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Introduction

Chairman Murkowski, Ranking Member Cantwell, and members of the Committee, I greatly appreciate the opportunity to appear before you today as you consider the need for investment and modernization of U.S. energy infrastructure. For the record, my name is Stefan Bird, and I am the President and CEO of Pacific Power, an electric utility serving 243 different communities located across Oregon, Washington and California. Pacific Power, along with its sister electric utility, Rocky Mountain Power, which serves customers in Utah, Wyoming and Idaho, comprises PacifiCorp, serving over 1.8 million customers with substantial assets located over 9 states in the Western U.S. With over 10,000 Megawatts of generation capacity from hydropower, coal, gas, wind, solar, geothermal and biomass resources, over 16,500 miles of high-voltage transmission, and more than 64,000 miles of distribution network, PacifiCorp can be safely described as an "all of the above" energy company. We are a proud member of the Berkshire Hathaway Energy family of businesses, but most of our customers know us as their local power company, and it is our customers and their communities that drive our business.

In my capacity as President and CEO at Pacific Power I have the responsibility to plan, manage and maintain PacifiCorp's transmission assets. PacifiCorp is the largest private transmission owner in the Western U.S., touching 10 Western states. Our network is critical to the movement of electricity between and within the Pacific Northwest, Intermountain West, and Southwest regions.

PacifiCorp invests in cost-effective energy resources and develops competitive transmission projects to meet load service and electric reliability needs of its customers. The demands placed on the electric grid and need to enhance the reach, capacity and security of the grid have never been more pronounced. Consider that most of the U.S. high-voltage transmission system was built before 1980, when the prevailing model was to site large, bulk power plants in remote areas and run transmission through sparsely populated areas to reach load centers.

Today, most electricity is still generated from central station power plants and the last era of transmission build-out was designed to accommodate that design. But with the explosive growth of renewable fuels, electricity is increasingly coming from a growing number of smaller, technologically diverse energy sources that take advantage of where it is windy, or sunny, or has hot water below ground. These sources, at large, utility-scale, can be located far from load demand and need new electric infrastructure to deliver this cleaner electricity to consumers. Even with the growth of small-scale, distributed energy resources, the transmission grid still works as the best available "virtual battery" that can absorb excess generation and efficiently move it to where it is needed. With the growth of population across the West over recent years, it is also becoming increasingly important and necessary to maintain and modernize existing infrastructure and to site

and construct new electricity infrastructure. As great as the need is to do this, so too has become the challenges to overcome to do it. Community opposition occurs at all levels in all branches of government, and since 1980, the increase in environmental regulation and potential for endangered and threatened species habitat encroachment has created new challenges in siting, construction and operation of infrastructure. These changes and challenges are natural and understandable. And can be overcome with thoughtful and balanced public policy solutions. In order to fulfill our collective mission to ensure the necessary energy infrastructure to meet today's needs and help encourage tomorrow's growth and prosperity, I would like to share some specific considerations that would benefit from Congressional attention.

Industry and government should share a common commitment to modernize the Grid

I. Today's changing energy resource mix, reliability needs and security requires new investment

The U.S. bulk transmission system has served the country well for decades. But it is aging and does not reach key resource areas nor has the capacity to meet the growing needs of electricity consumers. And, there is a growing need for both cyber and physical security strengthening of the grid that can be addressed through new infrastructure.

As renewable energy becomes a bigger part of the nation's energy mix, new transmission is needed to reach these generating resources

As we have seen at PacifiCorp, the Western U.S. is blessed with a wide array of energy resources. The U.S. energy mix is diversifying, which creates tremendous opportunities to take advantage of them, as well as challenges. The opportunities lay in the ability to achieve diversified generation portfolios that are low cost and low risk for customers, as well as supporting local and state economies through creation of jobs and increased tax base. That is true whether we're talking about generating electricity through mineral and gas extraction or by harnessing wind, sun, biomass and water. The challenges occur in the need to reach areas of resource potential, especially those associated with renewable generation that is location specific. In order to best integrate these technologies and take advantage of their many benefits, relieving capacity constraints by building new transmission lines and modernizing existing assets where possible is necessary. Improving the transfer capability of the grid is crucial to efficient integration of all of these generation resource technologies at the lowest cost for consumers.

