Appendix A
Applicant's Interests and Objectives

APPENDIX A

PROJECT INTERESTS AND OBJECTIVES

GATEWAY SOUTH TRANSMISSION PROJECT

REQUEST FOR RIGHT OF WAY

October 14, 2014

PACIFICORP
A BERKSHIRE HATHAWAY ENERGY COMPANY

Who We Are:

Applicant Overview & History

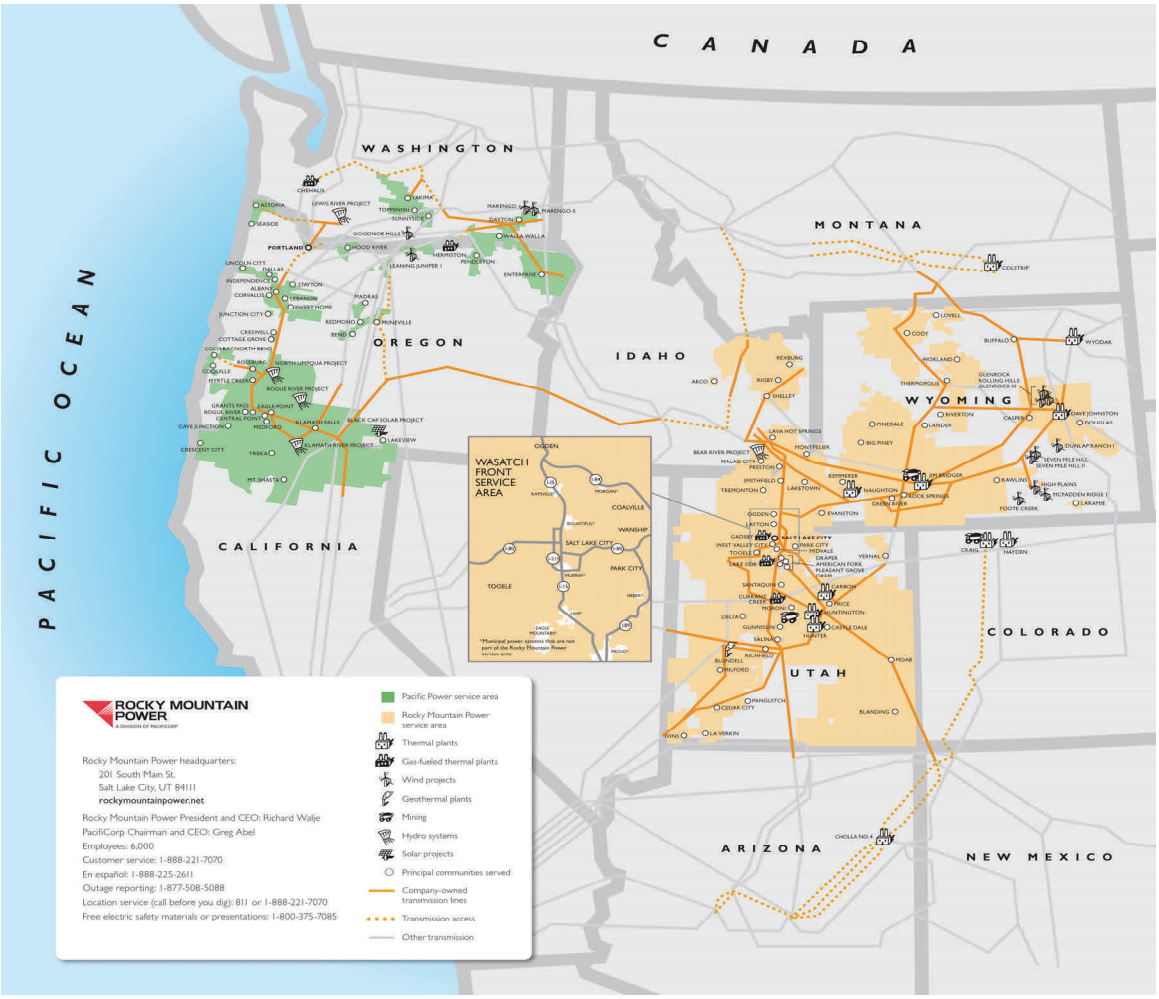
About PacifiCorp – An Overview

PacifiCorp, a Berkshire Hathaway Energy Company, is one of the West's leading utilities, serving more than 1.8 million customers across 136,000 square miles in six Western states. The Company consists of three business units, aggregating up to PacifiCorp: **PacifiCorp Energy**, containing the electric generation, commercial, energy trading and coal mining operations of the Company, is headquartered in Salt Lake City, Utah; **Pacific Power**, which delivers electricity to customers in Oregon, Washington and California, is headquartered in Portland, Oregon; and **Rocky Mountain Power**, which delivers electricity to customers in Utah, Wyoming and Idaho, is headquartered in Salt Lake City, Utah. PacifiCorp is headquartered in Portland, Oregon.

Rocky Mountain Power

Before the Company's name was changed in 2006, Rocky Mountain Power served customers in Utah and Idaho as Utah Power. Wyoming customers were served by Pacific Power, though some had been served earlier under the Utah Power name. Utah Power dates back to 1881, when Salt Lake City became the fifth city in the world to have central station electricity. Known then as Utah Power & Light (UP&L), the Company itself was formed in 1912 from several small electric companies in Utah, Idaho and western Colorado. In organizing dozens of small power companies, serving 130 small cities and towns, the new company supplied about 39,700 customers in 1912. In just 10 years, UP&L grew to serve 205 communities and 83,000 customers.

Historically, meeting the growing consumer and commercial needs for reliable, low-cost energy solutions is an ongoing focus for the Company, and thus, is the basis for this application.



