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August 22, 2017

VIA ELECTRONIC FILING AND HUDDLE

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

Attn: Filing Center

Re: UM 1802 – PacifiCorp Reply Testimony and Exhibit

PacifiCorp d/b/a Pacific Power hereby submits for filing the Reply Testimony and Exhibit of Daniel MacNeil. Electronic workpapers will be posted to Huddle.

Please direct any informal correspondence and questions regarding this filing to Natasha Siores Manager, Regulatory Affairs, at (503) 813-6583.

Sincerely,

Etta Lockey
Vice President, Regulation

Enclosures

CERTIFICATE OF SERVICE

I certify that I served a true and correct copy of PacifiCorp's **Reply Testimony** filed on August 22, 2017, on the parties listed below via electronic mail and/or or overnight delivery in compliance with OAR 860-001-0180.

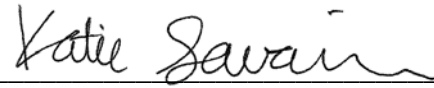
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Dated this 22nd day of August, 2017.

A handwritten signature in cursive script that reads "Katie Savarin". The signature is written in black ink and is positioned above a horizontal line.

Katie Savarin
Coordinator, Regulatory Operations

Docket No. UM 1802
Exhibit PAC/400
Witness: Daniel MacNeil

BEFORE THE PUBLIC UTILITY COMMISSION OF OREGON

PACIFICORP

Reply Testimony of Daniel MacNeil

August 2017

REPLY TESTIMONY OF DANIEL MACNEIL

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ATTACHED EXHIBIT

Exhibit PAC/401 – Illustrative comparison of proposed indicative avoided cost pricing

1 **Q. Are you the same Daniel MacNeil who previously submitted testimony in this**
2 **proceeding on behalf of PacifiCorp d/b/a Pacific Power?**

3 A. Yes.

4 **PURPOSE AND SUMMARY OF TESTIMONY**

5 **Q. What is the purpose of your reply testimony?**

6 A. My reply testimony replies to response testimony filed on August 14, 2017, by Public
7 Utility Commission of Oregon Staff (Staff) witness Ms. Brittany Andrus (Staff/200),
8 Renewable Energy Coalition (Coalition) and the Community Renewable Energy
9 Association (CREA) witnesses Mr. John R. Lowe, Mr. Brian Skeahan, and Mr. Kevin
10 Higgins (REC-CREA/200), and Industrial Customers of Northwest Utilities (ICNU)
11 witness Mr. Bradley G. Mullins (ICNU/200).

12 **Q. Please summarize your reply testimony.**

13 A. My testimony addresses PacifiCorp's recommendations that the Commission approve
14 the revised methodology for calculating non-standard non-renewable portfolio
15 standard (RPS) avoided cost prices,¹ as set forth in my January 2017 testimony
16 (PAC/100), and modified and clarified in my July 2017 testimony (PAC/300).

17 In summary, PacifiCorp asks the Commission to:

- 18 • Approve the Partial Displacement Differential Revenue Requirement
19 (PDDRR) methodology for calculating non-RPS avoided cost prices.
20 PacifiCorp's proposed methodology includes the following:
- 21 ▪ Defer like-for-like renewable resources;
 - 22 ▪ Eliminate the market price floor for non-standard avoided cost
23 prices;

¹ Because the distinguishing feature between the two price streams is tied to avoided RPS compliance costs, it is more precise to refer to the two price streams as the "RPS avoided cost price stream" and the "non-RPS avoided cost price stream." This terminology is consistent with the terminology used in PAC/300.

- 1 ▪ Calculate avoided cost prices based on all the Qualifying Facilities
2 (QFs) that have previously requested indicative pricing and are
3 timely proceeding with negotiations; and
- 4 ▪ QFs which complete negotiations and sign an execution-ready
5 contract may request updated pricing as of the date of execution
6 which incorporates only previously signed contracts.
- 7 • Find that the 2021 Wyoming wind resources included in the 2017
8 Integrated Resource Plan (IRP) preferred portfolio are not deferrable for
9 purposes of avoided cost pricing because of their unique factual
10 circumstances.
- 11 • Open a generic investigation to change the framework for determining
12 avoided cost prices for RPS-eligible QFs. To be clear, PacifiCorp is not
13 asking the Commission to rule on the merits of its recommended
14 framework in this case; rather, the company requests only that the
15 Commission open a generic investigation.

16 **Q. Please describe PacifiCorp’s proposal for calculating non-standard non-RPS**
17 **avoided cost prices.**

18 A. PacifiCorp’s proposal refines the PDDRR methodology approved by the Commission
19 in Order No. 16-174.² The approved PDDRR methodology allows for the deferral of
20 thermal resources identified in the IRP preferred portfolio. The non-RPS avoided
21 cost proposal expands the pool of deferrable resources to include cost-effective
22 renewable resources identified in the preferred portfolio. Due to differences in the
23 operational characteristics of renewable resources of various types, PacifiCorp
24 proposes that QFs be eligible to defer cost-effective renewable resources of the same
25 type. Or, if no renewable resources of the same type remain in the IRP preferred
26 portfolio during the proposed contract term, a QF would partially displace the next
27 major thermal resource in the IRP preferred portfolio, consistent with the existing

² *In the Matter of the Public Utility Commission of Oregon Investigation into Qualifying Facility Contracting and Pricing*, Docket No. UM 1610, Order No. 16-174 at 23 (May 13, 2016).

1 PDDRR methodology.

2 During periods when a QF is deferring a cost-effective renewable resource,
3 PacifiCorp would retain the renewable energy certificates (RECs) associated with the
4 QF's output to maintain customer indifference in light of the lost RECs from the
5 deferred resource. During other periods, the QF would retain all RECs associated
6 with its output. Using the same resource type to calculate avoided costs will better
7 ensure that customers remain indifferent to the QF generation by maintaining a risk
8 profile that is comparable to that of the least-cost, least-risk portfolio established in
9 the IRP. My testimony demonstrates that avoided cost pricing based on the deferral
10 of wind resources by solar or baseload resources, as proposed by Staff, the Coalition,
11 and CREA, produces unreasonable results.

