Wind Repowering

Technical Conference

(Docket No. 17-035-39)

August 30, 2017

PacifiCorp

A BERKSHIRE HATHAWAY ENERGY COMPANY

Wind Repowering Index

Detailed Project Scope

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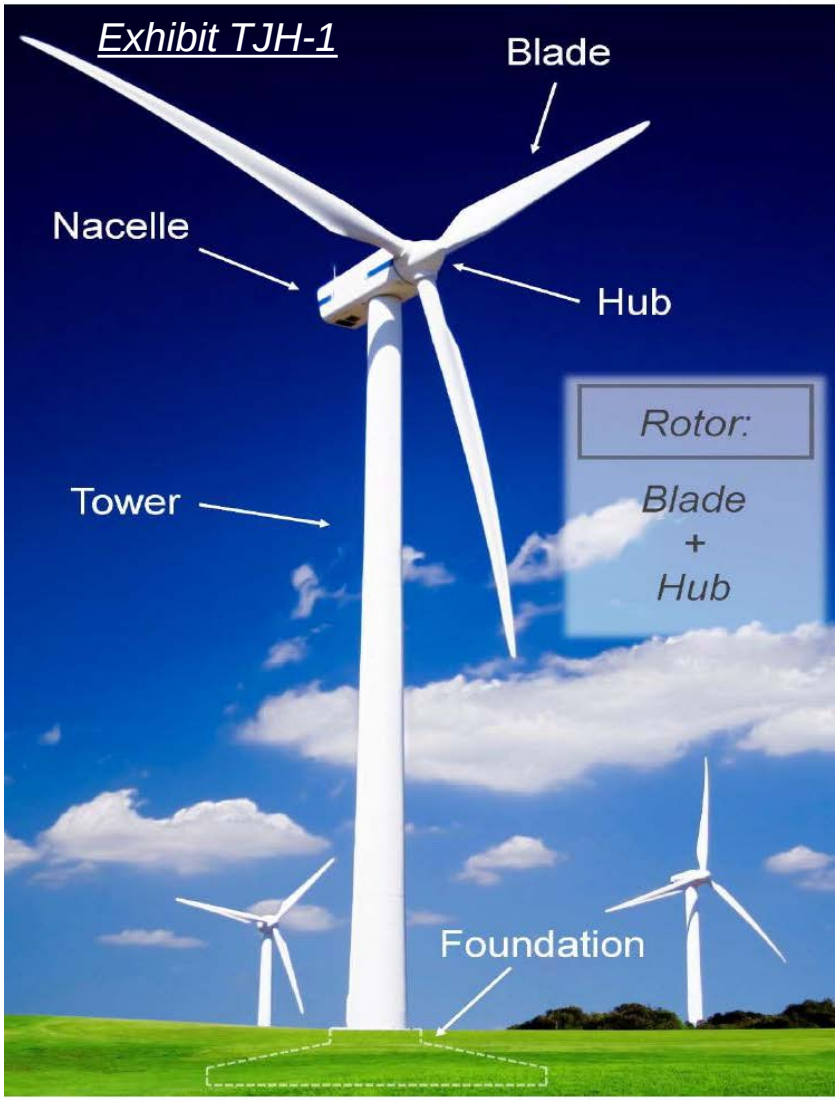
Project Scope



- Repowering is the upgrade of an existing wind facility with new wind-turbine-generator (WTG) equipment that can increase the facility's output.
- Replace the nacelle and rotor (hub and blades) of the WTG.
  - Total anticipated project cost of $1.13 billion
- Repowered facilities in Wyoming:
  - Glenrock I & III, Rolling Hills, Seven Mile Hill I & II, High Plains, McFadden Ridge, and Dunlap
- Repowered facilities in Washington:
  - Marengo I & II, Goodnoe Hills
- Repowered facility in Oregon:
  - Leaning Juniper

List of Projects to be Repowered

Project #	Wind Project	Location	Commercial Start Date	Years in Operation	Number of WTGs	Current Net Capacity (MW)	Current Long-Term Generation (MWh)
Wyoming Projects							
1	Glenrock I	Glenrock, WY	12/31/2008	8.5	66	99.0	303,723
2	Glenrock III	Glenrock, WY	1/17/2009	8.4	26	39.0	113,438
3	Rolling Hills	Glenrock, WY	1/17/2009	8.4	66	99.0	271,635
4	Seven Mile Hill I	Medicine Bow, WY	12/31/2008	8.5	66	99.0	339,195
5	Seven Mile Hill II	Medicine Bow, WY	12/31/2008	8.5	13	19.5	71,224
6	High Plains	McFadden, WY	9/13/2009	7.8	66	99.0	306,145
7	McFadden Ridge	McFadden, WY	9/29/2009	7.7	19	28.5	93,101
8	Dunlap I	Medicine Bow, WY	10/1/2010	6.7	74	111.0	389,045
					396	**594.0**	**1,887,506**
Washington Projects							
9	Marengo I	Dayton, WA	8/3/2007	9.9	78	140.4	360,279
10	Marengo II	Dayton, WA	6/26/2008	9.0	39	70.2	166,742
11	Goodnoe Hills	Goldendale, WA	5/31/2008	9.1	47	94.0	220,898
					164	**304.6**	**747,919**
Oregon Project							
12	Leaning Juniper	Arlington, OR	9/14/2006	10.8	67	100.5	233,592
					627	**999.1**	**2,869,016**

