

October 28, 2016

***VIA ELECTRONIC FILING
AND COURIER***

Public Utility Commission of Oregon
201 High Street SE, Suite 100
Salem, OR 97301-3398

Attn: Filing Center

Re: UM 1790—PacifiCorp’s Reply Comments

PacifiCorp, d/b/a Pacific Power (PacifiCorp or the Company) respectfully submits these comments in response to the comments of Public Utility Commission of Oregon Staff (Staff), Industrial Customers of Northwest Utilities (ICNU), Sierra Club, the Northwest Energy Coalition (NVEC), and Small Business Utility Advocates (SBUA); and to the joint comments submitted by Renewable Northwest and the Oregon Solar Energy Industries Association (OSEIA) (collectively, the Joint Parties) on PacifiCorp’s Updated 2017-2021 Renewable Portfolio Implementation Plan (Updated 2017-2021 RPIP). As directed by the Public Utility Commission of Oregon (Commission) in Order No. 16-158, PacifiCorp filed an Updated 2017-2021 RPIP on July 15, 2016.¹

I. Background

PacifiCorp’s Updated 2017-2021 RPIP represents a unique filing made in response to unique circumstances: the passage of Senate Bill (SB) 1547 in March 2016, three months after PacifiCorp filed its December 2015 Renewable Implementation Plan (RPIP). Among other things, SB 1547 changes renewable energy certificate (REC) banking rules and doubles the Renewable Portfolio Standard (RPS) requirement for PacifiCorp from 25 percent by 2025 to 50 percent by 2040. In addition to the analysis required in an RPIP, Staff requested and PacifiCorp provided additional analysis responsive to the new RPS landscape precipitated by the passage of SB 1547. Although the Updated 2017-2021 RPIP contains analysis distinct from previous RPIP filings, the fundamental purposes of the RPIP remains unchanged.

First, the RPIP forecasts the utility’s near-term RPS compliance position. The forecast in the RPIP is consistent with the utility’s integrated resource plan (IRP). Unlike the IRP, however, the RPIP is not intended to inform resource acquisition decisions or analyze different RPS compliance scenarios; the IRP remains the forum for analyzing resource needs.

Second, the RPIP presents a calculation of the utility’s expected incremental cost of compliance with the RPS. Importantly, the incremental cost calculation does not reflect the

¹ *In the Matter of PacifiCorp, dba Pacific Power 2017-2021 Renewable Portfolio Standard Implementation Plan*, Docket UM 1754, Order No. 16-158 at 1 (April 22, 2016).

actual cost to customers for complying with the RPS, but rather a forecast of the difference between RPS-resource costs and the cost of proxy resource alternatives. Although the Company presents its cost of RPS compliance in its RPIP, the Commission does not make cost-recovery decisions as part of its acknowledgment. In this regard, the RPIP is similar to the IRP in that the Commission's acknowledgment, or lack of acknowledgment, is not dispositive of the prudence of an investment. Indeed, the Commission's role in acknowledging the RPIP is not to determine whether any specific compliance actions are appropriate for cost-recovery, but to determine whether the utility's RPIP is consistent with the reporting requirements of ORS 469A.075 and the Commission's rules.

Fundamentally, the RPIP allows the Commission and stakeholders to see how the results of the Company's last acknowledged IRP affect an RPS compliance forecast over a five-year period and to see whether the costs of RPS compliance are approaching the four percent cost cap contained in ORS 469A.100. Resource need analysis and cost-recovery decisions are not, and should not be, part of the RPIP.

The Company's Updated 2017-2021 RPIP is responsive to both the RPIP process and the Commission's request for additional information in light of the passage of SB 1547. PacifiCorp respectfully requests the Commission acknowledge the Company's Updated 2017-2021 RPIP as filed.

II. Response to Comments

A. Comments of Staff

Staff's comments seek additional clarification on the following topics: (1) use of RECs with the shortest lives; (2) impacts of PacifiCorp's recent REC procurement; (3) cost comparison of early acquisition compliance versus acquisition post-"golden" RECs; and (4) system impacts of high renewable penetration with hydro variability. In addition to the requested clarifications, Staff requested PacifiCorp correct labeling errors in certain tables contained in the July RPIP; the labeling errors have been corrected and a corrected version of the report is attached to this filing. PacifiCorp addresses each of the requested clarifications as follows.

1. Use of RECs with the shortest lives.

Staff requests the Company provide further explanation regarding how the decision to use renewable energy certificates (RECs) with the shortest lives affects annual compliance costs. Staff's request seeks additional information on how the REC usage strategy was vetted and selected.²

The Company identified a strategy that uses RECs with the shortest lives first, in order to maximize the value of RECs before they are deemed expired for the Oregon RPS. While this approach generally assumes that the Company will surrender five-year RECs before surrendering RECs with an unlimited life ("golden" RECs), the determination of which specific RECs are

² Staff's Opening Comments at 2.

surrendered in a given year will also be dependent on the levelized cost of each resource (and variable inputs to the calculation, such as fuel prices), renewable resource performance, as well as the annual RPS target.

This strategy is intended to manage RPS compliance cost in the following ways: i) minimize the risk of losing unused RECs before they expire, avoiding the need to procure replacement RECs or resources; and ii) defer the use of the bank of golden RECs with lower incremental costs for use in years with higher RPS targets. The Company intends to identify the most balanced portfolio of RECs and renewable resources in order to manage RPS compliance costs relative to the four percent cost cap each year.

2. Effects of REC acquisition.

Staff requests the Company address how PacifiCorp's recent REC acquisitions affect the Company's RPS compliance position.³ Staff also requests information regarding the extent to which the newly-acquired RECs will be banked and applied to RPS compliance post-2021.⁴ As a result of PacifiCorp's recent REC RFP, PacifiCorp acquired more than 5.8 million RECs through long-term contracts for Oregon RPS compliance. The acquisition of these RECs pushes PacifiCorp's RPS compliance shortfall from 2025 to 2028. With regard to REC banking, in the short term, PacifiCorp's banking strategy will need to change in response to the new banking rules contained in SB 1547, which limit the life of certain RECs to five years. Approximately 3.7 million of these RECs are subject to the five-year REC life provisions and that temporal limitation will be considered by the Company in its short-term banking strategy.

3. Cost of compliance comparison.

Staff references the Company's analysis provided in response to Condition (2) as a comparison between an early build scenario and a scenario where capacity is added outside of the golden REC timeframe.⁵ Staff requests that PacifiCorp provide a comparison of compliance costs for these two scenarios.⁶

The two scenarios developed in response to Condition (2) are presented in Figures A-3 and A-4 in Attachment A of the Company's filing. Staff misinterprets these two scenarios, which do not compare an early build scenario with a scenario where capacity is added outside of the golden REC timeframe. Rather, both scenarios assume 792 MW of wind is procured in 2018, and therefore, the cost between both scenarios would be the same. The only thing that differs between the two scenarios is the assumption around golden RECs. In one scenario, it is assumed the RECs generated from this proxy wind resource qualify as golden RECs, which have an unlimited life for the first five years. In the second scenario, it is assumed that the RECs from

³ *Id.*

⁴ *Id.*

⁵ Staff's Opening Comments at 3.

⁶ *Id.*

the 2018 proxy resource have a five-year life.⁷ PacifiCorp analyzed cost differentials between early build and later build alternatives in its response to Condition (3).

4. Impacts of renewable penetration and hydro variability.

Staff asked the Company to address the impacts to the system with high levels of renewable penetration, in conjunction with hydro resource variability. To the extent that the Company does not find that hydro variability will impact compliance as has been experienced in the Northwest, it should include a discussion of any other additional pertinent regional factors.

Hydro resources (low-impact and incremental generation from efficiency improvements) are an important element of the Company's Oregon RPS compliance strategy. Over the 2017-2021 RPIP period, more than 15 percent of the Company's annual bundled RECs are expected to be generated from hydro resources. Hydro variability is an inevitable issue that existed before the passage of SB 1547; however, it can be managed effectively with the flexible banking provisions put in place by SB 1547. In years of low hydro generation, the Company will have to rely more on its existing bank and in years of strong hydro generation, the Company will be able to grow its REC bank.

B. Comments of Sierra Club

Sierra Club frames the Company's decision to pursue a least-cost, least-risk acquisition of RECs for RPS compliance as "unusually risky behavior" and raises concerns related to the Company's modeling of coal unit retirements.⁸ Although many of the issues raised by Sierra Club are more appropriately addressed as part of the IRP process, PacifiCorp provides the following responses to Sierra Club's comments.

1. PacifiCorp's decision to acquire RECs was prudent.

Sierra Club argues that PacifiCorp's first acquisition towards the new, increased RPS targets amounts to "unusually risky behavior;" with only vague allusions to its own "analysis," Sierra Club instead requests that the Commission order PacifiCorp to proceed with a request for proposal (RFP) process for at least 189 MW of physical resources and 504 MW of RECs. Alternatively, Sierra Club argues that the Company's 2017 IRP should model declining costs of renewables.⁹ Sierra Club's arguments have no merit, misunderstand the results of PacifiCorp's recent RFP process, and are inappropriately raised in this forum.

First, PacifiCorp clarifies that its Updated 2017-2021 RPIP was filed prior to the conclusion of the 2016 renewable resource and REC requests for proposals. The Company's Updated 2017-2021 RPIP and associated analysis provided in Attachment A to that filing do not reflect actual

⁷ This scenario might occur if PacifiCorp procured RECs beginning 2018 from a resource that came on-line prior to March 8, 2016.

⁸ Comments of Sierra Club at 1.

⁹ *Id.* at 7.

RFP bid data. The Company's analysis in Attachment A of the Updated 2017-2021 RPIP is illustrative and responsive to conditions specified in Order No. 16-158.

Second, Sierra Club claims that the Company is choosing to “preferentially wait until 2024 to acquire new resources rather than harness low cost resources today.”¹⁰ This statement is simply not true. PacifiCorp has clearly indicated that it will continue to monitor the market to assess the optimal time for additional acquisitions for RPS compliance. Sierra Club apparently conflated PacifiCorp's current analysis of renewable resource price trajectories—which indicated renewable resource prices will likely be lower post-2024—with a refusal to acquire resources before 2024. This assumption finds no factual basis in either the Updated 2017-2021 RPIP, the document that is actually at issue in this proceeding, or the Company's public documentation of its RFP process, which is not at issue in this proceeding.

Third, Sierra Club claims that PacifiCorp has been unwilling to test substantially lower renewable resource cost assumptions. This claim is not true. PacifiCorp evaluated lower renewable resource cost assumptions in its 2015 IRP, evaluated lower renewable resource costs in this Updated 2017-2021 RPIP, and is currently working on developing renewable resource cost and assumptions for its 2017 IRP. Finally, PacifiCorp notes that Sierra Club's request for the Commission to direct PacifiCorp to model certain price trajectories for renewable resources is not within the scope of the Updated 2017-2021 RPIP. To the extent Sierra Club wishes to influence the Company's IRP modeling process, Sierra Club is welcome to participate in the Company's IRP stakeholder process.

2. PacifiCorp appropriately modeled coal unit retirement.

Sierra Club claims PacifiCorp “inappropriately” considered transmission constraints, and the associated costs, when reviewing RFP bids. Sierra Club claims “PacifiCorp's existing coal units are not entitled to use of PacifiCorp's transmission.”¹¹ Sierra Club recommends the Commission order PacifiCorp to re-assess the RFP bids “assuming that existing coal could be displaced by renewables if those resources provide overall lower system costs.”¹²

As noted above, Sierra Club raises long-term resource planning concerns that are best addressed in the Company's IRP. Nonetheless, PacifiCorp's assumptions regarding use of existing transmission rights are consistent with PacifiCorp's Open Access Transmission Tariff (OATT), which requires that PacifiCorp submit a transmission service request to receive network resource status for new generating resources. Existing network generating resources have designated network transmission rights, which are used to deliver generation to load within PacifiCorp's system. Incremental network transmission rights would be needed to integrate new generating resources, which can require network upgrades to deliver energy to load. Aligning resource procurement with assumed coal unit retirement dates provides an opportunity to avoid these network upgrade costs.

¹⁰ *Id.* at 3.

¹¹ *Id.* at 9.

¹² *Id.* at 9-10.

C. Comments of ICNU

The comments of ICNU are substantively duplicative of ICNU's comments in response to the December 2015 RPIP. ICNU continues to request the Commission to require PacifiCorp to use a flexible capacity resources as its firming resource for purposes of calculating the incremental cost of RPS compliance. ICNU also restates its argument for recalculation of progress towards the four percent cost cap before resource acquisition decisions are made and reiterates its concerns regarding the approved methodology for calculation of the incremental cost of RPS compliance. For the reasons set forth below, PacifiCorp requests the Commission to reject ICNU's recommendations.