12 My testimony further demonstrates the deferral of the 2021 Wyoming wind
13 resources included in the 2017 IRP preferred portfolio is not a reasonable
14 representation of avoided costs for Oregon QFs. The time-sensitive customer benefits
15 provided by the Wyoming wind resources result largely from their eligibility for
16 federal wind production tax credits (PTCs). Accounting for PTCs in the avoided cost
17 prices, however, produces unreasonable results—if the PTCs are levelized over the
18 life of the resource, then customers may be deprived of their full value; or, if the
19 PTCs are included in the first ten years of the avoided cost price stream
20 (corresponding to when they would be received), the avoided cost prices are too low,
21 and sometimes negative. Given the fact-specific limitations on using the Wyoming
22 wind resources for avoided cost pricing, the company recommends that the

1 Commission conclude here that they are not deferrable, if the Commission chooses to
2 determine the avoided cost treatment of the resources in this case.

3 **Q. Do you have any additional recommendations?**

4 A. Yes. PacifiCorp continues to recommend that the Commission open a generic
5 investigation to develop a framework for calculating avoided RPS compliance costs
6 for use in standard and non-standard RPS avoided cost pricing and in other
7 applications as appropriate. The proposal for an RPS avoided cost price stream stems
8 from the recognition that, from a system cost perspective, whether a QF is ceding its
9 RECs to PacifiCorp has no bearing on how the energy and capacity from that
10 resource will displace alternatives.

11 **REPLY TESTIMONY**

12 **Deferral of Like-for-Like Resources**

13 **Q. Please describe PacifiCorp’s proposal for determining the avoided costs based**
14 **on deferral of cost-effective renewable resources from the IRP preferred**
15 **portfolio.**

16 A. PacifiCorp proposes that under the non-RPS avoided cost methodology, renewable
17 QFs would defer the next major cost-effective renewable resource of the same type in
18 the IRP preferred portfolio, based on equivalent capacity contributions. In my July
19 2017 testimony, I clarified that the “type” is meant to reflect the operational
20 characteristics of the QF on PacifiCorp’s system, not the specific technology of the
21 resource identified in the preferred portfolio.

22 The 2017 IRP preferred portfolio includes wind, solar, and geothermal
23 resources. The geothermal resource in the 2017 IRP preferred portfolio is expected to
24 have a flat generation profile with little daily or seasonal variation. Biomass, biogas,

1 hydro, and other renewable resources with similar output profiles would also be
2 eligible to displace the geothermal resource. Any resource with relatively flat output
3 over a daily and monthly timeframe would be considered a resource of the same type
4 as the geothermal resource in the 2017 IRP. Thus, all the likely types of renewable
5 QF resources correspond to a renewable resource identified in PacifiCorp's 2017 IRP
6 preferred portfolio.

7 **Q. What resources from the 2017 IRP preferred portfolio would be considered**
8 **deferrable by QFs in Oregon?**

9 A. PacifiCorp proposes that QFs in Oregon be eligible to defer the following resources
10 from the 2017 IRP preferred portfolio, with deferral of renewable resources limited to
11 QFs with the same operational characteristics. The commercial operation date and
12 nameplate capacity of each resource is also shown.

13 **Thermal:**

- 14 • 2029: Utah North simple cycle combustion turbine (SCCT) (200 MW)
- 15 • 2030: Willamette Valley combined cycle combustion turbine (CCCT) (436 MW)
- 16 • 2033: Dave Johnston SCCT (200 MW)
- 17 • 2033: Dave Johnston CCCT (477 MW)

18 **Wind:**

- 19 • 2031: Dave Johnston wind (85 MW)
- 20 • 2036: Goshen wind (774 MW)

21 **Solar:**

- 22 • 2028-2034: Yakima fixed tilt solar (240 MW)
- 23 • 2031-2036: Utah South single tracking solar (800 MW)

1 **Geothermal:**

- 2 • 2029: West geothermal (30 MW)

3 **Q. Do parties continue to object to PacifiCorp’s proposal to limit deferral of**
4 **renewable resources to QFs of the same type?**

5 A. Yes. In response testimony, parties largely reiterate arguments that were already
6 made and that were already addressed. But there are some new arguments and
7 proposals that I will address here.

8 **Q. The Coalition and CREA claim that “non-RPS renewable acquisitions would**
9 **never be part of the QF’s avoided cost rate.”³ Is this accurate?**

10 A. Not at all. As described above, several renewable resources are present in the IRP
11 preferred portfolio and are available for deferral. I also explained at length in my
12 previous testimony how non-RPS renewable acquisitions would be considered when
13 determining a non-RPS avoided cost price.⁴

14 **Q. Can Oregon QFs actually defer the 2028 solar resources from the IRP preferred**
15 **portfolio identified above?**

16 A. No. Since the 2017 IRP was prepared, PacifiCorp has entered contracts with solar
17 QFs totaling over 150 MW of nameplate capacity. After accounting for the deferral
18 associated with those resources as well as a 5 MW solar QF that was included in the
19 2017 IRP but recently terminated, the first deferrable solar resource in the 2017 IRP
20 preferred portfolio is now in 2031. This highlights the importance of the potential QF
21 queue and consideration of the aggregate effects of resource acquisitions.

³ REC-CREA/200, Lowe-Skeahan/8.

⁴ See PAC/300, MacNeil/14-25.

1 **Q. Has Staff modified its recommendation based on PacifiCorp’s proposal?**

2 A. Yes. Staff now argues that if the PDDRR methodology cannot adequately reflect
3 avoided costs without using PacifiCorp’s proposed like-for-like methodology, then
4 the Commission should reject the PDDRR methodology and revert back to the
5 previous methodology that used the proxy resource methodology, modified to
6 account for the avoided cost pricing factors set forth in the Federal Energy Regulatory
7 Commission’s (FERC) regulations.⁵

8 **Q. How do you respond to Staff’s recommendation to reject the PDDRR in favor of**
9 **the prior methodology?**

10 A. The Commission has already found that the PDDRR methodology is more accurate
11 than the prior one and Staff has not presented any compelling reason to revert back to
12 a less accurate methodology.⁶ Contrary to Staff’s assertion, PacifiCorp did not testify
13 that the PDDRR methodology cannot determine an avoided cost for different types of
14 renewable QFs. I testified that PacifiCorp’s proposal to calculate avoided costs based
15 on the deferral of a resource of the same type results in *more accurate avoided cost*
16 *prices*, which is the reason the Commission approved the PDDRR methodology in the
17 first place.⁷

18 Staff’s criticism of the PDDRR methodology also appears to misunderstand
19 the role of the Generation and Regulation Initiative Decision Tools model (GRID) in
20 calculating avoided costs. Staff testifies that PacifiCorp claims that GRID is non-

⁵ Staff/200, Andrus/7.

