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May 22, 2015

Via Electronic Mail

Public Utility Commission of Oregon
Attn: Filing Center
P.O. Box 2148
Salem, OR 97308-2148
puc.filingcenter@state.or.us

Re: OPUC Docket No. UM 1610

Attention Filing Center:

Attached for filing in the above-captioned docket is an electronic version of the *Opening Testimony and Exhibits of Bill Eddie on behalf of OneEnergy, Inc.*

Thank you in advance for your assistance.

Sincerely,

Ken Kaufmann

Ken Kaufmann
Attorney for OneEnergy, Inc.

Attachment

DOCKET NO. UM 1610
EXHIBIT ONEENERGY/400
WITNESS: BILL EDDIE

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

OPENING TESTIMONY OF BILL EDDIE

ON BEHALF OF

ONEENERGY, INC.

MAY 22, 2015

Q. PLEASE STATE YOUR NAME AND CURRENT EMPLOYMENT POSITION OR TITLE.

A. My name is Bill Eddie. I am the President of OneEnergy, Inc., a developer of utility-scale solar projects.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY IN THIS DOCKET?

A. Yes, I provided testimony in Phase I of the docket. My prior testimony included my background and qualifications.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to address Issues 1, 2, 3, and 4 from the Phase II Issues list.

Q: WHAT IS YOUR VIEWPOINT ON ISSUE #1 IN THE PHASE II ISSUES LIST (WHO OWNS THE GREEN TAGS IN THE LAST 5 YEARS OF A 20-YEAR PPA, WHEN THE PROJECT IS RECEIVING MARKET INDEX PRICING)?

A. Market index pricing reflects the price of undifferentiated "gray" power at a major traded energy hub. Green tags (also known as renewable energy certificates, renewable energy credits, or "RECs") are an additional tradable output of renewable energy generation. Green tags hold additional financial value because the utility can use them to comply with renewable mandates or to meet carbon emission reduction goals, or sell them to third parties. See, e.g., ORS 469A.130 *et seq.* (use of RECs for Oregon Renewable Portfolio Standard); RCW 19.285.040 (2)(a) (use of RECs for Washington Renewable Portfolio Standard).If the QF is not compensated for its green tags by the utility, then the project should retain the green tags for its own use or separate sale. Utilities will simply receive more than they pay for if the avoided cost price is based on "gray" market power, but the utility receives both power and green tags from the project. In sum, QFs should retain the green tags for the last five years of a 20 year power purchase agreement.

Q: WHAT IS YOUR VIEWPOINT ON ISSUE #2 IN THE PHASE II ISSUES LIST (WHETHER AVOIDED TRANSMISSION COSTS FOR NON-RENEWABLE AND RENEWABLE PROXY RESOURCES SHOULD BE INCLUDED IN THE CALCULATION OF AVOIDED COST PRICES)?

A: As a matter of policy, avoided transmission costs for both non-renewable and renewable proxy resources should be included in calculating avoided cost prices regardless of whether the proxy resource is off-system or on-system. For off-system proxy resources, I do not believe there is any material dispute among the parties that the cost of third party transmission to deliver the proxy resource's power to load must be included in avoided cost prices. However, there is a dispute as to whether transmission upgrade costs associated with on-system proxy resources should be included.

Q. WHAT POLICY TEST WOULD YOU RECOMMEND THE COMMISSION APPLY WITH RESPECT TO TRANSMISSION UPGRADE COSTS ASSOCIATED WITH ON-SYSTEM PROXY RESOURCES?

A. I recommend the Commission apply this test: If the on-system proxy resource cannot be designated a Network Resource at its full capacity without transmission upgrades and without de-rating or curtailing other Network

Resources, then the cost of transmission upgrades necessary to make it a Network Resource should be included in avoided cost prices.

Q. WHY SHOULD THE COMMISSION APPLY THIS TEST?

A. This test ensures that QF resources are not discriminated against in comparison to utility resources. The cost of transmission upgrades to get the proxy resource's output to load will be real, and they will be paid by someone. It is speculative and inappropriate to determine today that the Commission will approve a particular future transmission upgrade to be included in rate base. If avoided transmission costs are not included in avoided cost prices, then QF resources will receive lower prices on the presumption that a particular future transmission upgrade will be built and paid for by all ratepayers.

Q. IS THERE A LIVE EXAMPLE OF TRANSMISSION UPGRADE COSTS ASSOCIATED WITH AN ON-SYSTEM PROXY RESOURCE BEING EXCLUDED FROM AVOIDED COST?

A. Yes. PacifiCorp's renewable avoided cost prices are based on a proxy wind plant to be located in the "Aeolus wind bubble" in Wyoming. See PacifiCorp's Response to OneEnergy Data Request 6.1. OneEnergy/401, Eddie/1. Although this part of Wyoming undoubtedly has strong winds, it is widely known that insufficient transmission exists today to get new generation resources from the wind bubble to PacifiCorp load. Recent wind QF agreements with projects in this area have required the QF to accept a reduced purchase price to account for PacifiCorp's curtailment of other Network Resources using the same transmission paths. See PacifiCorp's Response to OneEnergy Data Request 6.5

(OneEnergy/401, Eddie/5). Nevertheless, the cost of backbone transmission upgrades needed to get proxy output to load from the Aeolus wind bubble area are not included in the proxy resource cost. See PacifiCorp's Response to OneEnergy Data Request 6.3 (OneEnergy/401, Eddie/3) ("The decision to locate the proxy renewable resources to meet the RPS requirements takes advantage of available transmission capability between various locations, in addition to costs and availability of renewable resources. There is no incremental transmission costs required for the proxy resource"). In other words, it is PacifiCorp's position that the Gateway West transmission upgrades will address the wind bubble congestion and those upgrades will be rate based (rather than assigned to new generation resources).

Q. WHY IS PACIFICORP'S EXCLUSION OF TRANSMISSION COSTS ASSOCIATED WITH THE RENEWABLE PROXY INAPPROPRIATE?

A. PacifiCorp's approach presumes the prudency of building those exact transmission upgrades, despite that the Commission has not acknowledged them in an IRP. The Parties have no way of determining today (a) whether or not PacifiCorp will build the upgrades, and (b) whether or not the Commission will agree they should be rate based. In fact, the Company has not even requested acknowledgement of the Windstar to Populus segment of the Gateway West transmission plan in either its 2013 or 2015 IRP. See 2013 IRP at 65 (OneEnergy/403, Eddie/1) ("In a future IRP, the Company will support a request for acknowledgement to construct Windstar to Populus with a thorough cost-benefit analysis for the project, similar to that provided in this IRP for the Sigurd to Red Butte transmission project"); see also 2015 IRP at 50, attached (OneEnergy/402, Eddie/4). Yet the offered renewable avoided cost rates to QFs today presume that the Windstar to Populus lines will be built and that the Commission will approve the upgrades for rate basing. A number of factors could arise that would render the Windstar to Populus segment unnecessary, including closure of the Dave Johnston coal plant, or increased loads in the wind bubble area from oil and gas exploration or any other source. Indeed, PacifiCorp's 2015 IRP undercuts some of the basis for the Energy Gateway effort, noting that third-party interest in paying for the upgrades has declined such that the Company has delayed the project, downsized the project (OneEnergy/402, Eddie/9), and that the amount of wind proposed in each IRP in recent history has declined (OneEnergy/402, Eddie/6).