1. PacifiCorp appropriately calculated the incremental cost of RPS compliance.

ICNU recommends that the Company use a flexible capacity resource as the firming resource in the Company's calculation of incremental cost. Specifically, ICNU recommends the Company use a Wärtsilä or LMS100 Simple Cycle Combustion Turbine (SCCT).¹³ ICNU argues that the Frame SCCT currently used by the Company is ill-suited as the firming resource because, as compared to a Wärtsilä or LMS100 SCCT, the Frame SCCT cannot ramp as quickly and is less fuel-efficient.¹⁴ ICNU further argues that the use of a flexible capacity resource will not introduce shaping costs into the incremental cost calculation, in violation of the stipulated agreement in docket UM 1616.¹⁵

As PacifiCorp previously noted in response to ICNU's comments in docket UM 1754, ICNU's proposal is contrary to the incremental cost methodology agreed to by parties in docket UM 1616, and accepted by the Commission in Order No. 14-034. The stipulation states as follows:

To create a capacity-equivalent Proxy CCCT, the fixed costs (including fixed operations and maintenance costs) of a simple-cycle natural-gas fired generating facility ("SCCT") shall be subtracted from the cost of the Proxy CCCT.¹⁶

The stipulation also states that this capacity equivalency is intended to capture what some parties referred to as the "firming costs" of the RPS resource relative to the Proxy CCCT. The characteristics of the alternate "firming resources" ICNU proposes might be better characterized as "shaping costs," which were proposed by some parties, but were not an element of the incremental cost methodology agreed upon by parties. The testimony supporting the stipulation indicated that identifiable shaping costs could be included in future incremental cost calculations, but that parties expected them to first be identified in a utility contract, integrated resource plan, rate case, or other filing.¹⁷ The Company believes it is premature to deviate from the stipulated incremental cost methodology at this time in the absence of a demonstration of identifiable costs.

¹³ Comments of ICNU at 4.

¹⁴ *Id.* at 5.

¹⁵ *Id.* at 6-7.

¹⁶ UM 1616 Stipulation, pg. 4.

¹⁷ UM 1616 Joint Stipulating Parties / 100 / pg. 15.

2. PacifiCorp complied with existing incremental cost calculation requirements.

ICNU recommends that any RPS compliance actions that deviate from the RPIP be accompanied by an updated incremental cost calculation that shows the action does not result in PacifiCorp exceeding the four percent cost cap. Second, ICNU recommends that any costs in excess of the four percent cost cap not be borne by customers.

First, PacifiCorp notes that the four percent cost cap is intended to act as a potential stopping point for RPS compliance and is not a prohibition on recovery of prudently incurred costs associated with RPS compliance. ORS 469A.100(1) states that utilities are not required to comply with a renewable portfolio standard during a compliance year to the extent that the incremental cost of compliance, the cost of unbundled [RECs] and the cost of alternative compliance payments under ORS 469A.180 exceeds four percent of the utility's annual revenue requirement for the compliance year.

Disallowance of costs in excess of the incremental cost cap is most appropriately addressed in the context of a future cost recovery proceeding where the prudence of the investment decision can be fully analyzed—cost recovery should not hinge on whether the investment results in incremental costs in excess of the four percent cap.

In response to ICNU's claims that the incremental cost calculation rules are inconsistent with statute, PacifiCorp notes that its incremental cost calculation was done consistent with the Commission's rules. PacifiCorp cannot unilaterally determine that the Commission's rules are inconsistent with statute and adopt an alternative methodology. PacifiCorp has previously supported proposals to revisit the incremental cost calculation rules as part of a new investigation or rulemaking process. However, under no circumstances should any revisions to the incremental cost calculation methodology be applied on a retroactive basis.

D. Comments of the Joint Parties

Similar to the Sierra Club, the Joint Parties raise concerns with the Company's REC-based RPS compliance strategy and recommend PacifiCorp pursue more physical compliance. The Joint Parties also recommend the Commission consider ways to update the RPIP process to better align with the utility's actual RPS compliance strategy.

1. PacifiCorp has not precluded physical compliance.

The Joint Parties recommend improvements to the RPIP process generally and also note the risks associated with PacifiCorp's REC-based strategy described in this RPIP as opposed to a "physical compliance strategy" for complying with the RPS. With respect to PacifiCorp's RPS compliance strategy described in the RPIP, the Joint Parties state that a predominantly REC-based strategy fails to take advantage of early action incentives that could offer customers significant potential savings and other benefits. While the Joint Parties' understanding is that

PacifiCorp's pursuit of a largely REC-based strategy is a short-term one, they nonetheless flag this concern in light of the time-limited early action incentives.

PacifiCorp's decision to acquire RECs for Oregon RPS compliance was the result of a thorough request for proposal (RFP) process and rigorous analysis that determined the REC-based strategy in the near-term is the least-cost, least-risk approach to RPS compliance. The analysis showed that REC purchases are currently lower cost than resource opportunities, particularly when considering potential continuing cost declines and on-going availability of the investment tax credit. Procurement of these RECs will extend PacifiCorp's initial RPS compliance shortfall in Oregon from 2025 to 2028 with rate impacts of 0.05 percent.

Additionally, PacifiCorp disagrees with the Joint Parties' characterization of the Company's compliance strategy as "predominantly REC-based," as the Oregon RPS still limits the use of unbundled RECs to 20 percent of the annual compliance target.

2. PacifiCorp supports improvements to the RPIP process.

Regardless of whether the Commission acknowledges this RPIP, the Joint Parties recommend that the Commission consider ways in which the RPIP process and calculations can be made more relevant and reflective of the Company's actual RPS compliance strategy. To accomplish this, it may be necessary to tie the timing of the RPIP more closely to utility actions rather than having it adhere to a schedule that stymies its usefulness. For example, the results of an RFP or acknowledged IRP could trigger recalculation of the incremental compliance cost as a percentage of the Company's annual retail revenue requirement.

While PacifiCorp supports better coordination of the RPIP and the IRP, the Company does not believe that recalculating incremental costs as the result of an RFP or acknowledged IRP is an appropriate solution. The Company is required to file an annual RPS compliance report to address material differences from the implementation plan, requiring the recalculation of incremental costs when a company acquires new qualifying electricity.

E. Comments of NWEAC

NWEAC notes that the Updated 2017-2021 RPIP does not reflect the results of the Company's recent RFP process and recommends the Commission consider ways to better align the RPIP and IRP process. PacifiCorp acknowledges that the Updated 2017-2021 RPIP could not, based on the required filing date, include the results of the RFP process. PacifiCorp supports NWEAC's request for Commission consideration of better alignment between the RPIP and IRP processes.

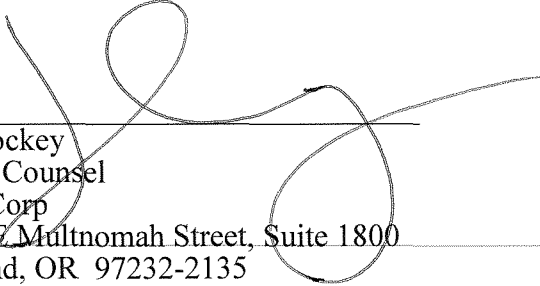
F. Comments of SBUA

SBUA's comments demonstrate an interest in more transparency and specificity related to the display of certain RPS compliance costs, including transmission costs. As previously mentioned, PacifiCorp is supportive of efforts to consider improvements to the RPIP process.

III. Conclusion

PacifiCorp appreciates the opportunity to provide these comments.

Respectfully submitted this 28th day of October, 2016.



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CERTIFICATE OF SERVICE

I certify that I served a true and correct copy of PacifiCorp's Reply Comments on the parties listed below via electronic mail delivery in compliance with OAR 860-001-0180. Parties qualified to receive confidential information in this docket will receive the confidential documents on Monday, October 31, 2016, via courier.

Service List UM 1790

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Dated this 28th day of October 2016.



Lauren Haney
Coordinator, Regulatory Operations

REDACTED PUBLIC VERSION

APPENDIX A

CONFIDENTIAL APPENDIX A

1. A discussion of the differences between SB 838 (i.e. ORS 469A.005 to ORS 469A.210) and SB 1547, with supporting analysis demonstrating the impacts of those differences on utility planning and operations decisions 2017-2040.

The most prominent difference between SB 838 and SB 1547 is the change in renewable portfolio standard targets. Table A-1 lists RPS targets for SB 838 and SB 1547.

Table A-1. Oregon RPS Targets

| | SB 838 | SB 1547 |
|---------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| RPS Target as % of Retail Sales | 2016-2019 = 15% 2020-2024 = 20% >2024 = 25% | 2016-2019 = 15% 2020-2024 = 20% 2025-2029 = 27% 2030-2034 = 35% 2035-2039 = 45% >2039 = 50% |

Further, SB 1547 contains provisions that affect renewable energy credit (REC) accounting and usage. Specifically, SB 1547 introduces the following REC accounting and usage provisions¹:

- RECs generated before March 8, 2016 have an unlimited life.
- RECs generated during the first five years for long-term projects coming online between March 8, 2016 and December 31, 2022 have an unlimited life (“Golden RECs”).²
- RECs generated on or after March 8, 2016 from resources that came online before March 8, 2016 expire five years beyond the year the REC was generated.
- RECs generated beyond the first five years for long-term projects coming online between March 8, 2016 and December 31, 2022 expire five years beyond the year the REC is generated.
- RECs generated from projects coming online after December 31, 2022 expire five years beyond the year the REC is generated.
- Banked RECs can be surrendered in any compliance year regardless of vintage (eliminates the “first-in, first-out” provision under SB 838).

Figure A-1 summarizes PacifiCorp’s forecasted Oregon RPS compliance position under SB 838 assuming no further procurement of RECs through 2040. This forecast assumes end-of-life retirement of existing renewable resources and that existing power purchase agreements that terminate over the compliance horizon are not extended. Under SB 838, PacifiCorp

¹ REC accounting and usage provisions apply to both bundled and unbundled RECs.

² A “long-term” project is a resource that has a life or power purchase agreement term of at least 20-years.

would surrender its oldest vintage RECs from its bank (i.e., green bars) and experience an initial compliance shortfall (i.e., red bars) in 2026 if no further procurement were pursued.

Figure A-1. PacifiCorp SB 838 Compliance Position without Procurement*

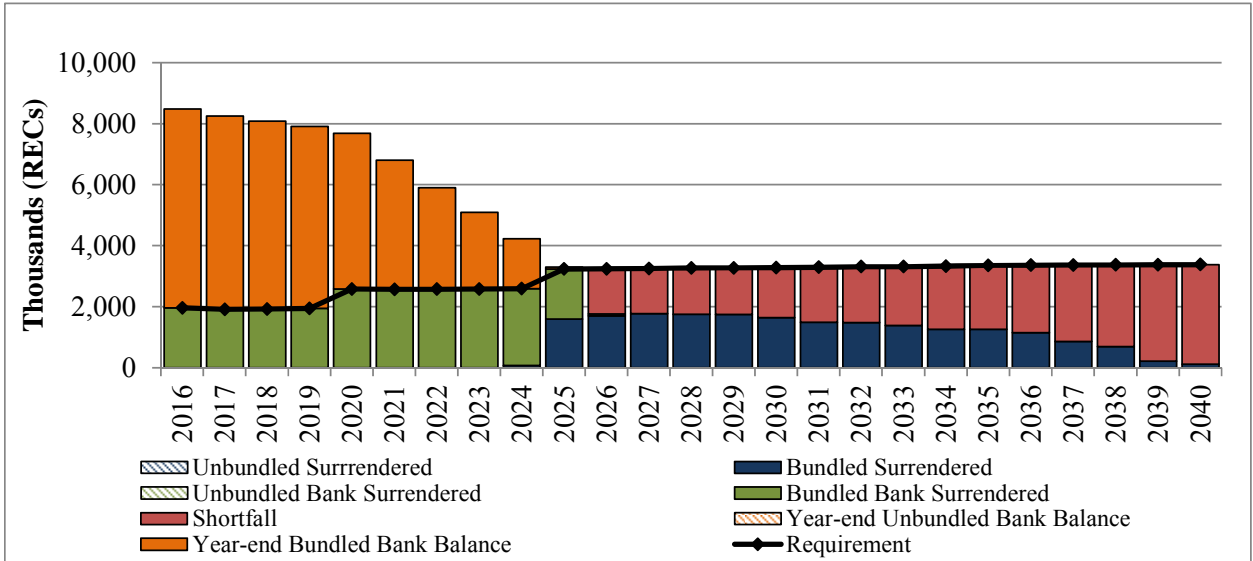
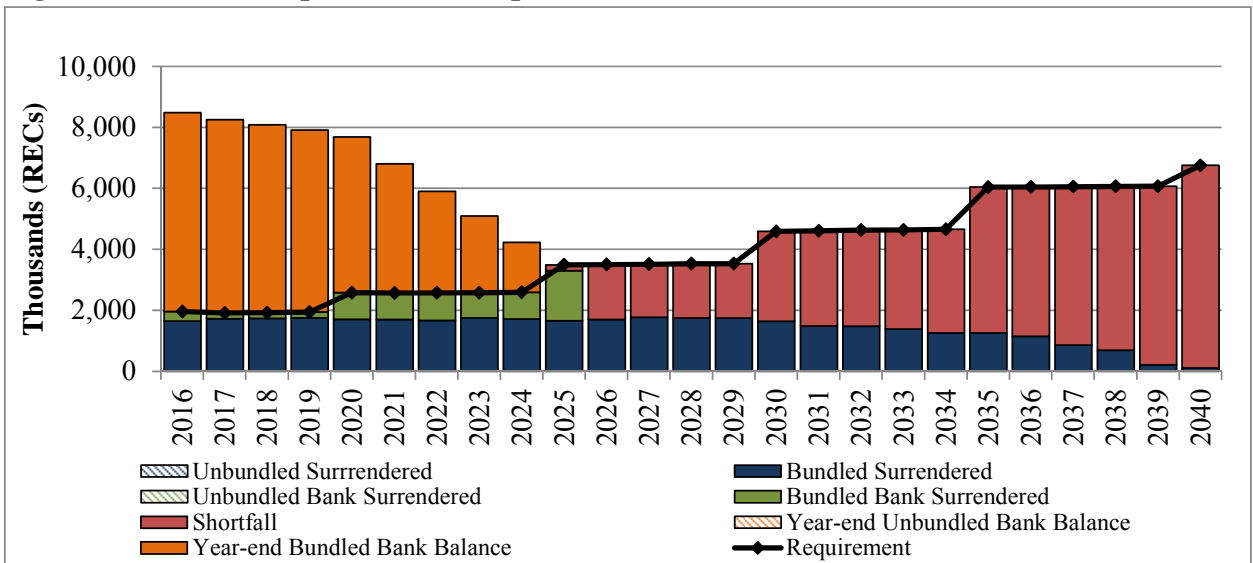