⁶ Order No. 16-174 at 23 (“We approve PacifiCorp’s request to use its PDDRR method going forward. We agree this GRID model-based method more accurately values energy and capacity on PacifiCorp’s system by taking into account the unique characteristics (including location, delivery pattern, and capacity contribution) of each QF.”).

⁷ Order No. 16-174 at 23 (“We are persuaded that the PDDRR method improves non-standard QF avoided cost pricing for QFs selling to PacifiCorp and we adopt it.”).

1 adaptable to determining avoided costs when a QF is assumed to defer a different
2 type of resource. The PDDRR methodology relies on GRID to model the avoided
3 cost of energy, not the avoided cost of capacity or the composition of a least-cost,
4 least-risk resource portfolio. PacifiCorp's position is that the GRID model, when
5 properly applied, produces a reasonable estimate of avoided energy costs. It is
6 necessary, however, to calculate the avoided cost of capacity by deferring like-for-
7 like resources because doing so maintains a reasonable balance of cost and risk that is
8 consistent with the IRP preferred portfolio. As my July 2017 testimony indicated, if a
9 solar QF, for example, is deemed to defer a wind resource, the cost and risk profile of
10 the company's resource portfolio will be altered in a way that cannot be reasonably
11 reflected in the avoided cost price.

12 Moreover, current standard renewable avoided cost prices have an implied
13 RPS compliance avoided cost of \$33.16 per MWh, which is patently unreasonable
14 when PacifiCorp has *three different types* of cost-effective renewable resources in its
15 2017 IRP preferred portfolio. These renewable resources provide capacity and
16 energy at a cost that is less than the available non-renewable alternatives without even
17 considering the RPS compliance value associated with their RECs. Reverting to a
18 methodology that is based on such an inflated avoided RPS compliance cost will not
19 produce a reasonable avoided cost price, even after the standard price is adjusted to
20 account for FERC's factors.

1 **Q. The Coalition and CREA recommend that the Commission not address**
2 **PacifiCorp’s proposal to calculate avoided costs by deferring a like resource**
3 **here, and instead, address it in a generic proceeding.⁸ Is this a reasonable**
4 **recommendation?**

5 A. No. PacifiCorp’s proposal is unique to PacifiCorp. Only one other utility—Portland
6 General Electric Company (PGE)—currently offers multiple price streams and PGE
7 does not use a methodology similar to the PDDRR methodology to calculate those
8 price streams.⁹ The Commission has found that each utility can calculate its non-
9 standard avoided costs in a different manner and this docket is specifically intended
10 to address PacifiCorp’s methodology for calculating its non-standard avoided cost
11 pricing for renewable resources. PacifiCorp’s proposal is best resolved in a utility-
12 specific investigation.

13 **Q. The Coalition and CREA also argue that the Commission previously rejected**
14 **PacifiCorp’s proposal to allow only deferral of a similar type of resource.¹⁰ Do**
15 **you agree with their understanding of Commission precedent?**

16 A. No. The Coalition and CREA point out that in Order No. 11-505 the Commission
17 declined to approve a different avoided cost price for each type of renewable
18 resource, implying that PacifiCorp’s proposal here was already disposed of in docket
19 UM 1396.¹¹ But in Order No. 14-058, the Commission adopted adjustments to
20 standard fixed avoided costs based on the specific operational characteristics of
21 different types of renewable resources. The current standard avoided cost pricing

⁸ REC-CREA/200, Lowe-Skeahan/6.

⁹ See Order No. 16-174 at 22 (describing PGE’s methodology for calculating non-standard avoided cost prices).

¹⁰ REC-CREA/200, Lowe-Skeahan/12.

¹¹ REC-CREA/200, Lowe-Skeahan/12.

1 includes rates specific to baseload, wind, tracking solar, and fixed solar resources.
2 PacifiCorp's proposal takes into consideration additional resource-specific
3 characteristics that are currently ignored for the purposes of simplicity in standard
4 avoided cost pricing.

5 **Q. The Coalition and CREA suggest that a renewable QF should have the option to**
6 **compare the pricing results from the available options prior to selecting its**
7 **preferred pricing stream.¹² How do you respond?**

8 A. The non-RPS avoided cost pricing methodology proposed in my July testimony
9 withdrew the proposal that QFs have the option to select the resources they wish to
10 defer. Instead, like renewable resources are deferred, or if none remain in the
11 preferred portfolio during the QFs term, non-renewable resources are deferred. This
12 recognizes that whether a QF retains the RECs it produces and how it chooses to be
13 compensated have no bearing on how the energy and capacity from that resource will
14 displace alternatives. QFs would have the option to provide additional RECs to
15 support PacifiCorp's RPS compliance obligations, but PacifiCorp is proposing that
16 the specifics of this option be addressed in a generic proceeding.

17 **2021 Wyoming Wind Resources**

18 **Q. Staff recommends that the treatment of the 2021 Wyoming wind resources in the**
19 **2017 IRP is beyond the scope of the issues for this case and should be instead**
20 **addressed in a post-IRP acknowledgement avoided cost filing.¹³ How do you**
21 **respond to this recommendation?**

22 A. PacifiCorp disagrees that the treatment of 2021 Wyoming wind resources is beyond

¹² REC-CREA/300, Higgins/3.

¹³ Staff/200, Andrus/9.