To summarize, today's renewable rates offered to QFs are lower because of the Company's reliance on future transmission projects which have not been acknowledged by the Commission. Reliance on unacknowledged resource acquisitions is inappropriate under Commission orders.

Q: HOW SHOULD THE COMMISSION CORRECT THIS ISSUE?

A: The Commission should direct PacifiCorp either (a) to include the cost of transmission upgrades in the renewable proxy resource (if the renewable proxy is to remain a Wyoming wind project in the Aeolus wind bubble), or (b) choose a different renewable proxy that does not require extensive transmission upgrades to serve loads.

Q: WHAT IS YOUR VIEWPOINT ON ISSUE #3 (WHETHER THE COMMISSION SHOULD REVISE THE METHODOLOGY FOR DETERMINING THE CAPACITY CONTRIBUTION ADDER FOR SOLAR QFs SELECTING THE STANDARD RENEWABLE AVOIDED COST PRICES)?

A. The Commission should revise the methodology to correct for an oversight in Order 14-058. That oversight has the practical outcome of under-paying solar for its capacity value. OneEnergy previously detailed its position on this issue in our Motion for Clarification and Application for Reconsideration filed jointly with the Community Renewable Energy Association on April 28, 2014, and in my prefiled response testimony filed on November 19, 2014 (OneEnergy/300, Eddie/1-4). In summary, the capacity adder for solar QFs accepting the renewable avoided cost rates is intended to pay solar QFs a certain amount of money ("Capacity Dollars") for the solar QF's performance during the handful of highest hours of maximum electric usage. Solar QFs perform well against the highest summertime loads, which occur on hot summer afternoons. For its 2015 IRP, PacifiCorp determined that single axis tracking solar PV projects in the utility's west side balancing area provide a 36.7% contribution to peak. 2015 IRP, Volume II Appendix N at 405 (2014 Wind and Solar Capacity Contribution Study). OneEnergy/404, Eddie/1.

But confusingly, the actual payment of Capacity Dollars to QFs under the current Oregon methodology are spread out over all "on-peak" hours (i.e. 6:00AM to 10:00PM every day except Sundays and holidays). In other words, to get the full amount of "Capacity Dollars" it is owed, a solar project would need to perform as well at 7:00 AM on a cool, cloudy April morning as it does on a hot sunny July afternoon.

The current methodology intends to credit Capacity Dollars to solar QFs, but the practical outcome is that solar QFs do not actually receive those Capacity Dollars. This does not make sense, and it sends the wrong economic signal to projects.

Q. HOW SHOULD THE COMMISSION IMPLEMENT THIS CORRECTION?

A. Staff has offered two possible solutions to implement this correction. One option is for the Capacity Dollars to be paid during all on-peak hours when a solar QF actually delivers energy. A second option would be to pay the Capacity Dollars in a more targeted way, focusing only on time periods of expected maximum need. Staff/300, Andrus/11-13. Although either solution is workable, I believe the first option is easier to implement and should be adopted by the Commission.

Q: WHAT IS YOUR VIEWPOINT ON ISSUE #4 (WHETHER THE SAME CAPACITY ADJUSTMENT FOR SOLAR QFs SHOULD BE APPLIED UNDER THE STANDARD NON-RENEWABLE AVOIDED COST PRICES)?

A. The exact same logic applies under the standard non-renewable avoided cost structure. The Commission should order the same correction for solar QFs for both standard renewable and standard non-renewable rates.

Q: DOES THIS COMPLETE YOUR OPENING TESTIMONY?

A. Yes.

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

EXHIBIT ACCOMPANYING OPENING TESTIMONY OF
BILL EDDIE

ON BEHALF OF

ONEENERGY, INC.

Responses to OneEnergy Data Requests 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7 and 6.8

May 22, 2015

OneEnergy Data Request 6.1

Please describe the wind proxy resource used to create the current standard renewable rate, including resource type, location, point of interconnection, and size (in MW).

Response to OneEnergy Data Request 6.1

The wind proxy used to create the current standard renewable rate is the Wyoming Wind resource identified in 2013 Integrated Resource Plan (IRP) (Volume I, Table 6.2 on pages 116 and 117). It is comprised of 2.3 megawatt (MW) turbines with a 40 percent capacity factor and is located in the Aeolus bubble in Wyoming.

OneEnergy Data Request 6.2

Please identify the assumed cost of generator interconnection for the proxy resource described in your answer to DR-6.1.

Response to OneEnergy Data Request 6.2

The "cost of generator interconnection" for the proxy Wyoming wind resource was included in the total balance-of-plant (i.e. non wind-turbine-generator) scope and cost. This balance of plant cost, determined on dollars per kilowatt-basis ($/kW), was applied to then-current pricing for wind turbine generators to develop the total cost for the proxy Wyoming wind resource reported in the 2013 Integrated Resource Plan (IRP). Balance-of-plant costs were calculated based on PacifiCorp's Dunlap Wind project. For the purpose of this data request, "cost of generator interconnection," using the Dunlap Wind project as the basis, are assumed to include: transmission line from the project switchyard to the point-of-interconnection substation, metering transformers and circuit breaker, interconnection substation property and rights-of-way, and transmission function direct assigned costs. The estimated direct "cost of generator interconnection" for these components is $60.85/kW (in 2012 dollars (2012 $)). This cost does not include any allocation of project management, engineering, allowance for funds used during construction or capital surcharge; however, these owner's costs were included in the overall balance-of-plant cost determination. Costs for the project switchyard or the Large Generator Interconnect Agreement (LGIA) are also part of the total balance of plant scope but, for the purposes of the data request, not part of the "cost of generator interconnection."

OneEnergy Data Request 6.3

Please identify the nature of and assumed cost of any transmission system upgrades required for the proxy resource described in your answer to DR-6.1.

Response to OneEnergy Data Request 6.3

The proxy wind resource, identified in the Company's response to OneEnergy Data Request 6.1, is added to meet the projected requirements of Federal and State (Oregon) renewable portfolio standards (RPS) on a least cost basis. The decision to locate the proxy renewable resources to meet the RPS requirements takes advantage of available transmission capability between various locations, in addition to costs and availability of renewable resources. There is no incremental transmission costs required for the proxy resource.

OneEnergy Data Request 6.4

Has PacifiCorp executed a power purchase agreement with Pioneer Wind Park I, LLC (the project subject to FERC Docket No. EL14-1-000), or any successor entity related to the same project?

Response to OneEnergy Data Request 6.4

Yes.

OneEnergy Data Request 6.5

Did PacifiCorp propose to reduce the purchase price of output from Pioneer Wind Park I because PacifiCorp's expected to at times curtail other network generating resources utilizing the same transmission path to PaciflCorp network load in order to accept output from Pioneer Wind Park I?

Response to OneEnergy Data Request 6.5

Yes. Pricing is consistent with Wyoming Schedule 38, and is consistent with Wyoming Public Service Commission (WPSC) orders in Docket 20000-388-EA-11.