Figure A-2 summarizes the same information under SB 1547. Under SB 1547, PacifiCorp would begin using RECs that expire five years beyond the vintage year (i.e., blue bars) before using older vintage RECs from the bank (green bars), which do not expire. Given the higher RPS targets in SB 1547, PacifiCorp will experience a relative small initial compliance shortfall in 2025—one year earlier than under SB 838.

Figure A-2. PacifiCorp SB 1547 Compliance Position without Procurement



The most notable impact of SB 1547 is the increased need driven by higher targets. Under SB 838, PacifiCorp’s 2040 shortfall without further procurement is approximately 3,236

GWh, which equates to about 1,064 MW of renewable resource capacity operating at a 35% capacity factor. Under SB 1547, PacifiCorp's 2040 shortfall without further procurement is approximately 6,639 GWh, which equates to about 2,165 MW of renewable resource capacity operating at a 35% capacity factor.

As described above, REC accounting provisions under SB 1547 apply a REC life to certain RECs. The REC life provisions do not influence PacifiCorp's baseline compliance position under SB 1547 as compared to SB 838. With elimination of the "first-in, first-out" provision in SB 838, RECs that would otherwise expire five years beyond the vintage year under SB 1547 can be surrendered well before they expire. Significant early procurement would be required before RECs would begin to expire. Annual procurement of bundled RECs from over 1,000 MW of existing wind facilities operating at a 35% capacity factor, which would defer PacifiCorp's compliance need to beyond 2040, could be added to PacifiCorp's portfolio beginning 2018 without any of the RECs expiring before being surrendered for compliance.

- 2. An analysis of these aspects of SB 1547: its elimination of the "first in, first out" requirement, its creation of unlimited renewable energy credit (REC) life status for the first five years of new resources acquired between 2016-2022, its shortening of the standard REC life, and steep compliance rate increase between 2025 and 2030. In particular, the analysis should address how these aspects of SB 1547 affect how the utility plans to optimize the mix of compliance RECs for least cost and lowest risk.**

The REC accounting and usage provisions of SB 1547 cannot be considered in isolation. For instance, REC life provisions causing certain RECs to expire five years beyond the vintage year, could limit early procurement activity. However, this is greatly mitigated by eliminating the "first-in, first-out" requirement. As discussed above, PacifiCorp could procure annually the RECs from over 1,000 MW of existing wind facilities operating at a 35% capacity factor beginning in 2018 without any of the RECs expiring before being surrendered for compliance. Likewise, the provisions under SB 1547 that allow unlimited banking of certain RECs from long-term projects coming online between March 8, 2016 and December 31, 2022 will not significantly influence procurement plans.

Figure A-3 shows PacifiCorp's RPS compliance position with procurement of 792 MW of wind operating at a 35% capacity factor in 2018 assuming the project qualifies for "Golden RECs" over the first five years of operation (i.e., from 2018, the vintage year, through 2023). This level of procurement, when accounting for banking, meets PacifiCorp's RPS obligations through 2040. In this case, "Golden RECs" are banked to preserve their use for a later time period. The oldest RECs surrendered in any compliance year under this scenario are two years older than the vintage year.

Figure A-3. PacifiCorp Compliance with 2018 Procurement Qualifying for “Golden RECs”

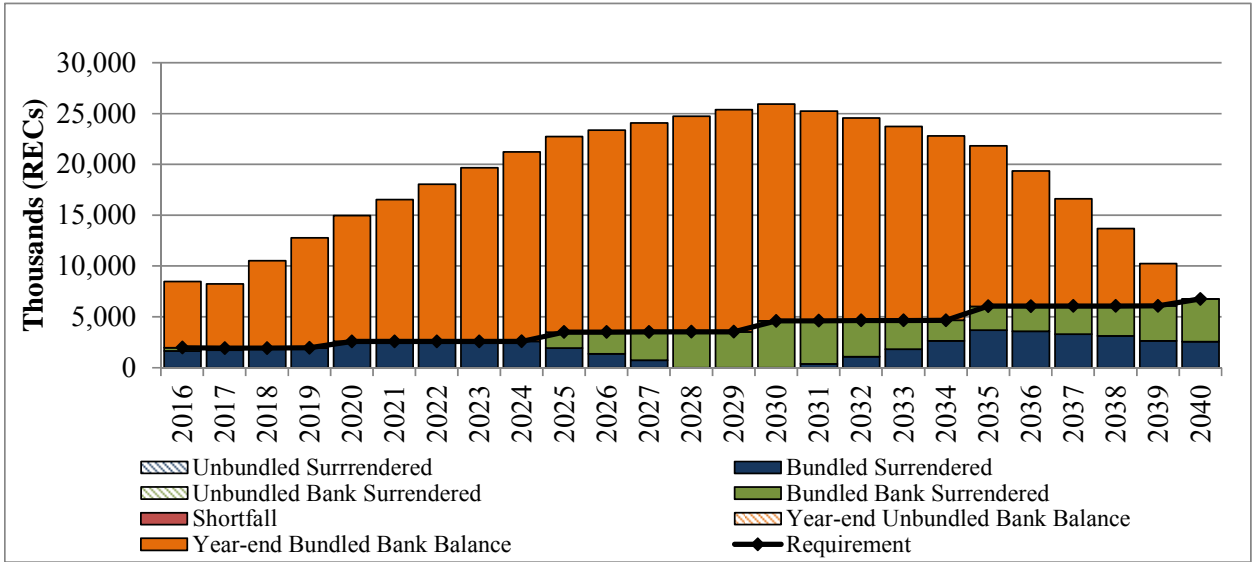
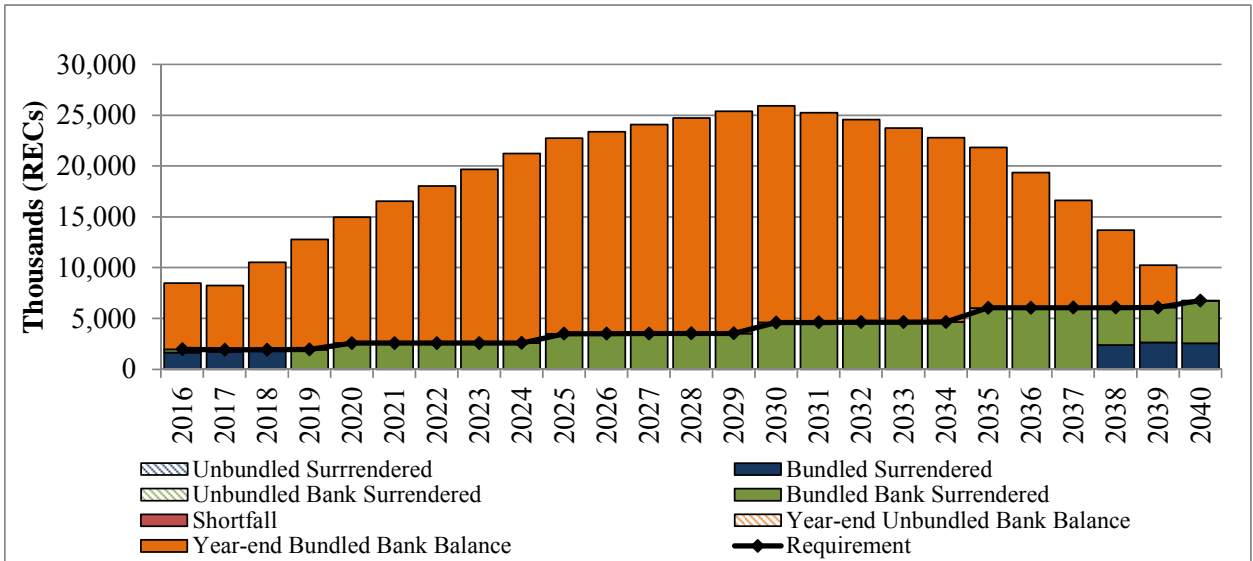


Figure A-4 shows the same compliance profile assuming the acquired resource(s) do not produce RECs that qualify as “Golden RECs”. The same level of capacity is added, which achieves the same level of compliance through 2040. The impact of procuring a resource that does not qualify for “Golden RECs” is in how the bank is managed over time. In this case, older vintage RECs (i.e., green bars) are pulled from the bank earlier, to ensure that they can be used before they expire. The oldest RECs surrendered in this scenario are four years older than the vintage year.

Figure A-4. PacifiCorp Compliance with 2018 Procurement without “Golden RECs”



As discussed above, SB 1547 has higher RPS targets, which increases the procurement need over time. Table A-2 summarizes the amount of renewable capacity needed to meet targets under SB 838 and SB 1547 at different time intervals assuming a 35% capacity factor and a just-in-time compliance strategy (i.e., procurement is deferred until the existing bank is depleted).

Table A-2. Procurement Needs over Time (Assuming 35% Capacity Factor)

| | SB 838 (Cumulative MW) | SB 1547 (Cumulative MW) |
|------|-----------------------------------|------------------------------------|
| 2025 | 0 | 62 |
| 2030 | 536 | 963 |
| 2035 | 683 | 1,558 |
| 2040 | 1,064 | 2,165 |

- 3. A discussion of how the timing of new renewable resource acquisitions impact long term cost of compliance with RPS to ratepayers with supporting analysis demonstrating these differences in timing. Under what conditions does the least cost/lowest risk strategy to satisfy the RPS compliance requirements of SB 1547 from 2017 through 2040 lead to new resource acquisition prior to a physical need and how will the utility evaluate this decision? PacifiCorp should provide a “tipping-point” analysis that depicts when physical resource acquisition is more cost effective than buying unbundled RECs.**

The timing of renewable resource and/or REC procurement and its impact on the long-term cost of compliance, as measured by revenue requirement, is driven by the cost and volume of near-term procurement opportunities in relation to forecasted, longer-term needs and cost. Early action procurement can be used to build a bank and defer longer-term procurement. If near-term procurement can defer higher cost longer-term procurement needs, then customers benefit. Conversely, if one expects long-term procurement costs will be lower than near-term procurement opportunities, then early action may not be warranted. Inter-temporal RPS compliance scenarios can be used to evaluate these tradeoffs.

Three different just-in-time compliance scenarios serve as the benchmark for this inter-temporal analysis. Under these scenarios, it is assumed that a just-in-time compliance strategy is implemented, whereby procurement of qualifying resources occurs when there is a physical compliance need.