1 the scope of this case because the PDDRR methodology approved by the Commission
2 in docket UM 1610 does not use the most recent *acknowledged* IRP to calculate
3 avoided costs. Instead, to produce an avoided cost forecast based on the most up-to-
4 date information, the PDDRR methodology relies on the most recently *filed* IRP.¹⁴
5 PacifiCorp explained in docket UM 1610 exactly how the PDDRR methodology
6 relies on the most recent IRP, or IRP update, to calculate avoided cost prices:

7 An accurate determination of non-standard avoided cost prices
8 requires a more involved calculation than the Proxy Method,
9 and merits the use of updated inputs. In order for retail
10 customers to be indifferent to the calculated avoided cost
11 prices, the underlying assumptions and modeling inputs must
12 be based on the best information available at the time the QF
13 pricing is prepared. Accordingly, all modeling inputs in the
14 PDDRR method should be subject to update, including but not
15 limited to the forecast of wholesale market prices for electricity
16 and natural gas, executed purchase and sale contracts, wheeling
17 contracts, coal contracts, and the retail load forecast. *The*
18 *resource additions outlined in the IRP preferred portfolio*
19 *should be updated with a new IRP or IRP update, or if there is*
20 *a known change to the IRP action plan, such as a delay or*
21 *abandonment of a resource addition that causes a change to*
22 *the preferred portfolio.*¹⁵

23 When the Commission approved the PDDRR methodology, it did not modify this
24 aspect of the methodology. Commission action in this docket does not require an
25 outcome in the 2017 IRP nor does it presume or prescribe an outcome in the 2017
26 request for proposals (RFP).

¹⁴ See, e.g., Docket No. UM 1610, PAC/800, Dickman/18 (“the PDDRR method includes avoided fixed costs of the Company’s next major resource acquisition, based on the cost and timing of the next deferrable resource in the IRP preferred portfolio . . . The timing for including avoided fixed costs from the next deferrable resource is adjusted to account for new QFs (since the IRP was published) that will be on the Company’s system at the time the next major resource is acquired.”); *id.* at 21-22 (“The calculation of the avoided energy cost begins with existing and planned resources that represent the Company’s most recent IRP resource portfolio.”); *id.* at 23 (“The Company calculates the avoided fixed costs of the next deferrable resource outside of the GRID model based on partial displacement of the next major thermal resource acquisition in the IRP (that has not already been displaced by QFs with contracts extending beyond the expected online date of the next major resource).”).

¹⁵ Docket No. UM 1610, PAC/800, Dickman/26 (emphasis added).

1 If, however, the Commission ultimately does not acknowledge the 2017 IRP,
2 or makes any specific findings related to the Wyoming wind resources in either the
3 2017 IRP or RFP docket, PacifiCorp will modify its treatment of the resources in its
4 avoided cost calculations as required by the Commission.

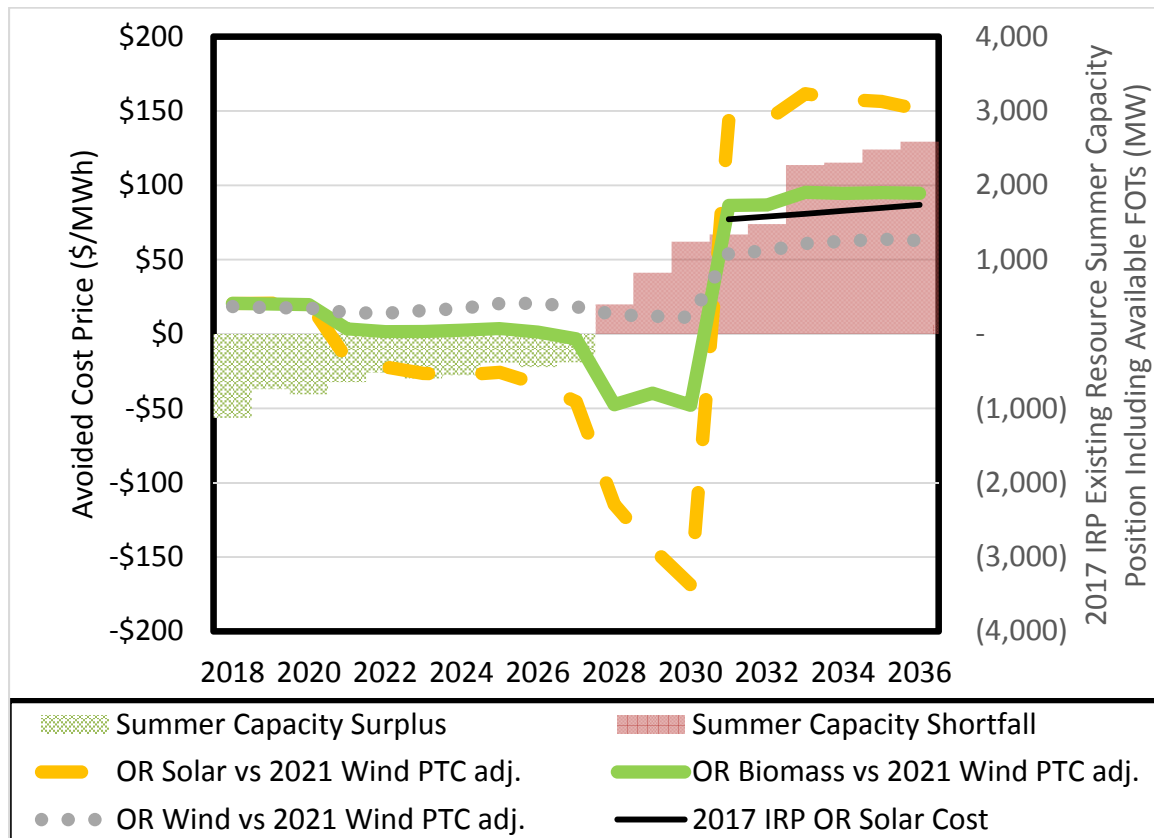
5 **Q. The Coalition and CREA recommend that the Commission determine here that**
6 **the 2021 Wyoming wind resources are deferrable and can form the basis for**
7 **Oregon avoided cost prices.¹⁶ How do you respond?**

8 A. PacifiCorp disagrees that the Wyoming wind resources are deferrable, for the reasons
9 set forth in my July testimony. If the Wyoming wind resources are considered
10 deferrable, however, the avoided cost prices must reasonably account for the value of
11 PTCs by recognizing their value in the avoided cost price in the first ten years, when
12 the PTCs are actually received.