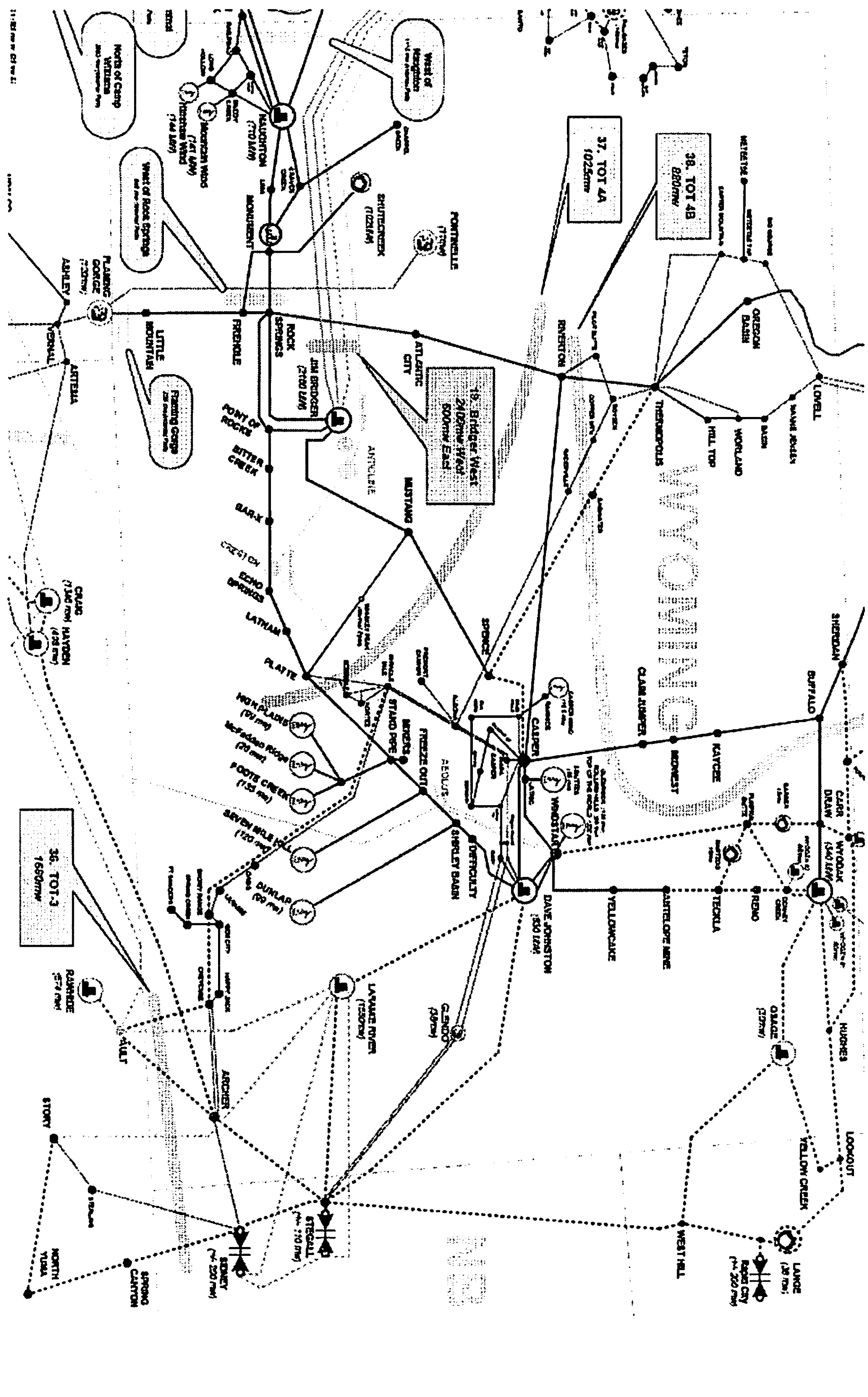
OneEnergy Data Request 6.6

What are the specific transmission constraints that at times would prevent output from Pioneer Wind Park I from serving load in PacifiCorp's system without curtailing other system resources?

Response to OneEnergy Data Request 6.6

The transmission constraints preventing Pioneer Wind Park I from serving PacifiCorp's system load without curtailing other system resources is defined within the Western Electricity Coordinating Council (WECC) Path Rating Catalog as Path 37 (TOT 4B) and Path 38 (TOT 4A). Please refer to Attachment OneEnergy 6.6; specifically the references to Path 37 (TOT 4B) and Path 38 (TOT 4A) in the two yellow colored boxes.

ATTACHMEMENT ONEENERGY 6.6



OneEnergy Data Request 6.7

Do the constraints identified in DR 6.6 also exist with respect to the wind proxy resource identified in DR 6.1? Explain why or why not.

Response to OneEnergy Data Request 6.7

Yes. The wind proxy resource located within the Aeolus bubble, which is behind the same Western Electricity Coordinating Council (WECC) Path Rating Catalog, Path 37 (TOT 4B), and Path 38 (TOT 4A) constraints as Pioneer Wind Park I.

UM 1610/PacifiCorp
May 1, 2015
OneEnergy Data Request 6.8

OneEnergy Data Request 6.8

Has PacifiCorp received delivery of energy from Pioneer Wind Park I, LLC, or any successor entity related to the same project?

Response to OneEnergy Data Request 6.8

No.

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

EXHIBIT ACCOMPANYING OPENING TESTIMONY OF
BILL EDDIE

ON BEHALF OF

ONEENERGY, INC.

Chapter 4
from
PacifiCorp's *2015 Integrated Resource Plan*, Volume I
(March 31, 2015)

May 22, 2015

CHAPTER 4 – TRANSMISSION

CHAPTER HIGHLIGHTS

- PacifiCorp is obligated to plan for and meet its customers' future needs, despite uncertainties surrounding environmental and emissions regulations and potential new renewable resource requirements. Regardless of future policy direction, the Company's planned transmission projects are well aligned to respond to changing policy direction, comply with increasing reliability requirements while providing sufficient flexibility to ensure investments cost-effectively and reliably meet its customers' future needs.
- Given the long periods of time necessary to site, permit and construct major new transmission lines, these projects need to be planned well in advance and developed in time to meet customer need.
- The Company's transmission planning and benefits evaluation efforts adhere to regulatory and compliance requirements and are responsive to commission and stakeholder requests for a robust evaluation process and criteria for evaluating transmission additions.
- PacifiCorp requests acknowledgment of its plan to construct the Wallula to McNary portion of the Walla Walla to McNary transmission project (Energy Gateway Segment A) based on customer need and associated regulatory requirements with continued permitting of the Walla Walla to McNary transmission line.
- While construction of future Energy Gateway segments (i.e., Gateway West, Gateway South and Boardman to Hemingway) is beyond the scope of acknowledgement for this IRP, these segments continue to offer benefits under multiple, future resource scenarios. Thus, the Company believes continued permitting of these segments is warranted to ensure it is well positioned to advance these projects as required to meet customer need.

Introduction

PacifiCorp's bulk transmission network is designed to reliably transport electric energy from generation resources (owned generation or market purchases) to various load centers. There are several related benefits associated with a robust transmission network:

1. Reliable delivery of energy to continuously changing customer demands under a wide variety of system operating conditions.
2. Ability to supply aggregate electrical demand and energy requirements of customers at all times, taking into account scheduled outages and the ability to maintain reliability during unscheduled outages.
3. Economic exchange of electric power among all systems and industry participants.
4. Development of economically feasible generation resources in areas where it is best suited.
5. Protection against extreme market conditions where limited transmission constrains energy supply.
6. Ability to meet obligations and requirements of PacifiCorp's Open Access Transmission Tariff (OATT).
7. Increased capability and capacity to access energy supply markets.