Table A-3 summarizes resource cost assumptions for the three different just-in-time compliance scenarios. Each scenario assumes progressively lower future costs for wind and solar resources. In Scenario JIT-1, 2018 capital cost, 2018 operations & maintenance (O&M) cost, and capacity factor assumptions are consistent with data presented in PacifiCorp’s 2015 IRP Update. It is assumed that wind costs grow at an annual inflation rate

of 2.3% per year. Considering that solar PV costs have been declining more steeply than wind resource costs, it is assumed that technological advancements in solar PV projects offset inflation, but that O&M costs grow with inflation over time.

Cost assumptions for Scenarios JIT-2 and JIT-3 are derived from projected potential cost declines through 2025 as published in a recent report issued by the International Renewable Energy Agency (IRENA).³ The IRENA report discusses potential for solar PV and onshore wind investment costs to decline, in real terms, by 57% and 12%, respectively, by 2025.⁴ In Scenario JIT-2, it is assumed that half of the potential cost declines identified in the IRENA report are achieved by 2025 and that O&M costs for both wind and solar projects grow at 2.0% per year, slightly lower than the assumed 2.3% annual inflation rate. In Scenario JIT-3, it is assumed that costs for wind and solar decline consistent with rates reported by IRENA. Future resource costs in JIT-3 are lower than JIT-2, and future resource costs in JIT-2 are lower than JIT-1.

Table A-3. Just-in-Time Scenario Proxy Resource Cost Assumptions

| Variable | Scenario JIT-1 | Scenario JIT-2* | Scenario JIT-3* |
|-------------------------------|----------------|----------------------------------|----------------------------------|
| OR Wind CapEx (2018\$/kW) | \$1,826 | \$1,792 | \$1,757 |
| WY Wind CapEx (2018\$/kW) | \$1,895 | \$1,860 | \$1,823 |
| Wind CapEx Ann. Esc. Rate | 2.3% | 1.7% through 2025, then 0.0% | 1.0% through 2025, then 0.0% |
| Wind O&M (2018\$/kW-yr) | \$40.19 | \$38.80 | \$38.80 |
| Wind O&M Ann. Esc. Rate | 2.3% | 2.0% | 2.0% |
| OR Wind Capacity Factor | 35.0% | 35.0% | 35.0% |
| WY Wind Capacity Factor | 43.0% | 43.0% | 43.0% |
| OR Solar PV CapEx (2018\$/kW) | \$2,429 | \$2,352 | \$2,019 |
| UT Solar PV CapEx (2018\$/kW) | \$2,318 | \$2,244 | \$1,927 |
| Solar CapEx Ann. Esc. Rate | 0.0% | -1.1% through 2025, then 0.0% | -6.0% through 2025, then 0.0% |
| Solar PV O&M (2018\$/kW-yr) | \$20.93 | \$20.81 | \$20.81 |
| Solar PV O&M Ann. Esc. Rate | 2.3% | 2.0% | 2.0% |
| OR Solar PV Capacity Factor | 29.2% | 29.2% | 29.2% |
| UT Solar PV Capacity Factor | 31.6% | 31.6% | 31.6% |
| Solar PV Annual Degradation | 0.5% | 0.5% | 0.5% |

* Wind and solar capital annual escalation assumptions for Scenarios JIT-2 and JIT-3 are based on potential cost declines reported by IRENA in real terms. The rates shown in this table are nominal, assuming a 2.3% inflation rate.

As noted earlier, without any incremental procurement, an initial Oregon RPS compliance shortfall is projected to occur in 2025. Procurement for the just-in-time compliance scenarios targets qualifying renewable resources that can avoid incremental transmission upgrade

³ International Renewable Energy Agency. (2016). *The Power to Change: Solar and Wind Cost Reduction Potential to 2025*: <http://www.irena.org/menu/index.aspx?mnu=Subcat&PriMenuID=36&CatID=141&SubcatID=2733>

⁴ *Id.*

costs, if possible. Table A-4 summarizes assumed just-in-time renewable resource procurement limits based on availability of transmission in high-potential renewable resource areas that would open up with future coal unit retirements. Assumed coal unit retirement dates are consistent with planning assumptions used in PacifiCorp’s 2015 IRP Update (through 2034) and/or align with current non-Oregon depreciable lives (beyond 2034).

Table A-4. Just-in-Time Scenario Proxy Resource Procurement Limits

| Period | Resource | Limit (MW) | Third Party Wheel |
|-----------|----------|-----------------------------------|-------------------|
| 2025-2027 | OR Wind | 400 (Pre-retirements) | BPA |
| 2025-2027 | OR Solar | 250 (Pre-retirements) | None |
| ≥ 2028 | WY Wind | 760 (DJ Retirement) | None |
| ≥ 2030 | UT Solar | 450 (Huntington 2 Retirement) | None |
| ≥ 2033 | UT Solar | +466 (Hunter 2 Retirement) | None |
| ≥ 2036 | UT Solar | +459 (Huntington 1 Retirement) | None |
| ≥ 2040 | WY Wind | +268 (Wyodak Retirement) | None |

In each of the just-in-time compliance scenarios, renewable resources are added beginning 2025 and revenue requirement is calculated for incremental renewable resources added to achieve compliance through 2040, consistent with the cost assumptions outlined above. Revenue requirement includes return on and return of capital, taxes, run-rate operating costs, integration costs, third-party wheeling costs, as applicable, net of energy and capacity benefits.

Table A-5 summarizes the renewable resource additions added to achieve Oregon RPS compliance as shown in Figure A-5 for Scenario JIT-1. The present value revenue requirement for the JIT-1 renewable resource portfolio yields customer costs totaling \$807 million. Much of this cost is driven by high cost resources needed in 2025 and 2026—before lower cost renewable resources can be procured without incremental transmission costs after assumed coal unit retirement dates.

Table A-5. Proxy Renewable Resources in Scenario JIT-1

| Resource | MW | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|---------------|-------|------------------------------------------|
| OR Solar 2025 | 250 | \$39.92 |
| OR Wind 2026 | 341 | \$45.25 |
| WY Wind 2030 | 416 | \$20.19 |
| UT Solar 2035 | 737 | \$15.81 |
| UT Solar 2040 | 371 | \$12.98 |
| Total | 2,116 | \$26.71 |

Figure A-5. PacifiCorp Compliance for Scenario JIT-1

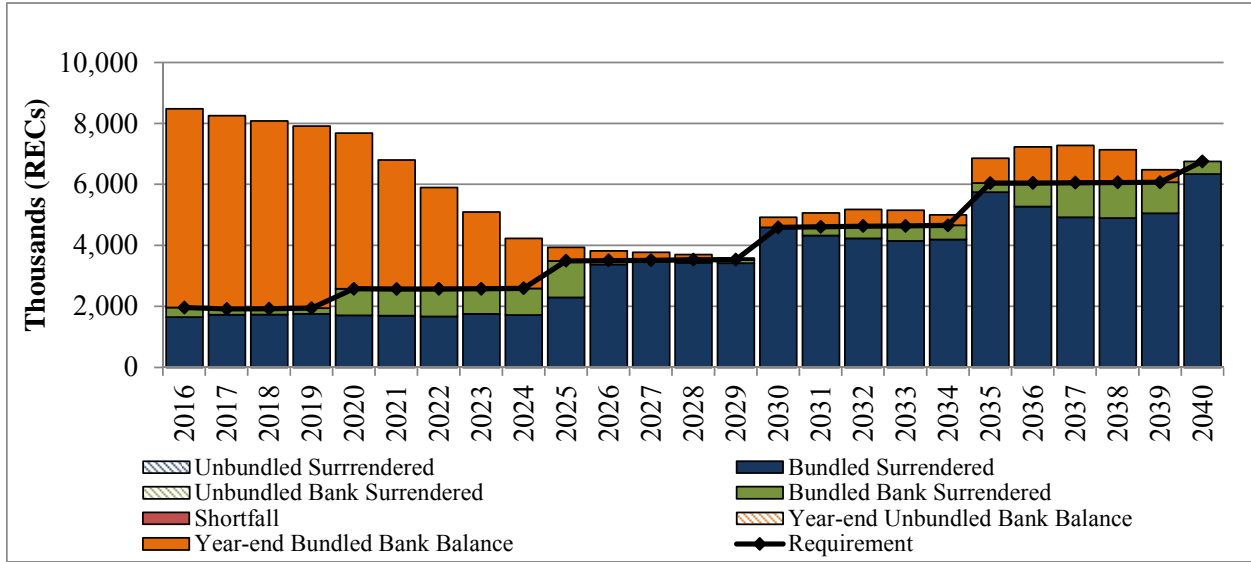


Table A-6 summarizes the renewable resource additions added to achieve Oregon RPS compliance as shown in Figure A-6 for Scenario JIT-2. With projected cost declines in future resources, the net cost of these resources is lower than in Scenario JIT-1. However, resources in the 2025-2026 timeframe remain higher cost than longer-term alternatives. The present value revenue requirement for the JIT-2 renewable resource portfolio yields customer costs totaling \$529 million.

Table A-6. Proxy Renewable Resources in Scenario JIT-2

| Resource | MW | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|---------------|-------|---------------------------------------|
| OR Solar 2025 | 250 | \$30.59 |
| OR Wind 2026 | 341 | \$38.86 |
| WY Wind 2030 | 416 | \$9.93 |
| WY Wind 2035 | 344 | \$4.04 |
| UT Solar 2036 | 305 | \$5.80 |
| UT Solar 2040 | 412 | \$2.10 |
| Total | 2,068 | \$17.09 |

Figure A-6. PacifiCorp Compliance for Scenario JIT-2

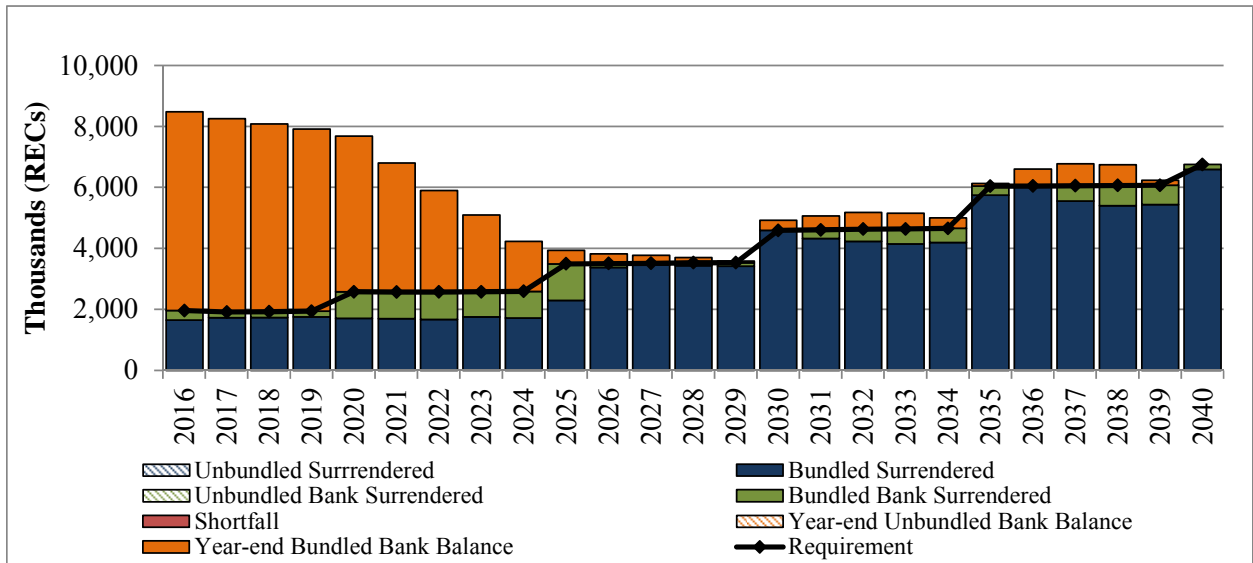


Table A-7 summarizes the renewable resource additions added to achieve Oregon RPS compliance as shown in Figure A-7 for Scenario JIT-3. In this case, steeper projected cost declines for future resources yield customer benefits for certain projects. It is assumed that these resources are added on a system basis with costs and benefits shared among PacifiCorp’s states. Consequently, for these resources, approximately 25% of the assumed resource potential is allocated to meeting the Oregon RPS targets. As there is not sufficient availability to achieve the target in 2025 without incremental transmission, the 2025 solar resource added in Utah includes incremental network transmission upgrade costs.⁵ The present value revenue requirement for the JIT-3 renewable resource portfolio yields customer a customer cost of \$2.5 million.

