on behalf of their consumers. Finally, it does not take into account the public benefits already provided by licensees under license conditions, including parks, recreational opportunities, and fisheries enhancement. In essence, GAO's methodology would permit the federal government to collect twice; once through license conditions and another time through land use charges. This methodology simply does not represent "fair market value."
- The GAO methodology is inconsistent with federal policies on hydropower. Its adoption would be a step in the wrong direction, particularly in light of all the work underway in Congress to resolve problems facing the hydropower resource and provide incentives for new development. Considering the nation's need for more renewable energy, now is not the time to

[1] NHA appreciated GAO's willingness to meet with individual members of the hydro industry and with the Association. However, for purposes of providing comments, NHA was not allowed to retain a copy of the draft report. As a result, these comments are based solely on notes and memory from two viewings of the draft report.

pursue policies that would undermine hydropower's role as the nation's leading renewable energy source.

BACKGROUND

Non-federal hydropower owners and operators whose projects are fully or partially located on federal land pay rent for the use of the public land. These land use charges are administered by the Federal Energy Regulatory Commission (FERC). The Federal Power Act (FPA) gives FERC the authority to collect these charges. FERC was not directed to obtain "fair market value" for the land. Instead, FERC was authorized to establish "reasonable" fees that balance land use with the public benefits of low cost and abundant supplies of energy.

In the 1990's, a FERC rulemaking explored several options to set charges for using public lands. After due deliberation, FERC adopted the U.S. Forest Service's fee system for linear rights of way on National Forest System land. The Forest Service zonal fee system annually produces a per acre charge on a county-by-county basis for every state. The zonal fees were prepared for homogeneous regions based on ROW appraisal information furnished by the utility industry. FERC charges the same fee as the Forest Service for transmission lines, and twice that amount for other federal land used within a hydropower project boundary.

In late 2000, the GAO agreed to a request by the Interior and Energy and Water Development Subcommittees of the House Appropriations Committee to prepare a report on federal land use charges for hydropower projects licensed by FERC. GAO shared a draft report with NHA for comment on March 17th and 19th of 2003. In its report, GAO asserts that the current charges applied to FERC-licensed hydropower projects do not represent a "fair market value" for the use of such public lands.

GAO's draft report suggests that FERC reassess its system of annual charges in light of: 1) information it provides concerning the estimated value of the contribution federal lands make to hydropower production; 2) the trend toward the restructuring of the nation's electric markets; and 3) flaws in the present system. The GAO also recommends that FERC develop new strategies for assessing annual charges commensurate with the benefits licensees receive. In conducting this reassessment, GAO suggests FERC determine methods for estimating "fair market value" of federal lands, and determine methods for assessing annual charges, taking into account the fair market value of the federal lands, while also achieving the competing goals of encouraging hydro development and avoiding unreasonable increases in electric rates to consumers.

See comment 3.

NHA strongly believes the draft report is flawed and that the GAO's methodology is not applicable to determining the value of federal lands to a FERC-licensed hydropower project. Fair market value, as determined by a "net benefits" calculation, is not an appropriate means of determining land use charges for federal lands. Though GAO does not recommend that FERC adopt its approach, should the Commission use this method, it could spell disaster for a sizable segment of the hydropower industry and its electric consumers. Should FERC decide to re-evaluate its system of determining annual charges based on this report, NHA recommends that the Commission reject the fair market value/net benefits approach. NHA also believes Congress should reject the fair market value analysis underpinning this report.

See comment 1.

Based on information disseminated by GAO in meetings with the hydropower licensees whose 24 hydro projects were studied, implementation of the "net benefits" methodology would cause huge increases and huge changes in annual federal land use charges from year to year. For instance, compared with current charges, the percentage change, using the GAO "net benefits" methodology, could range from approximately negative 130,000% to positive 875,000% depending on the project, market conditions and

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See comment 4.

the share of annual net project benefits paid as land use fees. In fact, based on 2000 market values and project characteristics, the land use charges for one particular project in the Northwest would skyrocket from $371,000 to over $602 million a year! This is especially troubling when one considers that Congress is currently exploring legislative solutions to prevent unreasonable increases in granted, issued or renewed rights-of-way fees associated with deployment of telecommunications and other critical infrastructure on federal lands.

The increased costs resulting from implementation of this GAO methodology would directly impact ratepayers. In addition, implementing this methodology would create a new layer of bureaucracy at FERC and further complicate the hydropower regulatory process. At a time when FERC is administering the most extensive and complex regulatory process for any energy source in the United States, it cannot afford to mobilize the huge effort necessary to implement GAO's complicated scheme. More importantly, implementing the GAO methodology could undermine recent administrative and pending legislative reforms to the hydropower licensing process – valuable reforms that took years to achieve. It would also undermine incentives for new hydropower development presently under consideration by Congress.

GAO's draft report to Congress on federal land use fees presents overwhelming substantive, legal and procedural concerns for the hydropower industry. Without question, GAO's recommendations would negatively impact hydropower at a time when policies are being developed to better integrate hydropower into our national energy strategy. Again, NHA appreciates the opportunity to comment on this important matter and hopes our comments will be fully taken into consideration, and the report revised to address our concerns.

COMMENTS OF THE ASSOCIATION

I. ECONOMICS

A. Basing Annual Charges on "Net Benefits" will Result in Unreasonable Increased Costs to Licensees

See comment 1.

Implementation of the "net benefits" approach used by GAO would greatly increase the operating costs of many hydro project owners. The sample of 24 non-federal FERC-licensed hydropower projects, as described in the draft report, currently pay a cumulative total of approximately $2.7 million. Under the GAO "net benefits" approach, these same projects could pay an estimated total of $157.5 million to $1.687 billion per year. These figures could correspond to an annual fee increase as much as 875,285% for one project alone.[2]

See comment 5.

Such a significant aggregate fee increase will necessarily be passed along, to the maximum extent possible, to the electric ratepayers who use power from the affected projects. Some electric ratepayers could end up paying as much as 25% more for their electric power without any additional benefit. At a time when electric industry restructuring is increasingly introducing competitive electric power markets in various regions of the country, this has the potential to render hydropower projects economically uncompetitive compared to other power generation technologies.

Estimating the effects of the GAO approach raises other significant economic questions relating to the different types of hydropower project operators. For example, investor-owned utilities subject to cost-of-service rate regulation, municipal or other public power producers, and federal agencies who operate

[2] This assumes that 100% of net benefits, as calculated by the GAO methodology, are collected as the annual land use fee.

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See comment 6.

hydropower facilities all pay taxes infrastructure maintenance and construction costs differently, and hence, would experience very different exposure to additional costs under the GAO's approach. This raises concerns about economic equity among the different types of hydropower operators in the U.S.

Even if economic equity issues can be addressed, issues of variability and volatility of economic impacts would still remain. "Net benefits" will fluctuate from year to year at any given project as costs or revenues fluctuate. A project that produces zero net revenue, or that produces a negative net benefit, would be very difficult to handle fairly under such an approach as the GAO uses. These are very serious issues which GAO fails to adequately address in its draft report.

B. GAO's Methodology Yields Anomalous Results

The methodology used by GAO yields anomalous results: for some of the projects, in some years the calculated "net benefit" is negative, not positive. For a few projects, the "net benefit" is negative in most scenarios. GAO attempts to explain this anomaly away, first by pointing out that the methodology forced a cost-of-capital based on an industry average return on investment of 7.22 percent, and then by concluding that negative "net benefits" must reflect a project owner's willingness to accept a lower-than-average return on investment. GAO further states that these projects would eventually be abandoned or shut down, if they are not able to provide a (presumably) competitive return on investment. Finally, GAO obscures the anomaly by ignoring these negative values when calculating the total land rents associated with the 24 projects in the sample used for the report.

There are several problems that are revealed by the appearance of negative benefits. First, negative benefits would imply that the landowner (the federal government acting on behalf of national taxpayers) should receive a less-than-competitive return on its investment in those years or scenarios that show a negative benefit, and should make payments to license holders. However, GAO does not propose that FERC should be provided with funds to actually make payments to licensees under these circumstances, because such a proposal would be ludicrous. Rather, GAO proposes that the landowner should have a preferential interest in the hypothetical "net benefits" of the projects: the landowner should get a share of these net benefits when they are positive, but should not share in the "net benefits" when they are negative.

This thinking undermines the very notion of applying the concept of "fair market value", because in a real market owners of fixed assets face the potential of losing money as well as making money. For example, the owner of a commercial building may face periods of extremely slack demand, when the building is empty and producing no revenues, yet the owner still has to pay property taxes and other operating and maintenance costs. Under these circumstances, the asset owner receives a "negative net benefit"; in contrast, GAO proposes special treatment for the federal landowner, assuring that the risks of ownership are not fully passed on to the landowner.

Second, by excluding these negative "net benefits," GAO overstates the potential land rents that could be assessed, and gives an unrealistically optimistic picture of the potential revenues that the federal landowner could earn. As GAO states, consistent negative "net benefits" could mean that these projects are eventually shut down or abandoned. If FERC imposes exorbitant land rents, based on the GAO methodology, the likelihood of such shut-downs will clearly increase. If FERC imposes an asymmetric land rent methodology, which increases costs in good years but does not provide rebates in bad years, the likelihood of project shut-downs will increase further. Projects that do not operate will not produce "net benefits" at all, and the federal landowner will not receive land rents at all.

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C. Land Is Not the Only Fixed Factor of Production

See comment 7.

GAO's methodology assumes that land is the only fixed factor of production (input). This is clearly an erroneous assumption in the context of this study. Although before the projects were built, land may have been the only fixed factor, at this point there are many other fixed inputs, including the hydroelectric structures themselves, in some cases water rights that have been acquired, many bridges and roads, fixed hatchery investments and other site improvements, and any other investments with negligible or even negative salvage value. These inputs are also fixed, in the sense that they cannot be picked up and moved to other locations, or put to other economic uses. From this point on, according to the economic theory applied by GAO, these other fixed factors, and not just land, should also receive a share of the "net benefits." In fact, these other fixed factors should receive shares of the "net benefits" commensurate with the nature of the investments that have been made and the risks that have been undertaken. GAO applies its "fixed factor" methodology in a highly selective manner, which demonstrates a bias toward capturing for the federal government a highly disproportionate share of the "net benefits." This cannot be described as an equitable application of the concept of "fair market value".

D. Only Individual Consumers Will Pay for Higher Land Rents

See comment 8.

GAO attempts to suggest that there may be circumstances in which shareholders, instead of ratepayers, will end up paying higher land rents. GAO's logic is flawed; ratepayers are the only source of revenues for these higher land rents, except in those few, isolated cases where non-federal hydro projects have already been sold to private entities. To see this, consider two scenarios: (1) the hydro projects remain as part of a regulated utility's rate base; and (2) the hydro projects (in those cases where the licensees are investor-owned utilities) are sold in the future to a private entity as part of a divestiture program. In the first scenario, it is clear that higher land rents will become just another cost of operation, passed along to consumers.

In the second scenario, now that GAO has put potential buyers on notice, the prices bid for hydro projects will be reduced to reflect not only the expected value of the higher land rents, but the volatility in such rents. Reductions in bid prices will automatically reduce the "transition credits" received by ratepayers when the hydro projects are sold to private buyers. That is, the capitalized cost to the buyer of the stream of future, higher land rents will reduce the prices offered for the assets in any divestiture program. Furthermore, higher operating costs in the form of land rents will under some circumstances increase the market price of energy, which will also drive up retail rates. The reduced prices paid for these assets at the time of divestiture, plus the higher costs for energy after divestiture, mean higher rates for ratepayers. Thus, there is no scenario, except where hydro projects have already been sold, in which shareholders would bear any of these additional land rent costs. GAO's conclusion is flawed, and Congress should understand that the entire weight of the higher land rents would fall squarely on the backs of consumers.

E. Rate Impacts in Washington, Oregon and Idaho

See comment 9.

GAO alleges that rates in Washington, Oregon and Idaho are relatively low, implying that increases in land rent costs will not be a significant problem. GAO has not recognized the significant increase in retail electricity rates in the Northwest since the fall of 2001, due to the West Coast energy crisis of 2000-01. These retail rates are under continuing upward pressure due to low water conditions in the region, as well as cost increases at the Bonneville Power Administration. For some utilities that would be affected directly by the methodology used by GAO, retail rates are now higher than in many other parts of the country. In part due to these rate increases, unemployment and retail shut-offs have increased. Further increases in retail rates will wreak more havoc on the Northwest economy.

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See comment 10.

F. GAO Relies on Market Price Indices that Do Not Represent Fair Market Value

For hydro projects in the West, GAO calculates "value" by using a market price index compiled from data associated with transactions at the California Power Exchange (Cal-PX). There are several problems with this approach. First, the Cal-PX no longer is in operation, which means that this market price index is not available. Second, for Northwest hydro projects, output cannot be sold in California without obtaining transmission rights, which are not available on a year-round basis due to previous commitments by transmission owners. Third, even when transmission capacity is available, it is not free. Thus, the Cal-PX index is inappropriate for Northwest hydro projects.

Most importantly, GAO seeks to determine fair market value, but has not evaluated whether this particular index, or any other index, in fact reflects the "fair market value" of the generation. If there is manipulation of the markets that produce these indices, as FERC has recently concluded, then the resulting prices themselves do not represent fair market value, but rather reflect market manipulation. By relying on manipulated price indices, GAO's methodology could produce a windfall profit for the federal landowner.

II. PRACTICALITY AND LOGISTICS

See comment 1.

The GAO methodology to determine the “net benefits” for use in assessing federal land use charges at FERC-licensed hydropower projects would create an unprecedented administrative burden and additional reporting requirements and accounting measures for both the FERC and licensees. The current system is efficient and poses reasonable administrative requirements on both the licensee and FERC. More or less, FERC has two staff personnel assigned part time to the work associated with all annual charges under Section 10(e) of the Federal Power Act (FPA). Adopting the GAO methodology would certainly require a major transfer in FERC personnel and resources to handle the workload required on a yearly basis to manage the new program. Likewise, the current system poses a reasonable burden on licensees in terms of record keeping and reporting requirements. The GAO “net benefits” approach, however, would represent an enormous and unnecessary administrative burden on licensees and FERC.

To illustrate some of the questions and difficulties that would arise with implementation of the highly complex “net benefits” approach used by GAO, it’s important to look at some of the critical elements that are part and parcel to such a methodology. Basically, it will be impossible to generalize any of the input parameters for a “net benefits” determination for all licensees because each licensee and each project will have distinct financial, operational and maintenance criteria, and the most likely form of alternative generation for comparison purposes will vary significantly from region to region.

For instance, the cost of money for public and private owners of hydropower projects varies according to the type of entity (i.e. state, county, public utility district, irrigation district, cooperative, private utility, industrial company, private entrepreneur, etc). The financing rate for funds varies dramatically for public agencies and other public non-profit entities. Likewise, private companies usually finance in a variety of approaches using a combination of debt and equity that can differ significantly from company to company. In addition, the cost of funds can and does change significantly from year to year. Therefore, this would require each licensee to develop and provide extensive financial data for each annual charge calculation.

See comment 11.

In addition, the operation and maintenance (O&M) costs for hydropower projects vary significantly, and are influenced by age, physical location, climate, and many other factors. Therefore, O&M costs fluctuate from project to project and for each individual project from year-to-year. There simply is no general information that would provide an accurate O&M cost for a hydropower project. Each licensee would need to furnish such information on an annual basis.

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See comment 12.

The value of power from the most likely alternative generating source, a critical input to the GAO's "net benefits" determination, will also change annually due to fuel costs, O&M costs, location, and availability factors. Hydropower projects located in the same area will have substantially different alternative power values based on the source for the alternative that is unique to each licensee, thus creating controversy, and, ultimately, inequities. In some cases there are no alternatives other than hydropower, creating a serious problem in determining one's fees if this aspect of the method is employed.

See comment 13.

