Statement of Timothy J. Hemstreet
Managing Director of Renewable Energy Development for PacifiCorp

U.S. Senate Committee on Energy and Natural Resources

Full Committee Hearing on Opportunities and Challenges in Deploying Innovative Battery and Non-Battery Technologies for Energy Storage

September 22, 2022

Introduction

Chairman Manchin, Ranking Member Barrasso, and members of the Committee, I appreciate the opportunity to appear before you today as you consider energy storage technologies necessary for our evolving electric generation and transmission system, as well as challenges and opportunities related to their deployment. This hearing is important for the customers and communities throughout the West who drive our business.

My name is Tim Hemstreet, and I am the Managing Director for Renewable Energy Development for PacifiCorp, an electric utility that serves approximately 1.9 million customers in communities across Utah, Wyoming and Idaho through its Rocky Mountain Power division, and across Oregon, Washington and California through its Pacific Power division. PacifiCorp's generation and transmission assets are located in ten states in the Western U.S., and include over 11,600 megawatts of owned generation capacity from hydropower, coal, gas, wind, solar, geothermal and biomass resources, with 40 percent of that capacity located in Wyoming. PacifiCorp is the single largest owner and operator of high-voltage transmission facilities in the West, and our system is still expanding, with a recent groundbreaking in Medicine Bow, Wyoming for our Gateway South transmission project. PacifiCorp can safely be described as an "all of the above" energy company. We are a proud member of the Berkshire Hathaway Energy family of businesses, but our customers – located predominantly in rural areas of the West – know us as their local power company.

As the Managing Director of Renewable Energy Development, I have the responsibility to plan and develop renewable generation assets to serve our customers so that we can safely, reliably and affordably meet their energy needs. PacifiCorp is seeing incredible growth in the amount of renewable generation we are bringing online, in addition to demand-side management and energy efficiency measures, to ensure we can meet our customers' needs and continue to power the growth of our communities. We are deeply engaged in this effort: in 2020 PacifiCorp completed an expansion of its transmission capacity in eastern Wyoming to improve reliability and create access to the highly favorable wind energy generation available in that part of our system. This effort resulted in the doubling of PacifiCorp's owned wind fleet to more than 2,250 megawatts, or nearly twenty percent of its owned generating capacity, with further growth anticipated.

We anticipate bringing on an additional 12,000 megawatts of new renewable generation to serve our customers over a twenty-year planning horizon. These new generating resources are anticipated to be predominantly fueled by the wind and the sun.

However, wind and solar resources are not dispatchable, and we also need to add substantial amounts of energy storage to ensure we can balance intermittent renewable generation with real-time customer energy needs. Indeed, we have found that this need calls for the addition of 5,500 megawatts of energy storage over the next twenty years to ensure we can meet this constant balancing act where generation need meet customer demand at all times.

Other generation types may also play an important role in meeting this challenge, and PacifiCorp is partnering on the development of TerraPower's Natrium advanced nuclear reactor design that is proposed to be located at the site of one of PacifiCorp's retiring coal facilities in Wyoming. An important attribute of this technology is its energy storage component, which can allow the 345-megawatt reactor to increase facility output capacity to 500 megawatts for more than five and a half hours using energy stored in molten salt. Natrium's design enhances grid reliability and stability while continuing to produce reliable power for our customers.

The Importance of Pumped Storage to Support Long-Duration Storage Needs

PacifiCorp is currently adding energy storage coupled with solar generation, and we anticipate adding a significant amount of standalone battery resources in the coming years to meet short-duration storage needs. Pumped storage hydropower can play an additional role that is unique and important in meeting the growing need for long-duration, commercially available energy storage that will be necessary to continue to supply reliable energy in the future.

Hydropower has historically been a meaningful component of PacifiCorp's generation portfolio, and it continues to comprise approximately ten percent of its generation capacity. Pumped storage hydropower can provide spinning reserves and quickly ramp up to balance energy supply and demand to integrate renewable resources cost-effectively while maintaining system reliability. We are also very familiar with the ability of hydropower to generate emissions-free energy, while also providing important ancillary services, including voltage and frequency support, as well as inertia and black-start capabilities that enhance the reliability and resiliency of the grid.

Given the valuable attributes of hydropower, pumped storage hydropower can play a critical role in meeting the present need for energy storage. This is not surprising given pumped storage hydropower is already serving this function. The Department of Energy reported last year that ninety-three percent of the utility-scale energy storage capacity in the United States was provided by this tried-and-true technology.