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About the Program:

Energy Gateway Transmission Expansion Program

Program Background -- Energy Gateway Transmission Expansion Program

PacifiCorp's large-scale transmission expansion program named the "Energy Gateway Transmission Expansion Program" consists of three principal parts: Gateway Central, Gateway West, and the proposed project, Gateway South. Gateway Central includes Populus to Terminal (135 miles of double-circuit 345kV placed in-service November 2010), Mona to Oquirrh (100 miles of single-circuit 500kV placed in-service May 2013), and Oquirrh to Terminal (14 miles of double-circuit 345kV scheduled to be in-service in 2017). Additionally, the Sigurd to Red Butte No. 2 project is 175 miles of single-circuit 345kV currently under construction with a scheduled in-service date of June 2015.

Energy Gateway's History & Evolution

Originally announced in May 2007, Energy Gateway consisted of a combination of single- and double-circuit 230kV, 345kV and 500kV lines connecting Wyoming, Idaho, Utah, Oregon, and Nevada.

The Energy Gateway Transmission Expansion Program is the result of years of ongoing local and regional transmission planning efforts with significant customer and stakeholder involvement. Since its announcement in May of 2007, Energy Gateway's scope of work and scale have continued to evolve to meet the changing needs of PacifiCorp customers, Federal, Regional, State, and Local regulations and standards.

While the core requirements for Energy Gateway's design have not changed, the project configuration and timing continue to be reviewed and modified to align with the latest mandatory transmission system reliability standards and performance requirements. Additionally, PacifiCorp reviews annual system reliability assessments, considers experience from years of federal and state permitting processes, assesses changing generation in resource planning in order to meet our customers' forecasted demand for energy.

Challenges to the Growth of the Energy Gateway Transmission Expansion Program

In response to regulatory and industry input regarding the benefits of "upsizing" the project capacity, PacifiCorp included in its original plan the potential for doubling the project's capacity to accommodate third-party and equity partnership interests. During late 2007 and early 2008, PacifiCorp received in excess of 6,000MW of requests for incremental transmission service across the Energy Gateway footprint — which validated the plan's upsized capacity configuration.

PacifiCorp identified the costs associated with this upsized system and offered transmission service contracts to potential interconnection customers, however these customers were unable to commit due to the upfront costs and lack of firm contracts with end-use customers to take delivery of future generation. Ultimately, these customers withdrew their requests, and PacifiCorp pursued several other potential partnerships in the Intermountain Region. Due to the significant upfront costs inherent in transmission investments, firm commitments and partnerships failed to materialize, leading PacifiCorp to pursue the current configuration with the intent of only developing system capacity sufficient to meet the long-term needs of its customers.

In 2011, PacifiCorp announced it would no longer pursue the 500kV segment between the Mona, UT substation and the Las Vegas (Crystal), NV substation. This extension of Gateway South Transmission Project was a component of the upsized system to address regional needs. However, despite the significant third-party interest in this segment, there was a lack of financial commitment needed to realize it.

In 2012, due to experience with land use limitations, National Environmental Policy Act permitting requirements and feedback from significant stakeholders, PacifiCorp eliminated one of the two new proposed 230kV lines between the Windstar, WY and Aeolus, WY substations. The best balance between cost and risk for customers resulted in one new 230kV line combined with a rebuild of the existing 230kV line.

During January of 2013, PacifiCorp began discussions with Portland General Electric (PGE) regarding changes to PGE's Cascade Crossing transmission project and potential opportunities for joint development and/or firm capacity rights into PacifiCorp's Oregon system. PacifiCorp had a Memorandum of Understanding (MOU) with PGE with respect to the development of Cascade Crossing that has subsequently terminated and further discussions with PGE about Cascade Crossing as an option for development ended. PacifiCorp continues to pursue potential partnership opportunities with other providers as alternatives to the originally proposed transmission segment.

About the Program:
Energy Gateway Transmission Expansion Program

Challenges to the Growth of the Energy Gateway Transmission Expansion Program (continued)

While permitting delays have played a significant role in the adjusted timing of some segments (e.g. Gateway West and Gateway South), with the exception of Populus to Terminal, PacifiCorp has been proactive in adjusting in-service dates due to permitting schedules, moderated load growth, changing customer needs, and system reliability improvements.

PacifiCorp will continue to adjust the timing, configuration and permitting activities of the proposed transmission investments based upon its ongoing assessment of the systems ability to meet customer needs and comply with mandatory reliability stand-ards.

Energy Gateway's Continued Commitment to Excellence

The Energy Gateway Transmission Expansion Program continues to play an important role in PacifiCorp's commitment to provide safe, reliable, and reasonably priced electricity to meet the needs of our customers. The design and extensive footprint provide needed system reliability improvements and support the development of a diverse range of cost-effective resources for meeting customers' forecasted energy needs.

The Energy Gateway Transmission Expansion Program has been incorporated into the Integrated Resource Plan (IRP) public process since 2007 as part of the solution for delivering the least cost resource portfolio for multiple planning cycles. PacifiCorp continues to develop methods, in parallel with current industry best practices and regional transmission planning requirements, to better quantify all the benefits of transmission that are essential to serve customers. Energy Gateway is designed to relieve operating limitations, increase capacity, and improve operations and reliability in the existing electric transmission grid while providing access to cost effective resources.

Several Energy Gateway developments have occurred since PacifiCorp's 2013 Integrated Resource Plan (IRP) was filed. These devel-opments include continued progress relative to construction and permitting milestones, adjusting in-service dates for future seg-ments to better align with customer needs and ongoing efforts around potential joint-development projects.

Table 1, below, which is included in the 2013 IRP Action Plan update, provides a status update on In-Service Dates for each of the Energy Gateway segments.