13 The figure below illustrates the avoided cost prices for several different
14 resource types based on the deferral of the Wyoming wind resources, and assuming
15 that the value of the PTC is not levelized.

¹⁶ REC-CREA/200, Higgins/2-3.

Figure 1: Avoided Cost Assuming Deferral of IRP Wind Resources without Levelized PTCs, by Resource Type, with Existing Resource Capacity Position



1 As the figure shows, if the Wyoming wind resources are considered deferrable
 2 for purposes of PacifiCorp’s avoided costs, the avoided cost prices are significantly
 3 lower than they would be otherwise because of the impact of the PTCs. In fact, for a
 4 solar QF, the avoided cost price is primarily negative until 2031 when the PTC for the
 5 Wyoming wind resource has expired.

6 **Q. What is the basis for including the PTCs in the first 10 years of the avoided cost**
 7 **calculation, rather than levelizing the tax credits over the life of the resource?**

8 A. As PacifiCorp has described, the new Wyoming wind resources will receive the full
 9 value of the PTCs only if they are on line by the end of 2020. Thus, these wind

1 resources cannot be deferred, because a deferral eliminates the PTC benefits and
2 makes the projects non-economic.

3 Moreover, because the PTCs will be received in the first 10 years of
4 operations, it is reasonable to model the same treatment in the avoided cost
5 calculation. If the value of the PTCs is spread out over the life of the resources for
6 purposes of avoided cost calculations, it is comparable to providing the QF a
7 levelized avoided cost payment, which the Commission has consistently declined to
8 do.¹⁷ To make customers truly indifferent as between the new Wyoming wind
9 resources or an Oregon QF, the PTCs must be accounted for in this way.

10 **Q. Why are the avoided cost prices in Figure 1 above different from the avoided**
11 **cost prices included in your July testimony that were also based on the deferral**
12 **of the 2021 Wyoming wind resources?¹⁸**

13 A. In my July testimony, I modeled avoided cost pricing assuming that the value of
14 PTCs was levelized over the life of the asset, which is thirty years in the case of the
15 2021 Wyoming wind resources. With levelized PTCs, if a QF is assumed to defer the
16 2021 Wyoming wind resources and has a contract term of fifteen years, retail
17 customers would lose at least half of the assumed benefits of the PTCs. The purpose
18 of the modeling in my July testimony was to demonstrate the impact of allowing any
19 type of renewable QF to defer the wind resources, and was not focused on how to
20 appropriately model the impact of PTCs on the avoided cost price, which is why, for
21 simplicity, my July testimony used levelized PTCs.

¹⁷ See Order No. 14-058 at 32.

¹⁸ See PAC/300, MacNeil/22 (Figure 1).

1 **Q. The Coalition and CREA claim that PacifiCorp has indicated that it will pursue**
2 **the 2021 Wyoming wind resources regardless of whether there are other**
3 **available supplies, like an Oregon QF.¹⁹ Is this true?**

4 A. No. First, PacifiCorp explained that unlike the remaining resources in its preferred
5 portfolio, the 2021 Wyoming wind resources cannot be deferred because any delay
6 will compromise their PTC-eligibility and render them uneconomic to meet
7 PacifiCorp's resource needs. Second, PacifiCorp explained that it cannot partially
8 defer or avoid the Wyoming wind resources because their economic benefits correlate
9 to their size. Thus, a 10 MW Oregon QF will not reduce the size of the Wyoming
10 wind resource by a capacity equivalent amount. PacifiCorp never claimed that it is
11 pursuing these resources at any cost or irrespective of market or resource
12 developments. Indeed, PacifiCorp has made clear that pursuit of the Wyoming wind
13 resources is not a zero-sum opportunity: if other opportunities exist for least-cost,
14 least-risk resources to meet PacifiCorp's resource needs, it is a matter of "and" not
15 "or".

16 **Q. Is there any additional evidence that the proposed wind and transmission**
17 **resources are not deferrable by QF resources elsewhere on PacifiCorp's system?**

18 A. Yes. I noted in my July testimony that the capacity contribution associated with the
19 new wind resources amounted to 174 MW. Since the 2017 IRP was prepared,
20 PacifiCorp has executed QF contracts for resources outside of the constrained area of
21 Wyoming with a capacity contribution totaling over 90 MW. On a capacity
22 equivalent basis, this represents approximately over half of the 2021 Wyoming wind

¹⁹ REC-CREA/200, Higgins/7.

1 resource, or over 500 MW nameplate capacity. Yet these acquisitions have had no
2 impact on PacifiCorp's plans to pursue the 2021 Wyoming wind resources because
3 even with the additional QFs, the wind and transmission resources remain cost-
4 effective.

5 **Q. ICNU cautions against setting avoided cost prices based on the 2021 Wyoming**
6 **wind resources because they may never be built if PacifiCorp does not receive**
7 **the regulatory approvals it requires.²⁰ Do you agree?**

8 A. I agree that the 2021 Wyoming wind resources should not be used to establish
9 avoided cost prices for the reasons set forth above and in my previous testimony. I
10 disagree with ICNU's argument that the Wyoming wind resources should be
11 excluded from the avoided cost calculation because they may never be built. That
12 same reasoning could apply to any resource in PacifiCorp's preferred portfolio—*i.e.*,
13 PacifiCorp may not ultimately build any resource if PacifiCorp does not obtain the
14 necessary regulatory approvals. Yet, for avoided costs we must assume that the
15 resources in the preferred portfolio will be acquired because that is a fundamental
16 assumption underlying the notion that a QF will allow the deferral of another
17 resource. If we assume that no resources will be built, then no resources can be
18 deferred. And, while ICNU is not clear about what regulatory approvals are required,
19 the only regulatory approval that is necessary to construct the wind resources is the
20 granting of a certificate of public convenience and necessity from the Wyoming
21 Public Service Commission.

²⁰ ICNU/200, Mullins/4.

1 Furthermore, if updated analysis incorporating the RFP results does not
2 indicate the new wind and transmission resources are part of the least-cost, least-risk
3 portfolio, PacifiCorp will stop its pursuit of this opportunity without requiring
4 regulatory action.