- *Exhibit TJH-2 above. Confidential Exhibit TJH-3 includes more detailed capital cost information, current/future capacity and generation information, etc.*

Eligibility to Requalify for PTCs: Safe Harbor & 80/20 Rule

- In 2015 Congress enacted changes to extend the full value of the PTC for wind facilities beginning construction in 2015 and 2016; with phase-down beginning 2017.
- Under longstanding 80/20 Rule, in order to qualify a facility as “originally placed in service” a facility may contain used property if the used property does not comprise more than 20% of the facility’s value.
  - Repowering meets the standard; however because test applies per WTG, at three facilities some 32 individual WTGs do not pass test.
- In May 2016, the IRS issued “continuous efforts safe harbor” guidance indicating that a project beginning construction in 2016 must be placed in service by 12/31/2020.
- Facilities will qualify as beginning construction if at least 5% of total project costs are incurred in a given year.
- To meet these tests and ensure qualification for the full value of PTCs available for 2016 projects, the Company executed safe-harbor purchases ($74 million) with GE and Vestas in December of 2016.

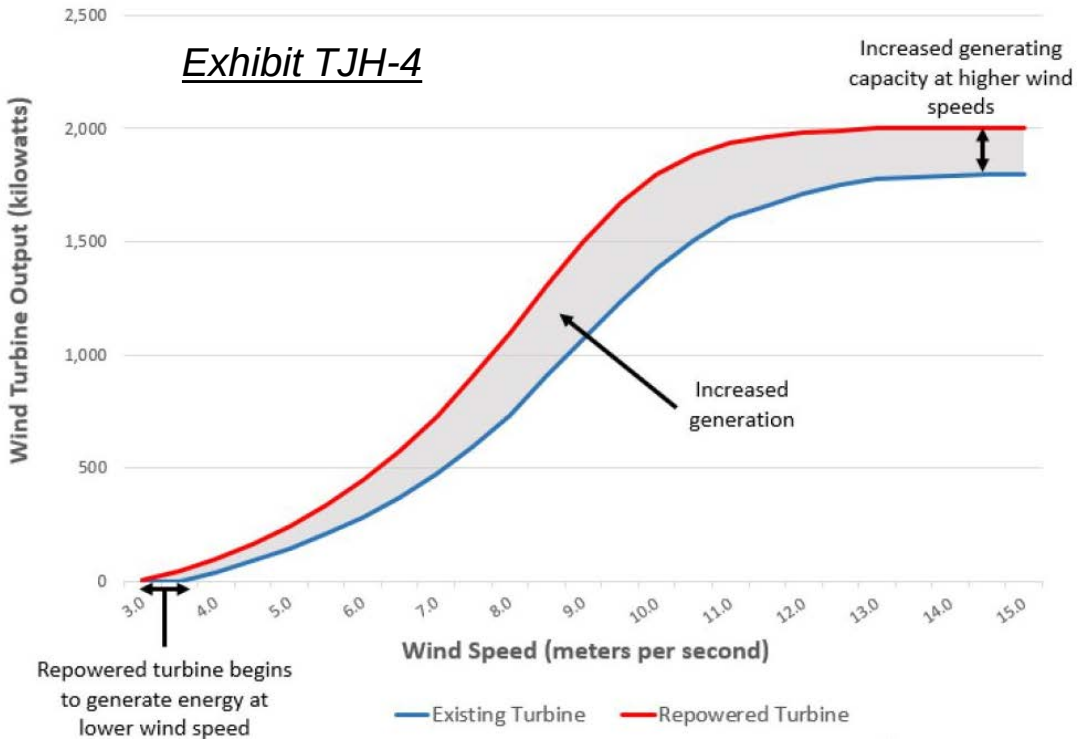
Benefits of Requalification

- Repowering requalifies projects for federal wind PTCs, with the proposed Resource Tracking Mechanism delivering their full benefits to customers for 10 years.
- Repowering increases generation and associated PTCs at a given facility by 11-35%.
  - Repowering also extends projects' lives ~10 years, during which time all of the generation *(i.e. not just the 11-35%)* becomes incremental generation.
- The Company has also scheduled individual repowering projects to ensure the greatest customer benefit.
  - To maximize the benefits *(~$100 million/year)* of existing PTCs, the Company will generally delay repowering until the original PTCs have expired.
  - Exception to this rule is Dunlap, at which PTCs expire in October of 2020; and construction must be underway before this time to meet the 12/31/2020 deadline.

Increased Energy Benefits

- New generators typically have greater nameplate capacities than those in the removed equipment, and will provide more generation at all ranges of wind speeds

- Repowering is expected to increase the Company's annual wind generation by 550,601 MWh when limited by existing large generator interconnection agreements (LGIAs) – an increase of 19%.
  - If/when LGIAs are amended, the annual increase would be 597,671 MWh, or 21%.



System Reliability & Operational Benefits

System Reliability Benefits

- The Company proposes to include two reliability features to the repowered WTGs in Wyoming: WindFREE Reactive Power (GE) and WindINERTIA (GE).
- Together these new technologies will defer the need to provide system voltage support through the construction of synchronous condensers or static VAr compensators.