Furthermore, the GAO methodology does not address the numerous inequities that will occur. For instance, there is no recognition of the entrepreneurial activity associated with constructing the primary facilities that create the value in a hydropower project, namely the dam and power generating and transmission facilities. These major elements of a hydropower project typically represent more than 95% of a project's total cost. Land associated with a hydropower facility represents 5 % or less of the total cost of a hydropower facility in many cases. However, the GAO application of the "net benefits" approach assumes that all the "net benefits" accrue to only the lands, so that for a project located entirely on federal land, up to 100 % of the "net benefits" could be assessed as the annual lands charge, thereby giving no credit for the investment in the important facilities that created the actual benefit. These and other inequities will inevitably result in disputes and litigation.

See comment 14.

Federal lands are included within FERC project boundaries for a variety of reasons. Lands devoted to power generation vary significantly and in some cases represent a small portion of the lands subject to annual charges. Large tracts of lands are included for non-power purposes that serve environmental, recreation, and other purposes. Licensees receive no income or value from these lands, yet are charged for their use as part of the FERC project license fees. In addition, the public receives benefits from these other purposes, and thus is already compensated for the use of federal lands by licensed hydropower projects. GAO's methodology completely ignores these other benefits. Furthermore, projects located in the same general area on federal land, and that should have the same approximate value, will have substantially different "net benefits" in light of the different alternative power values, financial costs, O&M and other factors cited above.

See comment 1.

Finally, if the GAO methodology is adopted, as stated above, it will be necessary for each licensee to submit on an annual basis extensive financial information, O&M costs, alternative power values, and other information to FERC. With respect to FERC, the agency would need to:

- Implement significant changes in its billing system,
- Conduct over 300 separate "net benefits" analyses every year,
- Make substantial revisions to its efficient computer-driven billing system to account for the variability of its annual charges billings,
- Substantially increase its staff and resources to process and gather the necessary information to perform the time-consuming "net benefits" analyses, and
- Process complaints, disputes, or litigation associated with the annual charge analyses.

In summary, the GAO methodology, if adopted, will create an entirely new system with extensive record keeping and reporting requirements that will substantially increase the administrative burden on FERC and the hydropower industry. What's more, the GAO methodology will be inherently unpredictable and inefficient, problems that the current system was designed to avoid. Disputes regarding computations, data, inequities, and other problems will inevitably result in complaints, disputes, or substantial and prolonged litigation.

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See comment 15.

See comment 1.

III. LEGAL IMPLICATIONS

A. The GAO Methodology is Inconsistent with the Federal Power Act, Because Fair Market Value is Not a Basis for a Reasonable Fee

FERC's authority to impose annual charges upon licensees comes from the Federal Power Act, Section 10(e), which, in relevant part, provides:

> "That the licensee shall pay to the United States reasonable annual charges in an amount to be fixed by the Commission for the purpose of reimbursing the United States for the costs of the administration of this Part; for recompensing it for the use, occupancy and enjoyment of its lands or other property; ... and in fixing such charges the Commission shall seek to avoid increasing the price to the consumers of power by such charges, and any such charges may be adjusted from time to time by the Commission as conditions may require: ..."

Section 10(e) goes on to provide that reasonable annual fees for the use of tribal lands and government dams will also be imposed by FERC. However, those fees are subject to approval by the Secretary of the Interior for dams in reclamation projects and by the Indian tribe for tribal lands.

Fair market value is not a reasonable fee. The GAO indicates the "net benefits" method is designed to obtain fair market value for the use of federal lands by a licensee. However, the FPA §10(e) requirement for land fees is **not** tied to fair market value. In fact, fair market value is a greater value than the "reasonable annual charge" set out in FPA §10(e). In *City of Vanceburg v. FERC*, the Court of Appeals considered the question of whether FPA §10(e) charges for the use of a governmental dam were reasonable. The court reasoned:

> "[T]he Commission must set a reasonable charge by considering all relevant factors and arriving at a charge which minimizes consumer costs, encourages power development, but at the same time, compensates the Government to some extent for the benefit it has conferred on the licensee.[3]"

In upholding the fee, the court indicated that FERC must consider a number of different factors in setting the fee, including factors that would necessarily result in a fee below the "fair market value" of the federal land. For example, if FERC were to always focus on a fee that met the fair market value of the federal land, the Commission would fail to take into account the FPA §10(e) direction to "seek to avoid increasing the price" of power to consumers. FPA §10(e) does not promote a fair market value standard. In fact, the court in *City of Vanceburg* also stated:

> "[W]e do not suggest that the Commission is free automatically to assess as charges the full amount of the value conferred on a licensee.[4]"

In the draft report, GAO recognizes the Federal Power Act's requirement that FERC balance competing interests in setting its fees. However, the use of fair market value and the "net benefits" analysis installs a baseline that is unreasonable from the start. Although GAO does not recommend that a certain percentage of the "net benefits" from a project go to the United States, the report points out that FERC has frequently used a 50/50 split to determine the benefits from the licensee's use of tribal land and the use of a government dam. Further, even if FERC were to use a smaller percentage in determining the amount of the annual charge for federal land, the GAO formula is still based on determining the value of the land

[3] *City of Vanceburg v. FERC*, 571 F.2d 630, 647 (D.C. Cir 1977).
[4] *Id.*

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through the determination of the "net benefits" obtained by the licensee through the operation of the hydro project.

B. The Annual Fee for Federal Lands Must Be Calculated Differently From the Fee for Use of a Government Dam

See comment 15.

Although the annual fee for the use of federal lands will compensate the United States for the benefit conferred upon the licensee, the reasonable fee amount should not be calculated in the same manner as the fee for the use of a government dam. The *Vanceburg* court explained that a national average rental value is appropriate to compensate the government for the use of federal lands, which is the benefit derived from a "fungible tract of real estate".[5] The use of water at a specific government owned dam provides a much larger benefit upon the licensee because the licensee need not construct or operate the dam.

In the case of federal land, the land could be, and generally is, used for authorized purposes (other than hydropower). Also, the licensee must construct, operate, and maintain all the necessary project works. Thus, the benefit conferred upon the licensee by the use of federal land is fundamentally different. However, the "net benefits" method would treat the use of federal land similarly to the use of a government dam.

Moreover, the compensation method for the use of government dams has significantly changed - now requiring a graduated charge in mills per kilowatt-hour based upon the amount of energy provided. 18 C.F.R. §11.3. Using the "net benefits" approach for government lands could result in a higher fee paid by users of federal lands than users of government dams.

C. The Use of a Royalty Type Fee is Inappropriate

FPA Section 10(e) is not "intended to be a general revenue raising statute".[6] When previously addressing the appropriate method for calculating annual charges, FERC concurred with this conclusion and determined:

> "that a percentage of gross sales fee or a flat rate per kilowatt hour fee is not a reasonable method of assessing land use charges. The tiered system suggested by the Forest Service is also unreasonable, as it would charge a royalty for run-of-river projects as though the Federal land being used was producing the power. This overlooks the fact that many projects use a combination of federal and private lands, and that the power output is a result of many factors (water rights, head, project structure) and not just the acreage of federal land involved."[7]

See comments 1 and 14.

The GAO analysis contains the very defects that caused FERC to dismiss similar valuation methods in the past. Moreover, the GAO method assumes that the federal lands contribute equal value to a hydro project's ability to generate power compared to the other private lands upon which the project is located. Unlike the use of a government dam, which directly enables a hydro project to divert water and generate power, the use of federal lands may or may not provide that benefit. FERC would need to conduct a case-by-case analysis of each hydro project to determine the value provided by the use of the federal lands. The GAO method does not propose such a case-by-case approach and its arbitrary division of value based upon the acreage of federal land occupied is inappropriate.

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[5] *Id.* at 646.
[6] *Id* at 643.
[7] Revision of Billing Procedures for Annual Charges for Administering Part I of the Federal Power Act and to the Methodology for Assessing Federal Land Use Charges, 52 Fed. Reg. 18,201, 18,206 (May 14, 1987).

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See comment 16.

D. The Sharing of the "Net Benefits" Method Does Not Accurately Consider the Actual Value of the Property

Importantly, determining the value of the federal lands used by the licensee should not be tied to the generation benefits that will be derived from the project. The benefits conferred upon the licensee by the land should be no different from the benefits conferred upon any other user of that federal land. The federal land's value is the value of its "highest and best use". This entails determining the "highest and best use" of the land at the time it was acquired or, at most, its likely use in the reasonably near future.[8] This value may be established by the use of comparable sales, or the average rental values of comparable lands. Court decisions dealing with the condemnation of land for hydro projects have reached this same conclusion. In *Public District No. 1 v. City of Seattle*, 382 F.2d 666, 673 (9th Cir. 1967), the court stated:

> "Power value may generally be said to be of two types. First, there is the value increment which one engaged in the assembling of lands needed for a power project would be willing to pay in order to include such land in its needed package. *Such values typically are established by proof of comparable sales."* (emphasis added).

The court went on to conclude that the profit that could be achieved from a power project was not an appropriate valuation method because it assumed that the property would be put to use as a hydroelectric project by the federal government in the near future. *Id.* The FERC would not have licensed a hydro project to a private party if the United States had plans to construct the hydro project. Consequently, the federal government may not now argue that hydropower was the highest and best use of the project. Assuming the federal land had value as a power generation source is not a valid method for calculating the annual charge for the use of the federal land.

Instead, the GAO report should consider the process by which the federal government determines the amount of compensation it would pay for private land acquisition. These federal acquisition guidelines require the use of comparable sales.[9] It also notes that the preferred way to appraise a leasehold estate is to use comparable lease transactions. [10] The FERC licenses are roughly equivalent to a land lease. Therefore, the value of the federal lands should be determined based upon the highest and best use of the lands before the lands were withdrawn for power purposes pursuant to FPA Section 24.

If the United States desires to obtain the power generation value of the federal lands, the FPA provides a mechanism to achieve that goal. FPA Sections 14 and 15 allow the United States to takeover a hydroelectric project at the end of the current license term. Allowing the federal government to impose the charges contemplated by the sharing of the "net benefits" method essentially gives the government 50 percent of the generation benefits created by a hydroelectric project without assuming any of the hydro project's risks and without compensating the licensee for this "taking." In other words, the GAO method gives the government over one-half the benefits envisioned by a take-over without the accompanying FPA responsibilities.

F. The GAO Method will Result in Significant Increases in Costs That Will Be Reflected in Electric Rates

The GAO method, if adopted by FERC, would admittedly result in increased annual charges paid by hydro project licensees. These costs must be accounted for in some fashion. Most municipal hydro

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[8] United States v. Buhler, 305 F.2d 319, 328 (5th Cir. 1962); Olson v. United States, 54 S. Ct. 704, 708-708 (1934).
[9] Uniform Appraisal Standards for Federal Land Acquisitions, Proceedings, Interagency Land Acquisition Conference (2000) at p. 25 (stating that land is to be valued on the use of comparable sales).
[10] Ibid, p. 61.

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See comment 17.

project owners and the majority of public utilities continue to pass through their hydro operation and maintenance costs along to their customers. This applies to private utilities as well. The increased charges for the use of federal lands will then cause consumer prices for electricity to increase. FPA Section 10(e) clearly instructs the Commission to avoid price increases to consumers.

IV. PUBLIC POLICY IMPLICATIONS

There are several public policy implications tied directly to FERC's potential use of the GAO methodology for determining fair market value for use of federal lands in assessing annual charges. The most notable are:

- a massive failure to adequately recognize the many valuable benefits our nation's leading renewable resource offers the American public;
- the creation of yet another barrier to further developing this underutilized but indispensable energy resource;
- the loss of hydropower generation and an increase in pollution from less clean alternate energy sources; and
- an increase in electricity costs.

A. GAO's Methodology Ignores or Fails to Capture the Many Benefits of Hydropower

See comment 18.

Hydropower offers the American public a tremendous number of valuable benefits. These benefits include, but are not limited to, low cost and pollution-free power supply, transmission system reliability, energy security, flood control, water supply, recreation and irrigation. In addition, projects licensed by FERC contribute to improved environmental and natural resource quality through protection, mitigation and enhancement measures conducted by licensees on their own or through license conditions issued by FERC. The industry has spent hundreds of millions, if not billions, of dollars enhancing the environment and providing recreation and other benefits for the American public.

One of the presumptions of GAO's report is that the federal government and the American taxpayer is coming up short due to today's system to collect federal land use fees. On the contrary – the American public and the taxpayer are gaining numerous invaluable benefits from use of federal land for hydropower production. In its attempt to capture fair market value, GAO's m0ethodology largely ignores or inaccurately captures these very important benefits when calculating the project's "net benefits." GAO's methodology does not consider what the American public gains when federal lands are used by hydropower owners and operators, whether these benefits where created by actions of the licensee, directed by FERC or federal resource agencies, or occur naturally as a result of using America's rivers to generate clean electricity. The GAO methodology instead focuses solely on the project owners' financial or "special benefits" – what the owners and operators are gaining financially for use of federal land to generate electricity.

When issuing licenses, however, FERC weighs all interests and adopts license terms and conditions to achieve a project that is well-suited to a comprehensive plan for the waterway. It does not focus solely on economics, as GAO does in its draft report. One of the ways in which the Commission achieves a balanced project is by requiring licensees to pay annual charges. The payment of annual charges is not a separate and distinct feature of the FPA. It is only one aspect of an overall framework of developing hydropower facilities that meet many public uses. Similarly, potential federal land use fees should be adjusted to recognize the public benefits provided by the projects, such as recreation, flood control, irrigation, navigation, water supply, fish and wildlife enhancement, etc. The current system for collecting

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land use fees captures these benefits and recognizes the value to the American public of using federal lands for hydropower generation. GAO's methodology, however, does not.

The "net benefits" approach used by GAO does not account for these public benefits in all instances. For example, the net benefit methodology calculates, for each project, the cost of generating hydropower. This calculation may account for some public benefits provided by the project, such as operation and maintenance costs for recreational facilities. However, many of the more costly license terms that reduce production at the facilities would not be included in any cost calculation.

For instance, many license conditions require the licensee to forego the use of some of its water to provide for in stream flows for whitewater rafting and fisheries enhancement. Other license conditions establish minimum and/or maximum reservoir levels to provide for recreation, flood control, and/or fisheries. All of these license conditions constrain the ability of licensees to operate their projects at a higher capacity. Yet, FERC Form 1 and EIA Form EIA-412, which GAO uses in its net benefit methodology, are not sufficiently sensitive to these concerns to yield useable and reliable data necessary to make these calculations. Because such constraints would not be included in the "net benefits" calculation, the methodology does not capture the expense associated with these public benefits.

In addition, FERC recognizes that hydropower projects possess benefits not present in fossil sources of generation. Many hydro projects serve peak loads and provide valuable ancillary services due to the unique nature of hydropower generation and its ability to dispatch electricity quickly. This is not the case for all facilities, however, as some plants are non-dispatchable or run-of-river facilities. Other methodologies could take these unique factors into account, but GAO's methodology fails to do so, again highlighting the inadequacy of the analysis and its inability to capture hydro's benefits.

See comment 1.

Congress and the administration have been working to devise hydropower policies that better recognize, and better balance, our nation's energy needs and important environmental goals. Significant progress has recently been made on these fronts through legislative and administrative improvements in the hydropower licensing process. In addition, Congress is considering incentives to tap into the large amount of unused hydro capacity in the U.S. Adopting the GAO "net benefits" recommendation would amount to nothing less than a significant step backwards in recognizing and valuing the contributions of our nation's hydropower resources in meeting our energy and environmental policies. By failing to capture or accurately recognize the many contributions hydropower makes to clean air, a sustainable future and a higher quality of life for American citizens, the GAO methodology fails to serve the American public and would jeopardize progress made on critical hydropower issues of late. It is a major flaw that cannot be overlooked.