PacifiCorp's transmission network is a critical component of the IRP process and is highly integrated with other transmission providers in the western United States. It has a long history of reliable service in meeting the bulk transmission needs of the region. Its purpose will become more critical in the future as energy resources become more dynamic and customer demand continues to grow.

Regulatory Requirements

Open Access Transmission Tariff

Consistent with the requirements of its OATT, approved by the Federal Energy Regulatory Commission (FERC), PacifiCorp plans and builds its transmission system based on its network customers' 10-year load and resource (L&R) forecasts. Each year, the Company solicits L&R data from each of its network customers in order to determine future load and resource requirements for all transmission network customers. These customers include PacifiCorp Energy (which serves PacifiCorp's retail customers and comprises the bulk of the Company's transmission network customer needs), Utah Associated Municipal Power Systems, Utah Municipal Power Agency, Deseret Generation & Transmission Cooperative (including Moon Lake Electric Association), Bonneville Power Administration, Basin Electric Power Cooperative, Black Hills Power and Light, Tri-State Generation & Transmission, the States Department of the Interior Bureau of Reclamation, and Western Area Power Administration.

The Company uses its customers' L&Rs and best available information to determine project need and investment timing. In the event that customer L&R forecasts change significantly, PacifiCorp may consider alternative deployment scenarios and/or schedules for its project investment as appropriate. Per FERC guidelines, the Company is able to reserve transmission network capacity based on this 10-year forecast data. PacifiCorp's experience, however, is that the lengthy planning, permitting and construction timeline required for significant transmission investments, as well as the typical useful life of these facilities, is well beyond the 10-year timeframe of load and resource forecasts.[21] A 20-year planning horizon and ability to reserve transmission capacity to meet forecasted need over that timeframe is more consistent with the time required to plan for and build large scale transmission projects, and PacifiCorp supports clear regulatory acknowledgement of this reality and corresponding policy guidance.

Reliability Standards

PacifiCorp is required to meet mandatory FERC, North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) reliability standards and planning requirements.[22] PacifiCorp's transmission system operations also responds to requests issued by Peak Reliability as the NERC Reliability Coordinator. The Company conducts annual system assessments to confirm minimum levels of system performance during a wide range of operating conditions, from serving loads with all system elements in service to extreme conditions where parts of the system are out of service. Factored into these assessments are load growth forecasts, operating history, seasonal performance, resource additions or removals, new transmission asset additions, and the largest transmission

[21] For example, PacifiCorp's application to begin the Environmental Impact Statement process for Gateway West of its Energy Gateway Transmission Expansion Project was filed with the Bureau of Land Management in 2007 and was received in late April 2013.
[22] FERC requirements; NERC standards; WECC standards.

and generation contingencies. Based on these analyses, the Company identifies any potential system deficiencies and determines the infrastructure improvements needed to reliably meet customer loads. NERC planning standards define reliability of the interconnected bulk electric system in terms of adequacy and security. Adequacy is the electric system's ability to meet aggregate electrical demand for customers at all times. Security is the electric system's ability to withstand sudden disturbances or unanticipated loss of system elements. Increasing transmission capacity often requires redundant facilities in order to meet NERC reliability criteria.

This chapter provides:

- Justification supporting acknowledgement of the Company's plan to construct the Wallula to McNary transmission project and support for the Company's plan to continue permitting Walla Walla to McNary.
- Support for the Company's plan to continue permitting Gateway West and Gateway South;
- Key background information on the evolution of the Energy Gateway Transmission Expansion Plan; and
- An overview of the Company's investments in recent short-term system improvements that have improved reliability, helped to maximize efficient use of the existing system and enabled the Company to defer the need for larger scale infrastructure investment.

Request for Acknowledgement of Wallula to McNary

The Wallula to McNary transmission project is required to satisfy the Company's federal regulatory obligations to its network transmission customers under its OATT. The project consists of a thirty mile 230 kilovolt (kV) transmission line between Wallula, Washington and McNary, Oregon and represents a portion of the Walla Walla, Washington to McNary, Oregon Energy Gateway transmission project (Segment A). Since 2008, the Company has worked with stakeholders to pursue permitting of the transmission project. In 2009, the Company decided to move forward with pursuing the Wallula to McNary portion of the transmission line and delay development of the Wallula to Walla Walla portion based on continuing evaluation of evolving regional transmission and resource plans. In 2011, PacifiCorp obtained a certificate of public convenience and necessity from the Oregon Public Utility Commission. In 2014, transmission customers determined a continued need for the Wallula to McNary portion of the transmission line that has prompted the Company to restart permitting and right-of-way activities. In addition, federal, county and local public outreach activities have been reinitiated in 2015. The project is estimated to be placed into service in 2017, subject to completion of permitting. To meet its obligation to network transmission customers under the OATT, the Company requests regulatory acknowledgement of the Wallula to McNary transmission project.

Factors Supporting Acknowledgement

The key driver supporting PacifiCorp's request for acknowledgement of the Wallula to McNary transmission project is meeting its obligations to its network transmission customers consistent with its OATT. Without the transmission line, there is no available capacity to serve transmission customers on the existing Wallula to McNary transmission line. This new line will enable the Company to meet its obligation to service transmission customers under the OATT and improve reliability in the area by providing a second connection between Wallula to McNary and a future connection between Walla Walla to McNary (see below Plan to Continue Permitting – Walla Walla to McNary). The transmission line will support future resource growth, including access to renewable energy, and transmission needs.

Plan to Continue Permitting – Walla Walla to McNary

The Walla Walla to McNary transmission project will offer benefits under multiple, future resource scenarios. In addition, as part of its agreements to exchange certain assets with Idaho Power there is an option upon close of the asset exchange for Idaho Power to partner with PacifiCorp to construct the remaining Walla Walla to Wallula portion of the transmission line.[23] To ensure the Company is well positioned to advance the projects as required to meet customer need, PacifiCorp believes it is prudent to continue to permit the Walla Walla to McNary transmission project.

Gateway West – Continued Permitting

The Gateway West transmission project is comprised of two segments: 1) Windstar to Populus (Energy Gateway Segment D) and 2) Populus to Hemingway (Energy Gateway Segment E). In a future IRP, the Company will support a request for acknowledgement to construct Gateway West with a cost-benefit analysis for the project. While the Company is not requesting acknowledgement in this IRP of a plan to construct the Windstar to Populus or the Populus to Hemingway segments at this time, the Company will continue to permit the projects.

Windstar to Populus (Segment D)

The Windstar to Populus transmission project consists of three key sections:

- A single-circuit 230 kilovolt (kV) line that will run approximately 75 miles between the existing Windstar substation in eastern Wyoming and the Aeolus substation to be constructed near Medicine Bow, Wyoming;
- A single-circuit 500 kV line running approximately 140 miles from the Aeolus substation to a new annex substation near the existing Bridger substation in western Wyoming; and
- A single-circuit 500 kV line running approximately 200 miles between the new annex substation and the recently constructed Populus substation in southeast Idaho.

Figure 4.1 – Segment D

Populus to Hemingway (Segment E)

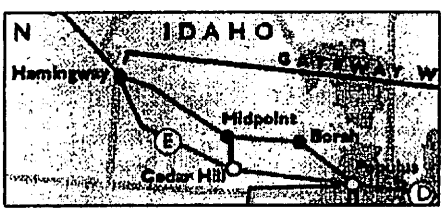


Figure 4.2 – Segment E

The Populus to Hemingway transmission project consists of two single-circuit 500 kV lines that run approximately 500 miles between the Populus substation in eastern Idaho to the Hemingway substation in western Idaho.