PacifiCorp is attempting to do this through the permitting and development of the Energy Gateway projects. The Energy Gateway projects are a series of proposed transmission lines across our service territory states, some of which have already been constructed and are in service, that add additional capacity and reliability benefits, both for our retail customers and our wholesale transmission customers. These projects also represent hundreds of living-wage construction jobs and millions in property and sales taxes in the communities where they would be sited. Energy Gateway consists of the following major segments:

- **Populus to Terminal** - 135 miles of double circuit 345 kV between Downey, Idaho and Salt Lake City, Utah. *Completed in November 2010*.
- **Mona to Oquirrh** – 100 miles of single circuit 500 kV and double circuit 345 kV between Mona, Utah and South Jordan, Utah. *Completed in May 2013*.
- **Sigurd to Red Butte** – 170 miles of single circuit 345 kV between Sigurd, Utah and the Town of Central, Utah. *Completed in May 2015*.
- **Gateway West** – 1000 miles of single circuit 230 kV and single circuit 500 kV between Glenrock, Wyoming and Murphy, Idaho. Planned in-service 2019-2024. *Bureau of Land Management Records of Decision granted in 2013 (for 8 of 10 sub-segments) and January 2017 for final two sub-segments*.
- **Gateway South** – 400 miles of single circuit 500 kV between Medicine Bow, Wyoming and Mona, Utah. Planned in-service 2020-2024. *Bureau of Land Management Records of Decision granted in December 2016*.

New transmission systems look like legacy systems, but have modern technologies

New transmission infrastructure will be more reliable, more efficient, and smarter. In addition to adding redundancy to the Western Grid and, PacifiCorp has added advanced metering and telemetry to its new and existing transmission assets to help create more real-time visibility to the system, as well as utilizing dynamic line rating equipment and composite core lines to increase line ratings and capability. Accelerating these investments will not only result in increased system reliability for customers, but also help avoid catastrophic impacts due to weather, natural disaster, or intentional disruptions.

Energy Gateway has been completely privately financed, no federal funding needed to date

Since becoming a Berkshire Hathaway Energy business, PacifiCorp has been fortunate to be able to utilize its strong credit and access to low-cost capital to privately finance its transmission projects, without need of government financial assistance, to the benefit of both its retail and wholesale customers. However, we are not the only transmission developers in our region and our system is only as modern as the systems we are interconnected with. It might very well be that other systems could be developed and modernized with federal assistance which would increase the reliability and efficiency of the entire region.

Congressional attention is needed towards improving the federal transmission permitting, siting, and review processes.

As the largest transmission owner in the Western U.S., PacifiCorp has long supported measures to better coordinate the existing federal permitting and siting processes for major electric transmission projects on public lands to reduce the uncertainty for project applicants and to streamline the approval process.

Additionally, as part of its ongoing effort to permit and site its multi-state Energy Gateway transmission project, among the nation's largest currently in development, PacifiCorp has first-hand experience in federal processes that require agency review and action. PacifiCorp offers the following observations and recommendations with the above experiences and perspectives in mind.

First, undue delays in obtaining federal regulatory permits only serve to postpone the construction of needed transmission projects and the clean energy, reliability and other benefits such projects provide for customers. To give you an idea of the delays we experience, consider the Record of Decision we received on the last day of the previous Administration for our Gateway West segment. It described the long and tortuous review and approval process beginning with our "initial application in May 2007"—almost ten years for a project designed to bring clean energy to our customers and relieve congestion constraints on our system. Indeed, in order to continue developing America's vast renewable energy resources and delivering them to customers, and maintaining an efficient and reliable electric grid, completing transmission projects on a timely basis will be essential, particularly where the life cycle of transmission development tends to be much longer than the life cycle of resource project construction. Without PacifiCorp's Energy Gateway and other regional transmission projects which must cross public lands, there will be no means to transport a diverse set of new generating resources to distant load centers. As a result, some of our nation's largest and best energy resources will remain unable to contribute as they wait for transmission lines to be sited and built. The most critical path item to achieving this objective is schedule predictability within the federal permitting process. We believe substantial process improvements, once realized, will deliver significant benefits to the nation's utility customers who depend upon adequate, reliable, and reasonably-priced electricity to carry on their daily business, and will support vital economic growth across the country while preserving and protecting our environment. The greatest efficiencies to be gained are through better permit application coordination and execution of NEPA, accordingly, BHE recommends focus on improving that part of the federal permitting and siting process. Previous efforts by federal agencies and congress to streamline the process although well intended, have missed the mark to gain efficiencies. DOE's effort in 2013 focused on an integrated interagency pre-application process which could not dove-tail well with NEPA resulting in duplicative requirements that simply added time and expense. It is not yet clear if the FAST-41inititatve will deliver permitting efficiencies or will add yet another layer of bureaucracy.