B. Adoption of the Methodology Would Discourage Hydropower Development

The GAO's "net benefits" methodology also discourages hydropower development, an already underutilized resource. FERC and the courts have long found that one of the main purposes of the FPA is to encourage hydropower development. One of the primary mechanisms to encourage development is for FERC to issue licenses with fixed terms sufficient to make the licensee secure in its investment. The FPA itself precludes unilateral changes to license terms and conditions by FERC or Congress. Even upon expiration of a license, FERC cannot simply change license terms in the new license without providing reasoned explanation.

To comply with this underling policy of the FPA, the Commission has chosen a straightforward, transparent means to calculate its federal land-use rents and has specifically rejected a more complex, cost-based system. In fact, FERC has previously rejected the "net benefits" approach on the basis that it would not serve the goal of encouraging hydroelectric development. In changing its methodology for

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collecting fees for the use of government dams from a "net benefits" approach to a flat rate approach, the Commission found that the flat rate approach:

> "is relatively simple and straightforward both for the Commission to administer and for potential developers to factor into their project feasibility studies. This will enhance the certainty of hydro project development...A flat rate method does not require the complex calculations inherent in the generic [net benefits] method...This complexity would interfere unnecessarily with the Commission's need for administrative workability and licensees' need for predictability."

Because the "net benefits" approach calculates a charge using data points that would likely fluctuate from year-to-year, its use would conflict with policies of the FPA that require certainty and predictability regarding licensees' obligations under the terms of their licenses. Considering the volatility of the electric market from year-to-year, the uncertainty of these costs would interfere with prudent utility management and long-term planning and budgeting. Certainly, this effect would be inconsistent with the broad policy of the FPA to encourage hydroelectric development.

NHA forecasts that 21.3 Gigawatts (GWs) of additional power from hydroelectric resources could be developed by 2020 – none of which would require the construction of a new dam or impoundment. In terms of greenhouse gas reductions, this would equal displacing 24 million metric tons of carbon emissions. Of the 21.3 GWs, over 4,300 MWs of "incremental hydropower" could be developed, meeting today's environmental standards at *existing* hydropower facilities through capacity additions and efficiency improvements. This is enough power for approximately four million homes – clearly a significant contribution to our nation's energy supply. Adoption of GAO's methodology would undermine attempts to develop this great renewable potential.

See comment 1.

At a time when the administration and Congress are designing policies to increase our usage of domestic energy resources, including hydropower, policy analyses, such as GAO's, would discourage and seriously undermine our ability to tap into unused hydropower capacity, should be strongly discouraged and rejected. GAO's approach to land use fees is inconsistent with the administration's National Energy Policy and Congress's intent as it debates a comprehensive national energy policy. What's more, the American public has spoken to the issue of encouraging additional hydropower development – 74% of registered voters support incentives from the federal government to further develop our existing hydropower infrastructure.[11] As Congress, the White House and the American public have realized, we need to encourage additional hydropower development. GAO's "net benefits" methodology does just the opposite, and that is a shortsighted and ill-advised policy to pursue.

C. GAO's Methodology Could Lead to the Loss of Hydropower Generation and an Increase in Pollution and Electricity Costs

See comment 1.

Adoption of the "net benefits" approach could also lead to the loss of hydropower generation and an increase in pollution and higher-priced electricity. As we outlined earlier in our comments, the financial impacts of the "net benefits" approach could be devastating for certain hydropower projects. If adoption of this methodology led to the shut down of hydropower facilities or a significant loss of clean megawatts, those facilities and its megawatts would likely be replaced with natural gas-fired or fossil power plants that emit greenhouse gases and would cost more in terms of electricity prices. Pursuing a policy that would create such a scenario is irresponsible, at best. The American public should be faced with neither of these choices – more pollution or higher electricity prices. At a time when air pollution,

[11] This poll of 1,000 nationwide, registered voters was conducted between January 19-27, 2002, by Bisconti Research, Inc. and contains a margin of error of +/- 3 percentage points.

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See comment 1.

greenhouse gases and electricity prices are of major concern, we should pursue policies which remedy these concerns, not exacerbate them, as the GAO "net benefits" methodology would surely do.

D. GAO's Methodology Would Require Congressional Action and a Major Shift in Energy Policy

Congress specifically structured the FPA not to require the collection of the full "fair market value" of federal lands used for energy production. Instead, the FPA is intended to meet policy goals other than recouping the United States for the full "fair market value" of its lands. As discussed above, the FPA is intended to encourage efficient administration, encourage hydropower development, ensure low-cost rates to consumers, and consolidate all hydropower regulatory authority in FERC. FERC's current system of collecting federal land-use rents is firmly rooted in all these policies.

Of course, Congress could implement changes, but even a seemingly simple amendment to require the collection of Federal land-use rents at "fair market value" would require a fundamental shift in policy. Indeed, under the FPA, Congress did not intend FERC to collect these charges at full "fair market value." When Congress desires an agency to recover land use fees at "fair market value," it specifically provides for such recovery. For example, many Federal statutes – such as the Federal Land Policy and Management Act, the Mineral Leasing Act, and the National Forest Ski Area Permit Act of 1986 – specifically require Federal agencies to recover "fair market value" for the use of Federal lands. However, Congress may dictate a standard other than full "fair market value," as it has done in the Federal Power Act. In fact, the Office of Management and Budget's ("OMB") Circular No. A-25, which implements Title V of the Independent Offices Appropriation Act of 1952, recognizes that Congress may establish a standard upon which to collect user fees other than full "fair market value." The GAO has even recognized in the subject report that a standard other than full "fair market value" may apply to federal land-use rents.

Indeed, Congress often requires standards other than the full "fair market value." For example, the Land and Water Conservation Fund Act requires land-use rental charges to be "fair and equitable." Similarly, the Taylor Grazing Act of 1934 requires holders of grazing permits to pay "annual reasonable fees." The same holds true for the FPA. In establishing cost recovery for the use of federal lands under the FPA, Congress specifically chose standards other than "fair market value."

Section 10(e)(1) of the FPA provides for licensees to "pay to the United States *reasonable annual charges*...for recompensing it for the use, occupancy, and enjoyment of its lands or other property..." Moreover, Section 10(e)(1) also sets the standard that "in fixing such charges the Commission shall seek to avoid increasing the price to the consumers of power by such charges..." Together, these standards in Section 10(e)(1) establish that Congress intended for the Commission not to collect in annual charges the full "fair market rental value" of Federal lands. As explained by the Court of Appeals for the District of Columbia Circuit:

> "[W]e do not suggest that the Commission is free automatically to assess as charges the full amount of the value conferred on a licensee . . . [T]he Commission must set a reasonable charge by considering all relevant factors and arriving at a charge which minimizes consumer costs, encourages power development, but at the same time, compensates the Government to some extent for the benefit it has conferred on the licensee."

Thus, Section 10(e)(1) embodies the fundamental policies of the FPA, such as encouraging hydropower development and ensuring low-cost power to consumers. If Congress were to determine that these policies should give way to an overriding policy that favors full recovery of federal land-use rents, it would have to specifically authorize FERC to collect federal land-use rents at fair market value. This

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would mark a major shift in policy that has been recognized and pursued for over 80 years. What's more, it would directly conflict with current efforts by Congress to devise legislative solutions to prevent unreasonable increases in granted, issued or renewed rights-of-way fees associated with deployment of telecommunications and other critical infrastructure on federal lands. This would force Congress into pursuing two very different paths with regard to land use and rights-of-way fees paid by various industries.

V. CONSISTENCY WITH SOUND ACCOUNTING PRACTICE

It is important that the underlying accounting philosophy used by the GAO be sound. First, it is desirable to provide equitable compensation for the land owner. Second, it is important that land use fees are determined in a way that does not distort the economics of existing projects or potential future projects. If land use fees are inappropriately high, the development of new projects and the expansion of existing economical, renewable energy projects would be discouraged.

See comment 13.

The GAO methodology does not correctly allocate the benefits of the project. When accounting for the value of land that is developed for its natural resources, there are generally three components that must be included: 1) acquisition, 2) exploration, and 3) development. By essentially prorating the value of the project on the basis of land ownership only, the GAO methodology ignores that substantial contributions have been made to the value of the land by development of the project and project improvements. If benefits of the project are to be allocated to the various capital components, then value should not be assigned solely to the land but should be further allocated among the other capital contributions. Further, beyond the need to recognize the contributions from capital, there must be recognition of and return provided for entrepreneurial risk. To illustrate the problems with the GAO methodology, consider the case at the extreme where 100% of project land is federally owned. The GAO methodology would not provide for allocation of any benefits to exploration and development, nor to entrepreneurial risk, nor to any other fixed investments that have been made in the projects.

Conflicts between the GAO methodology and sound appraisal practices are discussed elsewhere, but it should be noted that the GAO methodology is in conflict with accounting valuation practices as well as appraisal practices. Land value is most often established for accounting purposes based on historical cost, but other means of valuation are used. An alternative, fair market value (defined as what is given up to acquire the land or its own fair market value) is more consistent with current methodologies than the GAO methodology.

VI. CONSISTENCY WITH SOUND APPRAISAL PRACTICE

A. Present Methodology Used for Valuing Federal Hydro Land

In order to better understand the inconsistency between the "net benefits" methodology and established appraisal practice, it is important to understand the current method being used. In 1987, FERC adopted its current methodology of using a published United States Forest Service index of values of transmission rights of way in order to determine the annual charges for use of federal land on FERC-licensed hydroelectric projects under Section 10(e) of the Federal Power Act.

See comment 19.

The Forest Service fee schedule is based upon a survey of market values for the various types of land that the Forest Service has allowed to be occupied by linear rights of way.[12] The schedule is divided into regional zones and provides per-acre rental fees by state and county. These fees are arrived at by

[12] Revision of Billing Procedures for Annual Charges for Administering Part I of the Federal Power Act and to the Methodology for Assessing Federal Land Use Charges at 18,205.

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multiplying the raw value of the land in each zone by an unspecified rate-of-return.[13] The rates are adjusted downward to reflect the value difference between rights-of-way authorization granted by private landowners and those issued by the government. Because of encumbrances on federal land, it was valued approximately 70 percent less than similarly situated private land. The result is an annual fee per-acre per-year for lands used for electric transmission lines; the fees range from $2.24 for land in Nevada to $44.87 a year for land in some counties in Florida.[14] Because the Forest Service index is a rate for charges for transmission rights of way, the Commission doubled the fees in the index in order to derive a charge for project lands, explaining "transmission line rights-of-way will be assessed at the Forest Service index rate and other project land will be assessed at twice that rate."[15] This doubling of the fee schedule reflects the reduced residual utility of forestland devoted to hydroelectric project use as opposed to transmission corridor use.

In essence, the FERC's present methodology is based upon "across the fence" values. The use of an "across the fence" methodology captures the values of land with similar characteristics to the land being valued, and appraisers throughout the country routinely rely upon it because it establishes a value of land based upon comparable sales. Because the value of the subject land is based upon sales of other like pieces of land, the FERC present methodology correctly calculates rental fees based on the value of the land being used.

B. A History of Methodologies Used to Value Federal Property Used in Hydroelectric Projects

It is also important to understand the history of past methodologies when considering revisions. Since 1938, the Commission has established fees for hydroelectric licensees' use of federal land using various methodologies. From 1938 until 1942, the Commission based the fees on a project-by-project basis. This method proved to be uneconomic because of the excessive costs of the appraisal in comparison to the value of the land involved. Consequently, in 1942 the Commission developed a national average value of $50 an acre, and recognizing that the Federal land was being used rather than purchased, approximated a rental value by selecting an interest rate as a rate of return that could be multiplied by the value of the land to determine a fee. The Commission chose an interest rate of four percent, thereby deriving a rental rate of $2.00 per acre. Twenty years later, in 1962, the Commission increased the average value per acre of federal land to $60 but retained the four percent interest rate, thereby increasing the annual land use charge to $2.40 per acre. Then, in 1976, in Order No. 560, 56 F.P.C. 3860, the Commission increased the national average value to $150 per acre and adopted a fluctuating interest rate used by the United States Water Resources Council which was based on the average yield of long-term (15 or more years to maturity) United States interest-bearing securities.

In 1986, the Commission abandoned its traditional methodology of multiplying a national average per-acre land value by a rate of return as the basis for calculating the fees in favor of the Forest Service fee schedule discussed above.[16] In doing so, the Commission analyzed and rejected various proposed

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[13] Although the order states that the calculation of the rate of return is "discussed below," there is no such discussion in the order.

[14] Revision of Billing Procedures for Annual Charges for Administering Part I of the Federal Power Act and to the Methodology for Assessing Federal Land Use Charges at 18,205.

[15] Id., and 18 C.F.R. § 11.2 (B).

[16] The impetus behind the change was a study by the Inspector General of the Department of Energy that determined that the Commission had been undercharging licensees by approximately $15.2 million each year for the use of about 168,000 acres of Federal land. The Inspector General recommended revising the Commission's regulations to

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methodologies, including a charge assessed on a per-kilowatt-hour basis. The rejected per-kWh hour approach determined the fee by looking to the generating capability of the entire property-the land and the facilities on the land. Specifically, the methodology used by GAO determined the total income that the entire property could generate and assigned a percentage of that income to the land as rent. Consequently, the fee would have been based upon the income generating capacity of the particular property and *not* the value of the land itself. In its rejection of this income-based approach, the Commission stated that it --

See comment 1.

> "[A]grees with most of the comments that a percentage of gross sales fee or a flat rate per kilowatt hour fee is not a reasonable method of assessing land use charges. The tiered system suggested by the Forest Service is also unreasonable, as it would charge a royalty for run-of-river projects as though the Federal land being used was producing the power. This overlooks the fact that many projects use a combination of Federal and private lands, and that the power output is a result of many factors (water rights, head, project structure) and not just the acreage of Federal land involved. For these reasons the Commission decides not to adopt the above fee methodologies as a means of assessing land charges." 52 Fed. Reg. at 18,203.[17]

C. Accepted Appraisal Practice

See comment 20.

The GAO methodology conflicts with the Uniform Standards of Professional Appraisal Practice (USPAP) as established by the Appraisal Foundation. These standards were mandated by Congress and are the most authoritative text in the valuation of real estate and are the generally accepted standards for professional appraisal practice in North America. USPAP contains standards for all types of appraisal services. Standards are included for real estate, personal property, business and mass appraisal. The preparation of USPAP standards is overseen by the Justice Department and these are the standards required for most federal land transactions.

USPAP was originally written in 1986-1987 by an appraisal profession Ad Hoc Committee on Uniform Standards and was donated to The Appraisal Foundation in 1987. The Financial Institutions Reform, Recovery and Enforcement Act (FIRREA) of 1989 cites USPAP as the standards to be enforced by state real estate appraiser licensing agencies. USPAP compliance is also required by professional appraisal associations, client groups and by dozens of federal, state and local agencies. It contains the Standards of Practice for all appraisal disciplines (real estate, personal property, business and mass appraisal).

USPAP is released on an annual basis. Regulators base enforcement decisions on the edition of USPAP in effect as of the date of an appraisal report. It is enforced by regulatory agencies, professional appraisal associations and client groups; and is growing in acceptance throughout the world. Many professional associations in Central and South America, Europe and Asia have accepted and adopted USPAP as the standard of practice for their membership.

USPAP notes that the methodology to be used when determining the value of a subject property varies depending on the type of property being appraised. For example, when determining the value of a facility that includes both real and personal property, such as a hydroelectric facility, the appraiser would consider all three approaches to value: the income approach, the sales comparison approach, and the cost

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base such land use charges on the current fair market value of the land being used and the current long-term government-borrowing rate. The Inspector General also recommended replacing the national average land value with state-by-state averages. *See* Assessment of Charges Under the Hydroelectric Program, DOE/IG Report No. 0219 (Sept. 3, 1986).

[17] The Commission also rejected other methodologies, such as using agricultural land values as a proxy or individual appraisals. Id. at 18,202-05.

approach. When using the income approach, the appraiser does not attempt to separate out the value of land from the other assets being appraised; instead, the facility is valued as an income-producing unit. Similarly, when conducting a comparable sales analysis for the facility, the appraiser compares sales of comparable facilities and does not separate out the value of the land.