Operational Benefits

- Repowering will lower the ongoing costs of operating the wind facilities, and avoid costs from replacing certain major turbine components that are experiencing high failure rates.
- Additional capital cost savings associated with component failures on the existing fleet between now and repowering as idling a WTG until repowering may be favorable to immediate repair.
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Extension of Facility Lives

- All facilities proposed to be repowered are being depreciated assuming a 30-year life, with assumed retirements between 2036-2040.
  - Repowering would extend depreciation lives at least ten years beyond the original retirement dates.
- Projects are being certified to new equipment design life standards similar to new wind project developments.
  - Projects will be contractually required to obtain third-party certification per IEC standards
- Separate evaluation of foundations being undertaken by Company with consulting support (Black & Veatch) *(rather than a 3rd party on behalf of the supplier, as above)*.
  - Improved load-mitigation controls in the new WTGs can result in reduced foundation loading even with the larger rotors.

Schedule

- The Company is negotiating a turn-key master retrofit contract with GE that will include a per-turbine fixed price.
  - The Company must provide notice of intent 8-12 months in advance of projects' first scheduled turbine completion date.
- With Vestas, the Company has a master supply agreement that will facilitate the future repowering equipment supply (not installation).
  - The Company anticipates contracts must be signed 12 months before equipment delivery.
- Long lead-times for equipment supply owing to high demand for turbines (and labor and equipment) following the time-limited reauthorization of the PTCs.
- To meet supply lead times while optimizing PTCs for each project, contract execution must be underway in April, 2018.
- *See Exhibit TJH-5 for a detailed repowering schedule.*

Economic Analysis & Customer Benefits

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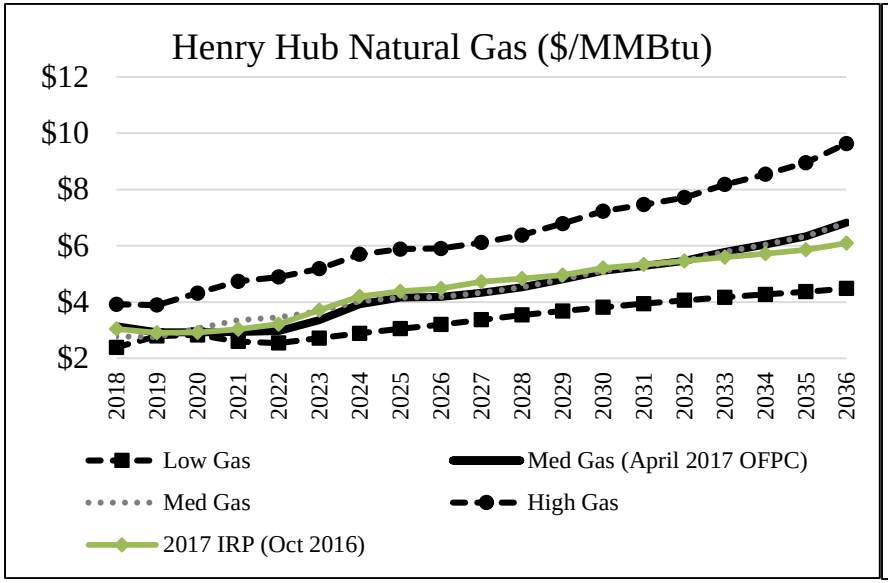
2017 Integrated Resource Plan

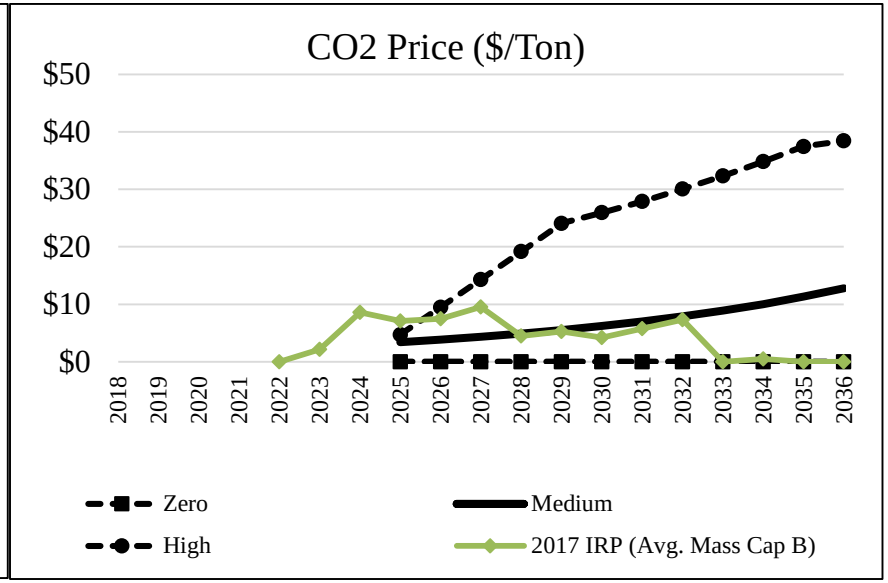
- After executing a safe-harbor equipment purchase in December 2016, PacifiCorp developed a sensitivity in the first quarter of 2017 to evaluate the net benefits of wind repowering in the 2017 IRP.
- This sensitivity showed significant reductions to system costs when repowering existing wind facilities.
  - The full value of PTCs applies to 10 additional years of generation.
  - Improved efficiency and increased energy output.
  - Resets the usable life of the asset, extending and increasing NPC benefits.
  - Reduced operating cost.
- The 2017 IRP preferred portfolio (least-cost, least-risk plan)
  - 905 MW of existing wind is repowered
  - Repowering completed by the end of 2020
  - Action item for the wind repowering project