5 **Market Price Floor**

6 **Q. Staff argues that PacifiCorp’s July 2017 testimony demonstrated that the**
7 **market price floor is appropriate until an individual QF causes a constraint that**
8 **limits access to market.²¹ How do you respond?**

9 A. PacifiCorp has demonstrated that the imposition of the market price floor produces
10 payments to QFs that exceed the company’s avoided costs because of transmission
11 constraints existing today. Indeed, Staff appears to acknowledge that current
12 transmission constraints mean that the market price floor increases QF payments
13 above PacifiCorp’s avoided costs. But Staff reasons that because the market price
14 floor only exceeds avoided costs by eight percent, it remains reasonable.²² PacifiCorp
15 disagrees and recommends that the Commission eliminate the market price floor in
16 this case.

17 If the Commission declines to eliminate the market price floor in this case,
18 however, consistent with Staff’s recommendation, the company will make a filing
19 with the Commission when a specific QF will experience a transmission constraint
20 that merits elimination of the market price floor.

²¹ Staff/200, Andrus/12.

²² Staff/200, Andrus/12.

1 **Q. Staff claims that market dynamics, such as market depth and volatility, are**
2 **included in PacifiCorp's forward price curve and that this means that the**
3 **forward price curve is an appropriate measure of PacifiCorp's avoided costs.²³**

4 **How do you respond?**

5 A. The Commission has previously found that PacifiCorp's forward price curve on its
6 own does not adequately capture market depth and volatility.²⁴ The forward price
7 curve itself is a point forecast, reflecting current market conditions in the near term,
8 and a single fundamentals-based forecast in the long term. Significant changes in
9 PacifiCorp's resource mix, such as the acquisition of appreciable volumes of QFs are
10 not reflected in the forecast. In light of the limitations of the forward price curve,
11 PacifiCorp proposed and the Commission applies limits to market sales within the
12 GRID model. Overriding these limits via the market price floor effectively assumes
13 unlimited market depth.

14 The Commission has also approved adjustments to account for the market
15 effects of historical day-ahead and real-time transactions within the GRID model,
16 though those have not been employed for avoided cost purposes.²⁵ As currently
17 formulated, the methodology results in incremental day-ahead and real-time
18 transaction costs that are identical to an historical average, regardless of the system
19 composition. While PacifiCorp has recently quantified day-ahead and real-time
20 transactions benefits associated with dispatchable resources, it has not quantified the

²³ Staff/200, Andrus/12-13.

²⁴ See, e.g., *In the Matter of PacifiCorp dba Pacific Power 2013 Transition Adjustment Mechanism*, Docket No. UE 245, Order No. 12-409 (Oct. 29, 2012) (addressing the use of market caps in GRID to account for the fact the forward price curve does not account for market liquidity).

²⁵ See *In the Matter of PacifiCorp dba Pacific Power 2016 Transition Adjustment Mechanism*, Docket No. UE 296, Order No. 15-394 (Dec. 11, 2015).

1 effect for QFs. In particular, wind and solar QFs are expected to contribute to higher
2 day-ahead and real-time costs. For instance, new wind resources are most likely to
3 generate when regional wind resources are also producing. Market prices are likely
4 to be depressed when significant quantities of wind resources are available.

5 **Q. Staff argues that if PacifiCorp's market price forecast is higher than its avoided**
6 **cost prices, then it is up to PacifiCorp to modify its forward price curve.²⁶ How**
7 **do you respond?**

8 A. Staff's argument misses the mark because the problem is not with the forward price
9 curve itself, it is with using the forward price curve, and only the forward price curve,
10 to calculate avoided cost prices. I testified that forward prices are not indicative of
11 avoided costs because PacifiCorp is required to hold reserves for QFs and the costs of
12 those reserves is not included in the forward price curve. Staff does not dispute this
13 fact, and instead, appears to argue that PacifiCorp should modify its forward price
14 curve to build in the cost of contingency reserves, which is a proposal that is
15 completely without merit.

16 I also testified that PacifiCorp's transmission limitations can preclude it from
17 selling QF output at market, which is a fundamental assumption underlying the use of
18 a market price as an avoided cost. Transmission constraints, however, are not built
19 into the company's forward price curve, and it would make little sense to forecast
20 market prices based on the PacifiCorp's expected transmission constraints.

21 My testimony demonstrated that there are many circumstances and costs that
22 are not included in the forward price curve that make the forward price curve an

²⁶ Staff/200, Andrus/13-14.

1 unreasonable proxy avoided cost price. There is no basis for Staff to claim that
2 PacifiCorp should simply modify its forward price curve to make it a more reasonable
3 proxy for an avoided cost price. Furthermore, the intent of the PDDRR methodology
4 and calculation of avoided energy costs within the GRID model is to capture each of
5 the adjustments described above, and to do so while accounting for both the
6 individual and aggregate effects of the resources on PacifiCorp's system.

7 **QF Queue**

8 **Q. Is the QF queue alternative provided by PacifiCorp more restrictive than that**
9 **proposed by the Coalition and CREA?**

10 A. Yes. PacifiCorp already has an obligation to purchase all QF output on behalf of its
11 customers, and the right under PURPA to pay no more than the cost it would
12 otherwise have incurred. Under no circumstance should be PacifiCorp be forced to
13 offer multiple QFs prices based on the same increment of avoided capacity or avoided
14 energy. The Coalition's and CREA's proposal combines the price certainty (within
15 certain limits, price updates are at a QF's request) of PacifiCorp's potential QF queue
16 methodology and avoided cost pricing based on the first increment of capacity and
17 energy from the signed QF queue methodology. This defeats the purpose of both
18 methodologies. PacifiCorp's proposal offers a shortcut for QFs that are unwilling to
19 wait until they naturally reach the front of the potential QF queue, but reasonably
20 requires the QF to demonstrate their ability to move forward by completing all
21 negotiations besides price before taking that shortcut.

1 **Conclusion**

2 **Q. Do you have any further comments regarding the determination of accurate**
3 **non-RPS avoided costs in this docket?**

4 A. Yes. I would like to note that, while parties have now provided two rounds of
5 testimony, their proposals have been general and have not quantified the impact of
6 their recommendations, even though, through discovery, PacifiCorp provided
7 indicative pricing based on the parties' preferred assumptions. Without quantifying
8 the impact of a particular proposal, it can be difficult to ascertain whether customers
9 would be indifferent to QF generation.