On the other hand, when determining the value of an individual piece of real estate, such as land to be included within the boundaries of a hydroelectric project, an appraiser typically determines value by examining comparable sales of parcels of land with identical or similar physical characteristics. Thus, the value of the subject property, the land, is based upon sales of comparable property. This is the approach recommended in appraisal texts and courses. The appraiser would not, utilizing accepted appraisal theory and practice, attempt to calculate the value of the real estate by using an approach that values the entire facility.

The GAO "net benefits" methodology appears to violate USPAP. In Standard 1: Real Property Appraisal, Development, Standards Rule 1-4 states that "an appraiser must: develop an opinion of site value by an appropriate appraisal method or technique." Here, the "net benefits" methodology values the land by looking at the income producing potential of the entire project and assigning a portion of the income value to the real estate. As explained above, the GAO methodology does not appear to be an appropriate appraisal method or technique to develop a site value. USPAP identifies the sales comparison approach as the most appropriate approach when determining the value of land.

Further, Standards Rule 1-1 states that "In developing a real property appraisal, an appraiser must: be aware of, understand, and correctly employ those recognized methods and techniques that are necessary to produce a credible appraisal; not commit a substantial error of omission or commission that significantly affects an appraisal; and not render appraisal services in a careless or negligent manner…". The Uniform Appraisal Standards for Federal Land Acquisitions, a document prepared for appraisers to utilize in preparing valuations for acquiring agencies on behalf of the United States, quotes case law, stating "historically, the capitalization of income approach to value has been suspect"[18]. Using the income capitalization approach requires appraisers to use "…a myriad of factors and variables, the accuracy of which cannot clearly and easily be demonstrated by market data". The "net benefits" approach is admittedly uniquely different from similar methods used in Canada to value hydroelectric projects (Canada capitalizes the "net benefits" over the life of the project – not each year). If the FERC projects are valued each year with the knowledge of the Canadian process using the life of the project as well as previously approved processes, the resulting valuations could be deemed to have been performed in a careless and negligent manner.

This "variant" of the Income Capitalization Approach would not use the actual income produced from the hydroelectric projects. Instead, it would use market prices of the hydropower produced by the projects to assign a market value to the land. These market prices will greatly fluctuate each year, be subject to uncontrollable market manipulations (as seen in California in 2000) and would not be a proper basis to determine a project's market value. Again, the Uniform Appraisal Standards for Federal Land Acquisitions notes that conjectural and speculative evidence of market value should not be considered.

D. Federal Appraisal Practices

The purpose of Title XI SEC. 1101.of FIRREA [12 U.S.C. 3331] is to provide that Federal financial and public policy interests in real estate related transactions will be protected by requiring that real estate appraisals utilized in connection with federally related transactions are performed in writing, in accordance with uniform standards, by individuals whose competency has been demonstrated and whose

[18] *Foster v. U.S.,* 2Cl. Ct. 426, 448 (1983).

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See comments 20 and 1.

professional conduct will be subject to effective supervision. Most Federal real estate transactions should be carried out in accordance with the standards set by USPAP. As discussed above the "net benefits" approach is not consistent with the requirements of USPAP and its implementation will set conflicting standards for Federal Government transactions.

The "net benefits" methodology is flawed. Its application would very likely lead to varying and arbitrary federal land use charges. Its application would be in conflict with the direction Congress has established under PURPA for the consistent application of Federal real estate transactions. This variation of land rents would not be related to the value of the land itself but, rather, on a variety of other factors. The current methodology is a well-recognized valuation methodology and does not violate appraisal theory or application. The value of the land is based upon the value of similar or comparable land. In addition, the current fee-schedule methodology accounts for the fact that Federal land is encumbered in a manner that private land is not, and therefore, has a lower value.

Moreover, if the licensee were able to purchase or condemn the federal land on which the project is located, it would most likely do so, and the resulting "just compensation" owed would be the upper limit of the value of the land. Because federal land is not subject to condemnation, however, the licensee is, in a sense, held hostage by the federal government. Application of the "net benefits" methodology would cause some licensees to pay rents substantially higher than what would be owed to a private landowner notwithstanding that the federal land is likely worth less than comparable private land because of governmental regulations and restrictions.

VII. CONCLUSION

Though the GAO, in its draft report, does not recommend a particular formula for assessing federal land use fees, the determination of fair market value through the use of a "net benefits" calculation establishes a baseline for discussion that NHA believes is fatally flawed, misleading and unfair to consumers. Again, NHA does not believe the "net benefits" methodology is applicable to determining the value of federal lands to a FERC-licensed hydropower project. As such, NHA strongly encourages FERC, should the Commission decide to revisit its program for collecting annual charges, to reject the GAO's "net benefits" approach. NHA also believes Congress should reject the GAO's "net benefits" analysis contained in the draft report as it undermines the nation's oldest, largest and most reliable renewable resource.

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March 31, 2003

Mr. Barry T. Hill
Director
Natural Resources and Environment
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Re: Response of Western Public Power Entities to GAO's Draft Report entitled, "Federal Energy Regulatory Commission: Charges for Hydropower Projects' Use of Federal Lands Need to Be Reassessed, March, 2003"

Dear Mr. Hill:

Thank you and your staff for the opportunity to review U.S. General Accounting Office's (GAO) Draft Report entitled, "Federal Energy Regulatory Commission: Charges for Hydropower Projects' Use of Federal Lands Need to Be Reassessed, A Report to Congressional Requesters, March, 2003." We appreciate the opportunity to review the materials. We want to acknowledge and congratulate GAO for the effort of its professional staff in this review and the cordial manner with which it has been conducted. This is our response to the Draft Report reviewed on March 17, 2003 on behalf of our client group of non-profit, public power entities designated herein as the Western Public Power Entities, including Seattle City Light (Seattle), City of Tacoma (Tacoma), Public Utility District No. 1 of Chelan County (Chelan), Sacramento Municipal Utility District (SMUD) and the Public Utility District No. 1 of Douglas County (Douglas).

SUMMARY OF RESPONSE

In its Draft Report, GAO concludes that the Federal Energy Regulatory Commission's (FERC) charges for hydropower projects' use of federal lands bear no relationship to the economic benefit of the federal lands used, and that the charges FERC currently collects for hydropower projects' use of federal lands are significantly less than fair market value (FMV). For the reasons outlined and discussed below, we strongly disagree.

FERC's current charges for hydropower projects' use of federal lands meet the fundamental objectives of FERC's governing statute, the Federal Power Act (FPA). These charges for hydropower projects' use of federal lands are the most reasonable and fair means of assessing annual charges while assuring that hydropower projects are operated under comprehensive plans for improving or developing waterways for the improvement and utilization of waterpower development, for the adequate protection, mitigation, and enhancement of fish and wildlife, and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes.

See comments 18 and 1.

Remarkably, GAO has described a method that negates the economic value of the many public benefits provided by hydroelectric projects, including recreation, fish and wildlife protection, wetlands protection, irrigation and water supply, and navigation. Despite the obvious public interest in these benefits, GAO assigns the entire residual or net-benefit of hydropower projects on federal lands as the FMV of the federal lands. In doing so, GAO has *de facto* assigned a value of *zero* to all public benefits. The GAO Report makes the case, implicitly, that efforts to ensure these public benefits for hydropower projects should be discarded and replaced by efforts to maximize the production of electricity (and cash).

GAO theorizes (but does not prove) that licensees receive a windfall for their use of federal lands. GAO proposes to have FERC "cash out" this windfall in the form of an annual charge. However, this purported windfall does not exist. For each of the Western Public Power Entities, none accrues profits or retains excess earnings. So, none can realize or hold the net benefit the GAO's methodology mistakenly assigns to them. Under such circumstances, implementing GAO's methodology and accepting GAO's description and estimate of "FMV" would result in a hidden tax or transfer payment on a renewable source of energy.

GAO's methodology incorrectly assumes that market forces completely govern power prices. This is not true. Public power licensees such as the Western Public Power Entities sell power to their retail customers at cost. Concerning private utilities, FERC has a statutory obligation under Parts II of the FPA to regulate wholesale rates of the hydroelectricity generated on federal lands. Consequently, it is not apparent how GAO reconciles its method as capturing the fair *market value* of the land when both: (i) the wholesale rates of the hydroelectricity generated are regulated (or otherwise constrained outside the market); and (ii) the rate of return to the "investor" is constrained by GAO's methodology, as described more fully below.

GAO's proposed methodology does not reflect reality. Very few licensees—and none from the Western Public Power Entities group—are authorized to charge market rates for power produced at hydroelectric projects. Adopting this model for assessing land-use charges would require licensees to pay annual charges based on a fabricated, perfect market that simply does not exist.

See comment 21.

Adopting GAO's proposed methodology would also dramatically increase transaction costs and create tremendous administrative burdens for both FERC and its licensees. Consider that GAO has taken nearly three years to collect data and calculate annual values under its proposed net benefits methodology for only 24 licensed projects. This undertaking has required GAO to conduct meetings with licensees and retain the services of at least three expert consultants to gather and analyze data. Implementing the same system to assess land use charges

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on an annual basis for the approximately 400 projects located on federal land would be an overwhelming burden for FERC.

See comment 1.

Under GAO's proposed methodology, annual charges and consumer electric rates would fluctuate greatly from year to year, eliminating certainty and predictability under the terms of licensees' licenses. Such radical fluctuation would interfere with prudent utility management and long-term planning and budgeting. This could increase the cost of capital to owners and further result in higher rates to consumers. Such a result would be contrary to a fundamental purpose of the FPA: to encourage hydroelectric development in a stable, efficient and business-like manner.

Adopting GAO's proposed methodology would also hinder the development of the leading source of renewable energy in the United States. The additional costs—discussed below—would make hydroelectric power less competitive in the market.

For all of these reasons, FERC and Congress should reject GAO's proposed methodology for charges for hydropower projects' use of federal lands. GAO's secondary findings concerning FERC's internal controls, information management, record keeping and billing practices may have merit and could be the subject of further study.

DISCUSSION

The Western Public Power Entities believe that adoption of the GAO's net benefits methodology is an unsound approach to assessing charges for hydropower projects' use of federal lands. Adopting these recommendations would undermine the purposes of the FPA; sacrifice public benefits of hydropower in pursuit of a maximum cash payout; and dramatically increase customer costs for renewable energy. Implementing GAO's net benefits methodology would have a profound negative impact on hydroelectric licensees, their customers and FERC.

I. FERC's Current Methodology for Assessing Annual Charges for the Use of Federal Land is Reasonable, Fair and Consistent with the FPA.

One of the most unsettling aspects of the Draft Report is the lack of any discussion regarding the context or history in which FERC has developed its methodology for collecting annual charges from its licensees, including its assessment of the federal land-use charges analyzed in the Draft Report. For example, the Draft Report does not adequately describe the current FERC system, the history of FERC's charges for hydropower projects' use of federal lands, its past rulemakings or its rationale for adopting the current system and the reasons that in 1987 FERC rejected a proposed method similar to GAO's net benefit approach. Without this information, GAO's report is incomplete.

See comment 3.

FERC's obligation to assess annual charges for hydropower licensees' use and occupancy of federal lands is set forth in Section 10(e)(1) of the FPA.[1] Section 10(e)(1) does not direct FERC to collect the "FMV" of the federal lands utilized and occupied by FERC-licensed

[1] 16 U.S.C. § 803(e)(1) (2000).

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See comment 1.

hydropower projects. Rather, FERC is directed under the FPA only to assess "reasonable" fees that balance land use with the public benefits of low cost and abundant supplies of energy.

Since passage of the FPA, FERC over the years has utilized several methodologies to assess the "reasonable" fee for licensees' use and occupancy of federal lands. Such methods have included conducting project-by-project appraisals and calculating a rate of return based on a single national acreage value of federal lands.[2] In the 1980s, a FERC rulemaking explored several other options to set charges for using public lands. After due deliberation and consideration of several options—including a methodology very similar to GAO's net benefits model in the Draft Report—FERC in 1987 adopted the U.S. Forest Service's fee system for linear rights-of-way (ROW) on National Forest System land.[3] The Forest Service zonal fee system annually produces a per acre charge on a county-by-county basis for every state. The zonal fees were prepared for homogeneous regions based on ROW appraisal information furnished by the utility industry. Under FERC's current regulations, therefore, hydroelectric licensees utilizing federal lands for transmission purposes are charged the same fee as the Forest Service charges for transmission lines. Licensees utilizing federal lands for other purposes of the hydroelectric project are charged twice the transmission amount.[4]

Upon proper consideration of the FPA, it is quite clear that FERC's current methodology for assessing federal land-use annual charges from hydroelectric licensees meets that statute's fundamental objectives, namely: (1) achieving hydroelectric development of the Nation's waterways in a manner that provides for multiple public benefits; (2) encouraging development of this important renewable source of energy in an efficient manner; and (3) protecting electric consumers.

First, Congress did not intend under the FPA to maximize hydroelectric generation so that the United States could assess a royalty payment from licensees, as the Draft Report appears to advocate. In fact, Congress intended the opposite approach. A fundamental objective of the FPA is to develop hydroelectric projects in a manner that achieves a comprehensive plan for developing the Nation's waterways by requiring licensees to develop a renewable source of energy while concurrently providing multiple other public benefits as well. Under Section 10(a)(1), it is incumbent upon FERC to ensure that each hydroelectric license is:

> best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of waterpower development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes . . . ."[5]

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[2] *See* 52 Fed. Reg. 18,201, at 18,202 (May 14, 1987).

[3] *See id.* at 18,204-06.

[4] 18 C.F.R. § 11.2 (2002).

[5] 16 U.S.C. § 803(a)(1) (2000).

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The Supreme Court, in fact, has recognized that the FPA requires FERC to craft licenses to accommodate not only power development, but also to ensure that the license meets "the public interest in preserving reaches of wild rivers and wilderness areas, the preservation of anadromous fish for commercial and recreational purposes, and the protection of wildlife."[6] Since the passage of the Electric Consumers Protection Act of 1986, moreover, FERC has been required to "give *equal consideration* to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality."[7]

See comments 22 and 23.

Second, contrary to the Draft Report, which would have FERC adopt a mechanism for assessing annual charges that would fluctuate dramatically from year to year, a fundamental purpose of the FPA is to encourage hydroelectric development in a stable, efficient and business-like manner. FERC and the courts have long found that one of the main purposes of the FPA is to "encourage the orderly development of plentiful supplies of electricity."[8] Indeed, "[o]ne of the main purposes of the [FPA] is to encourage the development of hydroelectric power."[9] A primary mechanism for encouraging the stable and efficient development of this renewable resource is for FERC to issue licenses with fixed terms sufficient to make the licensee secure in its investment.[10] The FPA itself precludes unilateral changes to license terms and conditions by FERC or Congress,[11] and even upon expiration of the existing license, FERC cannot simply change license terms in the new license without providing reasoned explanation.[12]

See comment 24.

The policy for encouraging stable and efficient hydroelectric development of the Nation's waterways continues today. The Bush Administration, in its recent *National Energy Policy* report, recognized hydroelectricity as the leading source of renewable source of energy "that produces no emissions" and that "will continue to be an important source of U.S. energy for the future."[13] In addition, Congress has continued to articulate a policy for encouraging efficient development of hydroelectric resources, as evidenced by pending bills that would provide incentives for development of incremental hydropower.[14]

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6 *Udall v. FPC*, 387 U.S. 428, 450 (1967).

7 Pub. L. No. 99-495, § 3(a), 100 Stat. 1243, 1243 (codified at 16 U.S.C. § 797(e) (2000)) (emphasis added).

8 *NAACP v. FPC*, 425 U.S. 662, 670 (1976).

9 *City of Vanceburg v. FERC*, 571 F.2d 630, 632 (D.C. Cir. 1977), *cert. denied*, 439 U.S. 818 (1978).