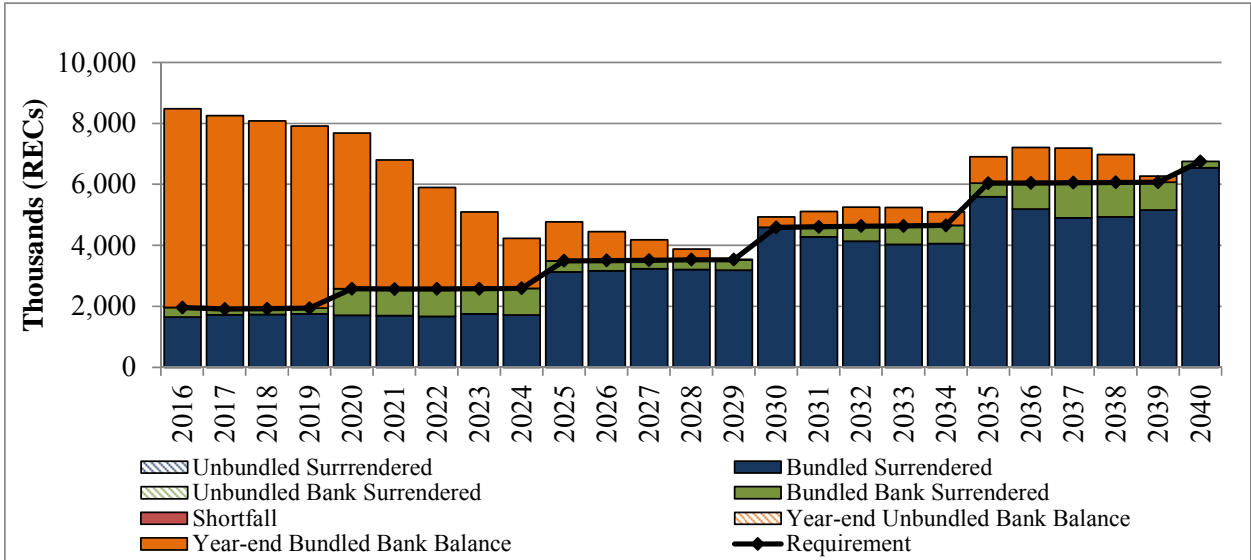
Table A-7. Proxy Renewable Resources in Scenario JIT-3

| Resource | MW | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|----------------|-------|---------------------------------------|
| OR Solar 2025 | 62 | (\$0.55) |
| UT Solar 2025* | 477 | \$12.66 |
| UT Solar 2030 | 499 | (\$12.68) |
| WY Wind 2030 | 126 | \$6.92 |
| WY Wind 2035 | 524 | \$1.04 |
| UT Solar 2040 | 113 | (\$24.68) |
| WY Wind 2040 | 262 | (\$1.48) |
| Total | 2,068 | \$0.08 |

*Includes \$218m for assumed network upgrade costs.

⁵ Given the sharper cost declines assumed in Scenario JIT-3, UT solar in 2025, with incremental transmission, is lower cost than adding OR wind, with a BPA wheel, in 2025.

Figure A-7. PacifiCorp Compliance for Scenario JIT-3



In the near-term, procurement of resources and/or RECs can defer longer-term procurement needs. Table A-8 summarizes near-term REC and resource cost assumptions used to analyze the inter-temporal trade-off between near-term and long-term procurement strategies. These data are reasonably consistent with offers submitted into PacifiCorp’s 2016 renewable resource and REC request for proposals. For resource opportunities, the cost (i.e., PPA price, acquisition cost, operating cost, integration cost, transmission cost, as applicable) net of benefits (i.e., energy and capacity value) is comparable to a REC price. The assumed near-term opportunities are ordered from lowest to highest cost.

Table A-8. Near-Term Resource and REC Procurement Assumptions

| Type | REC (GWh) | Resource Size (MW) | Term | Nom. Lev. Cost (\$/MWh) | Nom. Lev. (Benefit) (\$/MWh) | Net Nom. Lev. Cost or (Benefit) (\$/MWh) |
|------|-----------|--------------------|-----------|-------------------------|------------------------------|------------------------------------------|
| | | | 2017-2036 | | | |
| | | | 2017-2036 | | | |
| | | | 2018-2037 | | | |
| | | | 2018-2037 | | | |
| | | | 2017-2036 | | | |
| | | | 2018-2047 | | | |
| | | | 2018-2037 | | | |

The potential benefit of near-term procurement can be analyzed by assuming different levels of near-term procurement, progressing from the lowest cost to highest cost opportunities, relative to the just-in-time compliance scenarios outlined earlier. For the inter-temporal analysis, it is assumed that near-term procurement is pursued at three different intervals—opportunities with a net nominal levelized cost at or below [REDACTED]/MWh, at or below

█/MWh, and below █/MWh. In each near-term procurement scenario, long-term procurement is deferred when targeting compliance through 2040.

Table A-9 summarizes the renewable resource additions added to achieve Oregon RPS compliance as shown in Figure A-8 for the █/MWh near-term procurement level and long-term costs as defined under Scenario JIT-1. In this case, near-term procurement defers long-term procurement from 2025 to 2032. The present value revenue requirement for this scenario is \$476 million, which is \$331 million lower cost than the JIT-1 Scenario.

Table A-9. Renewable Resources with █/MWh Near-Term Procurement under the JIT-1 Scenario

| Type | MW or RECs | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|---------------|------------|---------------------------------------|
| █ | █ | █ |
| UT Solar 2032 | 450 MW | \$20.39 |
| WY Wind 2032 | 208 MW | \$20.58 |
| UT Solar 2035 | 466 MW | \$15.81 |
| WY Wind 2035 | 417 MW | \$21.23 |
| UT Solar 2040 | 459 MW | \$12.98 |
| WY Wind 2040 | 147 MW | \$27.72 |
| Total | █ | █ |

Figure A-8. PacifiCorp Compliance with █/MWh Near-Term Procurement under the JIT-1 Scenario

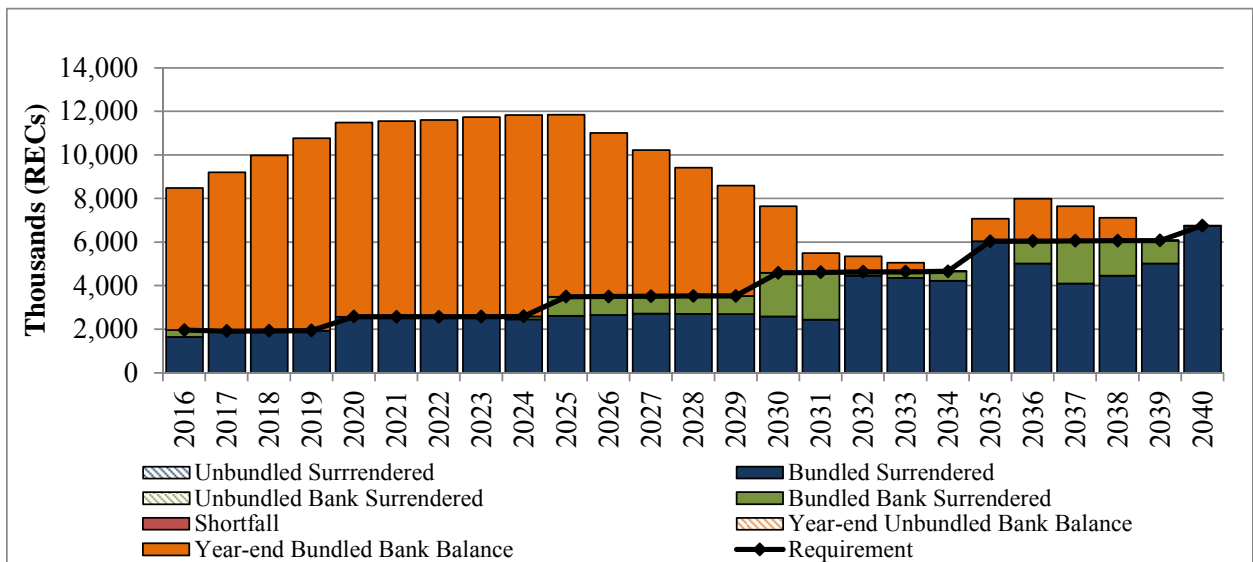


Table A-10 summarizes the renewable resource additions added to achieve the Oregon RPS compliance outcome shown in Figure A-9 for the █/MWh near-term procurement level and long-term costs as defined under Scenario JIT-1. In this case, near-term procurement defers long-term procurement from 2025 to 2037. The present value revenue requirement for this scenario is \$405 million, which is \$402 million lower cost than the JIT-1 Scenario.

Table A-10. Renewable Resources with [REDACTED]/MWh Near-Term Procurement under the JIT-1 Scenario

| Type | MW or RECs | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|---------------|------------|---------------------------------------|
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| UT Solar 2037 | 1,375 MW | \$13.65 |
| WY Wind 2038 | 291 MW | \$24.06 |
| WY Wind 2040 | 475 MW | \$27.72 |
| Total | [REDACTED] | [REDACTED] |

Figure A-9. PacifiCorp Compliance with [REDACTED]/MWh Near-Term Procurement under the JIT-1 Scenario

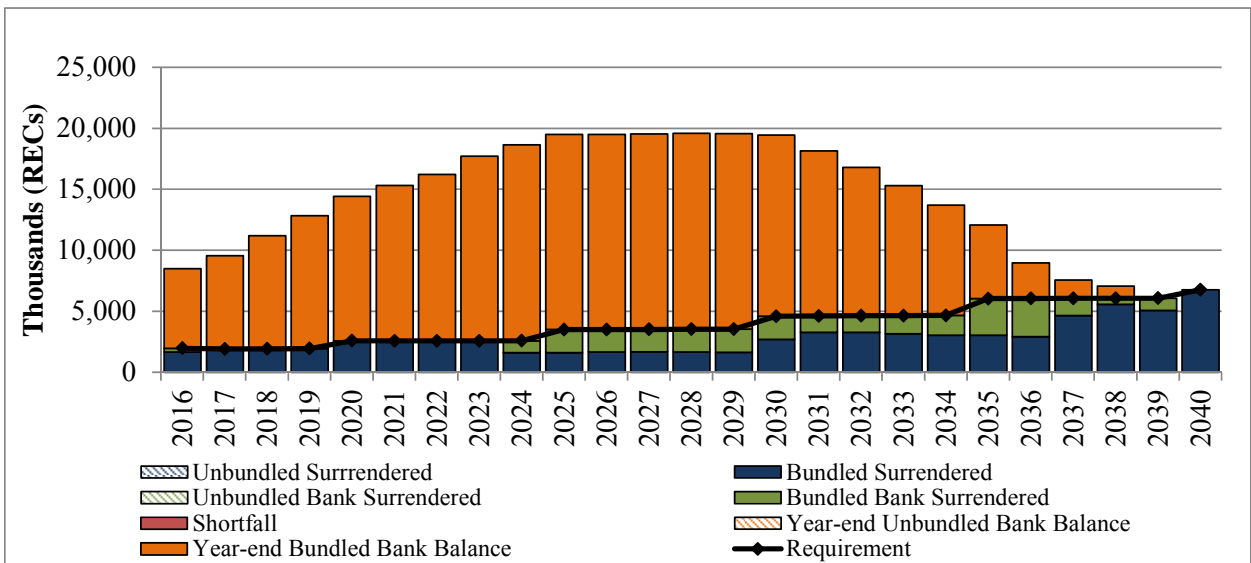


Table A-11 summarizes the renewable resource additions added to achieve the Oregon RPS compliance outcome shown in Figure A-10 for the [REDACTED]/MWh near-term procurement level and long-term costs as defined under Scenario JIT-1. In this case, near-term procurement defers long-term procurement from 2025 to 2040. The present value revenue requirement for this scenario is \$121 million, which is \$686 million lower cost than the JIT-1 Scenario.