The Gateway West project would enable the Company to more efficiently dispatch system resources, improve

[23] FERC Docket Nos. EC15-54 and ER15-680.

performance of the transmission system (i.e. reduced line losses), improve reliability, and enable access to a diverse range of new resource alternatives over the long-term.

Under the National Environmental Policy Act, the Bureau of Land Management (BLM) has completed the Environmental Impact Statement (EIS) for the Gateway West project. The BLM released its final EIS on April 26, 2013, followed by the Record of Decision on November 14, 2013, providing a right-of-way grant for all of Segment D and most of Segment E of the project. The agency chose to defer its decision on the western-most portion of Segment E of the project located in Idaho in order to perform additional review of the Morley Nelson Snake River Birds of Prey Conservation Area. Specifically, the sections of Gateway West that were deferred for a later Record of Decision include the sections of Segment E from Midpoint to Hemingway and Cedar Hill to Hemingway. The BLM is currently conducting a supplemental environmental analysis for that portion of the segment of the project which encompasses that area. A final record of decision is expected in late 2016, subject to permitting completion.

Gateway South – Continued Permitting

As part of PacifiCorp's Energy Gateway Transmission Expansion, the company is planning to build a high-voltage transmission line, known as Gateway South (Segment F), extending approximately 400 miles from the planned Aeolus substation in southeastern Wyoming into the Clover substation near Mona, Utah.

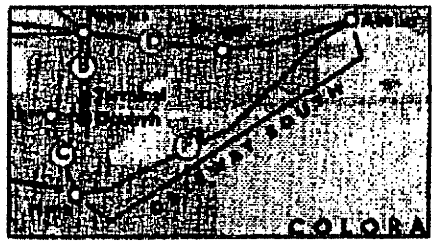


Figure 4.3 – Segment F

The BLM published its Notice of Intent in the Federal Register in April 2011, followed by public scoping meetings throughout the project area. Comments on this project from agencies and other interested stakeholders were considered as the BLM developed the draft EIS, which was issued in February 2014. Further comments were submitted on the draft EIS and a final EIS is expected in fall of 2015 with a Record of Decision to follow in late 2015.

Plan to Continue Permitting – Gateway West and Gateway South

The Gateway West and Gateway South transmission projects continue to offer benefits under multiple, future resource scenarios. To ensure the Company is well positioned to advance the projects as required to meet customer need, PacifiCorp believes it is prudent to continue to permit the Gateway West and Gateway South transmission projects.

Evolution of the Energy Gateway Transmission Expansion Plan

Introduction

Given the long periods of time necessary to successfully site, permit and construct major new transmission lines, these projects need to be planned and developed in time to meet customer need. The Energy Gateway Transmission Expansion Plan is the result of several robust local and regional transmission planning efforts that are ongoing and have been conducted multiple times over a period of several years. The purpose of this section is to provide important background information on the transmission planning efforts that led to the Company's proposal of the Energy Gateway Transmission Expansion Plan.

Background

Until the Company's announcement of Energy Gateway in 2007, its transmission planning efforts traditionally centered around the generation additions identified in the IRP. As the figure here shows, the generation resources in the Company's preferred portfolio have historically fluctuated significantly from one IRP to the next. With timelines of seven to ten years or more required to site, permit, and build transmission, this traditional planning approach was proven problematic, leading to a perpetual state of transmission planning and new transmission capacity not being available in time to be viable transmission resource options for meeting customer need. The existing transmission system has been at capacity for several years and new capability is necessary to enable new resource development.

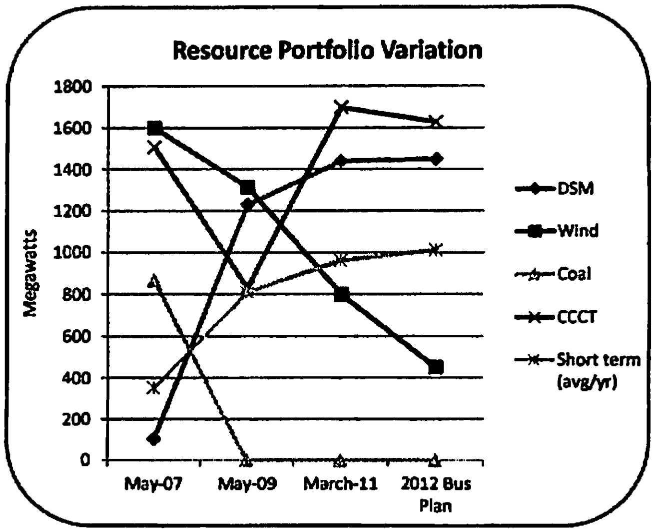


Figure 4.4 – Resource Portfolio Variation

The Energy Gateway Transmission Expansion Plan, formally announced in May 2007, has origins in numerous local and regional transmission planning efforts discussed further below. Energy Gateway was designed to ensure a reliable, adequate system capable of meeting current and future customer needs. Importantly, given the changing resource picture, its design supports multiple future resource scenarios by connecting resource-rich areas and major load centers across the Company's multi-state service area. Energy Gateway has since been included in all relevant local, regional and interconnection-wide transmission studies.

Planning Initiatives

Energy Gateway is the result of robust local and regional transmission planning efforts. The Company has participated in numerous transmission planning initiatives, both leading up to and since Energy Gateway's announcement. Stakeholder involvement has played an important role in each of these initiatives, including participation from state and federal regulators, government agencies, private and public energy providers, independent developers, consumer advocates, renewable energy groups, policy think tanks, environmental groups, and elected officials. These studies have shown a critical need to alleviate transmission congestion and move constrained energy resources to regional load centers throughout the West, and include:

- ***Northwest Transmission Assessment Committee (NTAC)***
  The NTAC was the sub-regional transmission planning group representing the Northwest region, preceding Northern Tier Transmission Group and ColumbiaGrid. The NTAC developed long term transmission options for resources located within the provinces of British Columbia and Alberta, and the states of Montana, Washington and Oregon to serve Northwest loads and Northern California.

- ***Rocky Mountain Area Transmission Study***[24]
  Recommended transmission expansions overlap significantly with Energy Gateway configuration, including:
  - Bridger system expansion similar to Gateway West
  - Southeast Idaho to Southwest Utah expansion akin to Gateway Central and Sigurd-Red Butte
  - Improved East-West connectivity similar to Energy Gateway Segment H alternatives

  "The analyses presented in this Report suggest that well-considered transmission upgrades, capable of giving LSEs greater access to lower cost generation and enhancing fuel diversity, are cost effective for consumers under a variety of reasonable assumptions about natural gas prices."

- ***Western Governors' Association Transmission Task Force Report***[25]
  Examined the transmission needed to deliver the largely remote generation resources contemplated by the Clean and Diversified Energy Advisory Committee. This effort built upon the transmission previously modeled by the Seams Steering Group-Western Interconnection, and included transmission necessary to support a range of resource scenarios, including high efficiency, high renewables and high coal scenarios. Again, for PacifiCorp's system, the transmission expansion that supported these scenarios closely resembled Energy Gateway's configuration.