10 *E.g., Pac. Gas & Elec. Co. v. FERC*, 720 F.2d 78, 83, 87 (D.C. Cir. 1983).

11 16 U.S.C. §§ 799, 822 (2000).

12 *E.g., Wis. Valley Improvement Co. v. FERC*, 236 F.3d 738 (D.C. Cir. 2001).

13 *National Energy Policy: Report of the National Energy Policy Development Group* at 1-8 (2001).

14 *E.g.*, H.R. 991, 108th Cong. § 2 (2003); H.R. 1294, 108th Cong. § 1 (2003); S. 464, 108th Cong. § 2 (2003).

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See comment 17.

Third, in contrast to the Draft Report, which would seem to dramatically increase FERC's annual charges for hydropower licensees' use of federal land, as well as its annual charges for the administration of the FPA, a fundamental policy of the FPA is to ensure a supply of renewable energy to electric consumers "at reasonable prices."[15] This is particularly relevant with respect to FERC's annual charges program at issue in the GAO Draft Report, as the FPA itself specifically directs that FERC, when establishing annual charges, "shall seek to avoid increasing the price to the consumers of power by such charges."[16]

See comment 1.

These fundamental objectives of the FPA do not express a Congressional intent for FERC to recoup federal land use fees at FMV, as implied by the Draft Report. In contrast to other statutes requiring reimbursement at FMV,[17] Congress only authorized FERC to recoup a "*reasonable* annual charge . . . for recompensing [the United States] for the use, occupancy, and enjoyment of its lands or other property."[18] By authorizing FERC to assess "reasonable" annual charges, Congress required that FERC devise a methodology of calculating annual charges "within the context of the larger purposes of the Act,"[19] *i.e.*, the multiple public benefits provided by hydroelectric licensees, encouraging efficient development of the Nation's waterways, and protecting electric consumers. This fundamental concept was perhaps best explained by the D.C. Circuit:

> [T]he Commission must set a reasonable charge by considering all relevant factors and arriving at a charge which minimizes consumer costs, encourages power development, but at the same time, compensates the Government to some extent for the benefit it has conferred on the licensee.[20]

Unlike the Draft Report, FERC's current methodology for calculating and assessing annual charges for the use of federal lands recognizes these bedrock purposes of the FPA and the context in which Congress has required an assessment of annual charges. FERC has deliberately chosen a straightforward, transparent, and stable means to calculate its federal land-use charges and has specifically rejected proposals to implement more complex, cost-based systems. Such a methodology is fully supported by the FPA.

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15 *NAACP*, 425 U.S. at 670; *see also Atl. Ref. Co. v. Pub. Serv. Comm'n*, 79 S. Ct. 1246, 1253-54 (1959); *Fla. Power & Light Co. v. Pub. Serv. Comm'n*, 617 F.2d 809, 816 (D.C. Cir. 1980); *Town of Alexandria v. FPC*, 555 F.2d 1020, 1028 (D.C. Cir. 1977).

16 16 U.S.C. § 803(e)(1) (2000).

17 *E.g.*, 16 U.S.C. § 497b(b)(8) (2000) (providing that ski area permits "shall be subject to a permit fee based on fair market value in accordance with applicable law"); 30 U.S.C. § 185(*l*) (2000) (providing that "the holder of a right-of-way or permit shall reimburse the United States . . . the fair market rental value of the right-of-way or permit"); 43 U.S.C. § 1764(g) (2000) (providing that the "holder of a right-of-way shall pay in advance the fair market value thereof").

18 16 U.S.C. § 803(e)(1) (emphasis added).

19 *Portland Gen. Elec. Co.*, 20 FERC ¶ 61,294, at 61,562 (1982).

20 *City of Vanceburg v. FERC*, 571 F.2d 630, 647 (D.C. Cir. 1977), *cert. denied*, 439 U.S. 818 (1978).

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See comment 1.

II. GAO's Proposed Methodology Ignores the Bedrock Objectives of the FPA by Failing to Account for the Multiple Public Benefits Provided by Hydroelectric Projects.

The Western Public Power Entities simply cannot understand why GAO has elected to propose a complex, unpredictable and inefficient system for FERC's collection of land-use fees. Not only does FERC's current system adequately capture the "reasonable annual charges" that are authorized under the FPA, but FERC has squarely rejected very similar methodologies to that proposed by GAO as being inconsistent with the purposes of the FPA. In rejecting a net benefits approach for calculating annual charges for the use of government dams, FERC found that a flat rate approach:

> is relatively simple and straightforward both for the Commission to administer and for potential developers to factor into their project feasibility studies. This will enhance the certainty of hydro project development . . . . A flat rate method does not require the complex calculations inherent in the generic [net benefits] method . . . . This complexity would interfere unnecessarily with the Commission's need for administrative workability and licensees' need for predictability.[21]

The Draft Report appears to criticize this and other reasons articulated by FERC for not adopting more rigorous methodologies for assessing annual charges, implying that FERC's current system is a result of administrative expediency to appease the hydroelectric industry and avoid litigation. Such a sweeping and dismissive approach, however, only illustrates that GAO failed to consider the underlying purposes and policies of the FPA and the context in which annual charges must be assessed. Certainly, FERC is entitled to consider its own administrative costs when determining an appropriate method of setting annual charges. Not only has the Supreme Court recognized this,[22] current directives of the Office of Management and Budget *require* agencies to implement efficient cost-recovery systems.[23] Considering that all of FERC's costs for administering the FPA are passed through directly to licensees, and that Congress specifically directed FERC to avoid setting annual charges that would result in higher rates to electric consumers,[24] FERC's concerns about unnecessarily increasing its administrative costs are quite valid.

See comment 1.

FERC's understanding and appreciation of the underlying policies of the FPA have caused it to reject, on at least three separate occasions, an income approach—very similar to the methodology advocated by the Draft Report—in calculating land use charges for licensees' use of federal lands. Not only did FERC find that such a system "would interfere unnecessarily with

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[21] 49 Fed. Reg. at 22,770, at 22,772 (June 1, 1984).

[22] *Permian Basin Area Rate Cases*, 390 U.S. 747, 777 (1968).

[23] OMB Circular No. A-25 § 7(f) (requiring that "[e]very effort should be made to keep the costs of collection to a minimum").

[24] 16 U.S.C. § 803(e)(1) (2000); *see also* 42 U.S.C. § 7178(a)(1) (2000).

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See comment 18.

the Commission's need for administrative workability" in the annual charges program,[25] but such methodology also:

> would charge a royalty . . . as though the Federal land being used was producing the power. This overlooks the fact that many projects use a combination of Federal and private lands, and that the power output is a result of many factors (water rights, head, project structure) and not just the acreage of Federal land involved."[26]

In its attempt to develop a sophisticated and comprehensive methodology for capturing land-use value, GAO has developed a method that negates the economic value of the public benefits provided by hydroelectric projects. These public benefits include recreation, fish and wildlife protection, wetlands protection, irrigation and water supply, and navigation. Moreover, as discussed above, Congress has required that FERC give equal consideration to these benefits and power benefits during the licensing process.

GAO states in its report that "We did not attempt to estimate the value of the federal lands used for purposes other than hydropower."[27] This statement, however, does not capture the full effect of GAO's application of the net-benefits approach. Since GAO assigns the entire residual or net-benefit as the FMV of federal land, it has *de facto* assigned a value of zero to all public benefits.[28] Not attempting to estimate the value of public benefits and assigning public benefits a value of zero differ greatly. Clearly, this is a major defect in the approach.[29]

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[25] *See* 52 Fed. Reg. 18,201 (May 14, 1987); 49 Fed. Reg. 22,770 (June 1, 1984); *Portland Gen. Elec.*, 20 FERC ¶ 61,294 (1982).

[26] 52 Fed. Reg. 18,201, at 18,206 (May 14, 1987).

[27] Draft Report at 10.

[28] Put in words, GAO's "equation" for estimating the fair market value of the land is to take the maximum revenues that could be realized by selling hydroelectric power at market rates; then subtract all costs including operations and maintenance, a portion of corporate general and administrative expenses related to the project, and an annual depreciation value of physical assets; finally, subtract a rate of return of 7.22%; the resulting number, or residual, represents the fair market value of the land.

[29] GAO addresses the issue of the economic value of public benefits in a rather oblique manner. GAO states in the Draft Report:

> While the cost to operate a hydropower project generally remains stable, low electricity prices can dramatically reduce revenues and thereby reduce or eliminate any net benefit for that year. For some of our sample projects, a negative net benefit estimate may also mean that the project was built for other purposes, such as irrigation. As such, the capital cost of the project included the cost associated with both irrigation and hydropower production. For these projects other purposes are emphasized over the production of hydropower. . . . As a result the revenue potential from hydropower operations is not maximized and the project has a minimal or negative net benefit.

Draft Report at 19. This line of reasoning suggests that for a minimal or negative net benefit value it would be impossible to know if the cause of the lower value is lower than expected electricity prices (or higher O&M cost) or the result of public benefits produced by the project. For example, if one project has a net benefit value of negative $1,000 and a second project a value of positive $1,000, is it necessarily true that the first project provides more public benefits than the second? More important, GAO in its Draft Report equates the "excess" depreciated capital cost (*e.g.*, for an irrigation system) with the "economic value" of the public benefits, when this is an approach that GAO explicitly rejects for calculating the fair market value of the land.

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Putting aside, for a moment, the estimation of the value of public benefits provided by hydroelectric projects, GAO's methodology creates a quasi-academic vacuum, unrelated to a well-established legal and policy framework. GAO does this in two ways. First, by assigning a zero value to public benefits, benefits that are mandated by the FPA and rigorously imposed by FERC, GAO makes the case, implicitly, that efforts to ensure these public benefits should be replaced by efforts to maximize the production of electricity from these hydroelectric projects. Second, GAO theorizes that licensees receive a windfall for their use of federal lands:

> the estimated fair market value of the federal lands used by our sample of 24 hydropower projects is a least $157 million annually and, under some market conditions, the value of these lands is worth hundreds of millions of dollars more. In comparison, FERC collected about $2.7 million in annual charges from these projects in 2002.[30]

GAO proposes to have FERC cash out this windfall in the form of an annual charge.

This purported windfall, indeed, does not exist. None of the Western Public Power Entities accrues profits or retains excess earnings. More importantly, for each of these entities, the established electricity rates are sufficient to cover costs with no provision made for profit or retained earnings. Thus, GAO's postulation of a windfall, and that the federal government is remiss by not collecting it, does not reflect the actual situation of the Western Public Power Entities.

By ignoring the public benefits of hydroelectric projects and by assuming a "potential market price" (*e.g.,* the California Power Exchange Price) rather than prices actually charged, GAO's model assumes that every acre within a project is or should be maximized for the production of power, at the expense of these other public benefits. In the context of the existing and well established legal and policy framework, this premise is flawed. Even in terms of economic theory, this premise can be questioned because whereas "kilowatt hours" can be provided by any number of substitutes—GAO assumes that gas-fired power plants are the least cost source for substitutes—these public lands are "scarce," perhaps even unique with respect to recreation, fish, wildlife and biodiversity, and the public goods they provide cannot be found elsewhere.

See comment 1.

In summary, GAO's methodology would propose that FERC, instead of ensuring a comprehensive plan for developing a waterway by requiring licensees to maintain multiple-use projects, should require licensees to maximize power development on federal lands so that the federal government can maximize an annual charge. Such an approach is contrary to any notion of "sustainable development" of natural resources and would run counter to federal policies and well-established legal framework in this regard.

[30] Draft Report at 5.

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III. GAO's Proposed Methodology is the Wrong Tool for Calculating FMV of Federal Lands.

At a fundamental level, GAO equates FMV with the "net benefits approach." GAO states specifically, that "net benefits analysis estimates the difference between the value of the power produced and the cost to produce it. This difference is our estimate of the land's annual fair market value."[31] GAO does this, however, without any elaboration or justification. Furthermore, the Draft Report somewhat misleadingly states that "FERC has acknowledged that using FMV is the most reasonable method for compensating the federal government for the use of land,"[32] when in fact FERC rejected the net benefits approach for determining FMV.[33] This is a troubling foundation for such an important change, one which affects to some extent, national energy policy.

See comment 14.

More specifically, GAO's methodology assumes that the "highest and best use" of all lands within a licensed hydroelectric project is the generation of electricity. This results from the logical conclusion that the value of the federal land is based on the production of hydroelectric power at market rates, whether each acre of land is used for power production or not. Earlier we stated how this assumption runs counter to the existing legal and regulatory framework, and how Congress has required that FERC give equal consideration to non-power or public benefits and power benefits during the licensing process. We pointed out that many acres of federal land included within the boundary of licensed projects have never been used for the purpose of generating hydroelectricity, but instead are included within the project only for the broader purposes of the FPA, such as recreation, wildlife enhancement, and wetlands mitigation.

Furthermore, the Draft Report criticizes FERC's existing methodology as being unrelated to the actual value of federal land. Yet the values derived from GAO's proposed methodology are even more divorced from any intrinsic land-based element. In fact, GAO's calculation of the "Federal Net Benefit (value of the land)" is based on an equation with well over 12 variables; only one variable is related to the physical elements of the land: the percentage of total project property that is federal land. The Draft Report acknowledges that changes in weather, rainfall patterns, regulatory constraints, costs of fuels, and significant changes in supply and demand for electricity all "dramatically" affect the value of federal lands. Consequently, dramatic year-to-

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[31] *Id.* at 3.

[32] *Id.* at 4.

See comment 25.

[33] 49 Fed. Reg. 22,770 (June 1, 1984). The Draft Report also states that the Confederated Tribes of Warm Springs Reservation in Oregon ("Confederated Tribes") have settled with FERC using a net benefits method and that the Bureau of Indian Affairs ("BIA") has adopted, as a stated position, the net benefits method as a starting point in negotiations between tribes and owners of hydropower projects. Draft Report at 38. In fact, FERC in *Portland General Electric Co.*, 20 FERC ¶ 61,294 (1982), *rejected* an annual net benefits calculation for setting annual charges for the licensee's use of the lands of the Confederated Tribes. In addition, GAO cites no support for its characterization of BIA's position, and it is FERC's longstanding policy that annual charges for the use of tribal lands are established through negotiations between the licensee and individual tribe, not BIA. *E.g.*, *Wis. Power & Light Co.*, 97 FERC ¶ 61,054, at 61,294 (2001); *City of Tacoma*, 84 FERC ¶ 61,107, at 61,578 (1998); *Portland Gen. Elec. Co.*, 31 FERC ¶ 61,306 (1985); *Ariz. Pub. Serv. Co.*, 39 F.P.C. 955, 963 (1968).

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See comment 26.

year changes in the value of federal land—and presumably in the fees collected—will result when a common-sense question would be: What about the land has actually changed?

Table 1a has been taken from the Draft Report. Table 1b provides a measure for lands that may be considered similar; it is provided only for comparison purposes. Since GAO equates its proposed net benefits approach with FMV, it is puzzling to see GAO's FMV results for these lands vary so greatly from year to year. It is even more puzzling to see the FMV of hydroelectric project lands change from a large negative value in one year to a large positive value the next year, when no physical changes to the land have occurred. Indeed, these large fluctuations are an artifact of the methodology and, we presume, would not track well with other measures of land FMV, such as those employed by appraisals of comparable parcels.