Given this understanding of the value of pumped storage hydropower, PacifiCorp is currently evaluating how we can incorporate pumped storage capabilities at our existing hydroelectric projects. Enhancing existing facilities to provide additional energy storage and needed capacity can be cost-effective by increasing the utilization of existing infrastructure, while also reducing environmental impacts. PacifiCorp has also filed eleven preliminary permit applications with the Federal Energy Regulatory Commission (FERC) in October 2021 to allow it to evaluate the feasibility of new pumped storage hydropower developments at promising locations across our service territory. Four of these potential projects are located in Utah, three in Wyoming, two in Oregon and one each in Idaho and Washington. These preliminary permits will preserve the company's priority in the competitive FERC licensing process if feasibility studies indicate the projects may benefit our customers while minimizing impacts.

Another important attribute of pumped storage worthy of note is the ability of the technology to be deployed at scale, with proposals for pumped storage projects before FERC that range in scale up to thousands of megawatts in capacity. Additionally, hydropower projects have long asset lives – the average age of hydropower units in PacifiCorp's fleet is ninety years. Thus, we know that investments in this form of storage are durable and these projects can continue to provide benefits for decades after they are built. And these storage benefits do not degrade over time. Investments in pumped storage also relieves pressure on battery storage resources that may have a higher value when deployed in electric vehicles – an increasing area of load growth. Finally, pumped storage projects can be developed with secure supply chains sourced

domestically or with strategic allies. This means pumped storage – given its durability and non-exotic sourcing and supply chains – can enhance our energy security.

Challenges and Opportunities for Pumped Storage Development

Despite the benefits of generation, load and grid support that pumped storage hydropower provides - there are challenges to its development. With long development timelines and high upfront costs, there has not been a large-scale pumped storage project brought online in the United States since the early 1990s.

Congress can help to address these issues by directing the U.S. Department of Energy to continue its efforts in evaluating how pumped storage can benefit the grid and maintain reliability to raise awareness about the value of pumped storage and other long-duration storage resources. Additional focus and assistance by national laboratories to model the value that pumped storage projects can provide to the grid can also be helpful to inform our modeling tools so they fully capture the value these projects provide.

Congress has already taken a step in providing incentives to technology-neutral storage resources, and this will be helpful in solving some of the economic challenges faced by pumped storage – and storage in general. Pumped storage projects, in particular, would also benefit by improved regulatory clarity that all components of these projects – dams, reservoirs, pumps, turbines, generators, water conveyances, generation interconnection and transmission tie lines – are included as property eligible for the newly enacted energy storage investment tax credit. This will provide needed certainty that will improve the ability of industry to raise capital and generate financing to support the development of these projects.

In most cases, development of a pumped storage project requires a license from FERC, and the licensing process for hydropower projects is highly complex and time consuming. A FERC licensing proceeding usually takes between seven to ten years to complete. Applicants must undertake extensive environmental studies in coordination with Federal and State agencies, and other stakeholders, to inform FERC's licensing process, including compliance with the National Environmental Policy Act, Clean Water Act, and the Endangered Species Act. These laws are, in turn, implemented by a number of Federal agencies, and some Federal laws, such as the Clean Water Act, are administered by States. The complex and lengthy licensing process, and the diffuse responsibility for licensing decisions and the terms and conditions that are ultimately incorporated into a license, adds uncertainty to the development of pumped storage projects.

The need for improvements to the FERC licensing process is acknowledged by a diverse number of parties with varying interests in licensing decisions. Recently, the representatives of the hydropower industry, Native American Tribes, and environmental stakeholders have agreed upon consensus recommendations to Congress around a package of reforms to the Federal Power Act. These recommendations have come out of a series of discussions among these stakeholders known as the Uncommon Dialogue. The reforms would improve the licensing process and result in more timely, less costly, and more scientifically defensible licensing decisions while also expanding the ability of Native American Tribes to represent their interests in licensing proceedings impacting Tribal lands. Significantly, these reforms would provide for a three-year licensing process for certain pumped storage projects. This is important to ensure pumped storage projects can be ready to meet the identified need for storage as our energy resource mix continues to evolve.

Enactment of the Uncommon Dialogue licensing reforms are a step in the right direction and will help address many challenges in the licensing process. Given the complexity of Federal laws, regulations, and policies that exist in the FERC process, additional steps could be taken to help applicants navigate the licensing process and enable FERC to issue licenses in a more timely manner, using existing agency authorities.

Given the long lead-time and costs associated with constructing pumped storage projects, it is important that Congress and Federal agencies take steps to streamline the permit process for these projects. Failing to do so will make it more difficult for the private sector to commit substantial resources to developing these projects in the near-term to meet our energy storage needs and meet our common goal of ensuring a safe and reliable energy system that fosters the economic growth of our communities.

I want to again thank you for the opportunity to participate in this hearing. PacifiCorp and Berkshire Hathaway Energy look forward to working with you further on these important issues.