Second, PacifiCorp appreciates that Congress sought to improve the federal transmission siting process in 2005 when it added new Section 216(h) to the Federal Power Act giving the Department of Energy (DOE) new lead agency authority to coordinate the approval of all required federal authorizations and related environmental reviews for "national corridor" transmission projects on public lands and which sought to give FERC additional authorities to improve the development and permitting process. While the courts have restricted its value and DOE has tried to accomplish the intent of Congress to identify and coordinate permitting reviews, we hope this committee would review Section 216(h) to address concerns raised by the courts and to improve the coordination provisions.

PacifiCorp encourages Congress to ensure that the efficiency and effectiveness of multiple agency reviews and decisions on major transmission projects is improved, and the uncertainty with federal cooperating agency reviews is reduced so that needed transmission expansion can keep pace with the nation's revolving resource mix that is being driven by a rapidly changing policy landscape. Congress should takes steps now to ensure that the federal agencies provide the schedule certainty lacking today and assign clear accountability within the cooperating agencies to meet permitting milestones on reasonable fixed timeframes. Ten years by any measure is too long for infrastructure projects. Similar measures are needed to ensure that national energy policies are infused into staff-level decisions and federal agency management must create feedback loops to obtain confidence that field staff is implementing their duties in light of current policies. Each of these recommendations, if adopted, would have the salutary effect of facilitating the timely release of critical review documents and mitigating the permit schedule uncertainties facing project sponsors by averting the potential for conflicting federal policy objectives.

Further, by taking more time, not only is the potential for more alternatives increased, but the federal agencies are continually adopting/developing/changing policies, manuals, and instructions that require additional analysis and create new compensatory mitigation requirements for projects that have been in permitting for many years. These projects don't get "grandfathered." This occurred on PacifiCorp's Gateway West and Gateway South projects with regards to sage grouse protection, landscape level mitigation, lands with wilderness characteristics, and new conservation easements funded by the Natural Resource Conservation Service – U.S. Department of Agriculture that conflict with proposed transmission line rights of way.

Above all, federal agencies must be required to meaningfully work together to assure consistent application of permitting requirements and clear communication of requirements between field/state/federal agency headquarter levels prior to the start of the permitting process and throughout the process. PacifiCorp's experience has been that this structure has worked fairly well where it has been implemented, *e.g.*, on PacifiCorp's Sigurd-to-Red Butte segment. This practice needs to be made a federal priority so the benefits can be more broadly realized. PacifiCorp believes it is reasonable for the federal lead agency to complete the NEPA process from right-of-way (ROW) application to the ROD and the ROW grant within three years. Schedule certainty is as critical if not more important than any actual benchmark.

Based on our experience, we hope you put further federal coordination around transmission permitting and siting on the list as a top priority, with the goal of assuring consistent and expedited treatment of transmission projects requiring interagency and intergovernmental coordination.

Congressional action should address the reliability benefits of vegetation management.

While building new, modern transmission infrastructure is vital to the nation's economic goals, maintaining that infrastructure is also a critical area that the Congress and federal government can help with. I will address two problems – the criticality of keeping trees from power lines, and the difficulties imposed by the decentralized decision making structure of Federal

agencies in achieving that goal. Put simply, we believe that integrated vegetation management is an environmentally-sound, cost effective way of keeping trees from power lines, and suggest the forest service adopt a policy of utilizing integrated vegetation management on Federal lands throughout the country.