  "The Task Force observes that transmission investments typically continue to provide value even as network conditions change. For example, transmission originally built to the site of a now obsolete power plant continues to be used since a new power plant is often constructed at the same location."

- ***Western Regional Transmission Expansion Partnership (WRTEP)***
  The WRTEP was a group of six utilities working with four western governors' offices to evaluate the proposed Frontier Transmission Line. The Frontier Line was proposed to connect California and Nevada to Wyoming's Powder River Basin through Utah. The utilities involved were PacifiCorp, Nevada Power, Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, and Sierra Pacific Power.

[24] http://psc.state.wy.us/rmats/rmats.htm
[25] http://www.westgov.org/index.php?option=com_joomdoc&task=doc_download&gid=97&Itemid

- ***Northern Tier Transmission Group Transmission Planning Reports***
    - 2007 Fast Track Project Process and Annual Planning Report[26]
    - 2008-2009 Transmission Plan[27]
    - 2010-2011 Transmission Plan[28]

  > "The Fast Track Project Process was used in 2007 to identify projects needed for reliability and to meet Transmission Service Requests."

  Each Energy Gateway segment was included in the 2007 Fast Track Project Process and has since been reevaluated as part of each Northern Tier Transmission Group biennial planning process. These are open, stakeholder processes.

- ***WECC/TEPPC Annual Reports*** **and** ***Western Interconnection Transmission Path Utilization Studies*** [29]

  > "Path 19 (Bridger) is the most heavily loaded WECC path in the study... Usage on this path is currently of interest due to the high number of requests for transmission service to move renewable power to the West from the Wyoming area."

  These analyses measure the historical utilization of transmission paths in the West to provide insight into where congestion is occurring and assess the cost of that congestion. The Energy Gateway segments have been included in the analyses that support these studies, alleviating several points of significant congestion on the system, including Path 19 (Bridger West) and Path 20 (Path C).

Energy Gateway Configuration

For addressing constraints identified on PacifiCorp's system, as well as meeting system reliability requirements discussed further below, the recommended bulk electric transmission additions took on a consistent footprint, which is now known as Energy Gateway. This expansion plan establishes a triangle over Utah, Idaho and Wyoming with paths extending into Oregon and Washington, and contemplates logical resource locations for the long-term based on environmental constraints, economic generation resources, and federal and state energy policies. Since Energy Gateway's announcement, this series of projects has continued to be vetted through multiple public transmission planning forums at the local, regional and interconnection-wide levels. In accordance with the local planning requirements in PacifiCorp's federal OATT, Attachment K, the Company has conducted numerous public meetings on Energy Gateway and transmission planning in general. Meeting notices and materials are posted publicly on PacifiCorp's Attachment K Open Access Same-time Information System (OASIS) site. PacifiCorp is also a member of the Northern Tier Transmission Group (NTTG) and WECC's Transmission Expansion Policy and Planning Committee (TEPPC).

These groups continually evaluate PacifiCorp's transmission plan in their efforts to develop and refine the optimal regional and interconnection-wide plans. Please refer to PacifiCorp's OASIS site for information and materials related to these public processes.[30]

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[26] http://nttg.biz/site/index.php?option=com_docman&task=doc_download&gid=353&Itemid=31
[27] http://nttg.biz/site/index.php?option=com_docman&task=doc_download&gid=1020&Itemid=31
[28] http://nttg.biz/site/index.php?option=com_docman&task=doc_download&gid=1437&Itemid=31
[29] http://www.wecc.biz/committees/BOD/TEPPC/External/Forms/external.aspx
[30] http://www.oatioasis.com/ppw/index.html

Additionally, the Project Teams conducted an extensive 18-month stakeholder process on Gateway West and Gateway South. This stakeholder process was conducted in accordance with WECC Regional Planning Project Review guidelines and FERC OATT planning principles, and was used to establish need, assess benefits to the region, vet alternatives and eliminate duplication of projects. Meeting materials and related reports can be found on PacifiCorp's Energy Gateway OASIS site.

Energy Gateway's Continued Evolution

The Energy Gateway Transmission Expansion Plan is the result of years of ongoing local and regional transmission planning efforts with significant customer and stakeholder involvement. Since its announcement in May 2007, Energy Gateway's scope and scale have continued to evolve to meet the future needs of PacifiCorp customers and the requirements of mandatory transmission planning standards and criteria. Additionally, the Company has improved its ability to meet near-term customer needs through a limited number of smaller-scale investments that maximize efficient use of the current system and help defer, to some degree, the need for larger capital investments like Energy Gateway (see the following section on Efforts to Maximize Existing System Capability). The IRP process, as compared to transmission planning, is a frequently changing resource planning process that does not support the longer-term development needs of transmission, or the ability to implement transmission in time to meet customer need. Together, however, the IRP and transmission planning processes complement each other by helping the Company optimize the timing of its transmission and resource investments for meeting customer needs.

While the core principles for Energy Gateway's design have not changed, the project configuration and timing continue to be reviewed and modified to coincide with the latest mandatory transmission system reliability standards and performance requirements, annual system reliability assessments, input from several years of federal and state permitting processes, and changes in generation resource planning and our customers' forecasted demand for energy.

As originally announced in May 2007, Energy Gateway consisted of a combination of single- and double-circuit 230 kV, 345 kV and 500 kV lines connecting Wyoming, Idaho, Utah, Oregon and Nevada. In response to regulatory and industry input regarding potential regional benefits of "upsizing" the project capacity (e.g. maximized use of energy corridors, reduced environmental impacts and improved economies of scale), the Company 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 6,000 MW of requests for incremental transmission service across the Energy Gateway footprint, which supported the upsized configuration. The Company identified the costs required for this upsized system and offered transmission service contracts to queue customers. These customers, however, were unable to commit due to the upfront costs and lack of firm contracts with customers to take delivery of future generation, and withdrew their requests. In parallel, PacifiCorp pursued several potential partnerships with other transmission developers and entities with transmission proposals in the Intermountain Region. Due to the significant upfront costs inherent in transmission investments, firm partnership commitments also failed to materialize, leading the Company to pursue the current configuration with the intent of only developing system capacity sufficient to meet the long-term needs of its customers.

In 2010, the Company entered into memorandums of understanding (MOU) to explore potential joint-development opportunities with Idaho Power on its Boardman to Hemingway project and with Portland General Electric (PGE) on its Cascade Crossing project. One of the key purposes of Energy Gateway is to better integrate the Company's East and West control areas, and Gateway Segment H from western Idaho into southern Oregon was originally proposed to satisfy this need. However, recognizing the potential mutual benefits and value for customers of jointly developing transmission, PacifiCorp has pursued these potential partnership opportunities as a lower cost alternative.

In 2011, the Company announced the indefinite postponement of the 500 kV Gateway South segment between the Mona substation in central Utah and Crystal substation in Nevada. This extension of Gateway South, like the double-circuit configuration discussed above, was a component of the upsized system to address regional needs if supported by queue customers or partnerships. However, despite significant third-party interest in the Gateway South segment to Nevada, there was a lack of financial commitment needed to support the upsized configuration.