Table 1a: GAO'S Net Benefit Approach for Calculating FMV of Federal Land (in dollars)

		1998	1999	% change	2000	% change
Boundary	WA	26,605,710	67,361,992	153%	297,596,987	342%
Rock Island	WA	139,250	596,309	328%	3,081,965	417%
Rocky Reach	WA	775,377	1,819,369	135%	7,408,316	307%
Skagit River	WA	(22,990,815)	15,289,797	167%	165,136,818	980%
Upper American River	CA	(39,178,080)	(34,344,422)	12%	68,686,643	300%

(Source: GAO Draft Report)

TABLE 1b: USDA Agricultural Land Values (in dollars/acre)

	1998	1999	% change	2000	% change
Washington State					
farm real estate	1,190	1,190	0%	1,200	1%
pasture	550	540	-2%	490	-9%
irrigated cropland	3,400	3,600	6%	3,500	-3%
non-irrigated cropland	840	760	-10%	700	-8%
California					
farm real estate	2,610	2,770	6%	2,850	3%
pasture	1,050	1,050	0%	1,000	-5%
irrigated cropland	5,600	6,100	9%	6,400	5%
non-irrigated cropland	1,700	1,580	-7%	1,400	-11%

(Source: USDA, National Agricultural Statistics Service, Agricultural Land Values, August 2002)

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Because the value of the federal lands changes dramatically under GAO's methodology from year to year based on weather and rainfall patterns—as well as regulatory constraints and significant changes in supply and demand for fuels and electricity—it is not unrealistic to state that the methodology proposed by GAO seems a more appropriate measure for the "FMV" of the water that flows over the land than a FMV of the land itself.

See comment 27.

The methodology proposed by GAO is not a mere academic exercise. The consequence of GAO's efforts would be a change in FERC's annual land-use charges. If FERC were to build on the proposed GAO methodology but assess an annual land-use charge proportional to GAO's methodology for estimated "FMV," the result would be nothing more than a royalty—a hidden tax or transfer payment on a renewable source of energy. This royalty (or hidden tax or transfer payment) results because GAO's methodology defines a "FMV" of federal lands as a measure of net income—with a fixed, regulated, "not-to-exceed" rate of return on investment—of the licensee generating power at the project. While this method may be an appropriate measure of valuing a captured resource, such as oil, gas or water, it is not an appropriate measure for valuing land.

IV. GAO's Methodology Is Based on Theoretical Markets and Incorrect Assumptions.

There are a number of assumptions—including the assumption of a theoretical market—built into GAO's proposed methodology. In this section we identify the major assumptions with a brief discussion of why they lead to an inappropriate application in the context of land-use charges.

See comment 28.

GAO's approach to assess "FMV" is presented with the underlying assumption that the U.S. electric industry is currently undergoing substantial restructuring and the trend is toward more deregulation and market-based pricing. While this assumption may have been accurate three or four years ago, since the 2001/2002 California energy crisis and the fallout from the Enron energy trading and fraud scandal, states have halted or significantly pulled back from their restructuring efforts. In fact, as of February 2003, six states have suspended or delayed their efforts to deregulate the electric generation and delivery system; only 17 states plus the District of Columbia have active restructuring plans, and in 27 states restructuring plans are not active (see Figure 1 below).

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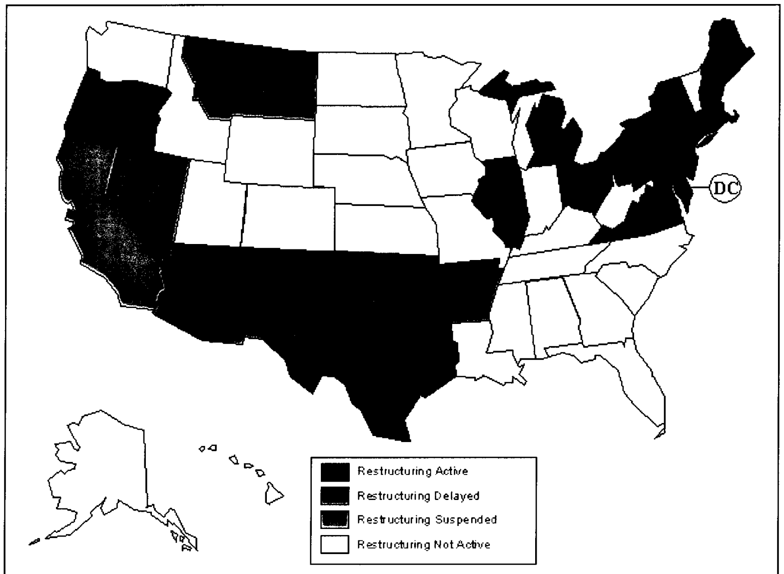
Note: This map may be viewed in color by going to www.eia.doe.gov/cheaf/electricity/chg_str/regmap.html.

Figure 1: Status of Electric Industry Restructuring Activitiy (February 2003)



Source: DOE Energy Information Administration

GAO's assumption regarding restructuring is particularly troubling, given that the most hydroelectric projects utilizing federal lands are located in states where restructuring activities are not active, or have been delayed or suspended.[34]

[34] *Compare* Draft Report at 8 (Figure 1).

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GAO's methodology incorrectly assumes that market forces completely govern power prices—that is, each link of the chain from production to consumption is based on market forces. Public power licensees such as the Western Public Power sell power to their retail customers at cost. Concerning private utilities, unlike oil and gas leases, grazing permits, special use permits, and other federal government authorizations—FERC has a statutory obligation under Parts II and III of the FPA to regulate wholesale rates of the hydroelectricity generated on federal lands. Consequently, we are puzzled that GAO regards its method as capturing the fair *market value* of the land when both: (i) the wholesale rates of the hydroelectricity generated is regulated (or otherwise and constrained outside the market); and (ii) the rate of return to the "investor" is constrained by GAO's methodology.

Even in a restructured market, the rates of public power entities will never be at market prices. Such entities are government owned, have no shareholders, and are required to sell all power to their constituents at cost. Thus, *any and all* increases to FERC's federal land-use charges would have to be completely passed through to consumers.

A significant number of projects located on federal land are licensed to public power entities. In GAO's sample of 24 projects, for example, 9 are public power facilities. Assuming that the annual land-use charge would be GAO's estimate of the FMV of federal lands for 2003, and using the estimate of existing FERC land-use fees for 2002 as a surrogate for 2003, we would expect a direct increase of $94 million in annual charges that must be passed on to consumers in the form of rate increases regardless of market conditions (See Table 2 below).

Table 2: GAO's Estimate of the FMV of Federal Land that Would Result in Rate Increases for Customers of Public Power Entities (in dollars)

Project Name	State	Licensee	% Proj. on Fed. Lands	GAO Estimate of FMV of Federal Lands for 2003		Actual 2002 FERC Land Charges*	Potential amount to be passed through to consumers as rate increases for 2003
Boundary (No. 2144)	WA	City of Seattle	69		85,120,000	34,000	85,086,000
Calif. Aqueduct (No. 2426)	CA	CA & LA Dept of Water	16	(20,029,000)		17,000	(20,046,000)
Don Pedro (No. 2299)	CA	Turlock & Mod. Irr. Dist.	37	(5,635,000)		249,000	(5,884,000)
Feather River (No. 2100)	CA	CA Dept of Water Res.	18		229,000	9,000	220,000
Priest Rapids (No. 2114)	WA	Grant County PUD	8		28,206,000	49,000	28,157,000
Rock Island (No. 943)	WA	Chelan County PUD	1		732,000	1,000	731,000
Rocky Reach (No. 2145)	WA	Chelan County PUD	1		2,013,000	3,000	2,010,000
Skagit River (No. 553)	WA	City of Seattle	70		20,497,000	917,000	19,580,000
Upper Am. River (No. 2101)	CA	Sacramento Mun. Util. Dist.	5	(15,175,000)		286,000	(15,461,000)
TOTAL				**(40,839,000)**	**136,797,000**	**1,565,000**	94,393,000

* assumes 2003 land-use charges to be the same as for 2002.
(Source: GAO Draft Report)

See comment 29.

GAO assumes that even if rate increases would result from this proposed methodology—that is, the purported windfall does not come from investors' profits but as increased prices to utility customers—it would be appropriate because currently taxpayers are subsidizing utility customers, *i.e.,* electricity rates are undervalued.[35] We believe GAO is wrongly viewing this subject and is ascribing subsidies where they do not exist. Unlike the case of federal dam-use charges, the federal government has incurred no costs for these lands. In fact, it is clear from the history of the FPA that its purpose was to encourage non-federal development of hydroelectricity throughout the United States, because the federal government was not in a position to incur the cost of developing these sites. Thus, there are no costs that have been assumed by the federal government for which utility consumers have not paid. It seems, rather, that GAO wrongly equates a loss of future potential revenue stream with a subsidy.

See comment 10.

A particularly troubling assumption is that GAO's proposal relies on theoretical market prices, rather than actual revenue to calculate the net income of a project. GAO recognizes this and states in its draft report "our estimates of the value of power generally differ from the revenues that the project owners earn for the sale of the hydropower that they generate."[36] GAO has taken for the price of electricity the price from the California Power Exchange (CAPX)—applied it to all licensees surveyed—and then has taken this hourly wholesale market price and multiplied it by each unit's hourly electrical generation rate. In fact, the Western Public Power Entities have not received and will not receive CAPX prices for each hour of electrical generation. Consequently, the model inappropriately leads to an overestimate of the FMV of the land; something that puts into question the notion that this method accurately assess "market value" at all. Table 3 illustrates this overestimation for two projects of the Western Public Power Entities.

Table 3: Examples of Actual Revenues Compared with GAO's Estimate of Revenues (in dollars)

	CAPX ($/MWhr)	Net Electricity Generation (MWhr)	Actual Revenues	GAO's Estimated Revenues	Overestimate
Rock Island (WA)					
1998	27.40	2,567,864	47,534,000	70,360,000	22,826,000
1999	35.43	3,184,967	49,947,000	112,840,000	62,893,000
2000	124.54	2,747,424	49,130,000	342,200,000	293,070,000
Rocky Reach (WA)					
1998	27.40	5,963,472	51,897,000	163,400,000	111,503,000
1999	35.43	7,425,231	58,141,000	263,100,000	204,959,000
2000	124.54	6,335,202	59,153,000	789,000,000	729,847,000

Notes: Net electricity generation and actual revenues provided by licensees. CAPX Price from GAO Draft report. Calculation of GAO's estimated revenues is CAPX multiplied by net electricity generation.
(Source: Information from Licensees and GAO Draft Report)

[35] Draft Report at 6.

[36] Draft Report at 42.

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Not only is this approach doubtful in the context of market estimation, the D.C. Circuit has found that only an approach that uses actual values would be reasonable as required by Section 10(e):

> The Commission's interpretation that Section 10(e) authorizes dam-use charges based on the *actual value* of dam use to the specific licensee is a reasonable one, and as such is entitled to great weight. We find nothing in the Act, which militates against this construction. Moreover, we believe that this interpretation is most consistent with the notion of compensation in that *each licensee is to be charged in direct proportion to the fiscal benefit it actually receives.*[37]

Because very few licensees are authorized to charge market rates for power produced at hydroelectric projects—and none from the Western Public Power Entities group—GAO's proposed methodology does not reflect reality. Furthermore, the adoption of this model as a basis for assessing land-use charges would require licensees to pay annual charges based not on reality, but on a fabricated, perfect market that simply does not exist.

GAO's methodology can and does produce "negative values" for the value of federal lands. These values result from the logic of the net benefits approach and are constrained by the fixed, regulated "return on investment" assumed by GAO. If the rate of return is allowed to vary more widely—as it does in reality—then the number and extent of "negative values" for the value of federal lands can be even greater. We understand GAO's explanation that negative values result from either a rate of return on investment that is lower than the fixed rate, or, indeed, a negative rate of return on investment. Because GAO's methodology constrains the upside of the rate of return—*i.e.,* it can be no greater than 7.22 percent—it would be patently unfair not to constrain the downside. How FERC would handle the likelihood of negative values for land-use charges is discussed in section V below.

See comment 18.

GAO states that "Wholesale market prices are a more accurate reflection of the economic value of power."[38] We take exception to this statement, as wholesale market prices do not account completely for the provision of public benefits. (See our discussion above in Section II regarding FPA's mandate for providing public benefits.) In fact, to the extent that wholesale market prices reflect public benefits, if at all, the GAO methodology may be inaccurate for the production of hydropower. In particular, if wholesale market prices used by GAO reflect the value of air pollution and control mitigation measures taken at fossil fuel fired power plants, then those "market prices" inaccurately reflect the value of the environmental enhancement measures taken at hydropower production plants.

Presuming that GAO wishes to accurately reflect the economic value of federal lands, it needs to provide estimates for the many public benefits provided related to irrigation, recreation, wetlands management, fisheries, credit for carbon-dioxide avoidance, and biodiversity

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37 *City of Vanceburg v. FERC*, 571 F.2d 630, 646 (D.C. Cir. 1977), *cert. denied*, 439 U.S. 818 (1978) (emphasis added).

38 Draft Report at 38.

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management. Values for these actions, provided to the public at low cost or without charge, result from the investments and ongoing management of the utility owners, and therefore, should be subtracted from the "net benefit value" as calculated by GAO's proposed methodology. We agree that each of these elements is difficult to quantify, but GAO made other, complex estimates in its Draft Report, and to the extent the GAO wishes to reflect all economic values, it should revise its methodology to be more comprehensive and appropriate.

V. GAO's Draft Report Failed to Consider Implementation Issues.

See comment 1.

In evaluating the tangible effects of GAO's proposed methodology, we identified a number of troubling issues. Below, we present the issues with a brief discussion of why they lead to an impractical process for assessing FERC related land-use charges.

GAO's proposed methodology only goes so far: it presents a way to estimate the FMV of federal lands, but does not instruct FERC as to the proper way to convert this value to an annual land use fee. Consequently, FERC would need to undertake a large, multi-year effort to develop a complementary methodology that would adjust the "full" FMV of federal lands to a reasonable fee.

If FERC were to adopt GAO's proposed methodology, it would dramatically increase transaction costs and create tremendous administrative burdens for both FERC and its licensees. We note that GAO has taken nearly three years to collect data and calculate annual values under its proposed net benefits methodology for only 24 licensed projects. This undertaking has required GAO to conduct meetings with licensees and retain the services of at least three expert consultants to gather and analyze data. It would be an overwhelming burden if FERC were required to implement the same system to assess land use charges on an annual basis for the approximately 400 projects located on federal land.[39]

Implementation of this system would require licensees to hire additional accountants, economists, appraisers and other consultants to provide, on an annual basis, the additional data that would be required for FERC to calculate the annual charge. Our "best guess" is that a land-use charge process based on GAO's proposed method would cost up to $85,000 annually for each of (approximately) 400 licensees and would require an additional 10 full-time-equivalent (FTE) staff for FERC for the program.[40] It is important to note that such system would be fully

[39] This result is particularly troubling in light of previous GAO efforts recognizing the need to develop efficient-cost recovery programs. *E.g.*, GAO/RCED-99-165, *Indian Programs: BIA Should Streamline Its Process for Estimating Land Rental Values* (1999).

[40] These estimates include part-time availability for clerical and accounting staff (estimated at $25,000 per year, fully loaded); engineering consultation regarding replacement costs every five years ($50,000 every five years); financial auditing services ($30,000 per year); management time ($20,000 per year). This $85,000 per year per licensee is multiplied by 400 licensees for an annual cost of $34 million). FTE estimates are based on one additional FERC FTE per 40 licensees at approximately $125,000 per FTE (Sources: FERC's "First Annual State of the Agency Report, FY2000" October 2000; GAO's "Department of Energy: Funding and Workforce Reduced, but Spending Remains Stable," April 1997; and Office of Inspector General, Department of the Treasury, "Information Report: A Primer on 5 Federal Financial Regulatory Agencies," December 2001.)

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and directly detrimental to consumers, because Section 10(e)(1) requires FERC to pass through all its administrative costs to hydroelectric licensees.[41] Consequently, the 10 FTEs would increase costs to hydroelectric licensees by up to $1.25 million annually.

It is important to keep in mind that the Draft Report has suggested that FERC needs to implement additional internal-control measures to ensure the reliability of its databases. This could increase the above "best guesses" by as much as $9.5 million annually.[42]

Summing up our "best guesses" of each of these components, we estimate an annual increase in fees—**excluding the actual land-use charges**—of up to $45 million solely to offset increased transaction costs.