The nation's electric system is comprised in part of hundreds of thousands of miles of transmission lines that reticulate North America. These lines are divided into three interconnects – eastern, western and Texas. Interconnected lines allow transmission of electricity to areas of greatest need, which can shift due to weather conditions. The system is efficient insofar as it has reduced the need to build power plants that may only be needed occasionally to cover peak loads in particular localities. While interconnects are efficient, they have been vulnerable to failure in cases of widespread high demand associated with region-wide heat waves. Failures have occurred three times in the past 20 years, when heavily-loaded lines were knocked out of service after sagging into trees. Electricity from these lines was diverted to other lines, overloading and causing them to trip off line, sending their lost capacity to other heavily loaded lines, knocking them out of service, eventually creating a series of cascading events that resulted in widespread blackouts. The most notorious of these three grid collapses occurred on August 14, 2003, where 50 million people in eastern North America were left without power, some for weeks.

The August 2003 blackout led to intense review by utilities, the Federal Energy Regulatory Commission (FERC), the North American Reliability Corporation (NERC) and others. For the utility industry, the most significant result has been development of a vegetation management standard by NERC approved by FERC. The standard is subject to potential compliance penalties of up to $1 million a day per violation for utilities that allow trees to grow into transmission lines with the objective of preventing cascading blackouts caused by trees. The ramifications of the NERC vegetation management standard is that FERC has a zero-tolerance policy regarding vegetation contacts with power lines. The challenge for the utility industry is how best to comply with zero tolerance when they are confronted by hundreds of thousands of miles of lines that span a vast continent.

One way industry has responded is though development of national consensus standards through the American National Standards Institute. The American National Standard for Tree Care Operations (ANSI A300) was issued in nine parts by the green industry, including representatives from the USDA Forest Service and National Parks Service. The International Society of Arboriculture has also published best management practices to accompany the ANSI A300 series.

ANSI A300 part 7 (2012) adapts the principles of integrated pest management to a principle called integrated vegetation management (IVM). In the case of integrated vegetation management, the "pest" populations are "incompatible" plants. Incompatible plants might be noxious weeds, invasive plant species or any vegetation that managers consider inappropriate for a given site. In a utility context, the inappropriate plants are often those that have the potential to interfere with or limit access to electric facilities at some point in their life.

ANSI A300 Part 7 defines IVM as a system of managing plant communities in which managers set objectives, identify compatible and incompatible vegetation, consider action thresholds, and evaluate, select and implement the most appropriate control method or methods to

achieve their established objectives. The choice of control method or methods is based on their environmental impact and anticipated effectiveness, given site characteristics, security, economics, current land use and other factors.

The ideal objective for the utility industry is to use IVM principles to establish plant communities comprised of species that will never interfere with the electric facilities. A useful tool is a biological control known as cover-type conversion, which provides a competitive advantage to short-growing, early successional plants, allowing them to thrive and successfully compete against unwanted tree species for sunlight, essential elements and water. It often requires selective use of herbicides against incompatible species to enable desirable species to become established. The early successional plant community is relatively stable and tree-resistant. As this community becomes increasingly established, the need for intervention decreases. In the long run, industry considers this type of biological control to be the most appropriate method, at least where it can be done effectively.

The wire-border zone concept is an important management philosophy that can be used in many areas and applied through cover type conversion. W.C. Bramble and W.R. Byrnes developed it in the mid-1980s out of research begun in 1952 on a transmission right-of-way in the Pennsylvania State Game Lands 33 Research and Demonstration project.

The wire zone is the section of a utility transmission right-of-way under the wires and extending on both sides to a specified distance. The wire zone is managed to promote a low-growing plant community dominated by grasses, herbs and small shrubs (e.g., under three-feet at maturity). The border zone is the remainder of the right-of-way. It is managed to establish small trees and tall shrubs (e.g., under 25-feet in height at maturity). The concept may be modified to accommodate side slope and changes in topography. When properly managed, diverse, tree-resistant plant communities develop in wire and border zones. The communities not only protect the electric facility and reduce long-term maintenance, but also enhance wildlife habitat, forest ecology and aesthetic values. It can’t be applied everywhere. For example, in some fire-prone areas, the border zone may not be indicated, as it may contribute ladder fuels that could exacerbate the spread of wildfire. However, wherever it can be applied, it has proven useful in enhancing wildlife habitat and protecting electric facilities.

