Statement of Robert W. Johnson, Commissioner
Bureau of Reclamation
U.S. Department of the Interior
Before the
Committee on Natural Resources
Subcommittee on Water and Power
United States House of Representatives
On
Reclamation's Hydropower Resources
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Madam Chairwoman and Members of the Subcommittee, I am Robert Johnson, Commissioner of the Bureau of Reclamation. I am pleased to provide the Department of the Interior's views on Reclamation's hydropower resources and the public benefits they provide.

Hydropower is a very efficient way to produce energy. Each kilowatt-hour of hydroelectricity is produced at an efficiency of more than twice that of any other energy source. Further, hydropower is extremely flexible and reliable. Hydropower can rapidly change its output to match needs – going from no power generation to maximum power generation in a short period of time.

While the Bureau of Reclamation is best known as a supplier of water for customers in the 17 western states, an equally important part of Reclamation's mission is the creation of electricity. In fact, we characterize Reclamation as a water and power organization. We are extremely proud of our hydropower program. Reclamation provides a clean, renewable source of power that has become an integral part of the electric system in the west.

Reclamation is not new to the power generation business. Since 1909, power revenues have contributed over $10 billion in project repayment to the Federal Treasury.

In an effort to provide an effective overview of Reclamation's hydropower program, I would like to divide my testimony into three parts:

1) Reclamation's Existing Hydropower Resources
2) The Current Challenges Facing Reclamation
3) The Opportunities Reclamation Sees in the Future

Reclamation's Existing Hydropower Resources

The Bureau of Reclamation manages water resources in the West. In the course of developing and managing these water resources, Reclamation built numerous projects with facilities that impound water to provide flood control and water supply for irrigation and municipal use. Along with those facilities, Reclamation constructed power plants to take advantage of the impounded water to generate clean, emission-free electricity that could also be used to finance the undertaking of the various projects.

Reclamation has 58 hydropower plants which, on an annual basis, produce over 44 million megawatt hours of electricity, enough to meet the needs of over 6 million households. Reclamation is the second largest producer of hydroelectric power in the western United States. It is worth noting that the energy produced by Reclamation facilities is the energy equivalent of replacing more than 80 million barrels of crude oil or about 48.4 billion pounds of coal. Further, Reclamation's facilities help to avoid the production of approximately 51 million pounds of carbon dioxide that would have been produced by fossil fuel power plants.

Reclamation produces power that has an annual value to its customers of slightly less than $1 billion. This offsets power that would otherwise cost over $3 billion as estimated by the Energy Information Administration. This is a significant benefit to the Nation's economy. After the hydropower is produced, Reclamation provides it to the Western Power Marketing Administration, which owns and operates the transmission lines and is responsible for marketing the power to its customers. The revenue collected from the sale of power to its customers is then deposited into the Treasury. The hydropower Reclamation produces is used for project purposes and then is provided to the Western Power Marketing Administration for sale to its customers.

Reclamation's hydropower plants also play an important role in the reliability of the electrical power grid. Most fossil and nuclear-fueled generating plants cannot restart themselves in the event of a total loss of power. Hydroelectric generators, since they can be started without an external power source, have traditionally been relied upon to restart the electric power system in the event of a blackout. As one of the largest owners and operators of hydroelectric resources, Reclamation has a key capability in restoration of the system, a function known as "blackstart." Reclamation has 18 of its hydroelectric power plants identified in blackstart restoration plans in the Western United States.

One other benefit of hydropower generation is the revenue that is collected and used to mitigate the impact of dam operations on fish and wildlife, including those listed for protection under the Endangered Species Act (ESA). A good example of this is the Bonneville Power Administration's (BPA's) use of hydropower revenues in the Columbia River Basin to avoid jeopardizing ESA-listed salmon stocks and to generally mitigate fish and wildlife affected by the Federal Columbia River Power System as required under the Pacific Northwest Electric Power Planning and Conservation Act. For Fiscal Years 2002 through 2006, BPA used hydropower revenues and borrowing authority repaid by revenues to provide an annual average of about $260 million for salmon recovery and mitigation efforts. This is nearly fifty percent of the average annual federal funding for Columbia River basin ESA implementation during the same time period. This money results from BPA's sale of hydropower produced at Reclamation and other facilities. This money has funded state of the art programs that are making a real difference in efforts to reestablish and maintain self-sustaining populations of endangered fish.