Table A-11. Renewable Resources with [REDACTED]/MWh Near-Term Procurement under the JIT-1 Scenario

| Type | MW or RECs | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|---------------|------------|---------------------------------------|
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| UT Solar 2040 | 50 MW | \$12.98 |
| Total | [REDACTED] | [REDACTED] |

Figure A-10. PacifiCorp Compliance with [REDACTED]/MWh Near-Term Procurement under the JIT-1 Scenario

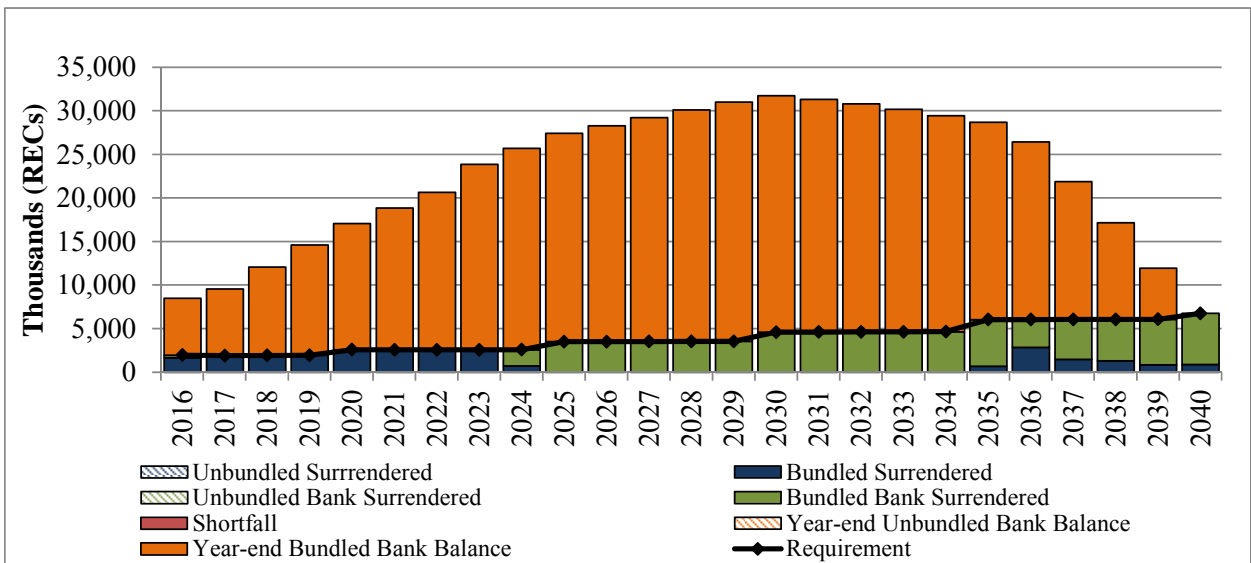


Table A-12 summarizes the renewable resource additions added to achieve Oregon RPS compliance as shown in Figure A-11 for the [REDACTED]/MWh near-term procurement level and long-term costs as defined under Scenario JIT-2. In this case, near-term procurement defers long-term procurement from 2025 to 2032. The present value revenue requirement for this scenario is \$156 million, which is \$373 million lower cost than the JIT-2 Scenario.

Table A-12. Renewable Resources with [REDACTED]/MWh Near-Term Procurement under the JIT-2 Scenario

| Type | MW or RECs | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|---------------|------------|---------------------------------------|
| [REDACTED] | [REDACTED] | [REDACTED] |
| WY Wind 2032 | 540 MW | \$7.65 |
| WY Wind 2035 | 220 MW | \$4.04 |
| UT Solar 2035 | 732 MW | \$7.45 |
| WY Wind 2040 | 268 MW | \$1.68 |
| UT Solar 2040 | 214 MW | \$4.25 |
| Total | [REDACTED] | [REDACTED] |

Figure A-11. PacifiCorp Compliance with [REDACTED]/MWh Near-Term Procurement under the JIT-2 Scenario

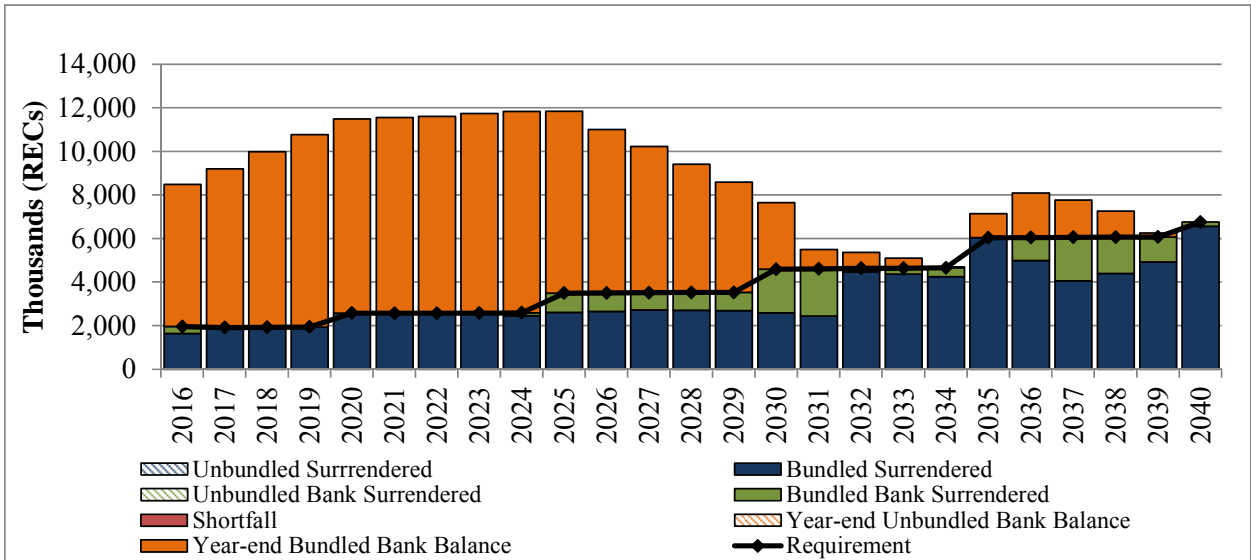


Table A-13 summarizes the renewable resource additions added to achieve Oregon RPS compliance as shown in Figure A-12 for the [REDACTED]/MWh near-term procurement level and long-term costs as defined under Scenario JIT-2. In this case, near-term procurement defers long-term procurement from 2025 to 2037. The present value revenue requirement for this scenario is \$87 million, which is \$442 million lower cost than the JIT-2 Scenario.

Table A-13. Renewable Resources with [REDACTED]/MWh Near-Term Procurement under the JIT-2 Scenario

| Type | MW or RECs | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|---------------|------------|---------------------------------------|
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| WY Wind 2037 | 760 MW | \$2.21 |
| UT Solar 2038 | 927 MW | \$4.78 |
| WY Wind 2040 | 268 MW | \$1.68 |
| UT Solar 2040 | 15 MW | \$4.25 |
| Total | [REDACTED] | [REDACTED] |

Figure A-12. PacifiCorp Compliance with [REDACTED]/MWh Near-Term Procurement under the JIT-2 Scenario

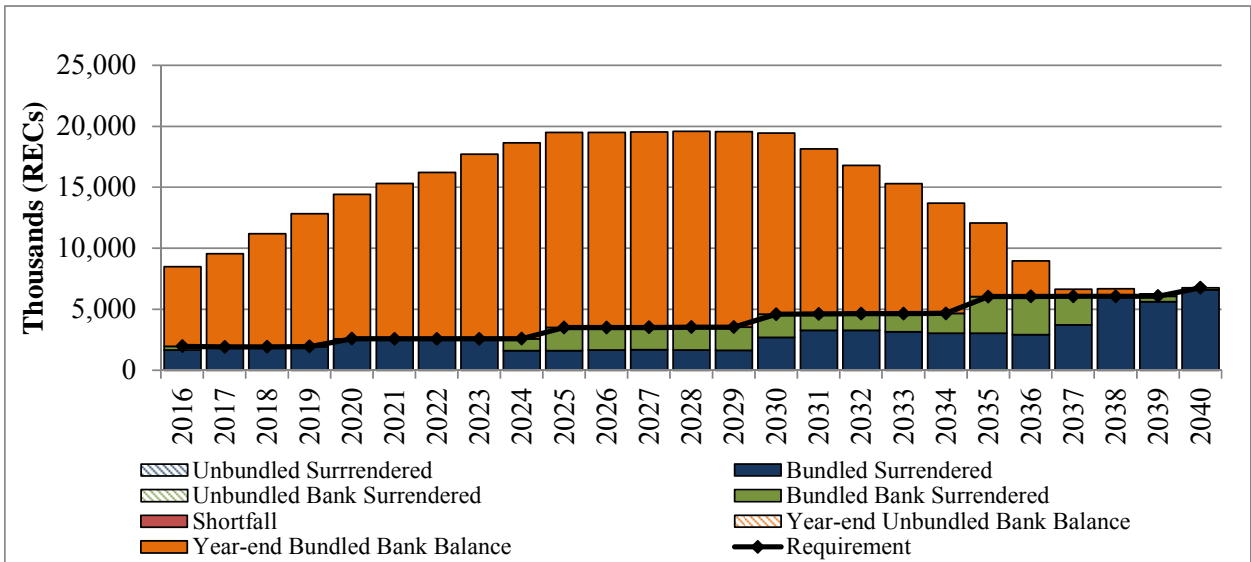


Table A-14 summarizes the renewable resource additions added to achieve Oregon RPS compliance as shown in Figure A-13 for the [REDACTED]/MWh near-term procurement level and long-term costs as defined under Scenario JIT-2. In this case, near-term procurement defers long-term procurement from 2025 to 2040. The present value revenue requirement for this scenario is \$118 million, which is \$411 million lower cost than the JIT-2 Scenario.

Table A-14. Renewable Resources with [REDACTED]/MWh Near-Term Procurement under the JIT-2 Scenario

| Type | MW or RECs | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|--------------|------------|---------------------------------------|
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| WY Wind 2040 | 37 MW | \$1.68 |
| Total | [REDACTED] | [REDACTED] |

Figure A-13. PacifiCorp Compliance with [REDACTED]/MWh Near-Term Procurement under the JIT-2 Scenario

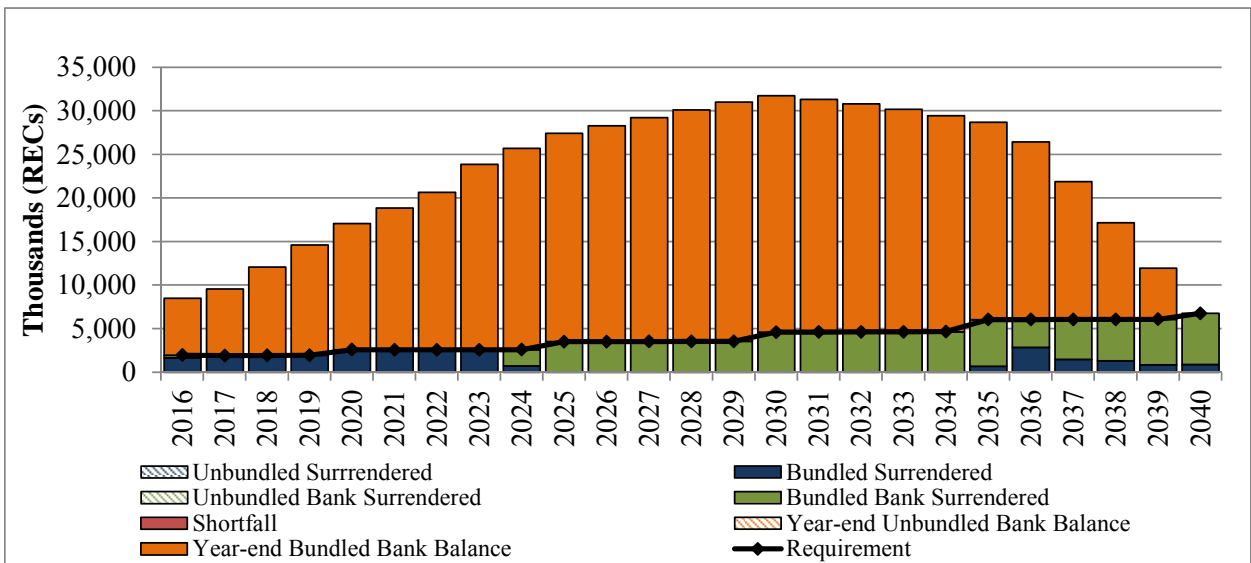


Table A-15 summarizes the renewable resource additions added to achieve Oregon RPS compliance as shown in Figure A-14 at the [REDACTED]/MWh near-term procurement level and long-term costs as defined under Scenario JIT-3. In this case, near-term procurement defers long-term procurement from 2025 to 2032. The present value revenue requirement for this scenario yields a \$102 million customer benefit, which is a \$105 million higher benefit than the JIT-3 Scenario.

Table A-15. Renewable Resources with [REDACTED]/MWh Near-Term Procurement under the JIT-3 Scenario

| Type | MW or RECs | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|----------------|------------|---------------------------------------|
| [REDACTED] | [REDACTED] | [REDACTED] |
| UT Solar 2032 | 111 MW | (\$15.75) |
| OR Solar 2032 | 62 MW | (\$12.86) |
| UT Solar 2032* | 568 MW | \$1.64 |
| UT Solar 2035 | 297 MW | (\$20.18) |
| WY Wind 2035 | 542 MW | \$1.04 |
| UT Solar 2040 | 115 MW | (\$24.68) |
| WY Wind 2040 | 400 MW | (\$1.48) |
| Total | [REDACTED] | [REDACTED] |

*Includes \$256m for assumed network upgrade costs.