The benefit of IVM and cover type conversion is that it works with nature, rather than against it, decreasing costs and the utility’s footprint over time. Furthermore, IVM can create opportunities to enhance the environment. For example, the EPA is actively supporting pollinator protection. The National Pollinator Protection Campaign, a collaboration of over 140 groups dedicated to promoting pollinators in North America, endorses integrated vegetation management on utility rights-of-way for expanding pollinator habitat comprised of meadow or prairie species. Those communities are consistent with industry’s objectives as well, as the species that comprise meadows and prairies will never interfere with the use of the transmission lines. A central point is that rather than looking at transmission corridors as sacrifice areas, industry, government, private environmental groups and the public working together can use them as areas of opportunity to provide much needed habitat that may be otherwise threatened, while at the same time protecting the nation’s electric supply.

The utility industry considers integrated vegetation management to be a sustainable, cost effective and environmentally-sound approach to protect the critical electric grid. Federal agency management in Washington, DC has agreed insofar as they were signatories to the [2006] MOU with EEI Member utilities, which emphasized application of IVM principles. They have also participated in developing the American National Standard for Tree Car Operations (ANSI A300), including Part 7, IVM. Many local managers agree and consider IVM to be the best approach in maintaining electric utilities that cross Federal property. However, at least from industry's perspective, others seem to view electric rights-of-way as loss areas, and work to impede maintenance, including vegetation management.

The inconsistent viewpoints of Federal land managers creates difficulties for utilities because local authorities are empowered to make their own decisions for what is or is not appropriate in their jurisdictions. The arrangement creates unpredictable directives regarding what is or what is not authorized on utility corridors on Federal lands - in spite of land managers ostensibly working with the same policies and procedures. Many utilities express frustration that requirements can change dramatically at district boundaries, which are ecologically arbitrary. In other cases authorization changes substantially when one individual transfers or retires and is replaced with someone with different views. To provide an understanding of the degree of difficulty can create, recall that PacifiCorp's facilities cross 33 different national forests. Each national forest is divided into three or four districts, each with independent decision making authority. That means PacifiCorp foresters may have to work individually with well over 100 different governing authorities for the USDA Forest Service alone. Add to that a number of regions of the BLM, national parks and Federal wildlife refuges, all of which have ongoing personnel changes, and one can understand how working with federal agencies can be so problematic and time consuming.

Local decision makers who oppose utility vegetation management can delay timely authorization for required routine maintenance. They can add redundancy and repetition in reviews and work requirements and add delay without a corresponding benefit. At other times, they can deny permission to remove dead and dying trees or other vegetation that poses a threat to transmission facilities, which can create unnecessary risk. Living trees continue to grow towards the power lines and dying trees continue to threaten to fall o electric facilities regardless of a decision timeline, so the inability to carryout routine maintenance can lead to emergency situations. All of these factors can unnecessarily raise costs, expose the electric grid to outages, including catastrophic grid failure, and increase fire risk.

That is not to say these problems are universal. On the contrary, some districts understand the issues, and cooperate in the context responsible land management.

Yet, PacifiCorp and other utilities continue to encounter problems with local Federal decision makers. Cyber security, national security, industry, commerce and domestic life are dependent on flawless functioning of the electrical interconnects. That is why FERC has a zero tolerance policy for tree contacts on interconnected transmission lines. The benefits electricity provides are too important to be left to a patchwork of independent assessments made by individuals who may or may not have electric or vegetation management training and may or may not understand the ramifications of their judgment on the electrical system. Industry would like to

see broader policy directives that not only take into consideration important environmental and land management issues, but also take into account the importance of the electric interconnect, the negative impact trees can have on it and the cost maintenance of the electric grid has to the public. Moreover, industry would like to see decisions based on research, rather than opinion, and from that perspective, that means leveraging proactive integrated vegetation management in creating plant communities that contribute to the environment without threatening the nation's electric supply. If protecting the electric grid is so important that the Federal government cannot tolerate contacts between trees and interconnected transmission lines, all facets of the government should work with industry to help meet that objective.

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.