Methodology

- Same modeling tools as used in the 2017 IRP:
  - System Optimizer (SO) Model
  - Planning and Risk (PaR)
- Simulations with and without wind repowering isolate the cost and benefits, which are summarized as the present-value revenue requirement differential (PVRR(d)).
  - System Modeling (levelized capital, system costs through 2036)
  - Annual Revenue Requirement (nominal capital for repowered wind facilities, system costs through 2050)
- Nine combinations of market and CO_2 price assumptions (price-policy scenarios).
- Three sensitivities:
  - 40-Year Life
  - Repowering with new wind and transmission
  - Increased capacity

Assumptions





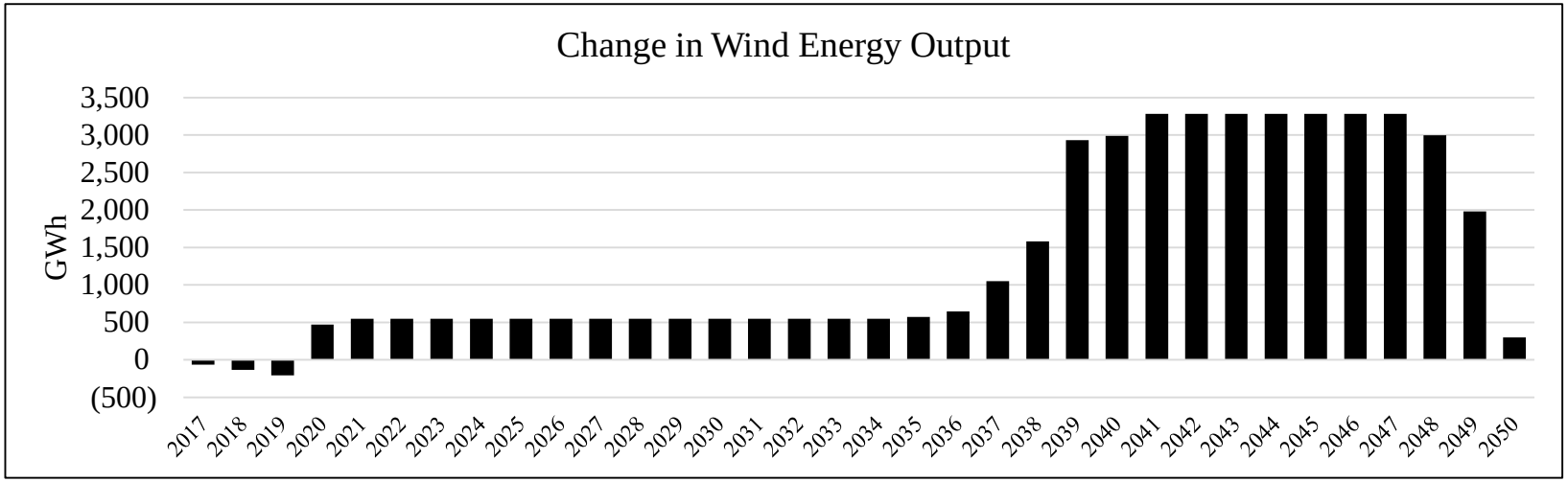
- Nine price-policy scenarios
- Cost and performance for wind repowering (expanded to include Goodnoe Hills)
- Energy Imbalance Market (EIM) benefits

System Modeling Price-Policy Results

Price-Policy Scenario	SO Model PVRR(d)	PaR Stochastic-Mean PVRR(d)	PaR Risk-Adjusted PVRR(d)
Low Gas, Zero CO2	$33	$43	$44
Low Gas, Medium CO2	$0	$9	$8
Low Gas, High CO2	($18)	($17)	($19)
Medium Gas, Zero CO2	($33)	($24)	($25)
Medium Gas, Medium CO2	($22)	($13)	($15)
Medium Gas, High CO2	($41)	($35)	($36)
High Gas, Zero CO2	($75)	($40)	($43)
High Gas, Medium CO2	($64)	($34)	($37)
High Gas, High CO2	($103)	($80)	($85)

- Wind repowering reduces customer costs in seven out of nine price-policy scenarios.
- The results above do not include any benefits from renewable energy credits (RECs)—benefits would improve by approximately $4 million for every dollar assigned to the incremental RECs that will be generated from repowered wind.