Segment	2013 IRP	2013 IRP Update (published 2014)
Segment A: Wallula to McNary	2013-2014	Sponsor Driven*
Segment B: Populus to Terminal	N/A	Completed Nov 2010
Segment C: Mona to Oquirrh	N/A	Completed May 2013
Segment C: Oquirrh to Terminal	June 2016	May 2017*
Segment D: Windstar to Populus	2019-2021	2021-2024*
Segment E: Populus to Hemingway	2020-2023	2020-2024*
Segment F: Aeolus to Mona	2020-2022	2020-2022
Segment G: Sigurd to Red Butte	June 2015	June 2015
Segment H: West of Hemingway	No date	Sponsor Driven

***Table 1.** The Energy Gateway Segments and the forecasted IRP in-service dates.

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Why This Project is Needed:

Gateway South Transmission Project

Summarized Objectives of the Gateway South Transmission Project

PacifiCorp needs to make improvements to its bulk transmission network in order to transport electricity reliably from generation resources to various load centers. Additional transmission infrastructure is needed to:

- **Maintain compliance with mandated national reliability standards** that require PacifiCorp to have a plan to: "operate to supply projected customer demands and projected Firm Transmission Services, at all demand levels over the range of forecast system demands…."
- **Meet obligations and requirements** specifically required under PacifiCorp's Open Access Transmission Tariff (OATT) approved by the Federal Energy Regulatory Commission (FERC).
- Ensure customers have an **adequate supply of reliable and low–cost energy.**
- **Reliably deliver power** to continuously changing customer energy–supply demands under a wide variety of system–operating conditions.
- **Supply electrical demand and energy requirements of customers,** taking into account planned and unplanned system outages.
- Allow PacifiCorp to access energy available from existing markets and to **sell excess generation** to those existing markets when cost effective to customers.
- Support options for **generation resource development** including economically feasible renewable generation as specified in PacifiCorp's current and future Integrated Resource Plans**.**
- **Meet the current and anticipated 20 year energy supply requirements**, policies, rules and laws at the federal level and in the states that PacifiCorp serves.

In particular, the Gateway South Transmission Project is needed to fulfill the following key responsibilities of PacifiCorp:

- **Serve Native Load.** PacifiCorp is responsible for providing electric service to 1.8 million retail customers in the states of California, Idaho, Oregon, Utah, Washington, and Wyoming. PacifiCorp has a legal obligation to ensure sufficient firm point–to–point and network transmission capacity is available to meet the electric demands of all its customers now and into the future.
- **Serve Third–Party Network Customers.** In addition to providing service to its native load customers, PacifiCorp also is required to provide transmission service to its third–party network customers, which in turn directly serve their customers in these same states. PacifiCorp has a legal responsibility to provide reliable transmission service to third parties if transmission capacity is available.
- **Ensure Reliability.** The Gateway South Transmission Project is needed to fulfill PacifiCorp's requirement to provide reliable electrical service to all its customers based on the current and 20 year energy supply forecasts.
- **Access to Energy Resources.** PacifiCorp has a legal obligation to transport identified third–party network generation to serve network loads. The Gateway South Transmission Project is needed to provide PacifiCorp with access to rich and diverse generation resources throughout its service territory needed to meet the growing electrical demands of its customers. In general, expansion of the transmission system is needed to accommodate a variety of future resource scenarios and plans.
- **Maximize Infrastructure Benefits.** When interconnected to the wider electric system in the west, including Energy Gateway, the Gateway South Transmission Project would function as a fully interconnected electric system element in the west–wide electric grid and would be expected to carry its fully rated capacity (1,500MW of electrical power flow) across the system.

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About the Proposed Project:

Gateway South Transmission Project

Project Background -- Gateway South Transmission Project

As a critical part of the Energy Gateway Transmission Expansion Program, PacifiCorp has designed the Gateway South Transmission Project, to deliver reliable electricity to more than a million retail customers in the service area of Rocky Mountain Power. Gateway South is a single-circuit 500kV facility alternating current (AC) transmission line that would run between existing, planned, and proposed substations. A proposed single-circuit 500-kilovolt (kV) transmission line approximately 400 miles in length would begin at the planned Aeolus Substation near Medicine Bow, Wyoming, connect to two separate proposed series compensation substations, and terminate at the existing Clover Substation near Mona, Utah.

Gateway South Transmission Project —Growth in Service Area and Increased Demand

Since 1996, within PacifiCorp's service area, employment levels have grown steadily. This growth coupled with an increase in per-customer electric usage has resulted in a sustained increase in the overall demand for electricity. As a result, the transmission system currently used to provide access to low-cost generating resources, including renewables and reliable service is now fully utilized.

The 2011 Integrated Resource Plan (IRP) indicated that while economic conditions have slowed, PacifiCorp's overall service territory has continued to grow in all segments, and forecasted an increase in energy usage across its system at an average of 2.3% per year over the next five years and by 2% each year over the next ten years.

In PacifiCorp's 2013 IRP update, PacifiCorp forecasts an increase in overall energy usage across its system at an average of 1.37% average annual growth over the next ten years. Currently, PacifiCorp has approximately 10,085MW of existing resources, and the ten-year plan forecasts a need of approximately 12,110MW by the year 2023. This is illustrated in Tables 3.1 and 3.2.

Table 3.1 – October 2013 (2013 IRP Update): Forecasted Annual Load Growth, 2014 through 2023 (Megawatt-hours)

Year	Total	OR	WA	CA	UT	WY	ID	SE-ID
2014	61,671,810	14,923,360	4,486,700	893,190	25,045,480	10,363,830	3,718,360	2,240,890
2015	63,220,770	15,189,220	4,518,200	896,110	26,029,690	10,579,850	3,744,330	2,263,370
2016	63,543,020	15,330,480	4,567,610	902,370	27,064,180	10,799,120	3,777,310	1,101,950
2017	63,426,040	15,523,770	4,592,920	903,900	27,661,650	10,943,500	3,800,300	
2018	64,379,000	15,654,580	4,630,880	907,500	28,254,680	11,103,180	3,828,180	
2019	65,325,360	15,794,210	4,668,890	911,200	28,825,420	11,268,210	3,857,430	
2020	66,909,690	15,958,340	4,715,380	915,940	29,973,520	11,456,530	3,889,980	
2021	67,665,770	16,038,280	4,736,970	916,850	30,487,500	11,572,410	3,913,760	
2022	68,636,570	16,176,320	4,772,560	920,630	31,103,380	11,719,810	3,943,870	
2023	69,701,020	16,336,850	4,809,360	924,510	31,783,990	11,870,410	3,975,900	
Average Annual Growth Rate for 2014-2023								
2014-2023	1.37%	1.01%	0.77%	0.38%	2.68%	1.52%	0.75%	