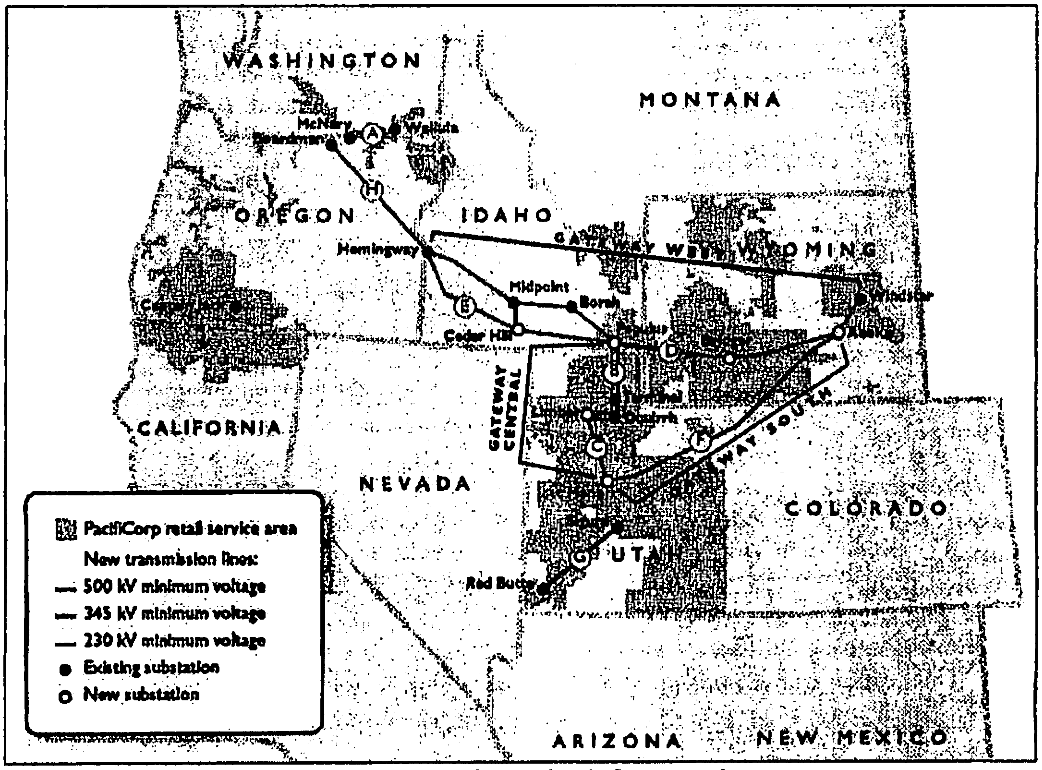
In 2012, the Company determined, due to experience with land use limitations and National Environmental Policy Act permitting requirements, that one new 230 kV line between the Windstar and Aeolus substations and a rebuild of the existing 230 kV line was feasible, and that the second new proposed 230 kV line planned between Windstar and Aeolus would be eliminated. This decision resulted from the Company's ongoing focus on meeting customer needs, taking stakeholder feedback and land use limitations into consideration, and finding the best balance between cost and risk for customers. In January 2012 the Company signed the Boardman to Hemingway Permitting Agreement with Idaho Power and Bonneville Power Administration (BPA) that provides for the Company's participation through the permitting phase of the project.

In January 2013, the Company began discussions with PGE regarding changes to its Cascade Crossing transmission project and potential opportunities for joint-development and/or firm capacity rights into PacifiCorp's Oregon system. The Company further notes that it had a memorandum of understanding with PGE with respect to the development of Cascade Crossing that terminated by its own terms. PacifiCorp had continued to evaluate potential partnership opportunities with PGE once it announced its intention to pursue a Cascade Crossing solution with BPA. However, because PGE decided to end discussions with BPA and instead pursue other options, PacifiCorp is not actively pursuing this development. PacifiCorp continues to look to partner with third parties on transmission development as opportunities arise such as potential partnership opportunities with Idaho Power and BPA on the Boardman to Hemingway project as an alternative to PacifiCorp's originally proposed transmission segment from eastern Idaho into southern Oregon (Hemingway to Captain Jack). Idaho Power leads the permitting efforts on the Boardman to Hemingway project and PacifiCorp continues to support these activities under the conditions of the Boardman to Hemingway Transmission Project Joint Permit Funding Agreement.

Finally, the timing of segments is regularly assessed and adjusted. While permitting delays have played a significant role in the adjusted timing of some segments (e.g., Gateway West and Gateway South), the Company has been proactive in deferring in-service dates as needed due to permitting schedules, moderated load growth, changing customer needs, and system reliability improvements.

The Company will continue to adjust the timing and configuration of its proposed transmission investments based on its ongoing assessment of the system's ability to meet customer needs and its compliance with mandatory reliability standards.

Figure 4.5 – Energy Gateway Transmission Expansion Plan



This map is for general reference only and reflects current plans.
It may not reflect the final routes, construction sequence or exact line configuration.

Segment & Name	Description	Approximate Mileage	Status[31] and Scheduled In-Service
(A) Wallula-McNary	230 kV, single circuit	30 mi	• Status: local permitting completed • Scheduled in-service: 2017 sponsor driven*
(B) Populus-Terminal	345 kV, double circuit	135 mi	• Status: completed • Placed in-service November 2010
(C) Mona-Oquirrh	500 kV single circuit 345 kV double circuit	100 mi	• Status: completed • Placed in-service: May 2013
Oquirrh-Terminal	345 kV double circuit	14 mi	• Status: rights-of-way acquisition underway • Scheduled in-service: June 2021*
(D) Windstar-Populus	230 kV single circuit 500 kV single circuit	400 mi	• Status: permitting underway • Scheduled in-service: 2019-2024*
(E) Populus-Hemingway	500 kV single circuit	500 mi	• Status: permitting underway • Scheduled in-service: 2019-2024*
(F) Aeolus-Mona	500 kV single circuit	400 mi	• Status: permitting underway • Scheduled in-service: 2020-2024*
(G) Sigurd-Red Butte	345 kV single circuit	170 mi	• Status: construction began April 2013 • Scheduled in-service: May 2015
(H) Boardman to Hemingway	500 kV single circuit	500 mi	• Status: pursuing joint-development and/or firm capacity opportunities with project sponsors • Scheduled in-service: sponsor driven

** Scheduled in-service date adjusted since last IRP Update.*

[31] Status as of the filing of this IRP.

Efforts to Maximize Existing System Capability

In addition to investing in the Energy Gateway transmission projects, the Company continues to make other system improvements that have helped maximize efficient use of the existing system and defer the need for larger scale longer-term infrastructure investment. Despite limited new transmission capacity being added to the system over the last 20 to 30 years, PacifiCorp has maintained system reliability and maximized system efficiency through other smaller-scale, incremental projects.

System-wide, the Company has instituted more than 120 grid operating procedures and 17 special protection schemes to maximize the existing system capability while managing system risk. In addition, PacifiCorp has been an active participant in the California Independent System Operator's ("ISO") Energy Imbalance Market ("EIM") since November 2014. The EIM provides for more efficient dispatch of participating resources in real-time through an automated system that dispatches generation across the EIM footprint which currently includes PacifiCorp's east and west balancing authority areas and the ISO's balancing authority area for use as short-term balancing resources to ensure energy supply matches demand. By broadening the pool of lower-cost resources that can be accessed to balance systems, reliability is enhanced and system costs are reduced. In addition, the automated system is able to identify and utilize available transmission capacity to transfer the dispatched resources enabling more efficient use of the available transmission system. Other opportunities that maximize existing transmission capability include the PacifiCorp and Idaho Power asset exchange as mentioned earlier in this chapter. This arrangement, if approved by regulators, would result in an exchange of transmission assets between the parties that optimizes ownership rights and transfer capability across certain transmission lines.