The Current Challenges Facing Reclamation

Reclamation faces many challenges in the operation of its power plants, which are operated to provide a variety of benefits. These benefits are derived not just from the actual quantity of water released and the power generated, but also from the timing of the release of water.

While the volume of water stored is a function of the weather, the timing of the releases for electrical generation usually is not. Traditionally, operation of the power plants allowed for

water releases to be timed such that generation coincided with the higher daytime electricity demand. This is referred to as "load following" and is one of the most significant benefits of hydrogeneration. However, this traditional operation is no longer accepted as routine. The decisions on when to release the water are becoming more contentious as existing electric resources are unable to meet the electric demand and as environmental requirements increase.

For example, in accordance with the Grand Canyon Protection Act of 1992, the Glen Canyon Dam is now required to be operated to protect and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, in addition to the Dam's traditional authorized purposes. This has resulted in modification of the facility's operations and has had an impact on meeting daily load following demand. Reclamation has experienced these and other types of environmental demands at a number of our hydroelectric generation dams. In addition, future conflicts between competing resource needs may be more pronounced in the face of still unknown, basin-level impacts from environmental factors such as global climate change.

Reclamation is one of many agencies and organizations that have been called upon to meet new challenges with existing resources, in ways that were never contemplated when our facilities were authorized, planned, and constructed. It is through cooperation and extensive dialogue within the Department of the Interior and among our stakeholders that the needs of the various project purposes are able to be met amidst these new demands. Through close interaction with the Fish and Wildlife Service, the National Park Service, the U.S Geological Survey, the environmental community and our power customers, Reclamation develops operational regimes to meet a variety of goals across the West.

To do this we work closely with public entities that purchase power generated at Reclamation facilities to improve the quantity and quality of power. Reclamation has developed many innovative means of stretching existing resources to meet the increasing demands or improve efficiency. As an example, since 2005, five of the 17 turbines at Hoover Dam have received new wicket gates and equipment modifications have been made to increase the gate opening so more water is allowed to flow through the turbines. These actions have increased the generating capacity at Hoover by 70 megawatts (MW). An additional 29 MW capacity gain is projected within the next three years, when work on three more units will be completed. Using a conservative market price for capacity ($2,660 per MW-month), the value of 99 megawatts of new capacity at Hoover Dam is $3.16 million per year. The Bonneville Power Administration had directly funded 10 runner replacements at Grand Coulee Dam, creating 22.7 MW of additional energy per year.

Also, pressures to improve the quality and safety of the existing electric resources have added a new dimension to Reclamation's decisions. The electric reliability standards necessary to ensure delivery of power and provide for competition among electricity market participants don't always recognize the variable and sometimes conflicting nature of decisions concerning hydroelectric supply. Reclamation is working closely with other federal entities involved in hydroelectric power to identify ways to reduce costs and improve reliability.

This point also ties in with the challenges Reclamation faces from our aging infrastructure. We are working with our water and power customers on our infrastructure needs. As noted above, we are making improvements and upgrades where possible. With most of our power customers,

we do not face the same financial challenges as with some of our water customers. Most of our power plants are directly funded by our power customers.

The Opportunities Reclamation Sees in the Future

The future will present many opportunities for Reclamation to continue its successful hydropower program. The most obvious opportunity is to enhance or expand our power production capabilities to meet the increasing demands of our power customers.

One of the most effective ways to improve efficiency is "benchmarking." In basic terms, benchmarking is a process by which an organization compares its systems against the best practices within an industry and then implements changes to improve system efficiency.

Reclamation uses benchmarking as a tool to ensure decisions on operation and maintenance are cost effective. Reclamation's cost to produce electricity is just over half of what the industry average is for hydropower plants. As a result of benchmarking, our operations at Hoover Dam went from average to best in its class.

We are also centralizing operations at Reclamation's Pick-Sloan Project and achieving efficiencies which benefit our power customers.

In closing, hydropower is an important part of our core competency. Our power customers are a highly valued part of Reclamation's overall program, and we will continue to work with them to continue to provide this important resource while at the same time balancing the many competing interests.

This concludes my written statement; I am pleased to answer any questions the Subcommittee may have.