Table 3.2 – October 2013 (2013 IRP Update): Forecasted Annual Coincident Peak Load (Megawatts)

Year	Total	OR	WA	CA	UT	WY	ID	SE-ID
2014	9,984	2,295	733	146	4,505	1,311	667	327
2015	10,152	2,338	738	147	4,574	1,335	691	330
2016	10,042	2,357	744	149	4,729	1,358	706	
2017	10,210	2,395	749	149	4,828	1,378	711	
2018	10,352	2,416	759	150	4,915	1,396	716	
2019	10,483	2,438	760	151	4,998	1,415	721	
2020	10,777	2,465	767	150	5,243	1,433	718	
2021	10,929	2,488	773	151	5,334	1,450	733	
2022	11,076	2,512	778	152	5,426	1,467	740	
2023	11,232	2,538	784	153	5,527	1,485	746	
Average Annual Growth Rate for 2013-2022								
2014-2023	1.32%	1.12%	0.74%	0.52%	2.30%	1.39%	1.25%	

Table 3.1 and 3.2. The 2013 IRP Update, published in March 2014, forecasts the Annual Load Growth (in Megawatt Hours) from 2014 through 2023.

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About the Proposed Project:

Gateway South Transmission Project

Gateway South Transmission Project —Growth in Service Area and Increased Demand (continued)

Although the latest two IRP filings indicate a reduction in load and resource projections, (Megawatt increase/year) between the two filings, the need to meet the projected load growth has not diminished, but rather has been shifted out in time. Regardless of changes to the future generating resource mix of PacifiCorp and other regulated utilities, such a resource change will not reduce the need to meet its obligations to provide safe, reliable electricity to its customers at a reasonable cost.

The purpose of the Gateway South Transmission Project is to alleviate constraints within PacifiCorp's existing transmission system, provide integration of planned and existing transmission segments, and improve system reliability and operational flexibility of the bulk electric system. The addition of this line would also provide opportunity to maintain the system with fewer operational constraints.

Gateway South Transmission Project —A Regulated Utility Resource

PacifiCorp's need for the Gateway South Transmission Project is additionally tied to its obligations as a regulated utility. The need to increase transmission capacity and provide safe, reliable electricity to customers at a reasonable cost is our commitment, and also the goal of federal, regional, and local regulatory entities.

PacifiCorp is a vertically integrated electric utility under the jurisdiction of the FERC and six-state regulatory commissions. Pacific Power, a business unit of PacifiCorp, offers service to more than 730,000 retail customers and is subject to regulatory oversight of the Oregon Public Utility Commission, Washington Utilities and Transportation Commission and California Public Utilities Commission. Rocky Mountain Power, also a business unit of PacifiCorp serving over one million customers, operates under the oversight and regulatory controls of the Public Service Commission of Utah, Wyoming Public Service Commission, and the Idaho Public Utilities Commission.

As provided in PacifiCorp's Open Access Transmissions Tariff, under Sections 15.4, 28.2, and 28.3, PacifiCorp is obligated to expand its transmission system to provide requested point-to-point and network transmission service, and to construct and place in-service sufficient capacity to deliver resources reliably to both network and native load customers. PacifiCorp is also required to plan for expansion of the system to ensure that its transmission system meets industry, regulatory and reliability standards.

PacifiCorp is subject to both mandated and voluntary standards which are directed at increasing the supply of renewable (or "green") energy sources as part of its overall least-cost, risk-adjusted, energy resource portfolio. The Energy Gateway Transmission Expansion Program and the Gateway South Transmission Project are both needed to ensure these long-term requirements are met. PacifiCorp, under North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) reliability standards, needs to plan, construct, and operate its system in a manner that accounts for the overall reliability of the Western Interconnection's electric supply system.

Transmission Service —Third-Parties, Partners and Investments

In addition to providing service to its native load customers, PacifiCorp also is required to provide transmission service to its third–party network customers, which in turn directly serve customers in these same states. PacifiCorp has a legal responsibility to provide reliable transmission service to third parties to the degree transmission capacity is available. The Gateway South Transmission Project was created to meet PacifiCorp's unique transmission capacity needs.

PacifiCorp requires additional transmission capacity to adequately serve its customers' load and growth needs for the next three decades. Recognizing the potential regional benefits of doubling the Gateway South Transmission Project's capacity — including maximizing the use of energy corridors, substantially minimizing environmental impacts and improving economies of scale — PacifiCorp included this potential for doubling the Gateway South Transmission Project's capacity in its original Energy Gateway Transmission Expansion Program to encourage third-party commitments and equity partnerships to support the investment. In the years since the initial announcement of the Energy Gateway Transmission Expansion Program, PacifiCorp has pursued such partnerships. However, due to significant costs that are part of transmission investments, and PacifiCorp's obligation to shelter its end customers from the costs and risks associated with upsizing the Energy Gateway Transmission Expansion Program specifically for third-party benefit, the commitments have not materialized.