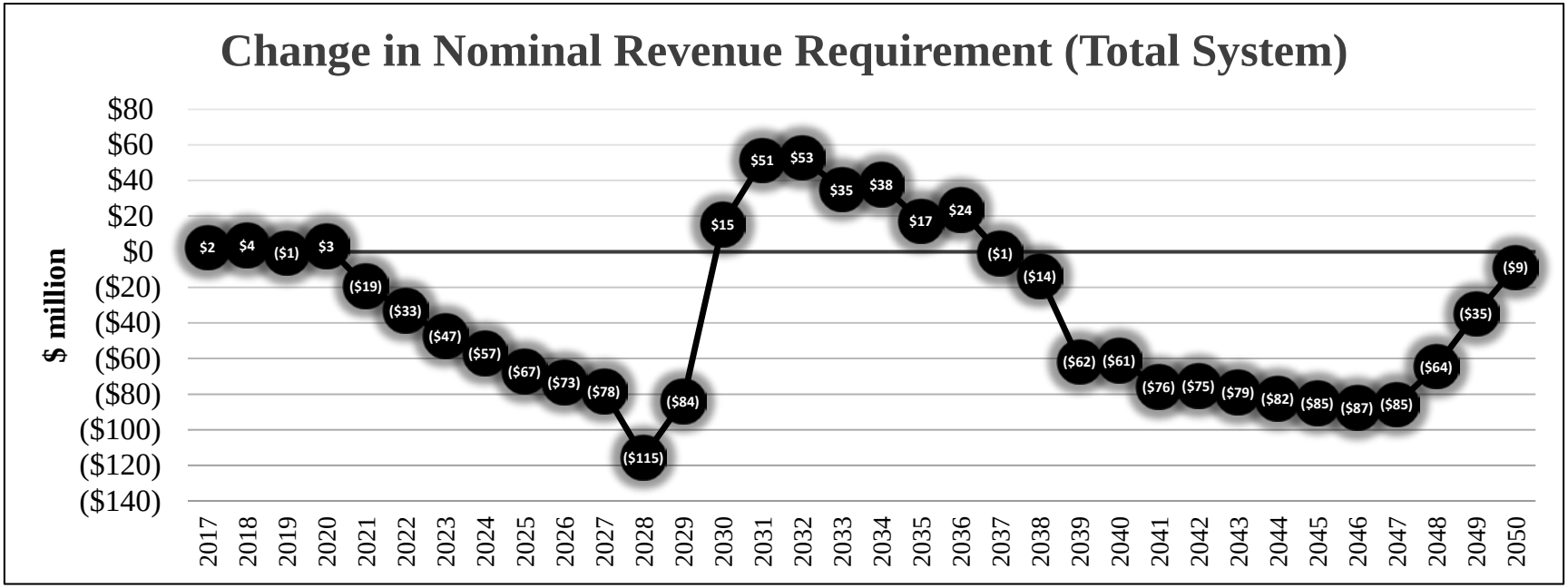
Annual Revenue Requirement Price-Policy Results



- When based on the change in system costs through 2050, the PVRR(d) results pick up the value of incremental wind generation beyond 2036, and all price-policy scenarios show customer benefits.
- Benefits would improve by approximately $11 million for every dollar assigned to the incremental RECs that will be generated from repowered wind.

Price-Policy Scenario	PaR Stochastic-Mean PVRR(d)
Low Gas, Zero CO2	($41)
Low Gas, Medium CO2	($245)
Low Gas, High CO2	($344)
Medium Gas, Zero CO2	($362)
Medium Gas, Medium CO2	($359)
Medium Gas, High CO2	($401)
High Gas, Zero CO2	($400)
High Gas, Medium CO2	($274)
High Gas, High CO2	($589)

Change in Nominal Revenue Requirement



- The figure reflects project costs including capital revenue requirement (*i.e.*, depreciation, return, income taxes and property taxes) net of O&M expenses, Wyoming wind-production taxes, and federal PTCs.

- Project costs are netted against the system impacts from wind repowering, reflecting the change in NPC, emissions, non-NPC variable costs, and system fixed costs that are affected by, but not directly associated with, wind repowering.

Sensitivity Study Results

40-Year Life (Benefit)/Cost ($ million)	Sensitivity PVRR(d)	Benchmark PVRR(d)	Change in PVRR(d)
SO Model	($60)	($22)	($38)
PaR Stochastic-Mean	($50)	($13)	($37)
PaR Risk-Adjusted	($52)	($15)	($37)

Combined with New Wind & Trans. (Benefit)/Cost ($ million)	Sensitivity PVRR(d)	Benchmark PVRR(d)	Change in PVRR(d)
SO Model	($114)	($22)	($91)
PaR Stochastic-Mean	($104)	($13)	($90)
PaR Risk-Adjusted	($116)	($15)	($101)

Increased Capacity (Benefit)/Cost ($ million)	Sensitivity PVRR(d)	Benchmark PVRR(d)	Change in PVRR(d)
SO Model	($109)	($114)	$4
PaR Stochastic-Mean	($106)	($104)	($2)
PaR Risk-Adjusted	($118)	($116)	($2)

- A longer life reduces book depreciation and drives lower annual revenue requirement.
- Wind repowering benefits persist when combined with new wind and transmission, which provide incremental customer benefits.
- With additional capacity, there may be additional upside to customer benefits.

