U.S. House of Representatives Committee on Energy and Commerce
Subcommittee on Energy
October 3, 2017 Hearing: "Part II: Powering American: Defining Reliability in a Transforming Electric Industry"

The Honorable Richard Hudson

1. Mr. Wright, hydropower has been a significant contributor of baseload electricity for a very long time. As you know, it consistently ranks as one of the cheapest and cleanest forms of energy.

a. Do you think there are opportunities to increase the nation's hydropower capacity.

A: Yes, the National Hydropower Association believes there are tremendous opportunities to increase hydropower capacity. In fact, the U.S. Department of Energy believes the same as highlighted in their 2016 Hydropower Vision Report. In the Report, DOE estimates that that close to 50 GW of new capacity is available by 2050, with the right conditions and policy support in place.

Potential growth in the hydropower industry comes from a variety of sources. They include: efficiency improvements and capacity additions at existing hydropower facilities; adding generation to non-powered dams (only 3 percent of U.S. dams generate power); pumped storage; conduit/irrigation power projects; as well as some new greenfield hydropower development.

NHA notes that additional capacity not captured in the DOE Hydropower Vision report is available in the marine energy and hydrokinetic sector, with projects that utilize ocean waves, ocean currents, tides and instream technologies.

Chelan PUD has front-line experience in expanding our existing hydropower resources. Between 1996 and 2006, Chelan PUD modernized the 1300 MW Rocky Reach Hydroelectric Project, replacing and upgrading turbines and generating equipment for a 4 percent peak efficiency gain. Between 2010 and 2011, we carried out an upgrade at the Lake Chelan Hydroelectric Project, increasing installed capacity from 48 MW to 59.2 MW by replacing existing turbines and generators with new units. We are currently modernizing the 624 MW Rock Island Hydroelectric Project. Through 2022 we will be modernizing Rock Island Powerhouse 1, with an expected peak efficiency gain of 12%. From 2021 to 2029, we will be modernizing Rock Island Powerhouse 2. At Powerhouse 2, we anticipate minimal generation gains, but the significant modernization effort is necessary to support ongoing operation of the project for the subsequent 40 years.

The Honorable Peter Welch

1. In DOE's recent request that FERC raise the prices of so called "baseload power" to keep coal and nuclear plants online, the agency says it is necessary because of "energy outages expected to result from the loss of this fuel-secure generation" and because of "recognition that organized markets do not pay generators for all the attributes they provide."

a. Whether or not that is true, do you believe generators of solar, wind, and energy storage are compensated fully for their attributes in wholesale markets.

A: Focusing on hydropower and pumped storage project owners, on behalf of whom I testified as the NHA witness, the Association does not believe that our sector is fully compensated for the grid reliability benefits that it provides. NHA stated so in its response to the Federal Energy Regulatory Commission's request for comments on the DOE proposal, reiterating the position it has made in many comments to FERC and other agencies that have investigated this issue over the years.

The U.S. Department of Energy in its 2016 Hydropower Vision Report agreed with this assessment, writing:

> "Hydropower plays a vital role in grid operation through its unique performance attributes and long-lasting facilities. In addition to providing energy production, capacity, and ancillary grid support services (as designated by the Federal Energy Regulatory Commission [FERC]), hydropower offers operational flexibility, energy storage, and other services essential to the continued reliability of the entire power system**. Improved market structures and compensation mechanisms could more appropriately reward new and existing hydropower for the numerous services and benefits it provides.** Important actions in this area include determining how much flexibility is provided by hydropower in existing grid operations, exploring opportunities to enhance market valuation of that flexibility, and examining how and at what time scale settlement of prices in energy markets could facilitate better use of hydropower flexibility to support integration of variable renewable generation resources. Additionally, improving the valuation and revenue of PSH services would help optimize PSH facility operation to benefit the entire electric system and stimulate new projects through improved economic performance." [emphasis added]

In its response to FERC, NHA also noted that capacity products tend to be undervalued when there is an energy surplus. The Association urged the Commission to recognize the changing generating resource mix and its impact on the availability of essential reliability services and examine remedies within a regional context. NHA suggested further work should be undertaken to study the value of rotating mass-based inertia, flexible capacity and resource sufficiency requirements.

b. Do wholesale markets price any electricity sources based on their attributes and how they benefit the public?

NHA agrees with the Department of Energy's notice of proposed rulemaking (82 FR 46940-46948) that current markets "do not necessarily pay generators for all the attributes they provide to the grid, including resiliency." In NHA's comments on the NOPR, the Association stated that this is particularly true for America's hydropower and pumped storage fleet, which is not adequately compensated for these essential services.

As I mentioned in my testimony, hydropower is the premiere electric generating resource. It is low cost, emission-free and, unlike any other generating resource, can provide *all* components of reliability, including: energy, peak capacity, voltage support, regulation, spinning and non-spinning reserves, storage, black start capability, and inertia. Hydro generators and pumped storage resources can normally be operational very quickly to support grid restoration. They typically have adequate fuel supply and (both in the reservoir and the rivers themselves, which are continuous source of fuel that is not dependent on man-made delivery systems) and can provide a sustained response. Yet market rules generally do not value, or undervalue, these characteristics, which significantly benefit the public.

As part of FERC's process in response to the NOPR, NHA recommends that the Federal Energy Regulatory Commission work with the ISOs and RTOs to define services and attributes that support reliable and resilient grid outcomes, rather than focusing too narrowly on a subset of eligible resources.

c. Do you think DOE is suggesting that FERC create a Value of Coal Tariff to price in non-monetizable attributes?

As NHA wrote to FERC in response to the notice of proposed rulemaking, compensation should be focused on the reliability and resiliency attributes or outcomes that warrant compensation themselves, without tying them to the specific fuel types that may provide them. If a final rule zeroes in on a narrow interpretation of the 90-day onsite fuel supply requirement, it appears it would largely benefit only coal and nuclear resources to the potential exclusion of hydropower or other resources that could also fulfill reliability and resilience needs.