Figure A-14. PacifiCorp Compliance with [REDACTED]/MWh Near-Term Procurement under the JIT-3 Scenario

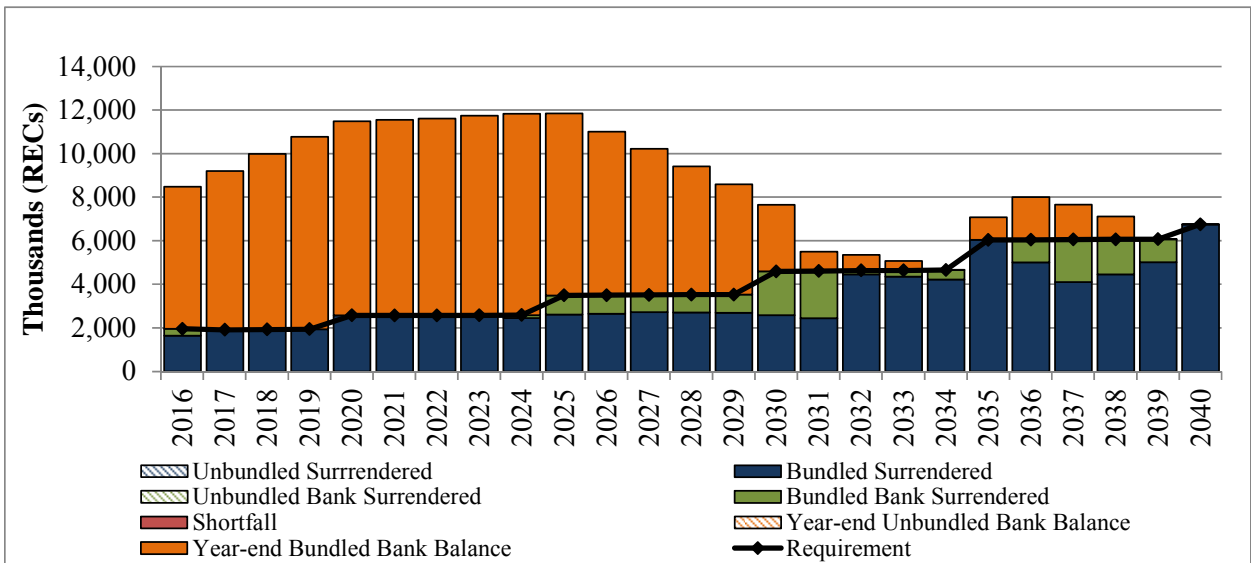


Table A-16 summarizes the renewable resource additions added to achieve Oregon RPS compliance as shown in Figure A-15 at the [REDACTED]/MWh near-term procurement level and costs as defined under Scenario JIT-3. In this case, near-term procurement defers long-term procurement from 2025 to 2037. The present value revenue requirement for this scenario yields a \$110 million customer benefit, which is a \$112 million higher benefit than the JIT-3 Scenario.

Table A-16. Renewable Resources with [REDACTED]/MWh Near-Term Procurement under the JIT-3 Scenario

| Type | MW or RECs | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|----------------|------------|---------------------------------------|
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| UT Solar 2037 | 339 MW | (\$22.70) |
| OR Solar 2037 | 62 MW | (\$20.93) |
| UT Solar 2037* | 750 MW | (\$7.96) |
| WY Wind 2038 | 671 MW | (\$1.15) |
| Total | [REDACTED] | [REDACTED] |

*Includes \$289m for assumed network upgrade costs.

Figure A-15. PacifiCorp Compliance with [REDACTED]/MWh Near-Term Procurement under the JIT-3 Scenario

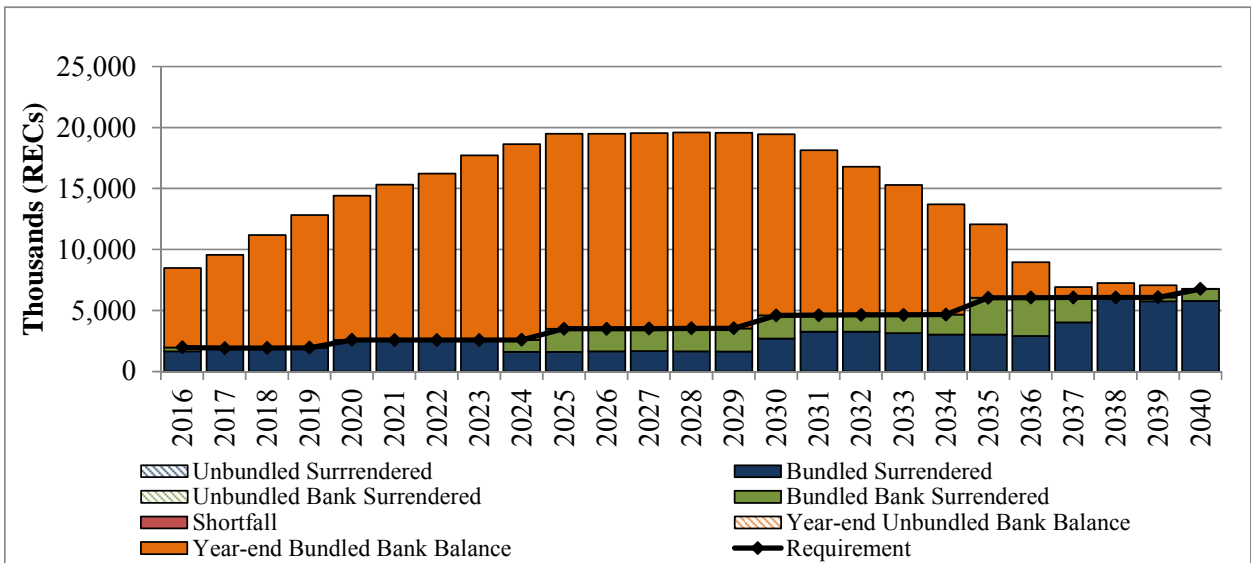


Table A-17 summarizes the renewable resource additions added to achieve Oregon RPS compliance as shown in Figure A-16 at the [REDACTED]/MWh near-term procurement level and long-term costs as defined under Scenario JIT-3. In this case, near-term procurement defers long-term procurement from 2025 to 2040. The present value revenue requirement for this scenario is \$108 million, which is \$106 million higher cost than the JIT-3 Scenario.

Table A-17. Renewable Resources with [REDACTED]/MWh Near-Term Procurement under the JIT-3 Scenario

| Type | MW or RECs | Nom. Lev. Net Cost/(Benefit) (\$/MWh) |
|---------------|------------|---------------------------------------|
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] |
| UT Solar 2040 | 50 MW | (\$24.68) |
| Total | [REDACTED] | [REDACTED] |

Figure A-16. PacifiCorp Compliance with [REDACTED]/MWh Near-Term Procurement under the JIT-3 Scenario

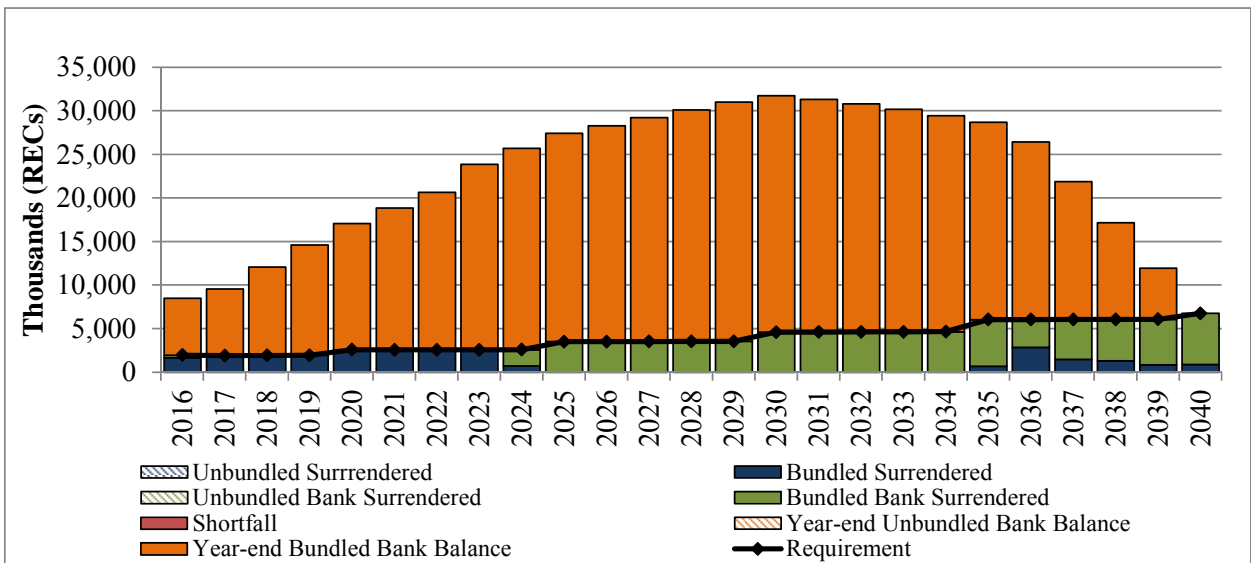


Table A-18 summarizes the present revenue requirement differential (PVRR(d)) between near-term procurement scenarios at varying penetration levels and the three just-in-time compliance scenarios. When future costs are relatively high (i.e., under Scenario JIT-1), near-term procurement opportunities having a net cost at, or even above, [REDACTED]/MWh yield customer benefits. With more moderate future costs (i.e., under Scenario JIT-2), near-term procurement continues to yield customer benefits; however, benefits are maximized when near-term costs are around [REDACTED]/MWh or less. With steeper cost reduction assumptions for future renewable resources (i.e., under Scenario JIT-3), near-term procurement can continue to provide customer benefits if those near-term procurement opportunities are competitively priced.

Table A-18. PVRR(d) Cost/(Benefit) of Near-Term Procurement Among JIT Scenarios (\$ Million)

| | JIT-1 Scenario | JIT-2 Scenario | JIT-3 Scenario |
|-----------------|----------------|----------------|----------------|
| █ MWh Scenario | (\$331) | (\$373) | (\$105) |
| █ MWh Scenario | (\$402) | (\$442) | (\$112) |
| █ /MWh Scenario | (\$686) | (\$411) | \$106 |

This analysis suggests, with the assumed range in future costs and near-term procurement cost and volume assumptions, that near-term procurement can lower RPS compliance costs over the long-term. Near-term procurement with a net cost above █/MWh may increase customer costs if future resource costs experience relatively steep declines. Competitively priced near-term procurement opportunities that can defer the need for future renewable resources until the 2028-2030 timeframe are most likely to yield customer benefits. Deferring future procurement to this timeframe provides an opportunity to align procurement of lower cost renewable resources with coal unit retirements, thereby avoiding incremental transmission upgrade costs.

While the above analysis assumes varying levels of near-term bundled REC procurement, unbundled RECs can also be used to satisfy Oregon RPS targets. The Oregon RPS rules allow up to 20% of the compliance mix to be comprised of unbundled RECs in any given compliance year.⁶ Unbundled RECs can be banked under the same rules as are applicable to bundled RECs, and therefore, unbundled RECs can be banked for use in a future compliance year if the 20% limit is reached.

PacifiCorp could acquire over 1,250,000 unbundled RECs annually, assuming these qualify as “Golden RECs” for the first five years, over a 20-year term without having any of the unbundled RECs expire before being used for compliance through 2040. Figure A-17 summarizes this hypothetical compliance profile, which shows a compliance shortfall in 2030. However, the unbundled REC bank is carried forward and used for compliance through 2040.

⁶ The restriction on use of unbundled RECs does not apply to unbundled RECs procured from a qualifying facility project located in Oregon.