Proposed Ratemaking Treatment

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Voluntary Request for Resource Decision

- The Company voluntarily requests that the Commission approve its “resource decision” for the Transmission Projects.
  - “Resource decisions” are defined to include those relating to “an energy utility’s acquisition, management, or operation of energy production, processing, transmission, or distribution facilities.
  - Requirements detailed under UCA § 54-17-402; public interest determination must assess:
    - Whether the decision will most likely result in the acquisition, production, and delivery of utility services at the lowest reasonable cost to the retail customers of the utility;
    - Long-term and short-term impacts;
    - Risk;
    - Reliability;
    - Financial impacts on the utility; and
    - Other factors determined by the commission to be relevant.

Resource Tracking Mechanism

- The proposed Resource Tracking Mechanism (RTM) is designed to capture customer benefits resulting from the repowered projects, matching those benefits with the costs of the projects until both are fully included in base rates.
- The Company would begin to defer costs and benefits with each new facility in the month it goes into service. Deferral will include the following revenue requirement components:
  - Plant revenue requirement, including: capital investment; ADR; ADIT; O&M; depreciation expense; property taxes; Wyoming Wind Tax.
  - NPC savings; PTCs.
- Once the full costs and benefits are fully included in base rates, recovery of those elements through the RTM would cease, with the exception of PTCs.
- Initial annual revenue requirement benefit for the years 2019 to 2022 would range from $0 *(owing to one year, 2020, in which the proposed cap is triggered)* to a $10.7 million benefit for Utah customers in 2022.

RTM Revenue Requirement Overview

Category	Base	New	Deferral
Capital Investment	Zero until the next general rate case. After rate case, the base will be the amount included in the test period, beginning on the rate effective date of that case.	Actual monthly plant-in-service balances associated with wind repowering, beginning with first repowering assets placed in service.	The difference between the base and new columns will be included in the mechanism calculation until the amounts are fully included in a general rate case, at which time this will end.
Accumulated Depreciation Reserve	Same as capital investment.	Monthly depreciation reserve of repowered assets.	
Accumulated Deferred Income Tax	Same as capital investment.	Actual accumulated deferred income tax balances associated with the repowering investment.	
Operation & Maintenance Expense	Four-year average O&M expense for wind projects from 2014 to 2017, (2018-2019 are excluded to avoid any changes in O&M related to repowering).	Actual O&M expense for wind projects.	
Depreciation Expense	Zero.	Actual monthly plant-in-service balances associated with wind repowering less the base multiplied by current depreciation rates. The plant in service amounts used will be reduced by the replaced assets until the next depreciation study.	

- *Exhibit JKL-1*

RTM Revenue Requirement Overview

Category	Base	New	Deferral
Property Taxes	Zero.	Capital Investment deferral less the Depreciation Reserve deferral multiplied by the average property tax rate from the last rate case.	The difference between the base and new columns will be included in the mechanism calculation until the amounts are fully included in a general rate case, at which time this will end.
Wind Tax	Zero.	Incremental energy production MWh associated with repowering multiplied by the wind tax rate.	
NPC Savings	The EBA tracks and captures any incremental changes to wind production between NPC in base rates and actual NPC. The base energy production = Actual energy produced by wind projects divided by (1 + percent of generation increase from Exhibit RMP__(TJH-3)).	The EBA has a 100% pass through of the difference between base NPC and actual NPC. The RTM will capture any savings not included in the EBA related to incremental energy production associated with repowering, and pass these savings back to customers.	Any incremental wind production not in base rates will be multiplied by monthly HLH and LLH prices, (Mid-C for west and Four Corners for east resources) less wind integration costs.
PTC	Zero until next general rate case. After a rate case, the base will be the amount included in the test period, starting on the rate effective date, associated with repowering projects.	Actual MWh eligible for PTC produced by repowered wind plants multiplied by the production tax rate.	Difference between the base and actual. Tracked until repowering PTCs have expired, and have been reset to zero in base rates.
RTM Cap	N/A	The Company is proposing to cap the RTM until the next general rate case so that, after taking into account the wind repowering benefits that will flow through the Company's EBA, it will not operate to surcharge customers.	