In analyzing the legal implications of such a system, we conclude that implementation would require an OMB rulemaking, which could very well trigger the Paperwork Reduction Act. Additionally, we believe that the implementation of an annual land-use charge system based on GAO's proposed methodology would require a statutory provision to allow for the collection of royalty payments for hydropower. More important, given the questionable assumptions, complex calculations, and extraordinarily high annual charges, FERC's implementation of GAO's proposed methodology would lead to initial and annual lawsuits challenging the annual charge assessment. We have yet to estimate the costs associated with rulemaking and legal challenges, but we believe they would be high and contribute to an escalation of transaction costs launched by the proposed methodology.

Perhaps the most detrimental consequence of adopting a land-use charge system based on GAO's proposed methodology would be a stifling of the development of the leading source of renewable energy in the United States. The additional costs—discussed above—would make hydroelectric power less competitive in the market. Also, land-use charges calculated pursuant to GAO's proposed methodology would fluctuate greatly from year to year, eliminating certainty and predictability under the terms of licensees' licenses. Recall from Table 1a above, the large year-to-year changes in GAO's estimate of land value. Such radical fluctuation would interfere with prudent utility management and long-term planning and budgeting.[43] Budgeting for such fluctuations may force utility owners to expand financing options and lines of credit to weather the year-to-year changes. This could increase the cost of capital to owners and further result in higher rates to consumers.

We also appreciate that budgeting for such fluctuations will be extremely difficult for FERC, since: (1) the revenue stream will be highly unpredictable from year to year; and (2)

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41 16 U.S.C. § 803(a)(1) (2000).

42 These estimates include part-time availability for clerical and accounting staff (estimated at $12,500 per year, fully loaded); and management time ($10,000 per year). This $22,500 per year per licensee is multiplied by 400 licensees for an annual cost of $9 million). FTE estimates are based on one additional FERC FTE per 100 licensees at approximately $125,000 per FTE (sources as above).

43 *See* 49 Fed. Reg. at 22,772 (finding that the complexity of an income approach "would interfere unnecessarily with . . . licensees' need for predictability").

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presumably FERC would need to provide for "refunds" for years where the value of federal lands is "negative." (FERC will be hard pressed to justify why it would develop a system that would shield itself from a loss of revenue—*i.e.,* not providing refunds—while passing all commercial risk completely onto licensees. Implementation of GAO's proposal without a refund mechanism would essentially authorize the federal government to reap the rewards of power development without having to assume the liabilities and risks associated with constructing, operating and maintaining the project; we believe legal challenges will prove this position untenable.)

Building such barriers to the development of the leading source of renewable energy in the United States would also adversely impact the environment. Keep in mind that every megawatt-hour of electricity produced by a hydroelectric plant avoids 0.9 metric tons of carbon dioxide—a greenhouse gas that contributes to global warming—as well as sulfur dioxide and other pollutants. Consequently, the annual production of hydroelectric power in the United States, some 224 million megawatt-hours, currently avoids approximately 200 million tons of carbon dioxide and a proportionate amount of other pollutants.[44] Eliminating hydroelectric generation would have negative consequences to the electricity grid as well. Hydroelectric facilities, because they can be brought on-line almost instantaneously, are invaluable as peaking facilities and provide stability to the grid.

Finally, implementing a land-use charge system based on GAO's proposed methodology would weaken the economies of communities highly dependent upon hydroelectricity. In its Draft Report GAO recognizes that increases to electrical rates could have a depressive effect on local economies because of higher unemployment, inflation, and presumably lower disposable income, etc. We agree and further believe that the negative economic effects will be, at a local level, significant. Also, we point out that taxpayers would not benefit from increased annual charges from hydroelectric licensees—further refuting GAO's assumption that increased charges will offset taxpayers' subsidies (see the discussion in Section IV above). Under the FPA, only 12.5 percent of the revenues generated from FERC's federal land-use charges are deposited into the general treasury. The other 87.5 percent goes to the Reclamation fund (50 percent of total revenues) and to the state in which the federal lands are located (37.5 percent).[45] Under a system implementing GAO's proposed methodology, therefore, hydroelectric licensees would be subsidizing unpaid debts for the construction of reclamation projects.

The impact to taxpayer consumers of public power entities would be especially disastrous. Not only would rates to consumers be increased as a result of the annual charge, but also rates to these consumers would be increased as a result of FERC's increased administrative charges to implement this system.[46] These higher charges to electricity consumers would come

44 Energy Information Administration, Office of Coal, Nuclear, Electric and Alternative Fuels, Coal and Electric Analysis Branch, U.S. Department of Energy, "Electricity Generation and Environmental Externalities: Case Studies," September 1995; Energy Information Administration, U.S. Department of Energy, "International Energy Annual 2001."

45 *See* 16 U.S.C. § 810 (2000).

46 *See:* 16 U.S.C. § 803(e)(1) (2000).

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with no commensurate gain in electricity quantity or quality—instead, these higher charges would be used solely to offset the higher transaction costs created under a system that is based on GAO's proposed methodology.

CONCLUSION

It is clear that GAO's net benefits approach to determining charges for hydropower projects' use of federal lands is undesirable, impractical and extremely costly. FERC and Congress should reject GAO's proposed methodology for charges for hydropower projects' use of federal lands. GAO's secondary findings concerning FERC's internal controls, information management, record keeping and billing practices may have merit and could be the subject of further study.

The Western Public Power Entities appreciate this opportunity to comment on the GAO's Draft Report and look forward to continuing discussions on this important topic. If you have any questions regarding the contents of this comment, please feel free to contact the undersigned.

Sincerely,

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Counsel to the Western Public Power Entities

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The following are GAO's comments on the National Hydropower Association's letter dated March 31, 2003.

GAO's Comments

1. We do not specifically recommend that FERC adopt our methodology as a mechanism for levying annual charges, as NHA later acknowledges on page 2 of its comments. Instead, we used the net benefits approach as a tool to value the federal lands used by a sample of FERC-licensed hydropower projects. In so doing, we found that FERC is collecting only a very small percentage of the federal lands' value in its current annual charge system. We also recognize that an annual charge that better reflects the value of land used for hydropower may likely raise consumers' costs. Consequently, we recommend that FERC reassess its current annual charge system, and in making any revisions, FERC consider "the federal land's fair market value as well as the competing goals of encouraging hydropower development and avoiding unreasonable rate increases to consumers." Under the Federal Power Act, FERC is directed to assess reasonable annual charges for the use of federal land, taking into account the act's competing goals. However, in our view, it is difficult for FERC to make an informed decision about what represents a reasonable annual charge without having a clear understanding of the land's fair market value.

2. These paragraphs summarize several points that NHA raised in the body of its comments. Our responses to these points are discussed in the comments that follow.

3. As the report discusses, while the Federal Power Act does not require FERC to charge fair market value, FERC has determined that fair market value is "the most reasonable method" of compensating the government for the use of its lands.

4. Even if we had not included 2000 in our analysis, our core findings would remain the same—that FERC's annual charges are less than 2 percent of the fair market value of federal lands. As we recognize in the report, 2000 was not a representative year. However, by using six different market conditions, we ensured that our estimates would not be overly influenced by market conditions in any single year.

5. Our report extensively discusses the potential impacts of increased annual charges on consumers and licensees. These impacts will largely depend on (1) how much of the land's fair market value FERC levies as

an annual charge and (2) whether the relevant project owner operates in a regulated or restructured electricity environment. (See also comment 1.) In addition, in no case should charging fair market value for the land result in an economic project's becoming uneconomic. A net benefit analysis reveals the economic contributions that federal lands make to the production of hydropower. Should FERC act at some point to capture all or some of this value as an annual charge, economic projects will still yield a rate of return that is at or above the industry average.

6. The net benefits method that we used is sensitive to short-term volatility in electricity market conditions as well as to our annualized capital cost estimates. Our estimates of a given project's replacement cost less physical depreciation (RCLPD) may be so high that its estimated net benefits could be negative for a low-price year, such as 1998. A negative net benefits estimate for such a project means that the hydropower that it produced was more expensive than the least-cost alternative for that year. On the basis of the specific year's data, an investor would pay zero dollars for the right to use this project's land for hydropower generation because there are lower-cost alternatives.

   A project's negative net benefits estimate for the use of the land for a specific year, however, does not mean that the project's land has no value in hydropower generation. Over the lifetime of the project, the average year's net benefits to the land may be positive owing to higher average electricity prices. However, a negative net benefit estimate, if accurate and representative for expected future market conditions, would mean that the full life-cycle cost of the project is above the current least-cost alternative. Consequently, an investor considering building such a project today would not find it economically feasible.[1] Nevertheless, a consistently negative net benefits estimate for the land in hydropower use does not mean that the federal land has no value. It may be valuable for other uses, such as cutting timber or grazing livestock.

[1] Many hydropower projects were built decades ago under different economic circumstances. Some projects may or may not be considered economically feasible under today's economic conditions. If an existing project would not be considered economically feasible today, it may still be profitable for the original owner or a future buyer. The majority of capital costs for most projects were incurred decades ago, and project owners are likely to have been largely compensated for these costs at rates of return set by regulators.

It is important to reiterate, in this regard, that our 1998 estimates are low for the western projects in our sample because 1998 wholesale prices in the western United States were relatively low. The average wholesale prices of electricity in the western United States are not likely to be as low for extended periods of time in the future. Our 2003 scenario, which is based on an estimate of expected long-run average wholesale electricity prices into the foreseeable future, yields only four negative net benefits estimates. We also note that our net benefits estimates for all scenarios are probably conservative because we used capital cost estimates based on RCLPD. We used RCLPD because we could not obtain reliable data on net book value, which is a more appropriate measure of capital costs, given our specific method of annualizing capital costs. RCLPD is likely to be systematically higher than actual capital costs, resulting in lower net benefits estimates in some cases. In addition, for three of our sample projects, we counted all capital costs against hydropower benefits, although the projects have other primary purposes besides hydropower generation, such as water supply conveyance, irrigation, or flood protection. (See app. I. for further discussion.)

7. As we state in our report, our methodology recognizes other fixed factors of production. It compensates the owners of capital for their capital investments at an after-tax rate of return reflecting industry averages. Appendix I provides further details on the capital costs that we assigned to each project's physical assets, including "(1) reservoirs, dams and waterways, (2) power plant structures, (3) power plant equipment, and (4) roads and bridges." The equation we use for our net benefits estimate includes a capital depreciation factor and a return on the capital investment based on the electric utility's average cost of capital (for both debt and equity.) We also state in appendix I that the appropriate variable in our equation is the net book value (NBV) of the assets, but since NBV data were not available, we used estimates of RCLPD. We further point out that RCLPD estimates are "likely to be systematically higher than the amount that would adequately compensate project owners for such costs" because RCLPD is measured in today's dollars, while NBV is measured in historical dollar values corresponding to the dates when the investments were made.

   Consistent with economic theory and the land residual technique in the appraisal literature, we deduct the cost of all factors of production, including the returns to capital, from the value of hydropower in order to obtain an estimate of the value of land used in the production of hydropower. Land is the only fixed factor that cannot be readily reproduced or substituted.

8. Contrary to NHA's assertion, ratepayers may not be the only group affected by higher annual charges. Shareholders could end up paying for higher annual charges, but only when the hydropower projects have already been sold to private entities. As our report states:

   In a restructured environment, where electricity rates are based on wholesale market prices, increased annual charges are much more likely to affect the profitability of the electric utility and its shareholders than consumers. Specifically, in a restructured environment with competition, the utility may not be able to pass on increases in annual charges and still keep its customers. For this reason, consumers would less likely be affected.

   We agree with NHA that, in the case of divestiture, bidders for a hydropower project are likely to offer lower bids if they think that FERC's charges for the use of federally owned land could increase. If a bidder is certain that FERC charges will remain low, chances are higher that the winning bid will exceed the NBV of the project. In these instances, states have stepped in and used sales proceeds over and above the NBV to fund "transition credits," which lower rates to consumers during the transition to a restructured market. We agree that lower purchase prices for projects mean lower "transition credits" for consumers. The trade-off is between benefits to a local utility's consumers on the one hand and the nation's taxpayers on the other hand.

9. Traditionally, hydropower has provided consumers across the United States with relatively low-cost electricity, and it continues to do so despite significant rate increases in a number of western jurisdictions following the 2000 energy crisis. We recognize that substantial increases in annual charges for the use of federal lands could reduce this benefit and result in adverse economic impacts under a system of cost-based regulation. Under cost-based regulation, low charges for the use of federal land means benefits to consumers of hydroelectric power in the form of relatively low electricity rates, while higher charges for the use of federal land means benefits to U.S. taxpayers in the form of greater revenues to the federal government. In this regard, if FERC chooses to reassess its current annual charge system, our report recommends that FERC consider the federal land's fair market value as

well as the competing goals of encouraging hydropower development and avoiding unreasonable rate increases to consumers.

10. We used California Power Exchange (CAPX) price data to value hydropower produced by projects in our sample because of the integrated nature of the wholesale electricity market in the western part of the country, including Idaho, Montana, Oregon, and Washington State, as well as California. Large quantities of electric power are traded across these states. Despite occasional differences in prices for different locations, annual averages for the price of power are similar. Furthermore, as discussed in appendix I, we consulted with a number of experts—including experts from the Northwest Power Planning Council, the California Independent System Operator, and the Idaho Public Utility Commission—on this matter, and they agreed that it is reasonable to use the annual average of hourly prices in California as a proxy for the annual average price for the entire Northwest region.

11. See comment 1. Furthermore, operation and maintenance costs were among the least difficult data for us to collect in our analysis. As discussed in appendix I, hydropower licensees routinely report these costs on either FERC Form 1 or EIA Form 412.

12. We used combined-cycle combustion turbine (CCCT) technology as the most likely alternative generating source because it is widely, if not universally, recognized as the least-cost alternative to run-of-river hydropower projects. In numerous meetings with industry representatives, where we presented our methodology and findings in detail, there were few, if any, objections to our assumption that the CCCT technology was the least-cost alternative to hydropower generation. In these meetings, we pointed out that our assumption is actually a conservative one. Some hydropower projects are used as peak-load resources, for which the alternative is a simple combustion turbine, whose life-cycle cost per kilowatt-hour is considerably higher. We also recognize that CCCT costs will vary with the price of fuel.

    In addition, contrary to NHA's assertion, there is always an alternative to any existing source of power generation at some price. The more expensive the alternative, the higher the net benefits estimate for the hydropower project.

13. As discussed in comment 7, we carefully considered the value of the plant and equipment used by the hydropower projects in our sample. As

discussed in appendix I, our methodology fully compensates project owners for these investments by subtracting as a cost (1) an annual depreciation factor and (2) a return on investment. We determined the return on investment by multiplying the project's RCLPD by 7.22 percent—which is the after-tax weighted cost of capital for investor-owned utilities estimated by Global Insight for 1998 and 2002. This rate is also consistent with guidance from the Office of Management and Budget. As we discussed in comment 7, our methodology probably overcompensates project owners because it uses RCLPD instead of the lower net book value of the utility's assets.

Like all capital investments that regulated utilities undertake, hydropower projects were developed with the certainty that owners would recover their costs (commonly referred to as "rate base") and earn a rate of return determined by state regulators. Risks to capital investments in such a "regulated monopoly" environment are generally considered lower than they are for entrepreneurs operating in a competitive, unregulated environment.

14. FERC decides what lands are required to be included within the boundaries of hydropower projects. Some lands are used to generate hydropower, while others are included to meet other objectives of the Federal Power Act—such as mitigating the negative impacts that hydropower may create. We did not try to distinguish between lands that meet varying purposes of the law. Rather, we relied on decisions that FERC made—and the licensee agreed to—regarding the lands that were necessary to operate each project. Furthermore, with regard to the public's receiving other benefits from the project's operation on these lands, these benefits are also a condition of obtaining a license from FERC. (Also see comment 18.)