About the Proposed Project:

Gateway South Transmission Project

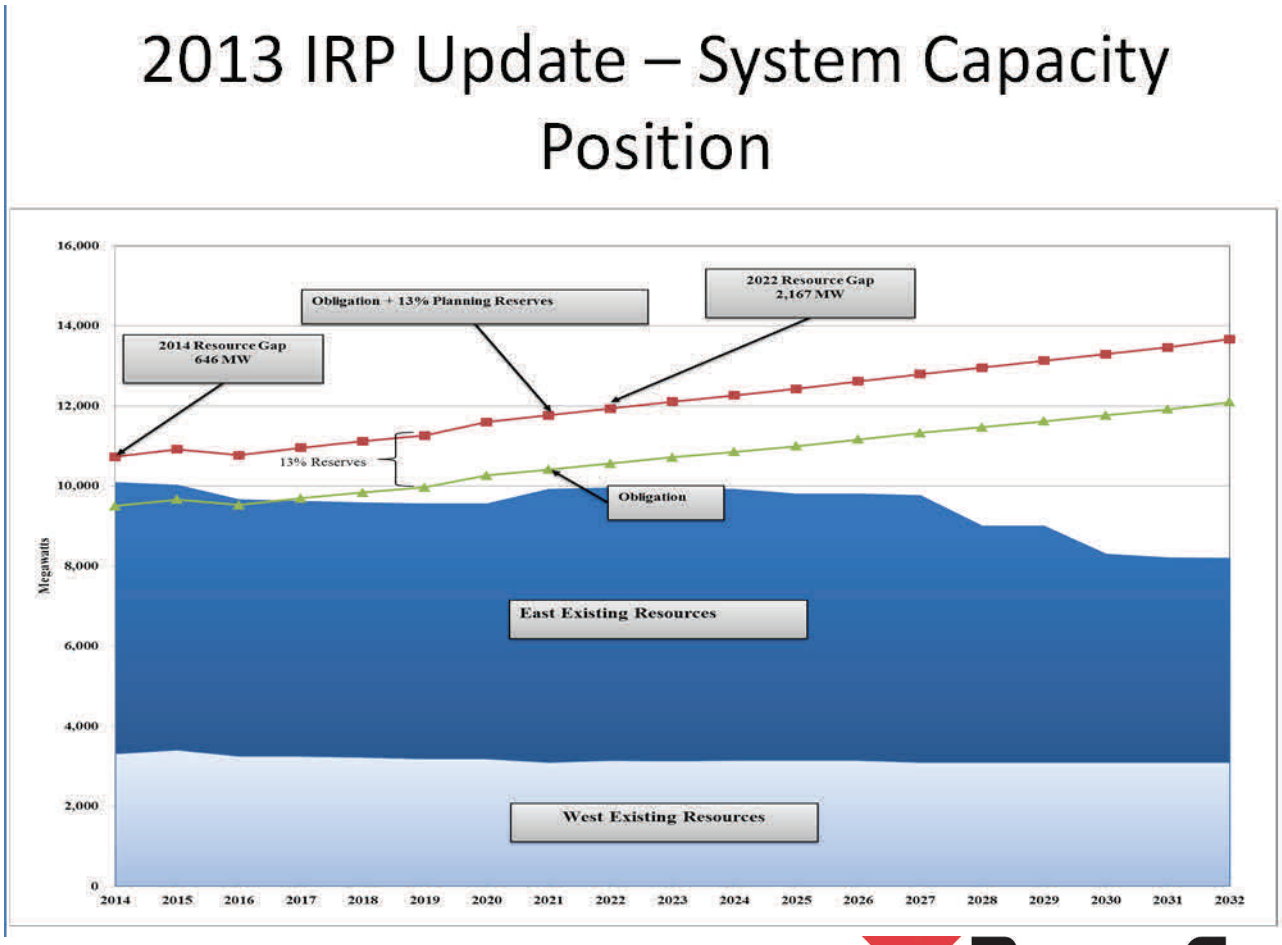
Transmission Service —Third-Parties, Partners and Investments (continued)

PacifiCorp is committed to building Gateway South Transmission Project to meet the needs of the customers and is moving ahead with the appropriate investments in order to do so. The timing of these investments to construct segments of the Program is dynamic and will be determined based on customer needs and third-party requests and commitments. This decision making process will be publically vetted in PacifiCorp's future Integrated Resource Plans (IRP). The latest IRP is the 2013 Update, and reflects a planned in-service date between the years 2020 and 2022 (See Table 1).

Existing Transmission Capacity, Constraints, and Regional Planning

The capacity ratings of transmission paths are determined based on technical studies that demonstrate compliance with established reliability criteria. PacifiCorp's high–voltage transmission system is composed of multiple 230kV, 345kV, and 500kV segments. Based on current projections (see figure below), loads and the dynamic blend of energy resources are expected to become more complex over the next 20 years, which will challenge the existing capabilities of the transmission network. PacifiCorp along with other regional utilities has determined that the Western Interconnection requires additional transmission facilities to meet increased demand for electrical transmission, including the accommodation of multiple renewable–generation projects.

Transmission reliability and the ability to address capacity or congestion issues in a timely manner represent important planning considerations for ensuring that peak load and energy obligations are met on a reliable basis. The time period required to add significant transmission infrastructure is often longer than adding generation resources or securing third–party resources. Transmission additions must be integrated into regional plans and then permits must be obtained to site and construct the physical assets. Inadequate transmission capacity limits the ability to access what would otherwise be cost effective generating resources.



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About the Proposed Project:
Gateway South Transmission Project

Existing Transmission Capacity, Constraints, and Regional Planning (continued)

Over the years, regional planning in the Western Interconnection evolved into a three–tiered approach where an interconnection –wide entity, in this case WECC members were required to conduct interregional planning at a high level. Four regional planning groups (Northern Tier Transmission Group–NTTG, Columbia Grid, California Independent System Operator, Westconnect) focus with greater depth on specific areas, and transmission providers perform local planning studies within their region. This coordinated planning helps to ensure that customers in the region are served reliably and at the least cost. PacifiCorp is one of the founding members of NTTG. Formed in 2007, NTTG has the goal of improving the operation and expansion of high–voltage transmission systems that deliver power to consumers in seven western states. The NTTG footprint includes approximately 4.3 million customers and more than 29,000 miles of transmission lines within Oregon, Washington, California, Idaho, Montana, Wyoming, and Utah.