In addition to the Energy Gateway transmission projects, PacifiCorp also has other planned transmission system improvements to be placed in-service over the next couple of years include:

- Construct new Standpipe substation and install a synchronous condenser located in Wyoming;
- Install an additional 230/115 kV 250 MVA transformer at Casper substation located in Wyoming;
- Install shunt capacitors at Fry substation located in Oregon;
- Install a load shedding scheme at Grass Creek substation and Thermopolis substation located in Wyoming;
- Install shunt capacitors and a static var compensator at Mathington substation located in Utah;
- Install a phase shifting transformer and series reactor at Upalco substation located in Utah;
- Install an additional 230/115 kV 250 MVA transformer and 230 kV ring bus at Union Gap substation located in Washington;
- Expand the 230 kV ring bus at Pomona Heights substation located in Washington;
- Install new relays on the Rigby to Sugarmill 161 kV line located in Idaho;
- Install new relays on the Rigby to Jefferson 161 kV line located in Idaho;
- Install a phase shifting transformer at Pinto substation located in Utah;
- Construct new Whetstone substation located in Oregon;
- Construct a 10 mile 46 kV line from the Holden substation tap to the Flowell Robison line located in Utah;
- Convert the Highland substation to 138 kV located in Utah;

- Construct a 138 kV line from Croydon substation to Silver Creek substation located in Utah;
- Convert the existing 69 kV line to 115 kV from Community Park substation to Casper substation located in Wyoming;
- Replace the existing 115/69 kV transformer at Weed substation with a 50 MVA LTC unit located in California;
- Replace 500 kV line relays at several 500 kV substations located in Oregon;
- Install a 138/46kV transformer at Snyderville substation located in Utah.

These investments help maximize the existing system's capability, improve the Company's ability to serve growing customer loads, improve reliability, increase transfer capacity across WECC Paths, reduce the risk of voltage collapse and maintain compliance with NERC and WECC reliability standards.

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

EXHIBIT ACCOMPANYING OPENING TESTIMONY OF
BILL EDDIE

ON BEHALF OF

ONEENERGY, INC.

Excerpts (Page 65)
from
PacifiCorp's *2013 Integrated Resource Plan*, Volume I
(March 31, 2015)

May 22, 2015

Table 4.1 – SBT-Derived Values for Sigurd to Red Butte

********* ***SBT-Derived values for Sigurd to Red Butte*** *********	
$645 million over 2015-2034 period, 1.64 benefit-cost ratio	
Operational Cost Savings	
• Energy (option at 25% of total)	$470 million
• Third-party wheeling	$104 million
Segment Loss Savings[22]	
• Energy	$55.5 million
• Capacity	$14.9 million
System Reliability Benefits	
• N-1 load curtailment (load over 580 MW)	$1 million
Customer and Regulatory Benefits	TBD
Wheeling Revenue Opportunity:	
• ATC firm southbound	$57 million
TOTAL MEASURED BENEFITS (minus Wheeling Revenue Opportunity)	**$645 million**
PROJECT CAPITAL COST	**$392 million**[23]
PROJECT BENEFIT-TO-COST RATIO	**1.64**
NOTE: See excel spreadsheet for detailed Sigurd to Red Butte SBT assumptions and calculations[24]	

Gateway West – Continued Permitting

The Windstar to Populus transmission project (Energy Gateway Segment D) is the first of two planned segments of Gateway West. Given the delays experienced in the permitting process, the current project schedule for Windstar to Populus shows a delay of the in-service date to December 31, 2019. In a future IRP, the Company will support a request for acknowledgement to construct Windstar to Populus with a thorough cost-benefit analysis for the project, similar to that provided in this IRP for the Sigurd to Red Butte transmission project. While the Company is

[22] All present value calculations for Sigurd to Red Butte line losses are based on a 20-year time horizon starting in 2015, using a 6.88% discount rate, which was PacifiCorp's weighted average cost of capital at the time the analysis was undertaken.

[23] Includes fully loaded capital and related operations and maintenance costs on a 20-year time horizon starting in 2015, discounted at 6.88%.

[24] "System Benefit Tool for Sigurd to Red Butte Transmission Line (Segment G)" http://www.pacificorp.com/content/dam/pacificorp/doc/Energy_Sources/Integrated_Resource_Plan/2013IRP/PacTrans_SigurdToRedButte-SBT_4-30-13.xlsx

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

EXHIBIT ACCOMPANYING OPENING TESTIMONY OF
BILL EDDIE

ON BEHALF OF

ONEENERGY, INC.

Excerpts (Page 405)
from
PacifiCorp's *2015 Integrated Resource Plan*, Volume II,
Appendix N (March 31, 2015)

May 22, 2015

APPENDIX N – 2014 WIND AND SOLAR CAPACITY CONTRIBUTION STUDY

Introduction

The capacity contribution of wind and solar resources, represented as a percentage of resource capacity, is a measure of the ability for these resources to reliably meet demand. For purposes of this report, PacifiCorp defines the peak capacity contribution of wind and solar resources as the availability among hours with the highest loss of load probability (LOLP). PacifiCorp calculated peak capacity contribution values for wind and solar resources using the capacity factor approximation method (CF Method) as outlined in a 2012 report produced by the National Renewable Energy Laboratory (NREL Report)[47].

The capacity contribution of wind and solar resources affects PacifiCorp's resource planning activities. PacifiCorp conducts its resource planning to ensure there is sufficient capacity on its system to meet its load obligation at the time of system coincident peak inclusive of a planning reserve margin. To ensure resource adequacy is maintained over time, all resource portfolios evaluated in the integrated resource plan (IRP) have sufficient capacity to meet PacifiCorp's net coincident peak load obligation inclusive of a planning reserve margin throughout a 20-year planning horizon. Consequently, planning for the coincident peak drives the amount and timing of new resources, while resource cost and performance metrics among a wide range of different resource alternatives drive the types of resources that can be chosen to minimize portfolio costs and risks.

PacifiCorp derives its planning reserve margin from a LOLP study. The study evaluates the relationship between reliability across all hours in a given year, accounting for variability and uncertainty in load and generation resources, and the cost of planning for system resources at varying levels of planning reserve margin. In this way, PacifiCorp's planning reserve margin LOLP study is the mechanism used to transform hourly reliability metrics into a resource adequacy target at the time of system coincident peak. This same LOLP study was utilized for calculating the peak capacity contribution using the CF Method. Table N.1 summarizes the peak capacity contribution results for PacifiCorp's east and west balancing authority areas (BAAs).

Table N.1 – Peak Capacity Contribution Values for Wind and Solar

	East BAA			West BAA		
	Wind	Fixed Tilt Solar PV	Single Axis Tracking Solar PV	Wind	Fixed Tilt Solar PV	Single Axis Tracking Solar PV
Capacity Contribution Percentage	14.5%	34.1%	39.1%	25.4%	32.2%	36.7%

[47] Madaeni, S. H.; Sioshansi, R.; and Denholm, P. "Comparison of Capacity Value Methods for Photovoltaics in the Western United States." NREL/TP-6A20-54704, Denver, CO: National Renewable Energy Laboratory, July 2012 (NREL Report). http://www.nrel.gov/docs/fy12osti/54704.pdf