- *Exhibit JKL-1*

Example of Annual RTM Deferral Calculation

Exhibit JKL-2

Line No.	$-Thousands	Reference	(a) 2019 Repowering Total Company	(b) Factor	(c) Factor %	(d) Utah Allocated	(e) 2020 Repowering Total Company	(f) Factor	(g) Factor %	(h) Utah Allocated
	Plant Revenue Requirement									
1	Capital Investment	Footnote 1	171,567	SG	42.6283%	73,136	986,120	SG	42.6283%	420,366
2	Depreciation Reserve	Footnote 1	(939)	SG	42.6283%	(400)	(23,511)	SG	42.6283%	(10,023)
3	Accumulated DIT Balance	Footnote 1	(43,669)	SG	42.6283%	(18,615)	(192,063)	SG	42.6283%	(81,873)
4	Net Rate Base	sum of lines 1-3	126,959			54,120	770,545			328,470
5	Pre-Tax Rate of Return	line 34	10.649%			10.649%	10.649%			10.649%
6	Pre-Tax Return on Rate Base	line 4 * line 5	13,520			5,763	82,057			34,979
7	Wholesale Wheeling Revenue	Footnote 4	-	SG	42.6283%	-	-	SG	42.6283%	-
8	Operation & Maintenance	Footnote 3	583	SG	42.6283%	248	4,379	SG	42.6283%	1,867
9	Depreciation	Footnote 3 & 6	8,454	SG	42.6283%	3,604	33,279	SG	42.6283%	14,186
10	Property Taxes	Footnote 3	-	GPS	42.4704%	-	7,506	GPS	42.4704%	3,188
11	Wind Tax	Footnote 3	60	SG	42.6283%	26	206	SG	42.6283%	88
12	**Total Plant Revenue Requirement**	sum of lines 6-11	**22,618**			**9,641**	**127,427**			**54,308**
	Net Power Cost									
13	NPC Incremental Savings	Footnote 3	(505)	SG	42.6283%	(215)	(9,703)	SG	42.6283%	(4,136)
	PTC Benefit									
14	PTC Benefit	Footnote 3	(17,405)	SG	42.6283%	(7,420)	(69,048)	SG	42.6283%	(29,434)
15	PTC Benefit in Base Rates	Footnote 3	-	SG	42.6283%	-	-	SG	42.6283%	-
16	Net PTC	sum of lines 14 and 15	(17,405)			(7,420)	(69,048)			(29,434)
17	Gross- up for taxes	line 16 * (line 32 - 1)	(10,646)			(4,538)	(42,232)			(18,003)
18	PTC Revenue Requirement	sum of lines 16 and 17	(28,051)			(11,958)	(111,280)			(47,437)
19	**Rev. Requirement**	sum of lines 12, 13, 18	(5,938)			(2,531)	6,443			2,735
	Adjustment for EBA Pass-through									
20	NPC Incremental Savings	line 13				(215)				(4,136)
21	Percentage included in EBA (100%)	UT EBA Sharing %				100%				100%
22	EBA Pass-through	line 20 * line 21				(215)				(4,136)
23	**Rev. Reqt. after EBA Pass-through**	line 19 - line 22				(2,316)				6,871
24	**Total Deferral - UT Share**	Footnote 5				(2,316)				4,136
25	**Net Customer Benefit**	line 22 + line 24				(2,531)				-
	Deferral Balance - UT Share									
26	Beginning Deferral Balance	line 30 of previous year				-				(2,352)
27	Monthly Deferral	Footnote 5				(2,316)				4,136
28	Deferral Collection	Footnote 3				-				1,568
29	Carrying Charge	Footnote 3				(36)				4
30	**Ending Deferral Balance**	sum of lines 26-29				(2,352)				3,356

Estimated Revenue Requirement Cost (Benefit)

- These numbers differ from those in Rick Link's testimony, because while these reflect only near-term revenue requirement impacts, Rick's analysis estimates the *change* in nominal revenue requirement due to costs that would otherwise have been incurred.

Repowering Estimated Revenue Requirement Cost (Benefit)
$thousands

	2019	2020	2021	2022
Total Company 1 Revenue Requirement	-$5,938	$6,443	-$9,380	-$25,184
2 Utah Allocated	-$2,531	$2,735	-$4,012	-$10,748
3 Utah EBA	-$215	-$4,136	-$5,869	-$7,732
4 Utah Deferral	-$2,316	$4,136	$1,857	-$3,017
5 Net Customer Benefit	-$2,531	$0	-$4,012	-$10,748

Questions Received Prior to Conference

(Docket No. 17-035-39)

PacifiCorp
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Questions from PSC Staff

- Direct Testimony of Rick Link, lines 349-359, regarding model de-rates to PacifiCorp's 230-kV transmission system**:** In the context of this section, please: 1) explain how PacifiCorp determined the "average de-rate of 146 MW over approximately 88 outage days per year;" and 2) identify the de-rate causes for the referenced line and their associated transmission system elements.

- Direct Testimony of Rick Link, pp. 18-22, Annual Revenue Requirement Modeling Methodology**:** Please review the use of nominal and levelized values in the analyses presented in this section.

- Direct Testimony of Rick Link, lines 601-605 and 699-702**:** Please explain how PacifiCorp determined its estimates of the values assigned to the incremental RECs generated from the repowered wind facilities through 2036 and through 2050.

Questions from the DPU (1-2)

1. Assignment of risk. The sole driver of the project is economic benefits, rather than, for example, reliability need. Some scenarios show relatively small net benefits in relation to the total cost of the project, and certain conceivable future conditions could result in the project imposing a net cost, rather than a benefit. How is the Company proposing to share in any risk that the project does not yield net benefits to customers?
2. Economic analysis workpapers. The economic analysis described in Mr. Link's Direct Testimony (Link) is supported by extensive workpapers. We would like the Company to walk through the workpapers to describe the analysis, and address some specific components of the analysis:
    a. Please explain which System Optimizer (SO) Model assumptions are varied between the runs and show where the details of those assumptions flow through the workpapers.
    b. For Planning and Risk (PaR) Model stochastic variables, please explain how values are represented by a distribution, especially please focus on wholesale purchases and sales. (Link, lines 246-258)
    c. Please provide the details of the calculation of the risk-adjusted PVRR, e.g., provide which elements of the stochastic-mean PVRR are adjusted, and where this calculation takes place in the workpapers. (Link, lines 246-258)
    d. Please quantify the recovery of remaining value of original equipment over depreciable life, including location in workpapers. (Link, lines 390-396)
    e. Please provide the details on the modifications to the accounting of streams of costs and benefits to apply the annual revenue requirement approach. (Link, lines 432-454)
    f. Please provide the additional detail of the forecast of costs and benefits for 2037-2050, including location of calculations in the workpapers. (Link, lines 455-470)
    g. Please provide the timing of retirement of wind resources (Link, lines 491-501)
    h. Please provide and walk through the details on system costs and benefits in the 2028-2036 period that were used for extrapolation in the 2037-2050 period, particularly the changes in fixed costs from the SO Model output.