Multiple Company, regional and inter–regional research studies have concluded that there is a critical need to "alleviate transmission congestion and move transmission–constrained energy resources to regional load centers." These include the Rocky Mountain Area Transmission Study (September 2004), the Western Governors' Association Transmission Task Force Report (May 2006), the NTTG Fast Track Project Process (2007), the Transmission Expansion Planning Policy Committee (TEPPC) 2009 Annual Report, the 2009 TEPPC Western Interconnection Transmission Path Utilization Study, and other subsequent PacifiCorp planning studies. In addition, the WECC Seams Steering Group–Western Interconnection (SSG-WI) of 2005 analyzed this region, and its results were included in the 2006 U.S. Department of Energy (DOE) National Electric Transmission Congestion Study (DOE 2006). The 2006 DOE study identifies the region from Wyoming to the west as a conditional constrained area, meaning that any generation developed in Wyoming will require additional transmission.

These studies helped develop the design of PacifiCorp's recommended bulk electric transmission additions, which took on a consistent footprint establishing a triangle of reliability over Idaho, Utah, and Wyoming, with paths extending into Oregon and Washington. The footprint defined by these studies is now known as Energy Gateway. Studies also were performed in 2007 through the NTTG Fast Track Project Process and as part of the approved NTTG 2011 and 2013 Biennial Transmission Plan, which indicated a strong need for a series of independent transmission segments, each of which addresses an independent purpose, though all are part of the larger grid. The Gateway South Transmission Project is an important component of the needed grid expansion identified by that planning effort.

Multiple Company, regional and inter–regional research studies have concluded that there is a critical need to "alleviate transmission congestion and move transmission–constrained energy resources to regional load centers."

All of these studies show that the existing generation is using all of the transmission capacity from Wyoming and that the addition of generation resources will require more transmission capacity. These studies also show that the cost of generation and transmission in Wyoming is typically much less than energy from other locations.

On a broader scale, the Department of Energy (DOE) also sponsored a study to assess the economic impact of *not* building transmission in the Pacific Northwest. The report was published in July 2008 and used a preliminary engineering review and analysis of planned transmission projects to preliminarily rank the projects based on estimates of their potential economic value, likelihood of execution, resource area(s) being accessed, size, and value to the transmission system as a whole. Although the Gateway South Transmission Project's primary purpose is to serve customers in Utah and the Southwest, it ranked 5th (of 15 major projects) in importance for the Pacific Northwest.

This conclusion provides a strong indicator that the Gateway South Transmission Project is important on both a local and regional scale.

About the Proposed Project:

Gateway South Transmission Project

Need to Ensure Reliability

Transmission systems in the United States must be planned, operated, and maintained according to NERC reliability standards. All system planners, users, owners, and operators of the bulk–power system and regional entities must comply with these standards or face significant penalties for noncompliance.

Regionally, PacifiCorp also is governed by WECC standards and criteria, which may be more stringent than those required by NERC. Compliance with these standards requires transmission systems to be planned and constructed with sufficient levels of redundancy to maintain reliable operation in the event of a loss or outage of system elements (i.e., transmission line segment or substation). NERC and WECC performance requirements also require detailed risk assessments of system impacts that would result from a multitude of outage scenarios. Compliance with these standards and regional criteria is not optional for PacifiCorp as a Transmission Owner and Transmission Planner under NERC registration.

The NERC and WECC standards and criteria are performance–based. Therefore, they do not dictate the site–specific locations of proposed transmission lines. The physical arrangement of new and existing lines and corridors is left to the transmission provider because it is most knowledgeable about the best method to meet its system performance requirements and manage reliability risks and costs. Should a transmission provider fail to meet NERC standards and WECC criteria resulting in widespread uncontrolled loss of generation or customer demand, it would be required per WECC System Performance TPL-001-WECC-CRT-2.1, WR5 Regional Criterion, to take action "so that future occurrences of the event will not result in cascading, or it must demonstrate that the Mean Time Between Failure (MTBF) is greater than 300 years (frequency less than 0.0033 outages/year) and approved by PCC." Severe measures would be required to meet this elevated level of required system performance .

PacifiCorp must have a forward–looking transmission plan of action to reliably serve current and anticipated future customer demands under all expected operating conditions.

NERC Transmission Planning Standard TPL-002 states that "system simulations and associated assessments are needed periodically to ensure that reliable systems are developed that meet specified performance requirements with sufficient lead time, and continue to be modified or upgraded as necessary to meet present and future system needs."

This means PacifiCorp must have a forward–looking transmission plan of action to reliably serve current and anticipated future customer demands under all expected operating conditions, including normal system operations (all system elements in service) and during system contingencies (where elements of the transmission system are out of service), both planned or unplanned.

Collectively these standards are designed to protect the Western Interconnection by dictating minimum performance levels of transmission system reliability for projects like the Gateway South Transmission Project. In the event that a new transmission line fails to perform in accordance with these reliability requirements, PacifiCorp may be required by WECC and NERC to limit the capacity or operation of the lines to levels that would not cause major disturbances or disruptions to the Western Interconnection. Therefore, the Gateway South Transmission Project has been designed such that a common–mode outage would not result in a reduction of its rated capacity (de–rating). This approach protects PacifiCorp's ability to maintain its obligations to its native load and network customers and minimizes the risk of a de–rating. If the Gateway South Transmission Project were subject to a de–rating, then PacifiCorp would be required to mitigate for the lost capacity. Given the scale of the Gateway South Transmission Project, this scenario would require the design and construction of an additional 500kV transmission facility, which would add significant cost to customers and increased environmental impacts.

About the Proposed Project:

Gateway South Transmission Project

Populus to Terminal Transmission Project and Impacts to the Energy Gateway Transmission Program

Studies conducted by PacifiCorp in 1982 established the 1000MW bi-direction path rating for the Path C transmission path. This "Existing" path rating was established based on single-contingency (N-1) outage of the Ben Lomond – Borah 345kV line overloading other transmission facilities.

A disturbance on the Western Interconnection occurred on July 2, 1996 that ultimately resulted in electric service interruptions to over two million customers, and took two nuclear reactors off-line.

The simultaneous combination of operating conditions on July 2, characterized by record peak summer demands in Idaho and Utah, maximum water flow conditions in the Pacific Northwest, high north-to south electricity transfers on the California -Oregon AC and DC interties, transfers from the Northwest to Idaho and Utah, high volumes of electricity transfers from Canada to the Northwest, and high amounts of thermal generation in Wyoming and Utah were not anticipated or studied. The speed of the collapse seen July 2 was not previously observed in this region and was not anticipated in studies.