10 The table below identifies each of the proposals that have been made in this
11 case, and exhibit PAC/401, to my testimony provides indicative pricing for solar,
12 wind, and biomass resources based on each of the proposals.

Table 1: Proposed Avoided Cost Methodologies

Methodology	First Proxy Resource		
	Solar	Wind	Biomass
PDDRR - Like for Like	2028 Solar	2031 Wind	2029 Geothermal
PDDRR - Any Renewable	2021 WY Wind	2021 WY Wind	2021 WY Wind
Standard Renewable	2028 WY Wind (2015 IRP)	2028 WY Wind (2015 IRP)	2028 WY Wind (2015 IRP)

Table 2: Sample QF REC Obligations to PacifiCorp, per MWh of QF output

Methodology	Start Year	IRP Resource	Solar	Wind	Biomass
PDDRR - Like for Like (first in queue)	Varies	Like	2028: 0.3; 2029: 0.6	2031: 0.8	2029: 0.9
PDDRR - Like for Like (later in queue)	Varies	Like	2033: 0 (SCCT)	2031: 0.3; 2036: 0.8	2033: 0 (SCCT)
PDDRR - Any Renewable	2021	WY Wind	6.1	0.8	2.7
Standard Renewable	2028	WY Wind (2015 IRP)	1.0	1.0	1.0

1 **Q. Are the differences in REC output between QFs and deferred resources in Table**
2 **2 significant?**

3 A. Yes. As I described in my July testimony, under the current standard renewable
4 avoided cost pricing a QF receives \$33.16 for each REC that is transferred to
5 PacifiCorp. At this price, the RECs delivered between 2028 and 2035 by the 1,100
6 MW of 2021 Wyoming wind resources identified in the IRP preferred portfolio would
7 be worth approximately \$1 billion. This time period corresponds to the current
8 renewable deficiency period and the end of the 15-year fixed price term of a QF
9 contract. Yet, the 2017 IRP analysis indicates that the 2021 Wyoming wind resources
10 are part of the least-cost, least-risk portfolio despite assuming a zero avoided RPS
11 compliance cost.

12 As shown in Table 2, each REC produced by a solar QF deferring the 2021
13 Wyoming wind resource would result in a loss of six RECs. If the 2021 Wyoming
14 wind resource is fully deferred by solar resources based on equivalent capacity
15 contributions, the net loss of RECs would represent an incremental RPS compliance
16 cost of over \$800 million based on the cost of RECs implied by the current standard
17 renewable avoided costs. Or the incremental RPS compliance cost associated with

1 these lost RECs could be zero, based on the fact that the fact that the 2021 Wyoming
2 wind resources are part of the least-cost, least-risk portfolio and less expensive than
3 non-renewable alternatives. In light of the appreciable difference in these outcomes it
4 is appropriate to maintain the same level of RPS compliance obligations when a QF
5 defers a renewable resource, an outcome that is supported by limiting deferral to
6 renewable resources of the same type.

7 **CONCLUSION**

8 **Q. Please summarize the recommendations in your reply testimony.**

9 A. My reply testimony supports PacifiCorp's recommendations asking the Commission
10 to approve the PDDRR methodology for calculating non-RPS avoided cost prices as
11 described in my reply testimony, and to find that the 2021 Wyoming wind resources
12 included in the 2017 IRP preferred portfolio are not deferrable for purposes of
13 avoided cost pricing because of their unique factual circumstances. In addition,
14 PacifiCorp asks the Commission to open a generic investigation to change the
15 framework for determining avoided cost prices for RPS-eligible QFs.