15. Vanceburg was decided about 26 years ago. Since then, FERC has determined that a "national average rental value," discussed with approval in Vanceburg, is not the most reasonable method for determining annual charges. In fact, on pages 16 and 17 of its comments, NHA acknowledges that FERC has recognized that a national average rental value is no longer an appropriate measure for annual charges. (See also comment 1.)

16. We agree that comparable sales data are the best indicator of land value, but we disagree that applicable comparable sales data exist for federal lands within the boundaries of hydropower projects. The

Uniform Standards for Federal Land Acquisitions provide that income-based valuation methods may be used where comparable sales data are lacking. The condemnation cases NHA cites did not address FERC's authority to establish annual charges under section 10(e) of the Federal Power Act and FERC made no reference to them in discussing its 10(e) authority in the 1987 rule making. FERC has stated that the most reasonable method for basing annual charges is fair market value, and that charges should be proportionate with the benefits conveyed. Therefore, the report recommends that FERC reassess its annual charge system for the use of federal lands. In doing so, the report also recommends that FERC determine methods for (1) estimating the fair market value of these lands and (2) assessing annual charges—taking into account the competing goals of the Federal Power Act.

NHA has asserted that lands within project boundaries must be valued according to their last use before they were included in the project. However, courts have held that these lands may be valued for power purposes. For example, in United States v. Pend Oreille PUD No. 1. 28 F.3d 1544 (9th Cir. 1994), cert. denied 514 U.S. 1015 (1995), the court held that the measure of damages for a project's unauthorized inundation of tribal lands was the value of the land for power production purposes. (Id. at 1551.)

For our purpose of estimating the fair market value of the land used to produce hydropower, prices of adjacent agricultural lands, for example, do not constitute useful comparables. The compensation that a landowner receives in a condemnation procedure also does not shed light on the value of land in hydropower generation for a similar reason because condemnation, by definition, is not a transaction between two willing parties.

17. The Federal Power Act states that FERC shall "seek to avoid" increases in consumer electricity rates. FERC has interpreted this provision to prohibit unreasonable charges that would be passed along to consumers—but not to prohibit all charges that would result in rate increases.

18. FERC has twice rejected NHA's assertion that potential annual charges for the use of federal land should be adjusted to recognize the public benefits provided by hydropower projects, such as recreation, flood control, irrigation, and fish and wildlife enhancement. Section 10(a) of the Federal Power Act requires FERC to determine, as a condition of

issuing a license, that the project will be best adapted to a comprehensive plan for waterway development “and for other beneficial uses, including recreational purposes.” In 1977 FERC stated:

> The argument that a licensee may reduce its statutory obligation to pay charges for the use of lands of the United States by offsetting the value of certain benefits provided, when the licensee’s right to construct, maintain, and operate its project depends in part on the provision of such benefits, is untenable. The “remuneration” to the licensee, if any is due, for providing these benefits is the Commission’s permission to operate the project; no further compensation, in the form of a credit to annual charge levies is due or owing.[2]

FERC reaffirmed this conclusion in its 1987 annual charge rule making. In short, under the Federal Power Act, public benefits are provided as a condition of receiving the license, and the licensee deserves no compensation for merely complying with the law.

19. We do not believe that the Forest Service’s rights-of-way fee system—on which the FERC annual charge system is based—is consistent with sound appraisal practices. We discussed the significant flaws of the Forest Service fee system for rights-of-way and refer to our 1996 report, where we examined this system in detail.[3] In short, the Forest Service stated that its rights-of-way system was not getting fair market value for rights-of-way. In fact, according to Forest Service officials, this system may be getting as little as 10 percent of the value for federal lands used for rights-of-way.

    In addition, lands used for rights-of-way are generally long, narrow corridors that accommodate power lines, pipelines, or communication lines. These lands contrast significantly with lands capable of producing hydropower, which may include large masses of land that can be as wide as a large river or large lake. Furthermore, lands suitable for rights-of-way are relatively common, while lands suitable for hydropower are scarce. Thus, we do not believe that the use of the Forest Service’s rights-of-way system is consistent with sound appraisal practices in determining the fair market value of lands capable of producing hydropower.

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[2] 42 *Fed. Reg.* 1229 (1977).

[3] See U.S. General Accounting Office, *U.S. Forest Service: Fee System for Rights-of-Way Program Needs Revision* (GAO/RCED-96-84, Apr. 22, 1996).

20. We believe that our analysis is consistent with generally accepted appraisal practices. As we discuss in our report, we could not use the comparable sales approach because there is no active market in lands rented for hydropower purposes. As discussed in our report, FERC requires licensees, as a condition of obtaining a license, to own the lands within the boundary of the projects or obtain an easement in perpetuity from another landowner. (Federal lands and lands within Indian reservations are not subject to this requirement.) As a result, we used a net benefits approach to determine the value of federal lands used to produce hydropower. This approach is similar to the income approach, which bases the value of property on its income-producing potential. Appraisal guidance indicates that in cases where no active market exists, a forecast of expected cash flows may aid in estimating the value of assets, provided the expected cash flows are discounted at a rate proportionate with the risk involved.[4] We essentially took this approach and modified it by using wholesale market prices to value hydropower instead of cost-based utility revenues. (See app I.) Our net benefits approach is grounded in economic principles that form the basis of the "land residual technique," detailed in The Appraisal of Real Estate—a widely accepted publication on appraisal practices.[5]

21. As we stated in comment 1, we do not specifically recommend that FERC adopt the net benefits approach as a means for assessing annual charges. In addition, FERC would have to factor in administrative costs into any decision it makes in revising its current annual charge system. Furthermore, while it took us nearly 3 years to complete and publish our analysis, FERC could likely perform its own analysis much more quickly because it has (1) more experience than we did with performing this type of analysis, (2) hydropower-engineering expertise on staff (we did not and had to contract out for this expertise), and (3) detailed information on electricity markets (we spent time and resources collecting this type of information).

22. As mentioned in comment 1, we used our methodology as a tool to value the federal lands used for hydropower generation. Our recommendation is for FERC to consider fair market value in setting charges for the use of federal land, but we do not prescribe a specific

[4] See Appraisal Standards Board Advisory Opinion 8 (AO-8).

[5] See *The Appraisal of Real Estate*, 12th ed. (Chicago: Appraisal Institute: 2001,) pp. 539-543.

method for setting charges. If FERC desires, a system of annual charges can be designed to vary little from year-to-year and could exclude the effects of a year such as 2000, which our report recognizes as an outlier.

23. While the Federal Power Act may preclude unilateral changes in license terms and conditions, the act does not preclude FERC from changing its annual charge system. We note that FERC currently adjusts charges for most licenses from year to year under its current system. These adjustments reflect the Forest Service's annual updating of its fee system for rights-of-way.

24. We recognize that FERC will have to consider a number of policy goals if it decides to reassess its current annual charge system. Even though NHA asserts that revising annual charges will go against some policy concerns raised in the Congress and the executive branch, we note that the Subcommittee on Energy and Water Development, House Committee on Appropriations—which oversees FERC's appropriations—has instructed the commission to consider making changes to its annual charge system. Specifically, in the report that accompanied FERC's fiscal year 2003 appropriations, the Committee stated:

> The General Accounting Office (GAO) has underway an analysis of the land rents charged by FERC for non-federal hydropower projects located on federal lands. Preliminary results from GAO indicate that the fee schedule presently used by FERC significantly underestimates, possibly by as much as two orders of magnitude, the fair market value of these project lands used for non-federal hydropower. The Committee directs FERC to submit a proposal to Congress that will revise the existing fee schedule to a new methodology that will capture more of the real market value of these federal lands.[6]

25. While FERC declined to adopt the net benefits methodology as a mechanism for establishing annual charges, FERC approved an indexed charge, on the basis of values derived from the net benefits methodology.

26. See comments 1 and 4. In addition, there is nothing unusual about using a technique that is similar to the income approach to value land. The income approach is a widely accepted appraisal practice.

[6] H. R. Rep. No. 107-681 (2002).

27. We disagree. As noted in Vanceburg, a tax is imposed by the sovereign without regard to choice or particular benefit. By contrast, an annual charge is a fee paid by choice in exchange for a particular benefit.[7] Furthermore, FERC has recognized that annual charges should be proportionate to the benefit conferred and that fair market value is the most reasonable method to measure that benefit.

28. The map presented in NHA's comments demonstrates that many states have considered or undergone significant change in restructuring their electricity markets since FERC issued its annual charge regulations in 1987.[8] In addition, as our report states, FERC's current policy is to encourage greater competition in all wholesale energy markets. Given the amount of change in electricity markets that has occurred and the potential for additional change, we believe that it is time for FERC to reassess its current annual charge system so that, among other things, it reflects the current electricity environment.

29. As the report discusses, the Federal Power Act has several goals, including the development of hydropower, the prohibition against unreasonable rate increases, and the compensation of the United States for the use of its lands.

[7] *City of Vanceburg v. FERC*, 571 F.2d 630, 644 n.48 (D.C Cir. 1977).

[8] This map may be viewed in color by going to www.eia.doe.gov/cneaf/electricity/chg_str/regmap.html.

Comments from the Department of the Interior

Note: GAO's comments appear at the end of this appendix.

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

APR - 3 2003

Mr. Barry Hill
Director, Natural Resources and Environment
U.S. General Accounting Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Hill:

The Department of the Interior has reviewed the General Accounting Office's (GAO) draft report entitled, "Federal Energy Regulatory Commission: Charges for Hydropower Projects' Use of Federal Lands Need to Be Reassessed" (GAO-03-383). Generally the Department agrees with the findings of the draft report. You have structured the problem well and conducted an important piece of research. We hope that your study will lead to improvements in public policy.

The Department agrees that FERC should reconsider its current system and develop strategies and options for assessing annual charges that are commensurate with the economic benefits conveyed to hydropower licensees. In reconsidering its current system, FERC should consult with affected licensees, agencies, Indian tribes, and other stakeholders.

The Department further agrees that improvements can be made in identifying and verifying the amount of federal lands hydropower projects use. The Department supports a recent FERC proposal to improve and standardize basic project boundary information submitted by license applicants (Notice of Proposed Rulemaking, February 20, 2003, 103 FERC ¶ 61,185). In addition, the Department offers to work with FERC in verifying the accounting of federal lands currently occupied by FERC-licensed projects.

The Department understands that you chose to focus your study on annual charges that are returned to the U.S. Treasury, and therefore excluded from this analysis annual charges returned to Indian tribes pursuant to Section 17(a) of the Federal Power Act. The Department notes that your findings apply equally to annual charges for Indian lands.

Additional comments and technical corrections are enclosed.

Sincerely,

P. Lynn Scarlett
Assistant Secretary
Policy, Management, and Budget

Enclosure

Note: Page numbers in the draft report may differ from those in this report.

ENCLOSURE

Additional Comments and Technical Corrections

See comment 1.

p 1. Footnote 1 needs to explicitly state that Indian reservations were excluded from the definition of "federal lands." It may also be useful to state what the number of projects would be if Indian reservations were included in the definition.

See comment 2.

p. 7 "about 173 of which use at least some federal lands." This statement is inconsistent with the figures in footnote 1. Either change 173 to 281, or change the statement to "about 173 of which use 25 or more acres of federal lands."

See comment 3.

p. 11 It should be noted that there is an inherent difference between the "linear rights-of-way" fees assessed by the Bureau of Land Management and the US Forest Service, and the "single user" fees assessed by FERC. Linear rights-of-way allow a single, non-exclusive use of the federal lands. The same land may be used for other purposes, including other rights-of-way, at the discretion of the land management agency, without prior approval of the right-of-way holder. By contrast, a hydropower facility is typically granted exclusive use, or at least prior approval for other uses.

See comment 4.

p. 37 "Our net benefits methodology, like the land residual technique, starts with the value of the goods that are produced and then subtracts the costs of all nonland factors of production. The residual net benefits are the estimated value of the land."

It should be noted that potential land rent (the price for the use of federal land for a specific time period) is not equal to the total economic rent (payments in excess of those necessary to attract a resource to the production of the product), but a portion of it determined by the cost of the next higher cost alternative means of producing power (see figure below). Under competitive economic conditions, no rational investor would pay more than the difference between the long-run marginal cost of generating power at the next-cheapest alternative source for power (C_a) and the long-run marginal cost (sans land rent) of generating power at the hydropower facility (C_h) for land rent for a hydropower facility.

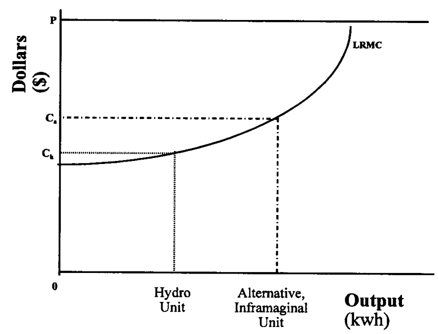
If the rent were greater than C_a-C_h a cost-minimizing investor considering whether to invest in and generate power with a hydropower facility versus investing in and generating power with the next-cheapest alternative source will select the alternative source. Thus, under competitive conditions, land rent is determined by the generating cost of the next higher cost unit.

ENCLOSURE

If one were to use the difference between the expected wholesale price for power (P) and the long-run marginal cost (sans land rent) of generating power at the hydropower facility to determine land rent, you would overpay the rent for land, i.e., pay more than the competitively determined amount. This difference,

$$P - C_h ,$$

is the sum of land rent *and* the economic rent (excess profit per kwh) for the hydropower facility. The only exception to this occurs when the hydropower facility is the marginal facility in the region. In that case, competition would indeed result in a land rent of $P - C_h$, and economic rent would be zero.



p. 45 Replace the symbol “R” in the definition section with the symbol “r” which appears in the formula.

p. 47 In the text, change operations and maintenance costs, including a share of the project owner’s overhead costs should be changed from $25 million to $20 million to match the numbers in Table 5.

The following are GAO's comments on the Department of the Interior's letter dated April 3, 2003.

GAO's Comments

1. We revised the first footnote to state that we did not include Indian reservations in our definition of federal lands.

2. For greater clarity, we added a footnote regarding the number of hydropower projects that use federal lands.

3. Our report discusses a number of flaws associated with using a fee system designed for rights-of-way to collect annual charges for hydropower uses. For the reasons discussed in the report, we believe it is difficult for FERC to defend its continued use of the current annual charge system. In its comments, the Department of the Interior observes yet another flaw—that federal lands used for rights-of-way remain available for most other uses, while federal lands licensed for use in hydropower projects in many cases do not. This is another reason for FERC to reassess its current annual charge system and consider making revisions.

4. The Department of the Interior argued that land rent in a competitive market that is stable in the long run cannot exceed the per-kilowatt cost differential between hydropower and the least-cost alternative for new capacity. Given the Department of the Interior's assumption of a long-term competitive equilibrium, we agree with this principle and believe that our valuation methodology is consistent with this approach while focusing on the more concrete but variable realization of land values in the shorter term. In practice, the price may be different from the incremental cost of a long-term alternative owing to various market conditions, such as when there are few, if any, options to the spot wholesale market for electricity. For example, to the extent that 2000 prices reflect the exercise of market power in California, they yield estimates of land values that are too high and cannot be sustained. In the longer term, low-cost alternatives, such as new production facilities based on natural gas or coal, would limit the value of the land to the cost differential between hydropower and these alternatives. Given the evolving state of the wholesale market for electricity, we chose to estimate fair market value on the basis of as much observable data as possible, while the analysis for 2003 embodies the principle that the market prices move to the price of the least-cost alternative in the long run.

GAO Contact and Staff Acknowledgments

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Acknowledgments

In addition to the individual named above, Robert J. Aiken, Paul Aussendorf, Karen Bracey, Carol Bray, Sandra Cantler, Allen Chan, Mark Connelly, Charlie Cotton, Philip Farah, Scott Farrow, Richard Johnson, Chester Joy, Joseph Kile, Frank Kovalak, Penny Pickett, Carol Herrnstadt Shulman, Donna Weiss, Arvin Wu, and James Yeager made key contributions to this report.

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