Insufficient voltage support in the Northwest and Idaho for the operating conditions of July 2 was a primary factor that contributed to the widespread impact of this disturbance. The initiating event, the near simultaneous outage of two 345kV Jim Bridger-West lines, should not have resulted in the system separations and loss of demand experienced on July 2, 1996.

This occurrence resulted in a derating of transmission paths in the Western Interconnection including Path C and for PacifiCorp a demand that new facilities be constructed in order to serve PacifiCorp's customers located in Utah's Wasatch Front. In order to restore the Path C rating, a new transmission line, Populus to Terminal, was required to be constructed.

Additionally, to fully integrate the project with the southern Idaho transmission system (including the Bridger West transmission path) the project called for looping the Ben Lomond – Borah 345kV, Bridger – Borah 345kV and Bridger – Kinport 345kV lines into the Populus 345kV substation.

In support of the proposed Populus – Terminal 345kV project facility additions, transmission path rating studies were performed in 2008 by a WECC project review group that identified the positive improvement that the project made to the Path C rating.

Following completion of the studies, and acceptance of technical study finding by all utilities in the Western Interconnection, WECC granted the project Phase 3 status (permitting, construction, and progress monitoring phase) on November 20, 2008 with an Accepted Rating of 1600MW north to south, and 1250MW south to north.

On November 19, 2010, the Path C transmission path rating was increased when all Populus – Terminal 345kV project facilities were placed in-service. WECC was informed of this project status on November 24, 2010.

One of the key objectives of adding the Populus – Terminal 345kV project was an improvement in system reliability, which was expected when the southern Idaho transmission system is tied more closely with the northern Utah transmission system. Since the Populus – Terminal project was placed into service in 2010, a number of system events have occurred that have demonstrated the importance of this project on overall system reliability of the PacifiCorp – East (PACE) Balancing Authority. These events have demonstrated that the project has resulted in improved voltage performance during steady-state and system outage conditions.

One event that emphasized the importance of this project on system reliability of the PACE BA, as well as the Western Interconnection, occurred on July 19, 2011. On this day, Path C flows briefly went above 1600 southbound because the entire region was short on energy and the WECC Reliability Coordinator (RC) was coordinating phase shifter operations to maximize the transmission paths without overloading specific paths. As a result of these actions, Path C flows "spiked" when more energy was being pushed from north to south through PacifiCorp's system and adjacent systems.

Without the Populus – Terminal 345kV project, such an event could have significantly impacted the transmission system from southeast Idaho to central Utah – potentially resulting in a major system event in Utah and potentially the Western Interconnection.

About the Proposed Project:
Gateway South Transmission Project

WECC Planning Studies to Establish Line Ratings

The WECC path rating studies are required to account for outages or, in other words, events and circumstances that are deemed credible based on the utility's system operating experience and history. Within the Gateway South Transmission Project area, there are other existing and planned EHV lines that PacifiCorp must consider when siting the Gateway South Transmission Project. If the proposed Gateway South Transmission Project and the other EHV lines are all co–located in close proximity then PacifiCorp must be able to demonstrate it has an acceptable back–up plan in place should they be simultaneously out of service for any reason.

For PacifiCorp to reliably serve future loads within its service area, a new transmission line needs to be designed such that it meets NERC and WECC planning and reliability criteria. However, meeting these planning criteria does not relieve PacifiCorp of other performance–based standards enforced by WECC. In particular if a severe system disturbance occurs due to line outages, PacifiCorp's experience demonstrates that WECC may reduce the line ratings and useable capacity in order to restore system reliability. Under such a scenario, PacifiCorp would expect that construction of a new line would be needed to make up for the lost capacity.

Use of Federally Designated Corridors

As part of its original feasibility analysis, PacifiCorp considered routes in federally designated corridors located within the Gateway South Transmission Project area, but suggested the removal of some routes from further consideration based upon many factors, including its fundamental need to comply with NERC and WECC requirements. The West–Wide Energy Corridors (WWEC) Programmatic Environmental Impact Statement (PEIS) published by the Department of Energy, Bureau of Land Management, and Forest Service confirms that compliance with NERC and WECC standards is essential to reliability.

The WWEC PEIS concludes that "…by far the most cost effective preemptive strategy against multiple simultaneous line loss involves ensuring adequate distance separation between lines at the planning stage. Experience among WECC system operators has also shown that the nature of the land between lines…should dictate safe separation distances on a case–by–case basis…[I]n forested areas or in areas where vegetation provides substantial amounts of fuel for fires, greater line spacing (up to 5 miles) may be necessary to prevent adjacent lines from becoming simultaneously involved in faults caused by ionized smoke."

PacifiCorp's planning for the Gateway South Transmission Project, therefore, incorporates the findings of the WWEC PEIS as well as its own experience.

El Dorado Valley Designated Utility Corridor

PACIFICORP
A BERKSHIRE HATHAWAY ENERGY COMPANY

About the Proposed Project:

Gateway South Transmission Project

Company and Industry Experience

As described above, PacifiCorp is required to use its experience when planning for new facilities. PacifiCorp has over 100 years of experience with instances of multiple transmission lines located in the same general proximity experiencing simultaneous outages due to a variety of causes, including but not limited to fire and smoke, high winds, dust storms, ice storms, blizzards, lightning, landslides, earthquakes, vandalism, tower or conductor failure, equipment failure, airplane collisions, and other experience.

The following examples demonstrate the need for PacifiCorp and the affected land–management agencies (e.g., Bureau of Land Management, Forest Service) to consider separation distances during the planning, design, and siting of the Gateway South Transmission Project as a means to reduce risk to system reliability in the planning and construction of new transmission lines:

1981. Fire forced two 345kV lines north of Camp Williams out of service and a third 345kV line cascaded, resulting in a Utah state–wide blackout.