Questions from the DPU (3-4)

3. Economic analysis workpapers. Please update the PVRR results listed in Table 3 of Link's testimony (p. 32) with the most recent official forward price curve for natural gas.

4. Hemstreet. Company witness Mr. Timothy J. Hemstreet discusses the potential impact on bird and bat kills, and related problems due to the larger blade sizes under the Company's proposed repowering (see lines 213-227 of his pre-filed direct testimony). It appears from Mr. Hemstreet's testimony that the Company does not know what, if any, effect the proposed repowering will have on birds and bats, but "...will continue ... monitoring to determine if the new turbine blades cause additional impacts to avian species...." (lines 223-225)

   Please explain what, if any, new information the Company has on this subject. Please discuss the effects on the project, the Company, and ratepayers if, hypothetically, the avian and bat impacts were to double from their current levels.

Questions from the OCS (1-3)

1. Tax Reform and the Corporate Tax Rate. In the technical conference, we would like the Company to explain the extent to which it has considered possible tax reform. The AICPA has indicated that there is a "window of opportunity" for tax reform between October 2017 and the first quarter of 2018 (after September budget issues and before focus starts shifting to elections). Such reform would likely include a reduction in the federal corporate tax rate. The house is suggesting corporate rate of 20%, while President Trump is suggesting a corporate rate of 15%. If a reduction in the federal rate happens, it would greatly impact the Company's analysis in this docket. We assume the Company has conducted some analyses to date on this issue. Please provide the impacts of lower corporate tax rates on your analysis and the risks associated with the potential tax reform. If the Company has not conducted any such analyses to date, please prepare some high-level analysis of the impact of tax reform to present at the August 30 technical conference.

2. See RMP_TJH-3, Table 1, entitled - Repowering Project Details, Capital Costs, and In-Service dates. The table indicates that the additional capacity that will be added to the PacifiCorp System by repowering the wind generators is xxx MW. The Company's expansions plans are found in the SO Summary files, which were supplied as part of Mr. Link's workpapers (SO Model Summary Reports), which indicate that the Repowering case adds 509 MW more capacity by 2036 than the Status Quo case. Please explain and discuss the reasonableness of the optimization process adding so much additional capacity in the repowering case compared to the Status Quo case.

3. The Company levelizes capital and other amounts including PTC benefits in its economic evaluations that end in 2036. Explain the logic that was used in developing levelized values and ultimately the NPV that is used in the 2036 analysis. Also, please explain why PTCs are levelized using this procedure, but Wind Integration, Wind Production Tax costs are not levelized. (See "IRP Repower LGIA Limit v13 WIC LJ.xlsm" tab: "LJ")

Questions from the OCS (4-6)

4. With regard to the economic evaluation performed through 2050, the Company neither develops an optimal expansion plan nor conducts production cost modeling to derive net power costs for the 2037 to 2050 time period. Please explain the procedure that the Company performs to derive the net power cost results for this time period.

5. Refer to the Repower Results Direct Testimony.xlsm file, Tab = Price-Policy Annual – PaR, row 51 = Net Change in Repower GWh. For the ten-year period up to 2036, the wind energy difference between the Status Quo case and the Repower case is approximately 550 GWh on average. After 2036 it goes up as high as 3,283 GWh. Please explain the reasonableness of the methodology that computes a benefit based on 550 GWh of wind energy, and then applies that in a linear fashion to calculate benefits for as much as 3,283 GWh.

6. The Office would like to understand how transmission congestion in Wyoming is affecting the current operation of the Company's wind resources (and thermal resources) located in Wyoming. In response to OCS 1.2 in Docket No. 17-035-23, the Company stated:

   The Company's transmission system in southeastern Wyoming is operating at capacity, which limits transfer of existing resources from this area. The transmission system that connects the prime wind region in eastern Wyoming to the more westerly areas of Wyoming consists largely of three 230 kV lines. These lines comprise the Western Electricity Coordinating Council rated Path 37, referred to as TOT 4A. For reference the path definition is the sum of line flows as follows:

   Riverton – Wyopo 230 kV

   Platte – Standpipe 230 kV

   Spence – Mustang 230 kV

   The limitation for this Path varies by outage condition, but in general, is limited by the amount of transmission capacity or "congestion" across this cut plane; the non-simultaneous rating of this path is 1025 MW.

   The Office would like the Company to explain the current capacities of the components of the southeastern Wyoming transmission system and how they relate to simultaneous peak output of wind resources, dispatch of thermal resources and any curtailments of wind. Please explain if wind resources are the cause of the transmission-limiting congestion across the "cut plane" referenced above. If not, what is the cause?

Wind Repowering

Technical Conference

(Docket No. 17-035-39)

August 30, 2017

PacifiCorp

A BERKSHIRE HATHAWAY ENERGY COMPANY