Figure A-17. Hypothetical Compliance Using Unbundled RECs that Qualify as Golden RECs

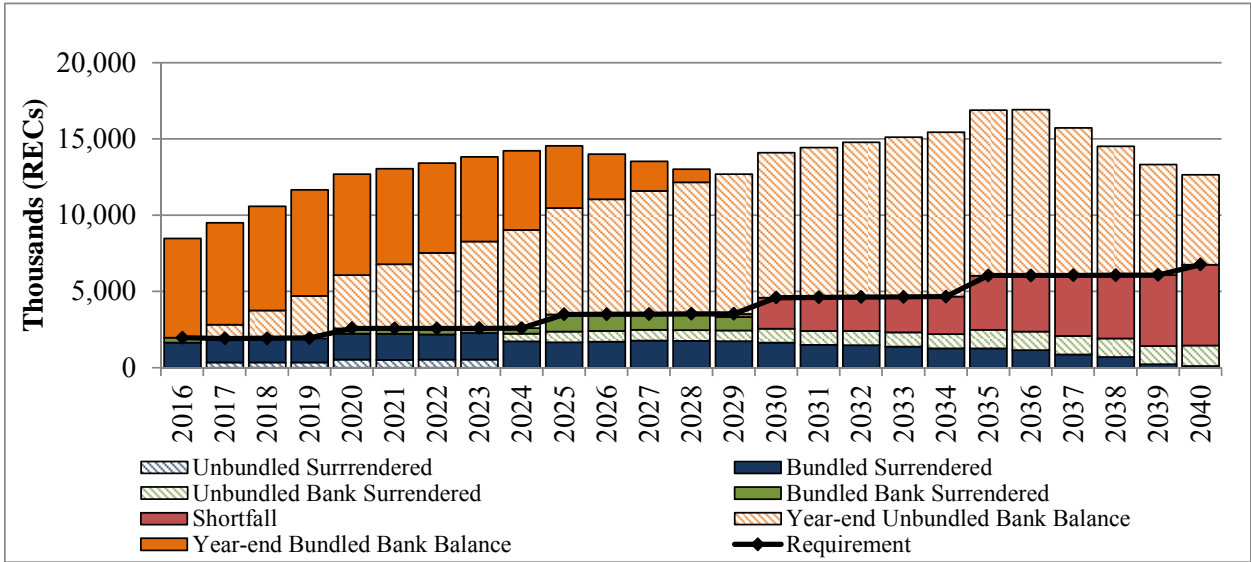
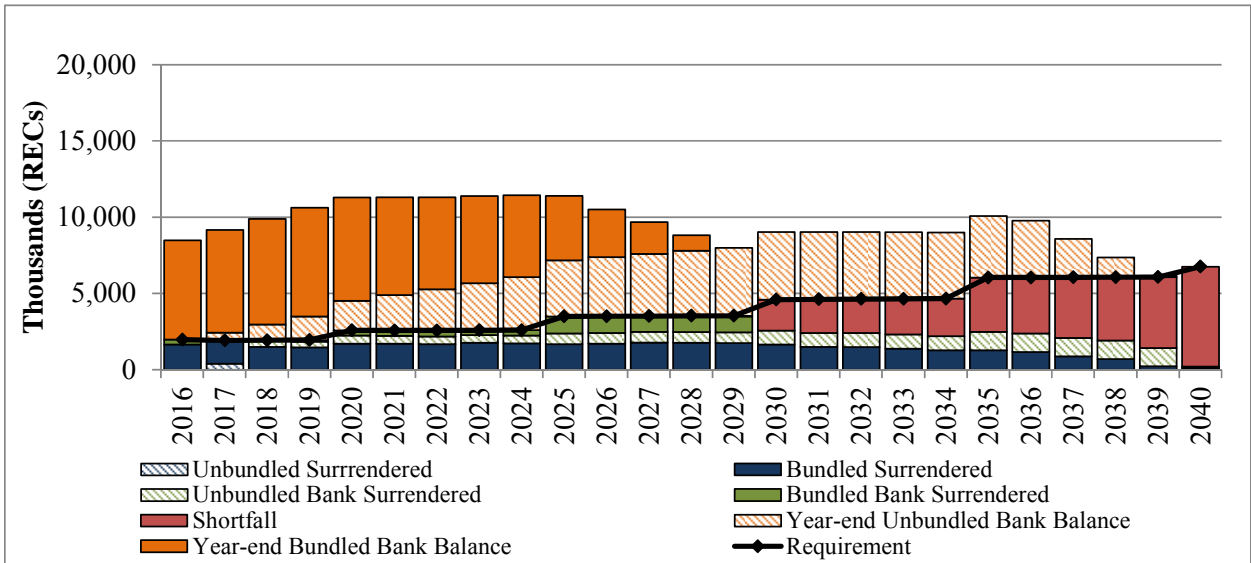


Figure A-18 shows a similar hypothetical compliance profile assuming none of the unbundled RECs qualify as “Golden RECs”. In this case, PacifiCorp could procure over 900,000 unbundled RECs annually over a 20-year term (18 million total unbundled RECs) without having any of the unbundled RECs expire before being used for compliance through 2040.

Figure A-18. Hypothetical Compliance Using Unbundled RECs that Do Not Qualify as Golden RECs



4. A discussion of how key market assumptions impact the relative range of risk and uncertainty related to cost over the compliance horizon. Load growth, hydroelectric

generation, project cost, natural gas and electricity market prices are some examples of key assumptions to be assessed in this discussion.

As discussed above, the relative cost of near-term and longer-term procurement is a key uncertainty that affects risk and cost over the compliance horizon. A key uncertainty in evaluating the net cost of renewable resources is the market value of energy produced by renewable resources. Higher market prices increase the value of energy produced by renewable resources, which reduces the net cost of renewable resource procurement. Conversely, lower market prices decrease the value of energy produced by renewable resources, which increases the net cost of renewable resource procurement.

The impact of market prices, assuming an adjustment of +/- 10% from the energy value of renewable resources and no change to the renewable resource portfolios assumed in the inter-temporal analysis presented above, is shown in Tables A-19 and A-20. Generally, near-term procurement improves customer benefits with lower wholesale energy prices and reduces customer benefits with higher wholesale energy prices. Nonetheless, near-term procurement of competitively priced resources and/or RECs can lower RPS compliance costs over the long-term—even when long-term resource costs are assumed to decline (i.e., as in Scenario JIT-3) concurrent with higher wholesale market prices.

Table A-19. PVRR(d) Cost/(Benefit) of Near-Term Procurement Among JIT Scenarios (\$ Million) with 10% Increase in Energy Value

| | JIT-1 Scenario | JIT-2 Scenario | JIT-3 Scenario |
|---------------|----------------|----------------|----------------|
| /MWh Scenario | (\$315) | (\$348) | (\$84) |
| /MWh Scenario | (\$388) | (\$419) | (\$72) |
| /MWh Scenario | (\$556) | (\$278) | \$240 |

Table A-20. PVRR(d) Cost/(Benefit) of Near-Term Procurement Among JIT Scenarios (\$ Million) with 10% Decrease in Energy Value

| | JIT-1 Scenario | JIT-2 Scenario | JIT-3 Scenario |
|---------------|----------------|----------------|----------------|
| /MWh Scenario | (\$347) | (\$398) | (\$126) |
| /MWh Scenario | (\$416) | (\$464) | (\$152) |
| /MWh Scenario | (\$815) | (\$544) | (\$29) |

Because RPS targets are calculated as a percentage of retail sales, changes to load growth will impact the timing and quantity of renewable resources needed for compliance. Figure A-19 shows PacifiCorp’s initial compliance position, assuming no incremental procurement, with a 0.5% increase in the compounded annual retail sale growth rate relative to the base forecast. Figure A-20 shows the impact of a 0.5% reduction in the compounded annual retail sale growth rate.

Figure A-19. PacifiCorp SB 1547 Compliance Position without Procurement and with an 0.5% Increase in the Annual Retail Sale Growth Rate

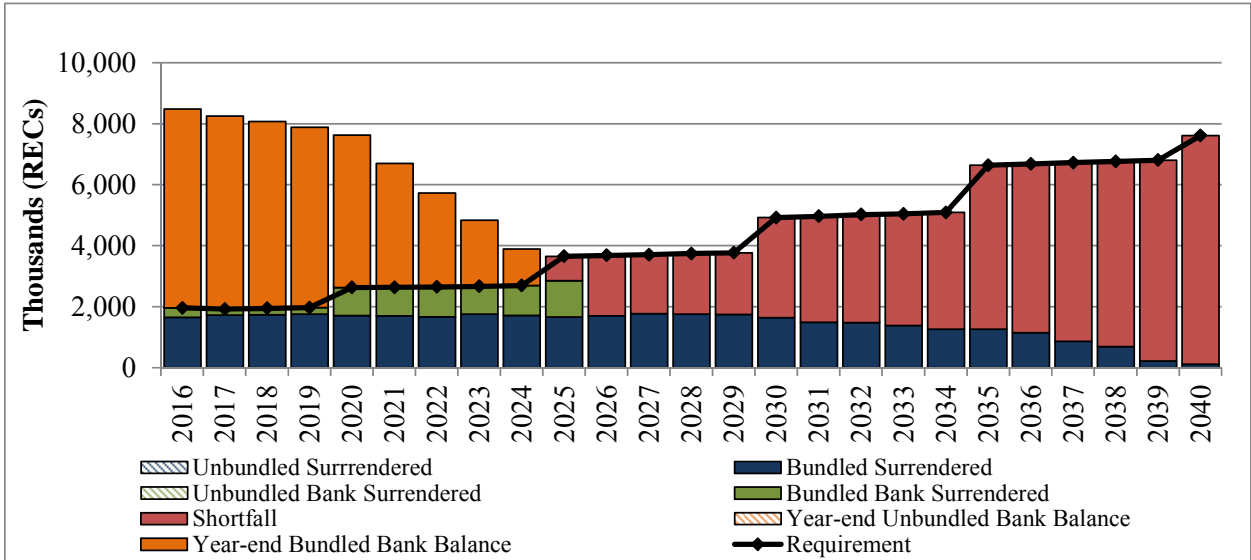
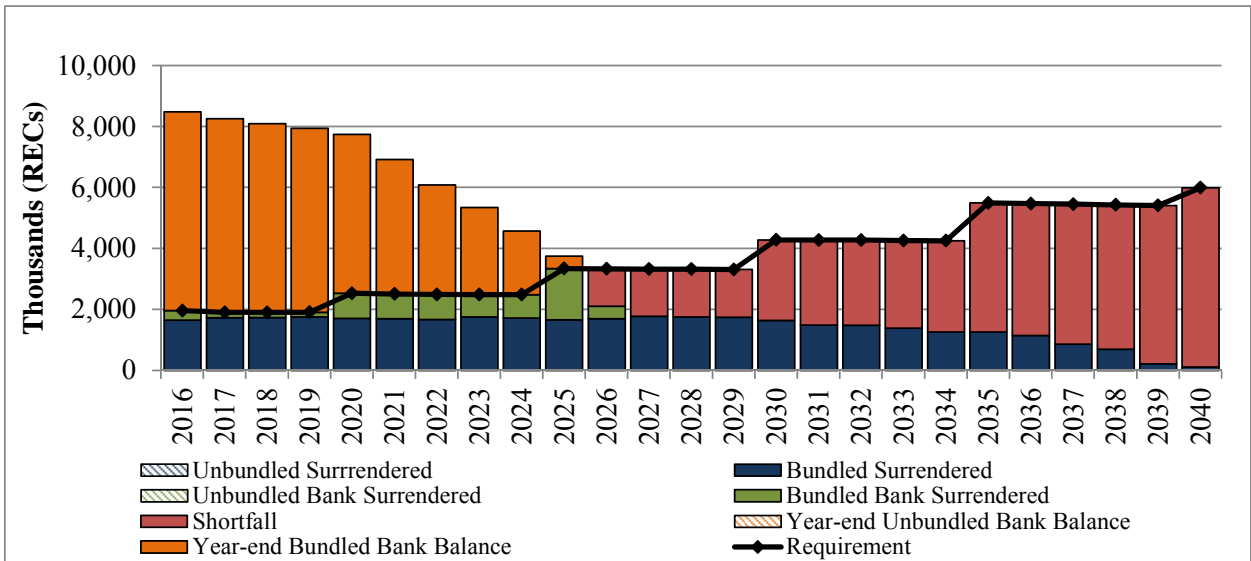


Figure A-20. PacifiCorp SB 1547 Compliance Position without Procurement and with an 0.5% Decrease in the Annual Retail Sale Growth Rate



With higher retail sales growth, PacifiCorp’s initial shortfall occurs in 2025, which is unchanged from the base initial shortfall year when the base retail sales forecast is applied. The 2025 shortfall is approximately 611 GWh higher relative to the base forecast, which equates to approximately 200 MW of renewable resource capacity operating at a 35% capacity factor. By 2040, the shortfall with a higher retail sales projection is about 857 GWh higher than in the base forecast. This equates to nearly 280 MW of renewable resource capacity operating at a 35% capacity factor.

With lower retail sales growth, PacifiCorp's initial shortfall occurs in 2026, which is one year later than in the base forecast. By 2040, the shortfall with a higher retail sales projection is about 764 GWh lower than in the base forecast. This equates to nearly 250 MW of renewable resource capacity operating at a 35% capacity factor.

- 5. Throughout the analysis, PacifiCorp should provide methodologies and assumptions used to support the RPIP along with a narrative describing the reasoning behind the selection of those methodologies and assumptions.**

PacifiCorp has explained its methodology and assumptions throughout its response to Attachment A of Order No. 15-158.