1982-83. Landslides destroyed transmission towers on the two Emery to Sigurd 345kV lines.

1983. Severe winds destroyed sections of seven lines between Salt Lake City and Ogden (345kV, 230kV and 138kV)

1990. A U.S. Air Force jet clipped an overhead shield wire, which wrapped around the double–circuit 345kV and 230kV lines between Terminal and Ben Lomond substations, causing outages.

2000. Fires in the corridor of Emery to Camp Williams and Huntington to Spanish Fork lines forced 345kV lines out of service.

2002-03. Multiple fires in the corridor between Mona and Camp Williams forced lines out of service.

2007. Fire caused both the Mona to Huntington and Mona to Bonanza 345kV lines in Central Utah to be de–energized for fire crew safety.

2007. Fire forced three 345kV lines connecting Jim Bridger in Wyoming and southeast Idaho out of service.

In addition to PacifiCorp's experience, other utilities in the WECC interconnection have experienced significant system outages:

1990. Fires caused six simultaneous outages (along with 17 single–line outages) of two Round Mountain to Table Mountain 500kV lines in northern California. Fires burned randomly back and forth across the corridor for more than 12 miles. Customer load interruptions ranged from 90MW to 1,000MW at times.

1993. High winds caused the loss of two adjacent 500kV line towers on the Pacific Intertie, leaving an estimated 5.2 million customers in several states without power. This simultaneous loss of two major EHV lines resulted in a system reliability and capacity review that led to the requirement in 1993 to build a third 500kV transmission line across the Pacific Intertie to restore capacity and improve reliability.

PacifiCorp has the experience and knowledge to be proactive in the planning and construction of the proposed transmission line projects in order to reduce risk to future reliability.

Acronyms and Definitions

Commonly Used Program/Project Acronyms and Definitions

Several acronyms and technical concepts are used in the document and the reader will better understand this report by becoming familiar with the following terms:

Adjacent Transmission Circuits: (as defined by Western Electricity Coordinating Council [WECC] TPL-001-WECC-CRT-2 System Performance Criterion) Two transmission circuits with separation between their center lines less than 250 feet at the point of separation with no Bulk Electric System circuit between them. Transmission circuits that cross, but are otherwise separated by 250 feet or more between their centerlines, are not Adjacent Transmission Circuits.

Bulk Electric System: The electrical generation resources, transmission lines, interconnections with neighboring systems and associated equipment generally operated at voltages of 100 kilovolts (kV) or higher. Radial transmission facilities serving only loads with one transmission line source generally are not in this definition.

Contingency Analysis: An assessment to determine the risk and system impact of certain facility outage scenarios on the electrical network.

Contingency Reserves: The generating capacity immediately available to a system operator to meet customer demand in the event of generator failure or transmission system outage. (i.e., contingencies).

Electrical Transfer: Power in an alternating current (AC) electric network does not travel along any one set path. Instead, power flows from a "generation source" to a "load sink" along all the paths that can connect them. This means that changes in generation and transmission at any point in the system will change loads on generators and transmission lines at every other point—often in ways not easily controlled.

Energy Gateway Transmission Expansion Program: PacifiCorp's large–scale transmission expansion program that consists of three principal legs: Gateway Central, Gateway West, and the subject project, Gateway South Transmission Project. Two Energy Gateway segments have been constructed including Populus to Terminal 345kV and Mona to Oquirrh 500kV/345kV. Sigurd to Red Butte 345kV No. 2 is also under construction with an in-service date of June 2015.

Extra–high Voltage (EHV): Electric transmission facility energized at 300,000 volts (300kV) or greater.

Fault: A condition when one or more electrical conductors contact the ground and/or each other typically resulting in protective equipment tripping out of service to stop the fault current that is several times larger in magnitude than the current that normally flows through a circuit.

Generation Tripping: An intentionally engineered loss or shut–down of generation facilities in response to system disturbances.

Load Shedding: An electrical power outage wherein a customer's electrical service is intentionally interrupted. Causes can be due to insufficient electrical generation capacity or transmission system outages. Load shedding, under certain contingency conditions, may be used by an electric utility company in order to avoid a cascading event that may result in a widespread blackout of the power system.

Mean Time Between Failures (MTBF): The elapsed time between failures of a system element or event during operation.

North American Electric Reliability Corporation (NERC): NERC is a self–regulatory, non–government organization that has statutory responsibility to regulate bulk power system users, owners, and operators through the adoption and enforcement of standards for fair, ethical and efficient practices. As of June 18, 2007, the Federal Energy Regulatory Commission (FERC) granted NERC the legal authority to enforce reliability standards with all users, owners, and operators of the bulk power system in the United States, and made compliance with those standards mandatory and enforceable.

Open Access Transmission Tariff (OATT): Requirement that all public utilities that own, control or operate facilities used for transmitting electric energy in interstate commerce provide non-discriminatory transmission tariffs.

Redundancy: The duplication of critical system components or transfer capacity of a system with the intention of increasing or maintaining reliability, usually a backup or fail–safe.

Transmission Capacity: The amount of power a transmission line can reliably deliver.

Transmission Path: Multiple transmission lines generally located in similar alignments and operating electrically in parallel are referred to as electrical transmission "paths."

Transmission Expansion Planning Policy Committee: TEPPC is a WECC Board committee that conducts and facilitates economic transmission planning for the Western Interconnection. TEPPC activities include fulfilling transmission owner/operator and Subregional Planning Group planning requirements under FERC Order 890. TEPPC has a balanced membership comprised of individuals from WECC–member organizations and stakeholders.

Western Electricity Coordinating Council: WECC is the regional entity responsible for coordinating and promoting bulk electric system reliability in the Western Interconnection.

Western Interconnection: The interconnected electrical systems that encompass the region of the Western Electricity Coordinating Council of the North American Electric Reliability Council. The region extends from Canada to Mexico. It includes the provinces of Alberta and British Columbia, the northern portion of Baja California (Mexico), and all or portions of the 14 western states in between.