16 **Q. Does this conclude your reply testimony?**

17 A. Yes.

Docket No. UM 1802
Exhibit PAC/401
Witness: Daniel MacNeil

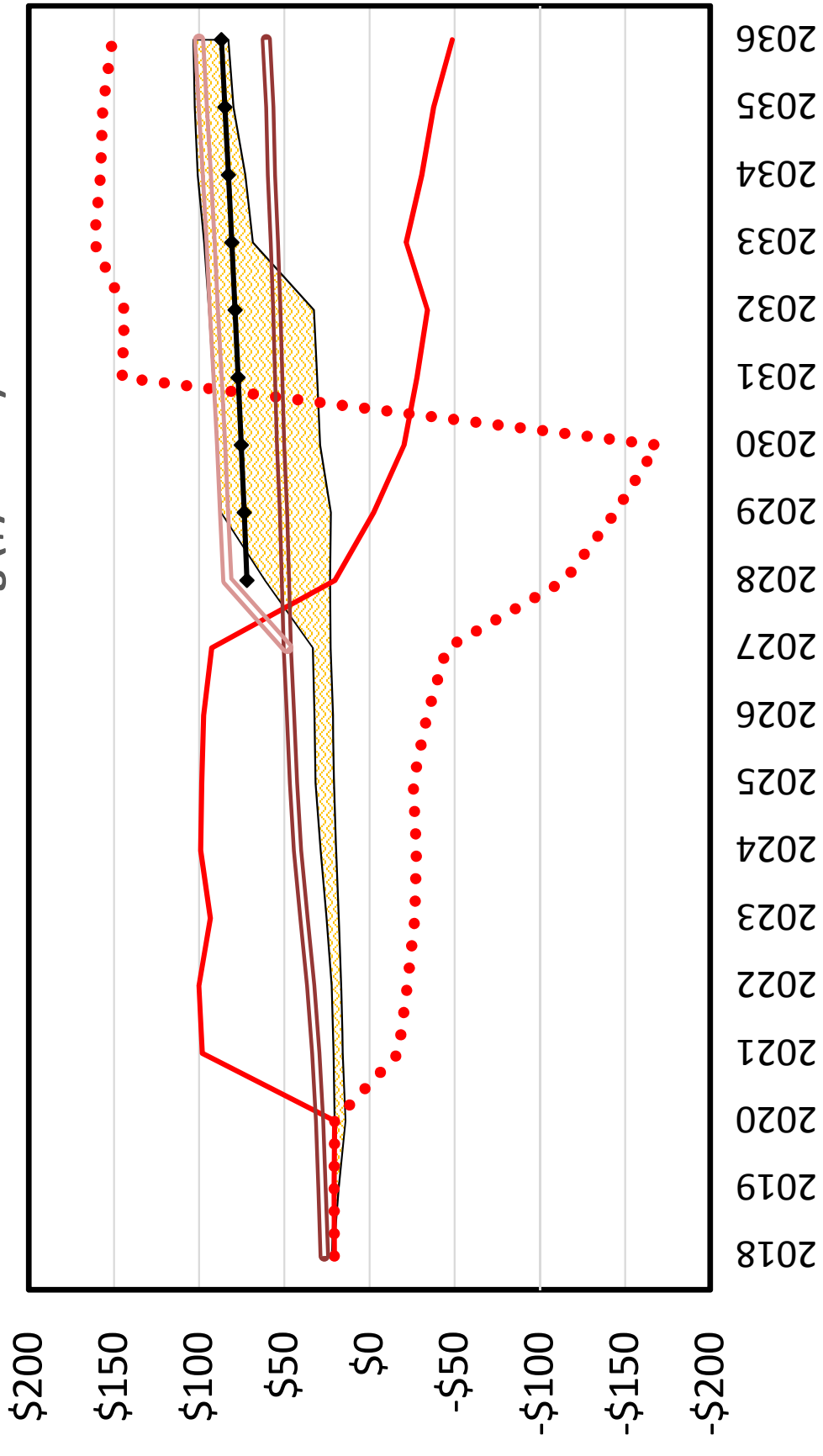
BEFORE THE PUBLIC UTILITY COMMISSION OF OREGON

PACIFICORP

Exhibit Accompanying Reply Testimony of Daniel MacNeil
Illustrative Comparison of Proposed Indicative Avoided Cost Pricing

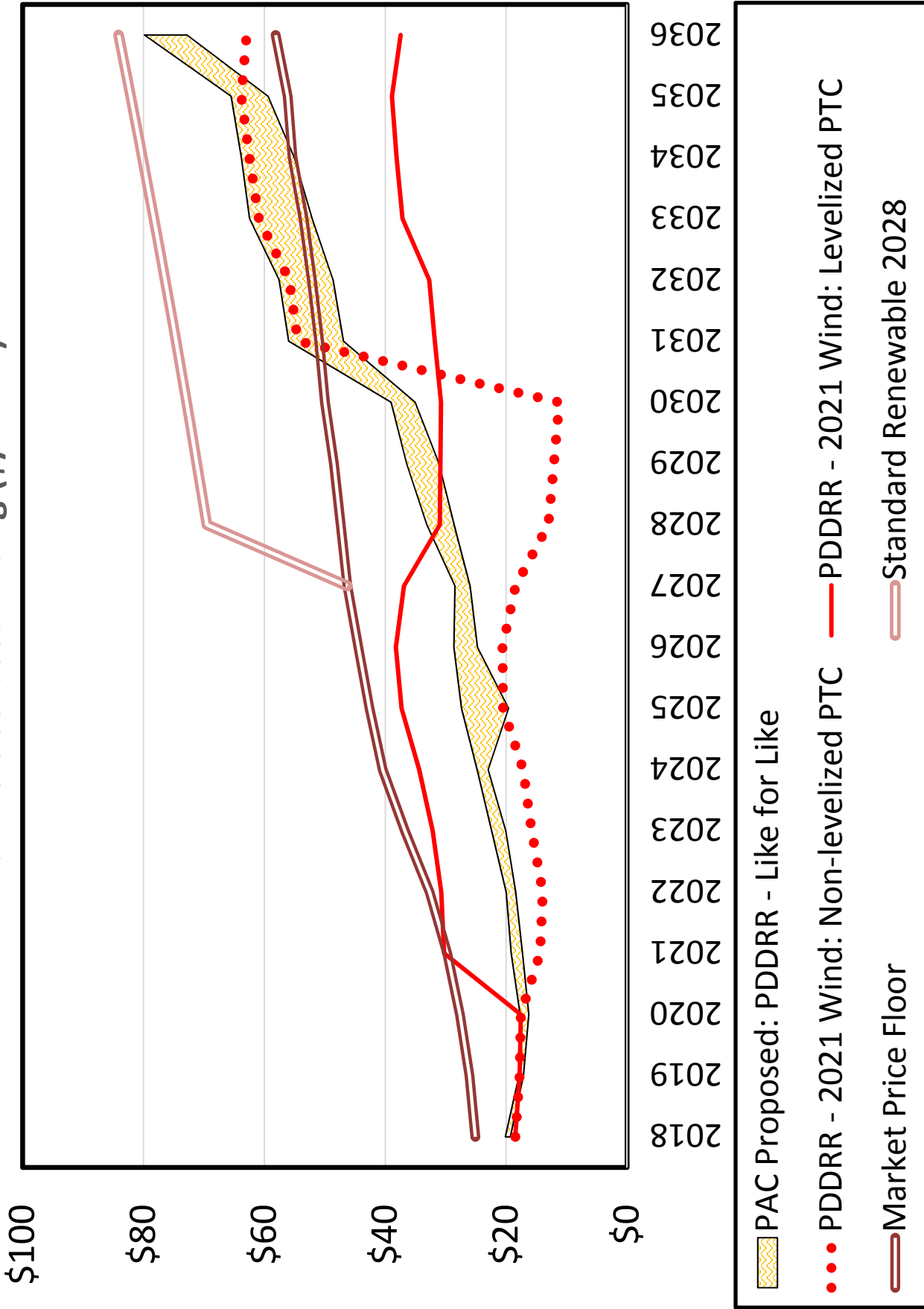
August 2017

Solar Avoided Cost Pricing (\$/MWh)



- PAC Proposed: PDDRR - Like for Like
- PDDRR - 2021 Wind
- PDDRR - 2021 Wind: Levelized PTC
- Market Price Floor
- Standard Renewable 2028

Wind Avoided Cost Pricing (\$/MWh)



Biomass Avoided Cost Pricing (\$/MWh)

